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School of Business

Strategic Finance and Business Analytics

Petra Rauniala

WORKING CAPITAL MANAGEMENT IN THE FINNISH FORESTRY INDUSTRY

1st Supervisor: Professor Mikael Collan

2nd Supervisor: Postdoctoral researcher Azzurra Morreale

ABSTRACT

Author:	Petra Rauniala
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Main objective of the thesis is to build a coherent view and understanding of the working capital management in general. The study aims to discover the actual state of working capital management within Finnish forestry companies and investigate whether the companies follow a clear strategy while managing working capital.

The quantitative data of the study is gathered from S&P Capital IQ and qualitative data is collected through half-structured theme interviews from one Finnish forestry company.

This thesis provided information on how Finnish companies are managing their working capital compared to their global competitors. It was shown that the Finnish companies seemed to be the only location with a clear trend of optimization. However, it was shown that the Finnish companies started with the highest working capital ratios. Additionally, the interviews revealed common concerns related to increasing trend of using financial instruments in the market while managing working capital instead of searching for sustainable improvement solutions. Furthermore, it was noticed that the opportunities provided by IT have not been fully exploited.

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Tämän tutkielman tavoite on rakentaa kattava kuva ja ymmärrys käyttöpääomaan hallinnasta yleisesti. Tutkielma pyrkii selvittämään mikä on käyttöpääoman hallinnan nykyinen asema suomalaisissa metsäteollisuusyrityksissä ja onko yrityksillä käytössään selkeä strategia hallitessaan käyttöpääomaa.

Kvantitatiivinen aineisto on kerätty S&P Capital IQ – tietokannasta ja kvalitatiivinen aineisto kerättiin puoli-strukturoitujen teemahaastatteluiden avulla eräässä suomalaisessa metsäteollisuusyrityksessä.

Tämä tutkielma tarjoaa tietoa siitä, että miten suomalaiset yritykset hallitsevat käyttöpääomaansa verrattuna globaaleihin kilpailijoihinsa. Tulokset osoittivat, että suomalaiset yritykset vaikuttivat olevan ainoita, joissa näkyi selkeä trendi käyttöpääoman optimoinnista. Kuitenkin, tulokset osoittivat, että suomalaiset yritykset aloittivat korkeimmista käyttöpääoman tunnusluvuista. Lisäksi, haastattelut paljastivat yleisen huolenaiheen liittyen käyttöpääoman hallinnan rahoitusinstrumenttien lisääntyvään käyttöön markkinoilla kestävien parannusratkaisujen etsimisen sijaan. Lisäksi, tulokset osoittivat, että IT:n tarjoamia mahdollisuuksia ei ole täysin hyödynnetty.

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Contents

1. Introduction.....	9
1.1. Motivation and objectives.....	11
1.2. Research questions	12
1.3. Literature review	13
1.4. Research methodology	17
1.5. Theoretical framework.....	17
1.6. Focus of the study.....	18
2. Working capital	21
2.1. Working capital definitions	23
2.2. Measuring working capital.....	24
2.2.1. Working capital ratios	24
2.2.2. Cash conversion cycle (CCC).....	25
3. Determinants of working capital.....	28
3.1. Inventories	28
3.1.1. Just-in-time and zero-inventory essentials.....	31
3.1.2. Economic order quantity (EOQ).....	31
3.1.3. Periodic Review Inventory Policy.....	32
3.1.4. Production smoothing and buffer-stock model.....	32
3.2. Trade credit.....	33
3.2.1. Finance motive	36
3.2.2. Transaction cost	36
3.2.3. Cost advantage.....	37
3.2.4. Price discrimination.....	37
3.2.5. Quality guarantees and marketability.....	38
3.2.6. Tax advantage	39

3.3. Advance payments	39
4. Working capital management strategies.....	41
4.1. Traditional view	43
4.2. Modern view.....	44
4.3. Working capital optimization	45
4.3.1. Inventory management	46
4.3.2. Management of trade credit	47
4.3.3. Other solutions for working capital optimization.....	49
4.4. Challenges in Working Capital Management	51
5. Research methodology.....	54
6. Data-based analysis of working capital strategies	56
6.1. Data collection and methodology	56
6.2. The results from data-based analysis	58
6.2.1. Measuring working capital strategy choices.....	58
6.2.2. Cash conversion cycle	60
6.2.3. Determinants of cash conversion cycle	63
6.2.4. Working capital and EBIT margin	69
6.3. Summary of the main findings of the data-based analysis.....	71
7. Analysis of interview data from Finnish forestry company	74
7.1. Collection of qualitative data	74
7.2. Results from the interviews	75
7.2.1. Strategy	76
7.2.2. Commitment	78
7.2.3. Challenges.....	80
7.3. Summary of the main findings.....	82
8. Discussion and conclusions.....	84
8.1. Summary of the findings	84

8.2. Discussion of the conclusions	88
8.3. Limitations to the interpretability of the results	89
8.4. Further research questions	90
Bibliography	92
Appendices	100
Appendix 1. Quantitative data.....	100
Appendix 2. The half-structured theme interview.....	104

List of Figures

Figure 1. Framework of the study.....	17
Figure 2. Structure of the study.....	19
Figure 3. Framework of financial management, adapted from (Kytönen, 2004)....	21
Figure 4. Illustration of the different working capital definitions, adapted from (Talonpoika, 2016)	23
Figure 5. Economic order quantity (EOQ) – reorder point (ROP) adapted from Vrat (2014).....	31
Figure 6. Periodic review inventory adapted from Vrat (2014)	32
Figure 7. Optional replenishment adapted from Vrat (2014)	33
Figure 8. Trade credit relationships (adapted from Petersen and Rajan (1997) and Ferrando and Mulier (2013).....	35
Figure 9. Working capital management strategies (adapted from Meszek & Polewski, 2006).....	42
Figure 10. Working capital management focus areas, adapted from PwC (2014)	46
Figure 11. Bullwhip effect (adapted from Towill & McCullen (1999)	52
Figure 12. Method triangulation adapted from Creswell 2012	55
Figure 13. Working capital strategy 2006.....	59
Figure 14. Working capital strategy 2015.....	59
Figure 15. Share of current assets of total assets	60
Figure 16. Average cash conversion cycle by locations.....	61

Figure 17. Average days inventory outstanding by locations	63
Figure 18. Average days sales outstanding by locations	65
Figure 19. Average days payables outstanding by locations	66
Figure 20. Average cash conversion cycle determinants: Finland	68
Figure 21. Average cash conversion cycle determinants: Other	68
Figure 22. Average cash conversion cycle determinants: Europe.....	69
Figure 23. Operational working capital percentage and EBIT margin: Finland	70
Figure 24. Operational working capital percentage and EBIT margin: Europe.....	70
Figure 25. Operational working capital percentage and EBIT margin: Other	71

List of Tables

Table 1. Previous literature	16
Table 2. Summary of the companies.....	57
Table 3. Average cash conversion cycle and change %	62
Table 4. Average days inventory outstanding and change %	64
Table 5. Average days sales outstanding and change %.....	65
Table 6. Average days payables outstanding and change %.....	67
Table 7. Summary of the conclusions from data based analysis.....	72
Table 8. Summary of the conclusions from the qualitative analysis	82
Table 9. Most important lessons learned	89

1. Introduction

Interest towards working capital management increased after the financial crisis on 2008. A research from Danske Bank and Ernst & Young (2009) revealed that the Nordic companies have started to pay attention for working capital management during the financial crisis. The liquidity levels in Nordic companies decreased during the financial crisis due to lower demand for products and services and thus over 30 % of payments were paid late. Decreased demand for products forces companies to adjust their production and inventory levels, however based on the research, actions were taken too late. The inventories had grown too large and there was too much capital tied up which decreased the liquidity levels. The research highlights the fact that the importance of forecasting demand has grown. It is considered to be important for companies to keep the inventories on adequate level at the correct time and the correct place.

A global survey by PwC (2015) also stated that companies were too slow in responding to declining sales which resulted in excess inventory during the financial crisis. With effect from the financial crisis, the working capital management has gained more and more attention and the companies have realized that optimizing the working capital is crucial. Based on a global survey done by PwC, working capital has increased marginally from 2010 to 2013. Nevertheless, in 2014 there was a significant improvement when the working capital decreased by 2.9 % which brought working capital to the same levels where it was before the crisis. (PwC, 2015)

Previously, the corporate finance literature has typically focused on investigating the long-term financial decisions and left short-term decisions with less attention. The main focus has been in analyzing investments, capital structure, dividends and company valuation. However, in many industries, the short-term assets and the resources which have a maturity of less than one year represent a great amount on a company's balance sheet. (García-Teruel & Martínez-Solane, 2015) Lately the interest towards working capital has evolved and the general attitude within investors towards increasing trend in working capital has become more unfavorable and critical. Often increased working capital tends to signal challenges

in business since capital might be tied up to the finished products inventory and there might not be any movement in it since the demand for these products has decreased. However, due to the decreased demand of products, inventories require more capital and might increase the company's net debt. Increased working capital thus has a negative influence on return on assets and return on equity ratios.

Working capital measures the efficiency and short-term financial health of a company. In other words, it measures how much cash a company has available for its daily operations. Working capital management is an important subject due to the fact that with efficient working capital management a company can ensure its liquidity, improve profitability and add value for shareholders (Shin & Soenen, 1998) (Raheman & Mohamed, 2007) (Deloof, 2003). Shareholder value is enhanced with reduced working capital since released cash can be used for other purposes like investments, dividends or company acquisitions (PwC, 2015).

There is a significant negative relationship with reduced working capital and profitability which means that with an optimally reduced working capital level profitability of the firm increases (Deloof, 2003) (Lazaridis & Tryfonidis, 2006) (Shin & Soenen, 1998) (Banos-Caballero, et al., 2010). However, it can be quite challenging to determine the optimal level of working capital. The relationship between reduced working capital and profitability means that while working capital decreases, profitability tends to increase. Nevertheless, when working capital is reduced too low levels it increases the risks of stock-outs and consequently reduce profitability. Conversely, increasing working capital means that more capital is tied up to inventories and accounts receivables which increase the risks of illiquidity and even bankruptcy, but the same actions might have a boosting impact on sales. It can be quite a challenge for companies to determine the optimal level of working capital since it changes between industries. Companies have to balance between decisions related to liquidity versus profitability and risk. Working capital management is crucial since with efficient working capital management a prominent competitive advantage might be achieved. Consequently, with inefficient working capital a company might face disastrous losses or even a bankruptcy.

1.1. Motivation and objectives

Prior literature has focused on studying the effect between working capital management and profitability in different industries and in different sized businesses. Some research papers explain the determinants of working capital through a quantitative analysis. However, there seems to be a gap within the previous literature for a few reasons. First, it seems that the factors affecting to working capital have not been studied from qualitative perspective at all. Second, there has been no research on the actual state of working capital management and whether companies follow a clear strategy. Additionally, working capital management is extremely important for industrial sector since they often have large assets and cash tied to inventories. However, there seems not to be any studies which focused on Finnish forestry industry which are actively managing their working capital in order to remain competitive.

Forestry industry is a natural choice to be studied from working capital management perspective due to few different reasons. First, as mentioned above working capital and its management are extremely important for forestry industry along with other industrial companies since they are more capital intensive and vulnerable for swings in the economy. (PwC, 2014). In order not to have money tied into inventories companies need to actively think ways that would decrease the inventory levels and keep the capital ongoing. In companies which are run inefficiently, cash does not flow freely and gets tied into working capital and thus prevents company from growing. Second, forestry industry has always been an important export industry for Finland. Thus, based on the latest press release from Metsäteollisuus, in 2015 forestry industry became the largest export industry in Finland. Forestry industry's exports were 21.7 % from the total export amount and the increase was mostly based on the increase in demand related to pulp and cardboard. (Metsäteollisuus, 2016) Third, digitalization has had a great effect on the forestry industry and it is interesting to see the forestry industry's development from pure paper and wood industry towards bio-economic products' industry. Since many forestry companies are currently going through the development from the traditional paper production to bio-economic products production, they have to

be able to grow and expand their businesses, which may be enhanced by well managed working capital.

A research from PwC (2014) reveals that it is often assumed that the Nordics are strong in working capital management. However, in reality this is not the case since the average working capital performance is worse than outside the Nordics. The Nordics have about the highest days of working capital after the Middle East and India. During the past years working capital performance has weakened by 4% in the Nordics and this is mainly due to worse performance with accounts receivables. In addition, inventory management has not improved. However, payables give us a glimmer of hope since there the Nordics have been able to do some improvements. Although, the development in the Nordics has not been successful, Finnish companies have been able to improve working capital which is due to fact that there has been a significant drop in their revenues which has led to the situation that companies were forced to focus more on cash flow management in order to find new solutions of future growth.

1.2. Research questions

This study aims to fill the gap in existing literature by studying working capital management within Finnish forestry industry. Main objective of the thesis is to build a coherent view and understanding of the working capital management in general and find out the actual state of working capital management and how the management is conducted. The study aims to discover what the relative size of the working capital management is and is there a clear strategy for managing working capital. Other interests of the study focus on analyzing the factors affecting to working capital and discovering the most important factors which complicate the estimation of optimal working capital level and solutions for tackling these problems will be developed. These factors lead to the main research question:

“To which extent working capital is managed within Finnish forestry companies?”

Due to the fact that the main question is as such is wide, it has been divided into following sub-questions:

Q1: Do Finnish forestry industry companies follow a clear strategy with long-term targets while managing working capital?

Q2: Are the objectives of the working capital management known across the company and are personnel committed to them?

Q3: What are the main challenges in managing working capital and how companies tackle them?

1.3. Literature review

Prior literature has been focusing on mainly into profitability, determinants of working capital and supply chain financing. Additionally, all these subjects have had different limitations like industry, geographical location and SMEs.

The most popular subject within researchers has been the relationship between working capital and profitability. Shin & Soenen (1998) were one of the first who discovered that there is a negative relationship between CCC and profitability. They studied listed American companies within a period of 1975-1994. Negative relationship between CCC and profitability means that value can be created for shareholders by reducing CCC to a reasonable minimum. This discovery was supported by Deloof (2003), Lazaridis & Tryfonidis (2006) and Garcia-Teruel & Martinez-Solane (2007) whose data was gathered from Belgian companies, listed Greek companies and Spanish SMEs. In addition, Eljelly (2004) found out that there is a significant negative relationship between liquidity and profitability.

Another popular subject within the field of working capital has been the determinants of working capital and especially the accounts receivables and trade credit. Long et al. (1993) studied a determinant of working capital, trade credit and whether it helps to separate high- and low-quality products from each other. In addition, they studied the financing motives for trade credit. After that, Deloof & Jegers (1996) studied also trade credit and its effect on product quality. In their study they begin with the idea that the customers can assess the product quality before paying by allowing them to buy with credit. Trade credit and credit policy choices were examined by Ng. et al. (1999) from a different perspective. They studied whether companies extend credit or do they require cash payments and also if credits were extended, whether companies adopted simple net terms or do they have discounts for early payments. Petersen & Raghuram (1997) studied trade credit within SMEs with limited access to capital markets and found that

companies tend to use more trade credit when there is no possibility to receive credit from financial institutions.

There was only a little research done which were fully focused on factoring or supply chain financing. Carlsson & Rönnqvist (2005) studied supply chain management in forestry industry through a Swedish case company Södra Cell AB. In their study they described projects which focused on improving supply chain management and optimization. Randall & Farris II (2009) aimed to reveal how techniques like cash-to-cash and shared weighted average cost of capital might improve supply chain profitability and performance. Additionally, Soufani (2001) studied the role of factoring in small businesses and the profiles of the firms using it. He discovered that the youngest and smallest businesses were not able to receive factoring services while larger businesses had less need for factoring services. Factoring services were only focused on a few different sectors.

There are also studies that have focused on studying Working Capital within specific geographical location or within some industry. As in this study focuses on Finnish forestry industry it is important to highlight research from Enqvist et al. (2014). They studied the impact of working capital management on firm profitability within different business cycles with evidence from Finnish companies. Previous research also includes two different papers related to paper industry and they both gathered their evidence from India. Panda (2012) studied the gross and net working capital and their relationship with sales between 1999 and 2008. Study from Ramachandran & Janakiraman (2009) focused on analyzing the connection of Working Capital Management Efficiency and EBIT between years 1997 and 2006.

Some studies focused on studying working capital within SMEs like already mentioned García-Teruel & Martínez-Solane (2015) and Soufani (2001). In 1996 Peel & Wilson were one of the first ones to study working capital management in SMEs. They found that from the small firms, high proportion claimed to use quantitative capital budgeting and working capital techniques. They also mentioned being active in reducing inventory levels in order to improve working capital. Later, working capital management in SMEs was also studied by Banos-Caballero, et al. (2010) and they highlighted the fact that efficient working capital

management is crucial for SMEs and due to that worth studying more carefully. Their focus is on the determinants of CCC for SMEs.

The most important studies have been gathered to the Table 1 and represented shortly.

Lately, there has been an increase in the Finnish research related to working capital management and its subsections. Especially the professors and doctoral students of Lappeenranta University of Technology have given more attention to working capital management, cash conversion cycle and especially to the factors of supply chain financing.

Table 1. Previous literature

Author	Year	Article	Introduction	Result
Deloof, M.	2003	Does Working Capital Management Affect Profitability of Belgian Firms?	Deloof studied the relationship between WCM and profitability with a sample of 1009 large Belgian non-financial companies during a period of 1992-1996.	Profitability can be increased by reducing the number of days accounts receivables and inventories.
García-Teruel, P. & Martínez-Solano, P.	2007	Effects of working capital management on SME profitability	García-Teruel & Martínez-Solano studied whether there is a relationship between WCM and profitability with a sample of 8 872 SMES during a period 1996-2002.	Profitability of SMEs can be enhanced by reducing their inventories and the number of days their accounts are outstanding, i.e. profitability increases when CCC is shortened.
Lazaridis, I. & Tryfonidis, D.	2006	The relationship between WCM and profitability of listed companies in the Athens Stock Exchange	Lazaridis & Tryfonidis studied the relationship of WCM and corporate profitability using a sample of 131 listed companies from Athens Stock Exchange from the period of 2001-2004.	They found a statistically significant relation between profitability and CCC. Profits can be increased by handling CCC correctly and keeping each determinant of CCC in an optimal level.
Shin, H. & Soenen, L.	1998	Efficiency of Working Capital Management and Corporate Profitability	Shin & Soenen studied the relationship between a company's profitability and net trade cycle. The sample included 58 985 companies within period of 1975-1994.	They found that in all cases there exists a strong negative relationship between profitability and net trade cycle. Additionally, shorter net trade cycles lead to higher risk-adjusted stock returns.
Ng, C., Smith, J. & Smith, R.	1999	Evidence on the Determinants of Credit Terms Used in Interfirm Trade	Ng, Smith & Smith studied the companies' credit policy choices and whether they extend credit or require cash payments. Additionally, if credits were extended they studied that is it adopted with simple net terms or terms with discounts for a quick payment. The data was gathered from a survey of the credit managers from 2 538 different companies.	The results indicated that the research supports theories where credit terms act as contractual solutions to asymmetry problems concerning product quality and buyer creditworthiness.
Eljelly, A.	2004	Liquidity - profitability tradeoff: An empirical investigation in an emerging market	Eljelly studied the relationship between profitability and liquidity, which were measured with current ratio and CCC within a sample of 29 joint stock companies in Saudi-Arabia during 1996-2000.	Results revealed that there is a significant negative relationship between profitability and liquidity. He also found out that current ratio tends to be the most important measure of liquidity that affects profitability. However, within some sectors CCC tends to be more important measure of liquidity that affects profitability.
Petersen, A. & Raghuram, G.	1997	Trade Credit: Theories and Evidence	Petersen & Raghuram studied theories of trade credit with empirical tests with a sample of 3 404 small companies whose access to capital markets may be limited during a fiscal year 1988.	They found out that supplier might have a financial advantage when the counterparty company is financially troubled. They found evidence that trade credits can be offered as a means of price discrimination.
Long M., Malitz, I. & Ravid S.	1993	Trade Credit, Quality Guarantees and Product Marketability	Long, Malitz & Ravid studied theories of trade credit and focused on the supplier decision to extend trade credit and developing a model reflecting influences on supply and demand. Their sample consisted from 356 industrial companies including data from years 1985-1987.	They concluded that the results are in line with the theories of quality controls (companies extend trade credit if their product quality assessment related to their products is more time consuming) and operational theory of trade credit (companies with varying demand tend to extend trade credits more than companies with stable demand). However, their evidence is inconsistent with the financial and liquidity theories.

1.4. Research methodology

Empirical section is carried out with method triangulation since the phenomena is studied by investigating both quantitative and qualitative analysis. Quantitative analysis is carried out by investigating financial data retrieved from S&P Capital IQ. The data includes financials from global forestry companies during 2006 and 2015. The data is studied by investigating different ratios commonly used within the working capital field and these ratios are introduced in the chapter 2.2 Measuring working capital. The data is represented in more detail in the chapter 6.1 Data collection and methodology.

The qualitative section includes an analysis of interview data from one Finnish actor from the forestry field. The data has been collected from half-structured theme interviews including employees in different positions. All the interviewed employees work with working capital to some extent and have a wide knowledge of working capital management. The details of qualitative data collection are represented in more detail in the chapter 7.1 Collection of qualitative data.

1.5. Theoretical framework

The theoretical framework expresses the structure and theoretical key concepts of the study, see Figure 1.

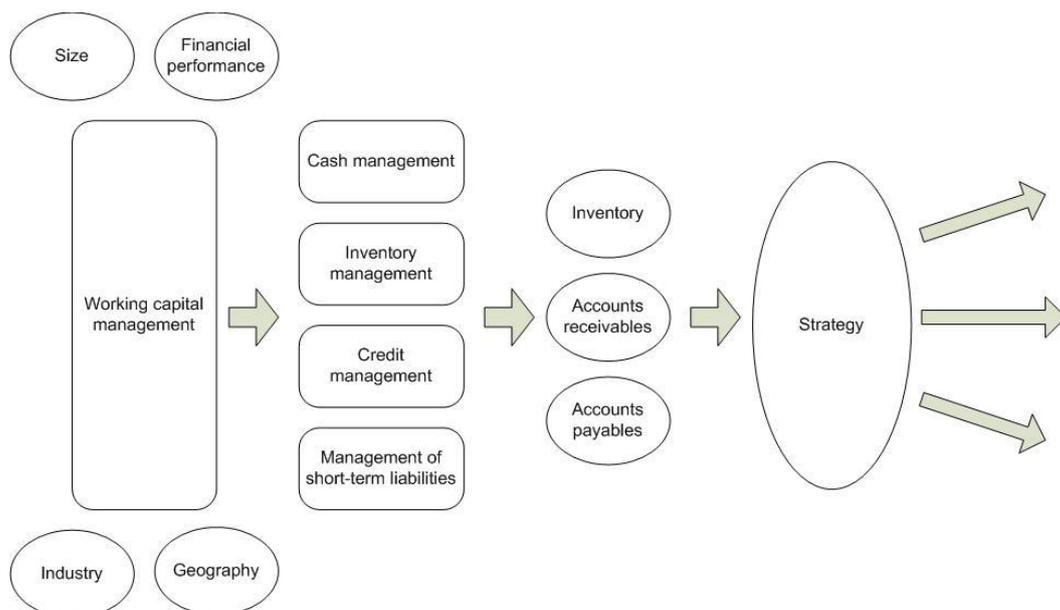


Figure 1. Framework of the study

The framework emphasizes the working capital management theories and outside factors affecting to the working capital requirements. Outside factors driving working capital requirement concern with the type of business, the economic maturity of the region, the size of the company and the company's concern related to cash. The context of the thesis is Finnish forestry industry since it is analyzed through both quantitative and qualitative data. In the quantitative section Finnish forestry company data is compared to their global competitors whereas in the qualitative data interviews from one Finnish forestry company are analyzed. The thesis studies the phenomenon of working capital management through a strategic company perspective.

1.6. Focus of the study

Previous section revealed that there seems to be some areas and perspectives which have not yet been fully investigated. Since this study aims to fill a gap in existing literature, it will face some important limitations. Many studies focused on explaining the importance of working capital management by studying its effect on profitability of the companies. Since the relationship has been proved by many researches, future studies can focus on investigating factors of working capital more deeply. Additionally, a very few of the studies seems to have focused on investigating the relationship between strategy and working capital management. Due to the gaps in previous literature this study will focus on investigating the strategy behind working capital decisions within Finnish forestry industry.

First, the most important limitation of the study is that only forestry companies' working capital management strategies are investigated. Second, the study will have a geographical focus on Finnish forestry industry. The quantitative analysis includes companies all around the world but the main focus will be on comparing the Finnish actors against other competitors. Additionally, the qualitative analysis includes data only from a Finnish forestry company. Third, the study will focus on large multinational companies. Although, this decision will be inconsistent with the fact that working capital management and liquidity is especially crucial for SMEs. In addition to the limitations mentioned above, this study focuses mainly on the operational side of working capital which means analysis on determinants of working capital such as inventories, receivables and payables.

The study includes four main sections: introduction, theoretical section, empirical section and conclusions and are structured as represented in Figure 2.

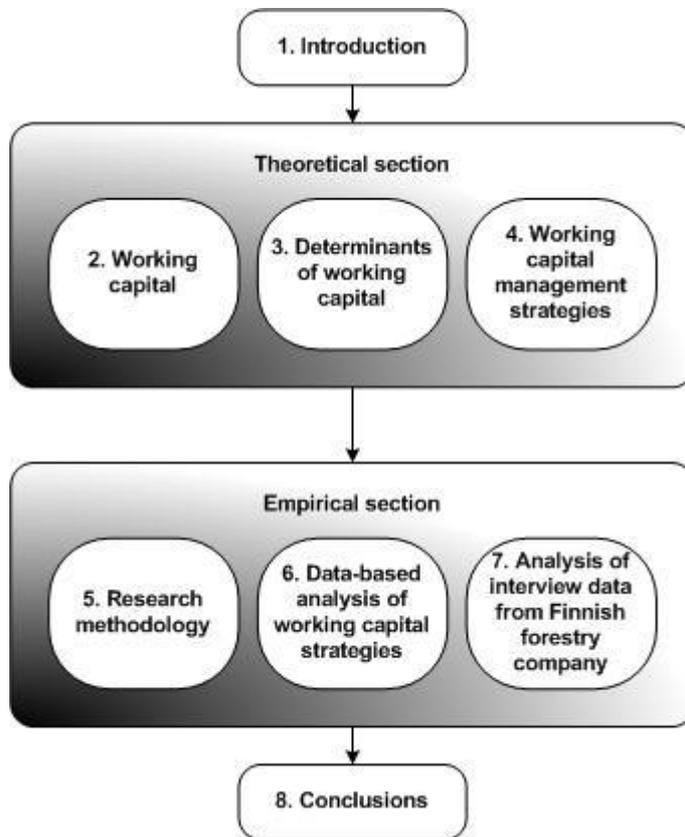


Figure 2. Structure of the study

The first chapter of the thesis familiarizes the reader to the working capital management by introducing background of the subject and most important prior literature. The first chapter then continues by introducing the motivation for the study and the research questions and the methodology. Furthermore, the theoretical framework is presented. At the end of the chapter the focus of the study including limitations and positioning of the study are discussed.

The theoretical section introduces the key concepts of working capital management through three different chapters. The second chapter of study aims in building a coherent view of working capital management by explaining the definitions and the measurement of working capital. The third chapter focuses on explaining determinants of operational working capital whereas the fourth chapter introduces different strategies of managing working capital and represents challenges in managing working capital and solutions for tackling these problems.

The empirical section begins with the fifth chapter which includes a presentation of the research methodology of the thesis. The sixth chapter discusses the results of the data-based analysis from the global competitors whereas the seventh chapter focuses on explaining the results from the interview data, which are presented through the themes introduced in the theoretical section.

Finally the eighth chapter concludes the thesis by summarizing the main findings and providing future research ideas.

2. Working capital

Working capital management is a significant part of the overall corporate strategy and thus it is an important factor of financial management. Financial management aims in managing a company's resources in a way that it achieves its short-term and long-term objectives and maximizes the value for shareholders. Since financial management involves managing a company's assets, liabilities, revenues, profitability and cash flow, it can be divided into management of long-term assets (capital budgeting), management of short-term assets and liabilities (working capital management) and management of long-term capital (capital structure) as in Figure 3. Furthermore, working capital management can be divided into cash management, inventory management, credit management and management of short-term liabilities, see Figure 3. (Kytönen, 2004)

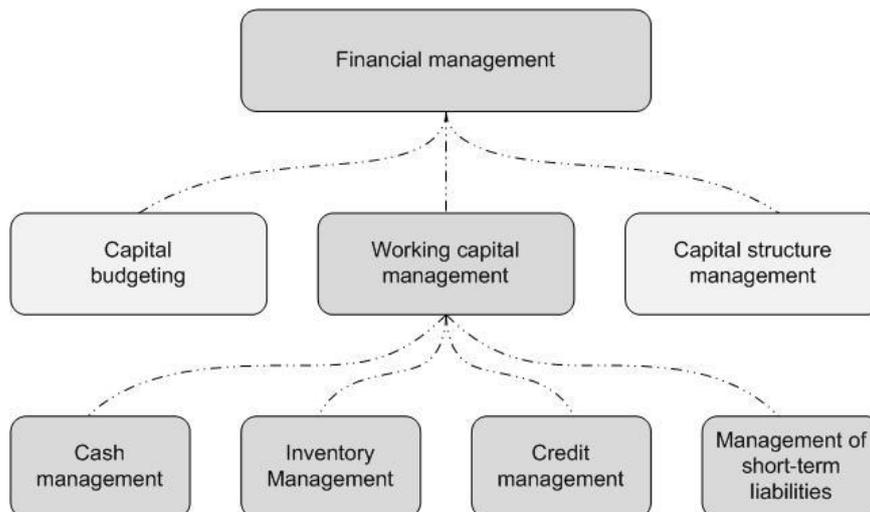


Figure 3. Framework of financial management, adapted from (Kytönen, 2004)

Cash management aims to guarantee that a company can meet its payments and other obligations on time and ensures that the company is financially stable and solvent. Efficient cash management increases the liquidity of the company and the need for external financing decreases. Efficient cash management requires that decisions can be made systemically with a prompt schedule. Additionally, cash management has to maintain correct up-to-date information on cash flow forecasts and bank account balances. (Nordea, 2016)

Inventory management means overseeing and controlling of the ordering, storage and use of inventory. Inventory includes components that are still used in production like raw materials and work-in-progress whereas finished products represent already finished production which await for a delivery for a customer. Inventory is one of the company's largest assets and they tie up money until the product is sold from inventory. Additionally, storing, tracking and insuring inventory causes costs for the company.

International credit insurance and surety association defines credit management as managing the credit risk of accounts receivable and it focus on ensuring that buyers pay on time, credit costs are kept on low levels and poor debt payments are received without damaging relationship with the buyer (ICISA, 2016). In addition management of short-term liabilities refers to management of accounts payable. Short-term liabilities refer to company's obligations that are due within one year and often the largest item is accounts payable.

Liquidity is strongly related to working capital since when there are plenty of capital tied up in assets, risk of insolvency increases. Liquidity means the ability to convert assets into cash and consequently, cash is treated as the most liquid asset while machinery is treated as illiquid. Although, companies should have enough liquidity to manage their day-to-day operations carrying excessively unoccupied cash is not in favor of the shareholders since the cash should be invested profitably or paid out as dividends. Hence, having excessive liquidity tends to lower profitability and thus creates a tradeoff between liquidity and profitability. (Eljelly, 2004)

In addition to the fact that working capital management affects the liquidity and profitability of the company, there are also other reasons for its importance. First, working capital management deals with current assets and current liabilities and for many manufacturing companies current assets often account for over half of its total assets. Managing of the current assets is important due to the fact that excessive levels of current assets can have a negative impact on the return on investment and the company might realize a substandard return on investment. (Raheman & Mohamed, 2007) Second, working capital management is crucial since low levels of current assets are not favorable either due to the possibility of

shortages and challenges in maintaining smooth operations. With efficient working capital management, planning and controlling current assets and current liabilities, the risk of inability to meet short-term obligations can be eliminated. (Eljelly, 2004)

2.1. Working capital definitions

Net working capital is calculated as Current assets less Current liabilities, see Figure 4. However, working capital can be broken down to different categories which are; financial working capital items such as cash and investments and operational working capital items such as inventories and receivables. Traditionally, the financial side of working capital has gained more attention than operational side and there are studies related to liquidity and cash management available. However, the operational side tends to fraction a larger amount of the total assets than the financial side and in other words the operational side ties up more capital.

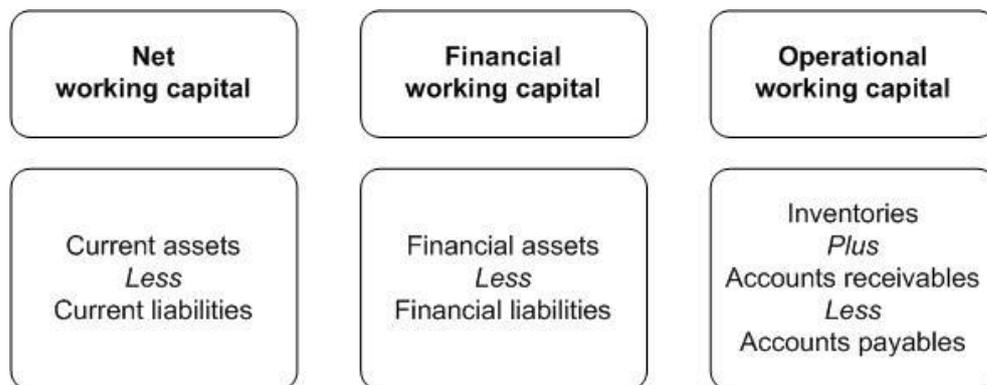


Figure 4. Illustration of the different working capital definitions, adapted from (Talonpoika, 2016)

Net working capital is defined as current assets less current liabilities, see Figure 4 (Eljelly, 2004). Current assets represent assets that can be converted into cash within one year and it includes following accounts: cash and cash equivalents, inventory, accounts receivable, marketable securities, advance payments and other liquid assets. Current liabilities refer to obligation that must be paid within one year and include accounts: short-term debt, accounts payable, accrued liabilities and other debts. Since net working capital includes both financial and operational items, both financial and operational working capital can be separated from the definition. Operational working capital refers to the assets which are tied

up on the day-to-day operations of a company and illustration of the calculation is available in Figure 4.

2.2. Measuring working capital

This section represents often used measures of working capital and liquidity. These measures and key ratios are used by researchers, investors and companies themselves. Measures of working capital could be divided into three categories depending on what kind of measure they are: position measures, leverage measures and activity measures. On the other hand, the measures can be classified depending on what they are measuring: net working capital measures, financial working capital measures and operational working capital measures. In order to clarify the connection between these two different categorization views, position measures are used to measure net working capital, leverage measures for financial working capital and activity measures for operational working capital. (Talonpoika, 2016)

Due to the criticism towards liquidity ratios (position measures) the researchers have concluded that liquidity in a company should rather be measured by its operating cash flow generated by its assets than based on the liquidation value of its assets. Operational working capital is often measured with cycle times or turnover times (Filbeck & Krueger, 2005). Operational working capital measures like cycle times or turnover times measure the efficiency of working capital management and are designed facilitating managerial decision-making (Talonpoika, 2016). Since the study focuses on only the operational working capital measures, only these measures will be introduced shortly.

2.2.1. Working capital ratios

Working capital turnover is probably the most well know working capital ratio and it describes how a company uses net working capital in order to create sales. In this study operational working capital turnover is measured as in Equation (1). Working capital turnover measures the efficiency of working capital management and the higher the ratio, the more efficient is the management of working capital. Working capital ratio is also recommended to benchmark against companies within the same industry. (Keythman, 2013)

$$\begin{aligned} \text{Operational working capital turnover} & \quad (1) \\ & = \frac{\text{revenues}}{\text{operational working capital}} \end{aligned}$$

Working capital percentage is an inverse ratio of working capital turnover. It aims at explaining which fraction of sales is used to finance net working capital. (Lohrey, 2013)

$$\begin{aligned} \text{Working capital percentage} & \quad (2) \\ & = \frac{\text{Operational working capital}}{\text{revenues}} \end{aligned}$$

2.2.2. Cash conversion cycle (CCC)

Richards & Laughlin (1980) were one of the first ones to introduce the concept of cash conversion cycle and the general definition of cash conversion cycle is defined as the number of days from the time when the company pays for its purchases of raw materials until the time the company collects payments of its sales of finished products. In other words it is the time lag between buying the raw materials from supplier and receiving the payments from its customers (Deloof, 2003). S&P Capital IQ defines average cash conversion cycle as in equation (3).

$$\text{Avg. CCC} = \text{Avg. DSO} + \text{Avg. DIO} - \text{Avg. DPO} \quad (3)$$

Thus, in order to calculate CCC, the formulas for days sales outstanding (DSO), days inventory outstanding (DIO) and days payables outstanding (DPO) has to be known. S&P Capital IQ defines them as in equations (4), (5) and (6).

$$\begin{aligned} & (\text{accounts receivable } (t) + \text{accounts receivable } (t - 1)) / 2 \quad (4) \\ \text{Avg. DSO} = & \frac{\text{Revenues} * (\text{Number of Days in the Period})}{\text{Revenues} * (\text{Number of Days in the Period})} \end{aligned}$$

$$\text{Avg. DIO} = \frac{(\text{inventory } (t) + \text{inventory } (t - 1))/_2}{\text{cost of goods sold} * (\text{Number of Days in the Period})} \quad (5)$$

$$\text{Avg. DSO} = \frac{(\text{accounts payable } (t) + \text{accounts payable } (t - 1))/_2}{(\text{cost of goods sold} - \text{inventory } (t) + \text{inventory } (t - 1)) * (\text{Number of Days in the Period})} \quad (6)$$

Working capital management involves a tradeoff between profitability and liquidity which means that decisions related to increasing working capital tend to increase profitability and risk. Since a large amount of capital is tied up in current assets, which means that a company could face some illiquidity problems. Conversely, decisions related to reducing working capital tend to reduce risks since less capital is tied up in current assets, which means that liquidity of the company improves. In addition to the reduced risks, optimally minimized working capital tends to reduce profitability. This is why cash conversion cycle is preferred factor in working capital management. Cash conversion cycle reflects decisions on how much to invest in the customer and inventory accounts and represents the average days between the date when a company must start paying for its suppliers and the date when payments are received from its customers. (García-Teruel & Martínez-Solane, 2015)

Later in 1990s Gentry et al. (1990) developed an advanced version of the cash conversion cycle, which was called weighted cash conversion cycle. In weighted cash conversion cycle the timing is scaled by the amount of capital in each step of the cycle. The amount of capital in each step divided by the total value of each step represents the weights. The weighted cash conversion cycle thus is more advance version of cash conversion cycle since it takes into account both the days and the amount of capital that is tied up at each step of the cash cycle. (Shin & Soenen, 1998) Even though the weighted cash conversion cycle brings more information, traditional cash conversion cycle is more often used in studies due to that fact that there is more information needed in order to analyze the weighted

cash conversion cycle. However, both measures are analyzed in the same way that the longer the cash conversion cycle, i.e. the time lag between the date when raw materials are paid for the supplier and the date when cash is collected from the customers, the larger is the investment in working capital. When cash conversion cycle becomes shorter, working capital decreases. Furthermore, when cash conversion cycle is reduced to its reasonable minimum, shareholder value increases. (Shin & Soenen, 1998)

3. Determinants of working capital

Cash conversion cycle's different components can be managed with different strategies. Working capital can be managed in order to enhance the growth of the company or maximize the profitability of the company depending on the target set by the company. In order to understand the different strategy choices of working capital management it is crucial to know the determinants of working capital. Working capital is divided to these components; inventory, accounts receivables and accounts payables, which are represented in more detailed level in this chapter.

Companies tend to focus on different determinants of working capital. Lazaridis & Tryfonidis (2006) noticed that there were differences between companies focusing on cash management, stock management and credit management. Larger companies with fewer sales and more seasonality tend to have more cash flow problems and thus focus on cash management. On the other hand, smaller companies tend to focus on stock management while less profitable companies focus on credit management. Based on their study it was suggested that companies targeting on high growth should limit their credit policy towards and not be too generous since their capital is more tied up in their inventories. Nevertheless, while growing they will strengthen their relationship with the suppliers and be able to negotiate better terms on their payables which increase their accounts payables. (Lazaridis & Tryfonidis, 2006)

Traditionally working capital only includes inventories, accounts payables and accounts receivables. However, paid and received advance payments can often be important determinants of working capital. In order to manage working capital efficiently the company has to recognize the components important for itself. (Talonpoika, et al., 2014)

3.1. Inventories

Inventories are one of the main items in working capital and it includes raw materials, work in progress, finished goods and other inventories. Raw materials are materials which are needed in the production of finished products. Work in progress includes products which are not still fully finished. Finished goods

inventory includes products which are ready for a delivery. Other inventories include items which do not belong to any of these inventory groups mentioned earlier. (Yritystutkimusneuvottelukunta, 2005)

There are different reasons and strategies for companies to hold inventory and they can be divided to four different classes. Business motive is one of the most popular strategies. In the business motive a company keeps its inventory in a level where they are always able to reply the demand. Some companies follow a strategy in which they tend to keep the inventory in excessive level in order to reply the demand also in unexpected situations. This strategy ties up a large amount of capital since it always over exaggerates its inventory levels. Third motive for increasing inventory levels is due to a situation where the company is expecting the market price to increase in the future. Fourth, company might have also agreed some inventory level which is based on an agreement and then its target is to maintain the level agreed in the contract. (Niskanen & Niskanen, 2000)

Companies should have inventories large enough in order to secure its ability to function and its standard of service. On the other hand, inventories should be minimized since they tie up a large amount of capital. Inventory is an investment for a company and it has to calculate the costs of having it. Inventory costs do not include only the storage costs and the costs of obsolete inventory but it has to also take into account the return which could have received on an investment with the same risk. Many studies have proven that there is a negative relationship with the number of days in inventory and the profitability of a company. In case of sudden unexpected drop in sales with while inventories have grown excessively due to mismanagement of inventory leads to a situation where capital is tied up in the inventory at the expense of profitable operations. (Lazaridis & Tryfonidis, 2006)

There are different theories of holding inventory which will be represented shortly. However, companies hold inventories for many reasons but perhaps the most important ones are following (Blinder & Maccini, 1991):

- display purpose
- inventories are unavoidable due to pipeline production
- to improve production scheduling

- to smooth production while sales are fluctuating (buffer-stock)
- to minimize stock-out costs
- to hedge against price movements
- to reduce purchasing costs by buying in quantity
- to shorten lags in deliveries

Vrat (2014) also represents some important concepts why inventories are needed. First, there is a time lag between replacing an order for supplier and when the order is received from the supplier. Due to the “replenishment lead time”, inventory is needed in order to avoid any shortages. Second, holding inventory acts as a shield against supply uncertainty, which is due to variability of lead times. Because of the uncertainty, companies often prefer just-in-case concept to just-in-time. If there was no uncertainty and demand and supply would be deterministic, companies would use just-in-time concept with no or low inventory. Third, additional inventory is needed in order to cover up the variability in demand. Because of the variability or the uncertainty of the level of demand, companies need to have excess inventory in order to avoid shortages. Fourth, in case of cyclic or seasonal demand, companies may increase their inventory already during the lean period in order to meet the peak period demand. Fifth, pipeline inventory is often a reason for increased inventory amounts and can be optimized by making the supply chain move faster. Pipeline inventory is called work-in-progress inventory and is due to the distribution of a product or a commodity that is transported over long distances.

In addition to these concepts mentioned there are other factors for holding inventory. These can be inflationary pressures, shortage of materials in the market and quantity discounts which encourage purchasing large amounts of raw materials. Additionally, inventory planners might also be tempted in spending the whole budget before the financial year ends although this might mean unnecessary purchases. Some of the generally known theories of inventory management are represented in more detail below.

3.1.1. Just-in-time and zero-inventory essentials

From working capital management perspective just-in-time system is the most ideal concept known since there are no inventories, no shortages and no need for replenishment orders. Just-in-time concept contains a system which allows the company to supply whatever material is required, wherever and whenever by a client with a complete supply assurance without keeping any inventory. This system leans on greatly towards the supplier since they need to be local and completely dependable. Additionally, company needs to have a long-term relationship with the supplier since the requirements are demanding. They need to be able to provide frequent deliveries of small orders without any additional costs and the supplier needs to have a sufficient capacity in order to supply anytime company makes an order. However, the overcapacity needs to be managed without passing on any costs to the buyer. (Vrat, 2014)

3.1.2. Economic order quantity (EOQ)

Economic order quantity (EOQ) - reorder point (ROP) concept requires that the inventory level is continuously monitored, see Figure 5. In the model replenishment order should be made whenever inventory falls under a predetermined level which is referred as reorder point (ROP). The size of the order is fixed and referred as economic order quantity (EOQ). Thus, the company needs to determine EOQ (Q) and ROP (R) in order to know how much to buy and when.

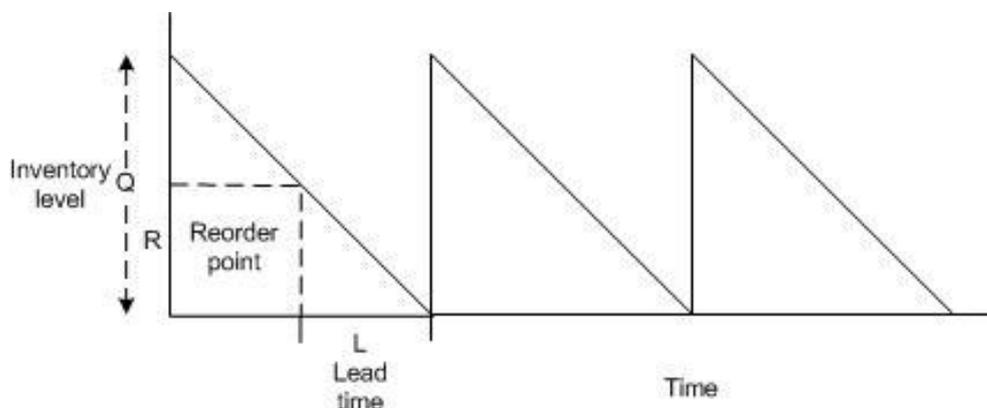


Figure 5. Economic order quantity (EOQ) – reorder point (ROP) adapted from Vrat (2014)

3.1.3. Periodic Review Inventory Policy

In periodic review inventory policy inventory levels are monitored and reviewed periodically during a fixed time interval. When the end of time period has been reached a replenishment order is made, see Figure 6. The size of the order is determined by analyzing the maximum inventory level needed (S) and the inventory on hand (X), see Equation (7).

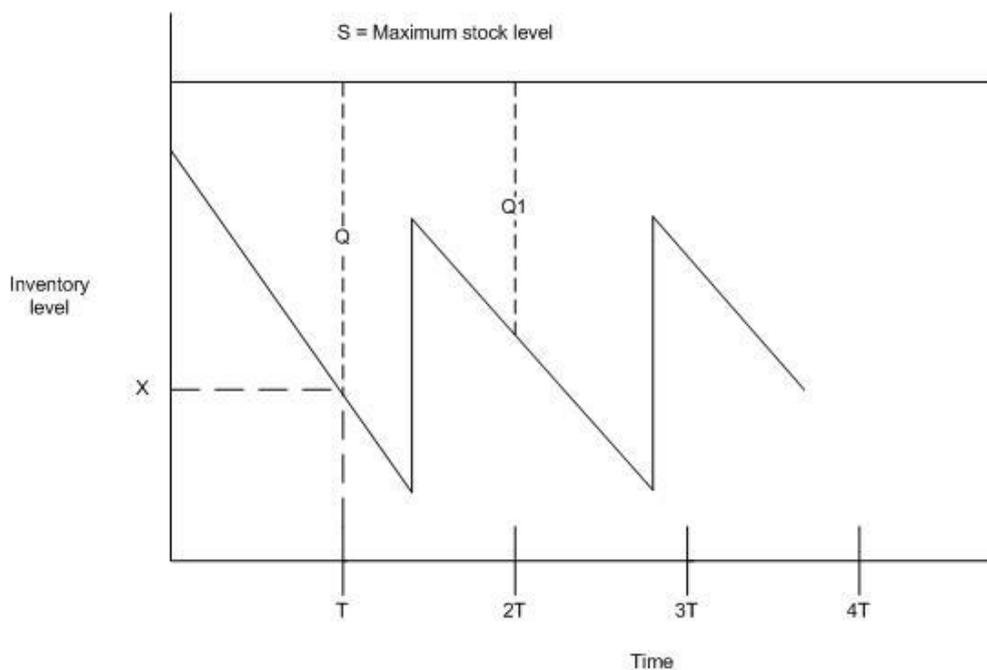


Figure 6. Periodic review inventory adapted from Vrat (2014)

$$Q = \text{order quantity} = S - X \quad (7)$$

Model is easy to use since the inventory levels demand reviewing only at the end of the time interval. However, this concept is sensitive to the consumption since if the inventory level is high, the order quantity for the next period becomes low. Still, this replenishment order has to be mandatorily placed even the inventory levels are high. (Vrat, 2014)

3.1.4. Production smoothing and buffer-stock model

Production smoothing and buffer-stock model (S, s) is a strategy where a company decides a level which is the minimum where a company lets its inventory to fall (s), see Figure 7. When inventory reaches this minimum level, a company

makes larger orders in order to reach its maximum inventory level (S). The quantity $S - s$ or in other words the optimum lot size depends on different variables like the fixed cost, the purchase price, the probability distribution of sales and the interest rate. (Blinder & Maccini, 1991)

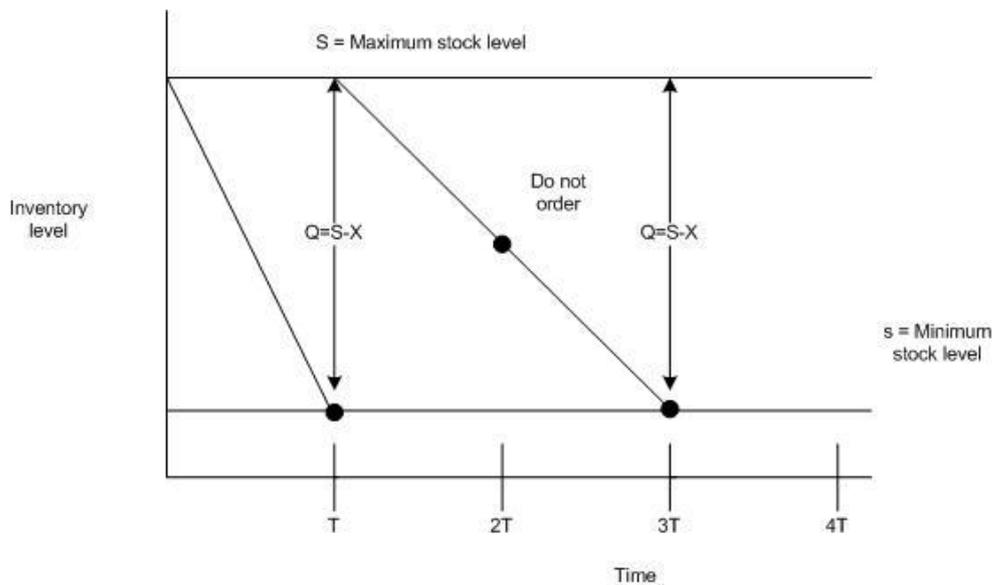


Figure 7. Optional replenishment adapted from Vrat (2014)

Vrat (2014) is referring to the same idea with optional replenishment policy. It is highlighted that the inventory levels are investigated with a fixed time interval and replenishment order is made if inventory at hand is less than the minimum inventory level (s). Conversely, if inventory at hand is more than the minimum inventory level (s), replenishment order is delayed until next review period.

3.2. Trade credit

Another important determinant of working capital is trade credit which is divided to accounts receivables and accounts payables. However, they are often studied together since they represent the different sides of trade credit. For the customer, it is a source of financing through accounts payable and conversely, for the supplier trade credit is an investment in accounts receivable. (Long, et al., 1993)

Trade credit is an agreement where a customer purchases goods from a supplier but does not pay in cash when the goods are delivered. In the other words, it exists when supplier provides terms that allow the customer to delay payment. Depending on the credit terms negotiated with the supplier, the customer pays for

the products later for example in 30, 60 or 90 days. Trade credit is an important section of working capital management since includes large section of short-term financing. From a company's point of view trade credit includes both accounts; accounts receivables where the company acts as a supplier and accounts payables where the company acts as a customer.

There are multiple theories which explain reasons for trade credit. In the other words, theories explain why suppliers provide financial intermediary services for their customers and why the customers are willing to use trade credit. Trade credit is known more expensive form of finance after the discount rate compared to bank debt. (Niskanen & Niskanen, 2006) Additionally, trade credit is often offered in the following situations; when there are information asymmetries existing between the supplier and buyer, when monitoring and other transaction costs are high, and when there are a large amount of specialized investment at stake from the supplier. Some other determinants of trade credit policy are economies of scale, price discrimination and naturally seller liquidity. (Ng, et al., 1999)

The financial theory of trade credit states that companies with easy access to credit markets finance those with limited access (Emery, 1984). A company's accounts receivable can be understood as a proxy of how much it has decided to lend, but this decision is not done exclusively by the company. Accounts receivable referred as TC Receivables in Figure 8, is determined together by the fact that how much a company is willing to lend and based on the ability or willingness of its customer to repay. (Petersen & Raghuram, 1997) However, company is also a customer of trade credit and its accounts payables, TC Payables in Figure 8, represent borrowings from its supplier. Often companies that receive trade credit tend to offer trade credit also for their customers. (Ferrando & Mulier, 2013)

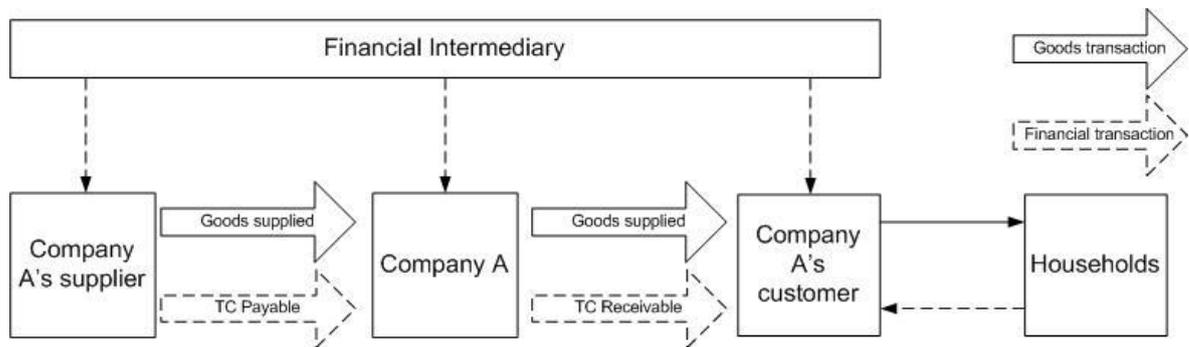


Figure 8. Trade credit relationships (adapted from Petersen and Rajan (1997) and Ferrando and Mulier (2013))

Accounts receivable refer to a case where a sale has been made but the money has not yet been collected from customers. Companies tend to sell products on credit rather than requiring immediate cash payment and thus credit sales generate accounts receivable. (Mian & Smith, 1992) Managing of accounts receivable is an important matter since they are a substantial fraction of company's assets. While accounts receivables tie up cash which reduces the liquidity of the firm, granting longer payment terms for customers may enhance sales. To conclude, if working capital is minimized, accounts receivable should decrease which means that the money from the sale should be collected more promptly.

Accounts payables refer to money in the balance sheet which has not yet been paid for the supplier although the sale has already happened and the delivery has been received. Payments for supplier can be delayed as long as possible in order to assess the quality of products received or to receive inexpensive and flexible source of financing. However the supplier might also offer discounts for early payments and in these cases lengthening the payment periods can become costly. (Deloof, 2003) Accounts payables may form a substantial fraction of companies' balance sheet and it is an important source of funding for companies with limited access to capital markets (Niskanen & Niskanen, 2006). To conclude, if working capital is minimized, accounts payable should increase which means that the payment terms for the suppliers should be lengthened.

3.2.1. Finance motive

Finance motive is one of the most important motives for trade credit and exists in cases when companies are unable to raise financing through more traditional channels. Companies which are able to get finance with low cost from capital markets have an incentive to offer trade credit for customers who are not able to get finance at low cost from capital markets, or do not have access to capital markets at all. (Schwartz, 1974) For the supplier this is beneficial since in these cases they might be better able to evaluate, control and monitor the credit risk of customers than financial institutions. In these cases, trade credit is a way for companies which have better access to the credit markets, to act as an intermediate finance for the firms which do not have access to credit markets. (Petersen & Rajan, 1997) Especially smaller companies face constraints while raising finance from capital markets (Berger & Udell, 1998). Smaller companies find it hard to obtain capital in small amounts and if they are able to obtain capital, the interest rates are high. These problems are due to market frictions like information asymmetries and agency costs, suggested by economic theories. (Niskanen & Niskanen, 2006)

3.2.2. Transaction cost

Reduced transaction costs also motive in offering trade credit. Trade credit reduces transaction costs of paying bills and creates flexibility for the customer. This is due to the fact that while purchasing with credit, the customer does not pay for the goods every time they are delivered. (Ferris, 1981) The customer might cumulate obligations and pay for all the deliveries at once on a monthly or quarterly basis. (Petersen & Rajan, 1997) Furthermore, by allowing bills to accumulate and pay at once, it gives the buyer a possibility to plan a payment schedule, prepare for unexpected purchases, forecast future cash outflows in more detailed level and streamline their cash management (Schwartz, 1974).

Additionally, seasonality in consumption patterns in the demand for a company's products, tend to increase a company's inventories in order to maintain smooth production cycles. This creates two different costs: warehousing the inventory costs and the costs of financing the inventory. (Petersen & Rajan, 1997) Separating these costs through trade credit is beneficial if the supplier has an

advantage at bearing the financial cost but does not have an advantage at bearing the warehousing the inventory cost. The arrangement will increase the wealth of the both of these companies, if the supplier and the customer can specialize at incurring the components of these costs. (Emery, 1987)

3.2.3. Cost advantage

The supplier might have a cost advantage in information acquisition and credit evaluation and monitoring of the customer. These advantages are available when the supplier has a close and more physical relationship with the supplier and the customer (Niskanen & Niskanen, 2006). First, the customer and its creditworthiness can be easily monitored since the manufacturer's sales representative often visits the customer. Additionally, if the products are marketed through a retailer, the supplier has a continuous interest and on-going retailer evaluation in the retailer quality. (Mian & Smith, 1992) Second, if the customer does not pay in time, the supplier has a possibility to threat the customer by cutting off its future supplies (Niskanen & Niskanen, 2006). Conversely, financial intermediaries do not have this advantage since the threat to withdraw future finance does not have an immediate effect on a company's behavior (Petersen & Rajan, 1997)

Another form of cost advantage is that the supplier might have an advantage in salvaging value from existing asset, which means that the supplier might have a cost advantage in credit collection if the collateral of the customer is more valuable for the supplier than for a financial intermediary. If the credit is not repaid, the supplier may repossess the merchandise and resell it. (Mian & Smith, 1992)

3.2.4. Price discrimination

Direct price discrimination is prohibited in law, but a form of price discrimination can be exercised through high-priced trade credit (Petersen & Raghuram, 1997). Companies tend to offer trade credits while engaging themselves into price discrimination motivated by greater returns. Price discrimination is managed through coordinating credit terms and output prices. (Mian & Smith, 1992) Companies with high contribution margins have an incentive to obtain additional sales without reducing the price for existing customers. Since trade credit is

offered to all customers with the same terms, the creditworthy customers find the trade credit expensive and will avoid paying late since it will become costly. (Niskanen & Niskanen, 2006) However, the less creditworthy customers will find the trade credit worthwhile and pay on the due date or even later, since the terms may still be more affordable than obtaining finance from other sources they have. (Petersen & Rajan, 1997)

3.2.5. Quality guarantees and marketability

Trade credit is also considered as a marketing approach and a quality guarantee. Trade credit can be seen as a marketing approach when trade credit serves as an incentive to attract new customers or gaining larger orders from existing customers. On the other hand, quality guarantees offer a possibility for the customer to assess product quality before paying, when the supplier offers trade credit. (Lazaridis & Tryfonidis, 2006) Trade credit serves marketability since it makes possible to distinguish high- and low-quality products and producers, when there is informational asymmetry concerning the company type and product quality. The suppliers in the market have realized that they must establish a reputation for product quality and to obtain long-term relationships with the customers by offering trade credit. Trade credit can be used as a mean to generate repeat sales while it also generates information about the customers' default risk. Additionally, smaller companies and companies who may yet have established a well-known reputation of their product quality, like new companies in the market and companies which products require a long time period in order to verify product quality, tend to offer more trade credit. (Long, et al., 1993)

Asymmetrical information exists also in the case of quality guarantees since only the supplier knows the quality of its product and thus trade credit is needed in order to be sure about the quality of the product. In this setting, it seems that the cash discounts tend to reveal information about the quality of the product. The suppliers with lower product quality tend to offer higher cash discounts since they have an incentive to receive irrevocable cash discount purchases, where the customer bears more risk. Conversely, high-quality suppliers tend to offer lower cash discounts since they believe on the quality of their product and believe that it will not fail in the market. (Lee & Stowe, 1993) Additionally, in case of

prepayments, the buyer might assume greater product quality risk due to the fact that the buyer cannot inspect the product before payment (Ng, et al., 1999).

3.2.6. Tax advantage

There is a tax advantage in providing trade credit. When the financing is qualified as an installment loan, the profit for the supplier is calculated over the loan life rather than at the sale date. On the other words, offering trade credit reduces the present value of the supplier's taxes. (Mian & Smith, 1992) Additionally, theory states that there is an incentive for companies within higher tax brackets to offer trade credit for companies within lower tax brackets. The arrangement is beneficial also for companies within low tax brackets only when the supplier of trade credit has higher tax bracket. If this is not the case, the customer can borrow finance elsewhere with lower after-tax cost than the supplier and pays the purchase with lower cash price rather than trade credit. (Brick & Fung, 1984)

3.3. Advance payments

Advance payments are a component of working capital which is not always included in the model. This is due to the fact that they are used less frequently. Advance payments can be seen as a form of trade credit where the customer grants credit for the supplier. (Ferris, 1981) In the other words, advance payments are cash flows from a customer to supplier when the payment has been done before the product has been delivered for the customer. However, advance payments are important and they should be taken into account when observing the efficiency of working capital management. (Talonpoika, et al., 2014)

Working capital management and liquidity issues are strongly related to the recent financial crisis since credit was not easily available for companies and thus they needed to find new solutions for finance. Then advance payments received from the customers were a possibility to finance business operations. Currently, advance payments are considered being a part of net working capital which is the current assets less current liabilities but it has not been included in measuring the efficiency of operating working capital and the cash conversion cycle. Companies should include advance payments when analyzing the performance of the

company since advance payments have an important role in working capital management in practice. (Talonpoika, et al., 2014)

In order to highlight the importance of the advance payments in relation to operational working capital, Talonpoika, et al. (2014) measured cycle times of working capital with mCCC, where advance payments were also included. They suggested that advance payments have a remarkable effect on the cycle time of working capital depending on the industry.

4. Working capital management strategies

The main target for companies is to maximize their profits and create value for shareholders. In addition, maintaining liquidity is an important objective for companies since increasing profits at the cost of liquidity will cause serious problems. If a company has liquidity issues it will not be able to pay its short-term obligations and become insolvent and even face a bankruptcy. (Raheman & Mohamed, 2007) Decisions that tend to maximize profitability tend to have a negative impact on achieving adequate level of liquidity since when capital is tied up in inventories and customers are granted with long payment terms will increase sales and impact on profitability will be positive. However, since capital is tied up in inventories and accounts receivables, will not maximize changes of adequate liquidity. However, focusing completely on liquidity matters tend to reduce the potential profitability of the company. (Shin & Soenen, 1998) Thus, companies must tradeoff between these two objectives and neither one should be forgotten since they both have their importance and ensure the continuity of the firm. For these reasons working capital management should be carefully considered and a proper strategy should be created. (Raheman & Mohamed, 2007)

Working capital is driven by different factors such as industry, geographical location, financial performance and size, see Figure 1. Furthermore, the demand of working capital differentiates between companies and industries and it is affected by at least following factors: volume, prices of production factors, seasonality, payment terms and strategy of the company. However, the factors affecting capital employed are the size of the company and its growth. It is usual that when company grows its working capital increases due to the fact that there is more capital employed in accounts receivables and in inventories.

Working capital management strategy can be measured with following equations (8) and (9). (Meszek & Polewski, 2006)

$$\text{Asset management strategy} = \frac{\text{current assets}}{\text{total assets}} \quad (8)$$

$$\text{Liquidity management strategy} = \frac{\text{current liabilities}}{\text{total assets}} \quad (9)$$

Based on these equations above, working capital management strategies can be divided into aggressive, conservative and moderate strategies, see Figure 9. In the aggressive strategy the current liabilities are kept on high levels while current assets are kept on low levels compared to the total assets. In the conservative strategy current liabilities are kept on low levels whereas the current assets are kept on high levels compared to total assets. Moderate strategy lies somewhere in between these two strategies as an intermediate strategy.

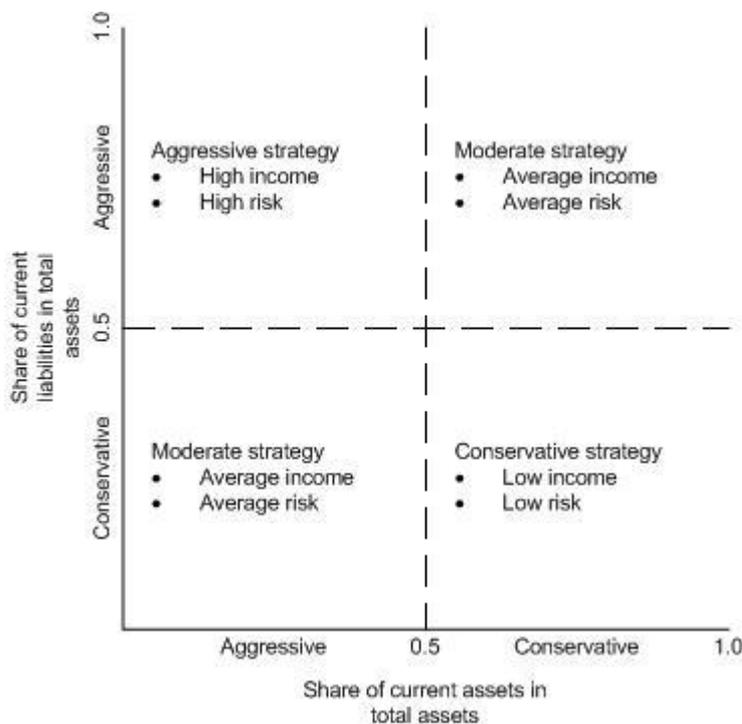


Figure 9. Working capital management strategies (adapted from Meszek & Polewski, 2006)

As shortly introduced above there are at least two different strategies for managing working capital. Companies can either maximize or minimize working capital where decisions related to maximizing working capital tend to increase profitability and decisions related to minimizing tend to increase liquidity. There might be an optimal level of working capital which maximizes shareholder value. These different views of working capital are discussed in this chapter in more detail.

4.1. Traditional view

One option is to invest heavily on working capital which means expanding the inventory levels and trade credit. In general, higher sales are resulted from large inventory and a generous trade policy for customers (Deloof & Jegers, 1996) (Long, et al., 1993). This strategy is often referred as conservative policy since it aims in increasing the amount of current assets. Expanded levels of inventory and trade credit more traditionally lead to higher profitability with the expense of liquidity (García-Teruel & Martínez-Solane, 2015).

Working capital can be increased by boosting up production and thus the inventory levels. Maintaining the higher inventory levels has plenty of positive factors. First, it reduces the cost of possible interruptions in production process for example maintenance breaks, machine breakdowns and strikes. Second, it reduces the risk of loss of business due to scarcity of the products or stock-out. Third, supply costs can be reduced since quantity discounts can be negotiated with the supplier. Fourth, higher inventory protects against price fluctuations. (Blinder & Maccini, 1991).

Working capital can be increased also by increasing the levels or accounts receivables which means granting more credits for customers. This is also in favor for sales in many ways. (García-Teruel & Martínez-Solane, 2015) First, granting more credit can act as an effective price cut (Brennan, et al., 1988) (Petersen & Rajan, 1997). Second, by granting more flexible payment terms sales can be enhanced even at times of lower demand (Emery, 1987). Third, quality assurance can be guaranteed which means that while payment terms are extended, customers have a possibility to check that the quality and quantity of purchased goods are as agreed with the supplier (Smith, 1987). Fourth, flexible and extended payment terms with customers tend to strengthen the relationship with customers and form long-term relationships with customers (Ng, et al., 1999). However, there is an opportunity cost that due these benefits mentioned above offset the costs of reduced liquidity due to increased investments in current assets (García-Teruel & Martínez-Solane, 2015)

Increased working capital does not only tie up capital but also increases the economic risks due to the fact that when working capital increases, risks related to the inventory waste and damaged inventory increase. Materials left in inventory might damage or their resale value might decrease. When the accounts receivables of a company increase substantially it can be a signal that the customers might have some increased challenges with payments due to illiquidity. In the other words, increased accounts receivables increase credit risk.

Furthermore, increased working capital is not always a bad signal. Instead it can be a signal of a company which is trying to increase the level of its spare parts inventory in order to shorten the time of maintenance breaks and shutdowns. Companies can also increase their materials inventory due to the fact that when they order materials with higher volumes, deliveries can be done less frequently which would make the freight costs to decrease. In addition, increasing accounts receivables can promote new sales for new customers and thus can be a signal of growth. However, while the company grows, it is preferable to maintain the same percentage compared to the sales. In the other words, working capital percentage should remain the same while the company grows, since both working capital and sales are increasing. If the company has rational economic reasons for the increased working capital, it should justify these clearly in its reports and publications. From investor point of view, investors should start worrying when working capital has increased for more than one quarter without an explanation.

4.2. Modern view

The interest towards working capital has expanded after companies had faced some challenges with liquidity after the financial crisis and these matters have created a greater attraction towards working capital optimization.

Since working capital is a combination of inventory, accounts receivables and accounts payables, companies can reduce working capital by reducing or increasing these items depending on which account in question. First, working capital is reduced by reducing the inventory levels. Although inventories tie up a large amount of capital, it is important to have enough inventories in order to avoid stock-outs. Second, accounts receivables should be reduced by shortening the

payment periods granted for customers which can be achieved by offering cash discounts for customers. Third, accounts payables should be increased since as long as the company has not yet paid for purchased goods it can invest the money elsewhere. In order to increase accounts payables, the payment terms should be extended by renegotiating with the supplier. By delaying payments to suppliers a company can receive inexpensive and flexible financing and it gains a possibility to assess the quality of the products before payment. However, delaying the payments might be very costly if the company would have had a possibility to gain discounts for early payment. (Raheman & Mohamed, 2007)

The strategy of minimizing working capital is referred as an aggressive policy since it aims in decreasing the amount of current assets and increasing the amount of current liabilities. Although, this increases liquidity and it has been said that there is a tradeoff between liquidity and profitability, minimizing working capital to optimal level has a positive influence on profitability of the company. (García-Teruel & Martínez-Solane, 2015) However, inventory levels and accounts receivables should not be reduced excessively since then these actions might provoke a reduction in sales. (Wang, 2002) As mentioned above accounts payables should be increased and the payment terms extended. However, there is an opportunity cost between cash discount and extended payment terms and the opportunity cost depends on the discount percentage and the discount period granted within prompt payments. (García-Teruel & Martínez-Solane, 2015)

4.3. Working capital optimization

Since it has been proved in many studies that profitability is enhanced by minimizing working capital to some extent, some possibilities for optimization are introduced in more detail. Based on EY's report (2015) on working capital performance of the world's largest companies revealed that in 2014 working capital performance improved both in US and in Europe. They mentioned that the companies often focused on streamlining manufacturing and supply chains, more collaboration with the suppliers and customers, more efficient payment term management for customers, improvements in billing and cash collection, extending supplier payments terms and more efficient procurement and payable process.

Additionally, Figure 10 shows some focus areas what companies should consider while managing working capital.

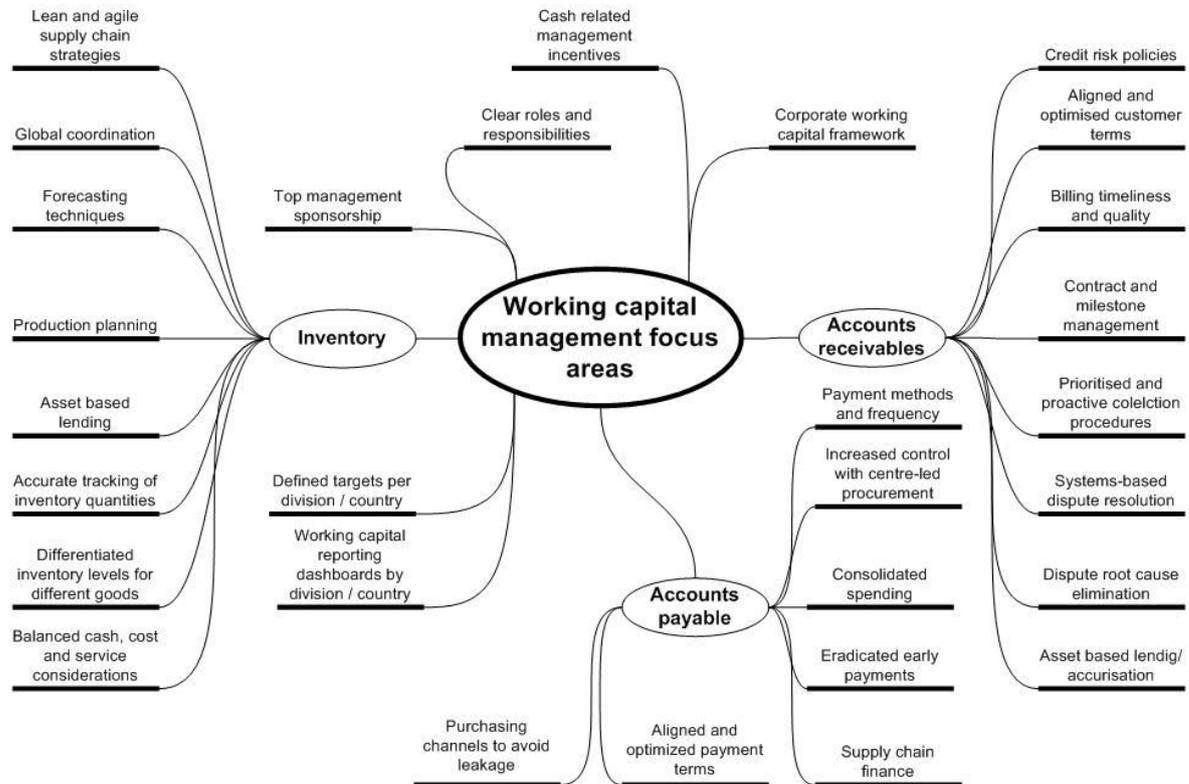


Figure 10. Working capital management focus areas, adapted from PwC (2014)

4.3.1. Inventory management

Working capital improvements in inventory management often target lower production requirements and lower overhead absorption rates. A simple way to reduce working capital tied up in inventories is to rebalance the mix by finessing logic for stocking and replenishment decisions to better follow the demand. With an improved mix a company can face larger sales and production volumes but with a lower inventory balance. Additionally, margins may improve due to decreased overtime, order expediting and obsolescence write-offs. (EY, 2015)

Inventory management can be also affected indirectly by improving supply chain management since inventory management is one element of supply chain management. Supply chain management aims in removing communication barriers and eliminating redundancies by coordinating, monitoring and controlling processes. Information systems which refer to management of informational and

financial flows within the supply chain and supply chain relationships are also important elements of supply chain management. (Power, 2005)

During the recent years many studies have revealed different kinds of ways to utilize multi-criteria decision-making models in working capital management, which can enhance especially supply chain management and inventory management. The purchasing function has become a strategic issue in organizations and the buyer and supplier relationships have gained a great deal of attention. When the relationship with the supplier is strong and well-managed, the relationship will have a lasting effect on the competitiveness of the entire supply chain and creates barriers to entry for competitors. Multi-criteria decision-making has been utilized in supplier evaluation and selection within supply chains. Choosing the supplier has become an important strategic decision but the nature of the decision is complex since there are both quantitative and qualitative factors to consider. In general, price, quality, and delivery performance are factors that are crucial for choosing the supplier. Before, many models have already been created for choosing suppliers but these have considered only quantitative factors. (Chen, et al., 2006) More extensive approaches has been created, such as analytic hierarchy process (AHP), analytical network process (ANP), case-based reasoning (CBR), data envelopment analysis (DEA), fuzzy set theory, genetic algorithm (GA), mathematical programming, simple multi-attribute rating technique (SMART) and hybrids of the models mentioned. (Ho, et al., 2010)

4.3.2. Management of trade credit

Based on Lazaridis & Tryfonidis (2006) study there is a negative relationship between accounts receivables and profitability of a company. Basically it means that less profitable firms tend to pursue decreasing their accounts receivables targeting on reducing the cash conversion cycle. In addition, Bastos and Pindado (2013) suggest that the contagion effect from economic shocks enhance both the positive relationship between trade credit demand and the level of accounts receivables and also the relationship between trade credit demand and the probability of insolvency.

Increasing accounts receivables could be a sign of financial distress of a company. This is due to the fact that based on a study from Petersen and Rajan (1997) companies whose sales have dropped and profits have turned to negative might increase trade receivables to their clients. By increasing trade receivables, a company might gain market share and increase sales. The strategy of increasing trade receivables for clients in order to boost sales can become costly, especially for companies with no access to financial credit. Additionally, it is suggested that the financial distress can be divided into two different stages: companies facing profitability issues and companies with cash flow issues. They suggest that companies with profitability issues tend to increase the use of trade receivables in order to boost sales. On the other hand, companies with cash flow issues tend to provide fewer trade receivables due to reduce liquidity. (Mian & Smith, 1992) (Molina & Preve, 2009) Trade receivables may be decreased by granting less flexible payment terms for customers. Furthermore, while negotiating of the terms with the customer, the company has to be careful and avoid setting too strict payments terms since this might drive the customer away.

Unlike in the case of accounts receivables, Lazaridis & Tryfonidis (2006) found out that there is a relationship between lower gross operating profit and increase in number of days of accounts payables. In the other words this means that companies with profitability issues wait longer to pay their debt by extending the payment period as long as possible and taking advantage of the credit period received from the suppliers.

Factoring and supply chain management arrangements are financial instruments or tools of working capital management. In factoring arrangement working capital decreases through decreased accounts receivable whereas in supply chain financing working capital decreases through increased accounts payable.

In a factoring arrangement a company transfers its rights to the cash collected from its receivables to a third party in exchange for a cash payment. When receivables are factored and the receivables have been taken out from the balance sheet, it means that the risks and rewards of the sold receivables have been transferred to the third party. Main risks which are transferred against a fee are credit risk and late payment risk. Credit risk means that the customer will not

pay where the risk amounts to the size of the receivable. On the other hand late payment risk refers to the situation where the customer pays late where the risk means time value of money or interest cost. Supply chain management is somewhat related to factoring with the difference that it is managed through accounts payables. If a company is targeting on reducing accounts payables it might engage to supply chain management program where a third party would pay the purchases for the supplier but the company with reduced working capital would still have the accounts payables in its balance sheet and thus owe to the third party.

There are plenty of benefits for the company engaging itself to a factoring arrangement and some of these benefits apply also for the supply chain management. First, as mentioned already above, with factoring arrangements the credit risk and the risk of default is transferred to a third party. Second, CCC will reduce since the company gets paid earlier and consequently working capital will reduce. Third, due to the reduced working capital, an important ratio for many publicly traded companies, return on capital employed might increase depending on the level of the profitability of the company. Fourth, factoring arrangements may reduce the amount of cash discounts granted for customer when terms are renegotiated. Despite of these benefits companies should carefully consider also the costs of these arrangements since these could be considered as financial instruments where third party is included, the arrangement could become costly.

Mian and Smith (1992) state that companies tend to use factoring to manage their accounts receivables if they have low bond ratings. They are collecting their receivables faster as their bond ratings' quality decreases. Mian and Smith (1992) suggest that if the selling process generates credit information from the customer, companies tend to use less factoring and credit-reporting companies. Additionally, factoring becomes more expensive than internal credit administration policy, if the main reason for extending trade credit is price discrimination.

4.3.3. Other solutions for working capital optimization

An important factor is that the working capital optimization program begins from the board, CEO and CFO. The management should clearly announce that the

working capital improvement efforts are companywide priorities and that it has a link with business and individual performance. (Deloitte, 2014) A report from PwC (2014) also highlights the importance of the change in management towards more cash oriented culture which originates from the management. While creating a new culture it should aim for higher levels of performance and driving continuous improvement.

An important role for the management is that they should collaborate and coordinate across the organization. This is because working capital optimization program involves many people from different departments. The management has to coordinate with other leaders in order to embedding the target to all systems, analytics and performance metrics. (Deloitte, 2014) In addition, the key stakeholders should remain engaged to the project (PwC, 2014).

Working capital optimization levers should be identified and used consistently. More efficient management of working capital determinants and embedding specific metrics for measuring working capital can be identified as levers and then companies must try to understand how these levers can be accelerated in order to improve working capital. The importance of proper metrics cannot be highlighted enough. A proper set of metrics should be built into the working capital optimization program and used as an ongoing feedback system. The optimization program's effectiveness can be thus followed by many different departments but for example Treasury could follow the impact on the cost of capital. With analytics, a company can use the metrics in order to determine the capital required for manufacturing processes and it can create a dashboard which would show even daily views on metrics and how do they impact on cash flow and working capital. (Deloitte, 2014) With the analytics, the attention should also be taken into the cash management, where the effective utilization and forecasting of cash would be ensured (PwC, 2014).

The management should focus on aligning the incentives with the improvements in order to sustain working capital improvements. It is important that the incentives are clearly announced throughout the company and there is a connection with the business performance and overall compensation. (Deloitte, 2014) PwC (2014) also

highlights that the benefits should be realized. In the other words, company should ensure that the cash generation objectives and are achieved and maintained.

4.4. Challenges in Working Capital Management

There are many different challenges within the field of working capital of which the most common one within all the industries is growth. This is because in many cases working capital tends to increase due to company's intentions to grow. When a company is targeting to the increase in sales, it ties up capital in the beginning because the growth often requires increasing inventory level. In order to boost the sales a company has to have enough products in inventory to fulfill all the demand and thus the risk of stock-out is eliminated. (Deloof, 2003) In addition, accounts receivables often increase due to a generous trade credit policy which is believed to enhance sales since it allows customers to assess the product quality before paying for it (Long, et al., 1993) (Deloof & Jegers, 1996). The growth might also demand creating new products or production lines which also require capital in the beginning.

There are also some industry specific challenges which tend to challenge working capital optimization. Theory suggests that bullwhip effect is a crucial challenge for forestry companies. Consider a supply chain where there are several different companies who order from its immediate upstream member. All these orders include valuable information how to manage production and which inventory decisions to take for upstream member. However, the information which transfers as orders from member to its upstream member can considerably misguide decision makers due to the fact that the variance of orders tends to be larger than the variance of sales. This phenomenon is referred as bullwhip effect where the distortion tends to increase as the information flow moves upstream. (Lee, et al., 2004)

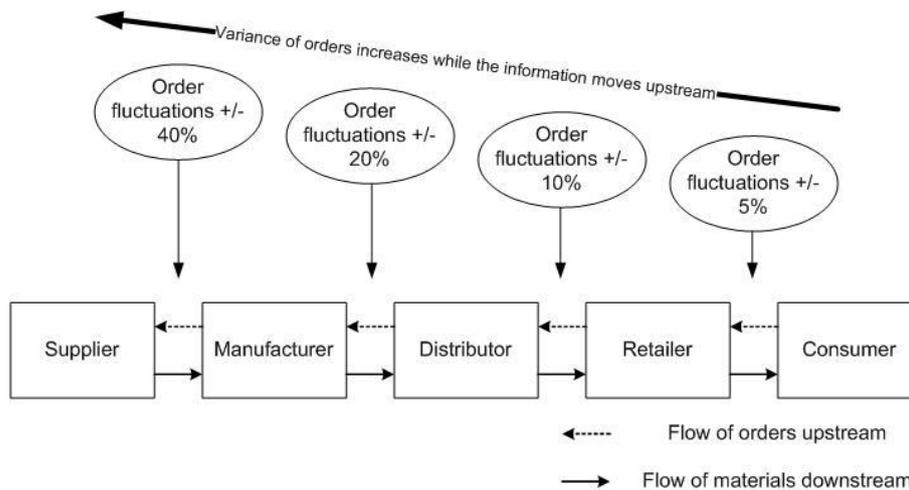


Figure 11. Bullwhip effect (adapted from Towill & McCullen (1999))

There are at least four reasons for bullwhip effect, which are common effects in distribution channels: demand signaling processing, rationing game, order batching and price variations. Retailers generally use actual demand level as signals for future demand. Additionally, order batching is a common routine of retailers' decision process since buyers target is to constantly gain economies of scale in pricing and transportation. Rationing game on the other hand is related to products in their growth phase when demand exceeds supply whereas price promotions are related to more mature products where manufacturers try to take part in market share war. (Lee, et al., 2004)

In general, focusing on supply chain management helps companies in tackling the issues with bullwhip effect. There are different solutions for tackling bullwhip effect such as sell through data, exchange of inventory status information, order coordination and simplified pricing schemes. Generally, the sales data and inventory status data might be sensitive and not to be given for other agents in the market. However, in order to beat the bullwhip effect, the data should be given for the supplier. (Lee, et al., 2004) Furthermore, Lee et al. (2004) highlight the fact that giving the access to the data is beneficial for the supplier, but it is interesting and challenging to analyze the benefits for the retailer. More advanced version of giving access to sales data and inventory status information is vendor managed inventory (VMI). It reduces bullwhip effect for at least two reasons: one layer of

decision-making is reduced and information time flow delays can be eliminated. (Disney & Towill, 2003)

Additionally, one challenge for the companies is the fact that they do not have access or do not measure real-time data and metrics in order to measure the effectiveness of working capital. In other words, companies do not have enough information available to make any decisions towards efficient working capital management. Another challenge with working capital management is that a formal structure is needed in order to complete the improvement efforts. This is because working capital improvements are often cross-functional efforts or driven by finance, so it can be challenging to sustain the efforts without a formal structure. Additionally, few companies thus have a formal optimization program. A substantial challenge is that since working capital improvement efforts are cross-functional efforts, they often have a number of people involved and probably from different fields of working capital, which makes implementing the program difficult. Some people involved may be working with the field of accounts receivables and some with accounts payables and one with inventory management and each stakeholder might have a different view on how working capital should be managed. These perspectives might also differ from the ones running the operation. Last but not least, an important challenge is time. Companies might struggle whether they should focus on working capital optimization since there are other priorities competing for attention. (Deloitte, 2014)

5. Research methodology

This chapter introduces on high level the research methodology chosen for studying working capital management strategies within Finnish forestry industry. Research methodologies can be classified in different ways but most often they are divided into quantitative and qualitative analyses. Quantitative analysis aims in analyzing causalities and correlations from numerical data whereas qualitative analysis aims in describing, understanding and interpreting different phenomena. The meaning of qualitative research is not to test a theory and a hypothesis but rather observe an occurrence thoroughly (Hirsjärvi, et al., 2009). Often qualitative research is conducted with interviews, observation, text analysis or transcribing (Metsämuuronen, 2003).

Since this thesis aims in understanding and explaining a certain phenomenon, a qualitative analysis is a natural choice for a research method. Furthermore, previous literature seems to miss qualitative research concerning the subject which supports even more choosing the qualitative research for this study. However, in order to receive more coherent view of the subject a quantitative analysis was implemented. The empirical section is first studied with quantitative analysis in order to have an understanding what is the current situation with Finnish forestry companies compared to other global actors and how the working capital management has developed during the years. After the view of the current situation and development has been built then it is investigated whether the interview data supports the findings from quantitative data.

Since study includes both qualitative and quantitative analysis of the same phenomena and the methodology could be thus referred as methodological triangulation. Triangulation as such refers as the use of more than one method and data source in order to create a coherent view of phenomena (Patton, 1999). Triangulation may be divided into 4 different categories of which method triangulation refers to a research method where multiple methods of data collection and is used to study the same phenomenon (Polit & Beck, 2012). Since multiple data sources are studied and compared, if the conclusions from both are the same, validity of the study increases. Method triangulation often includes interviews, results from surveys and focus groups and it is commonly used in

qualitative studies. (Guion, 2002) In this study method triangulation involves both interviews and financial data analysis and the phenomenon may be observed as in Figure 12.

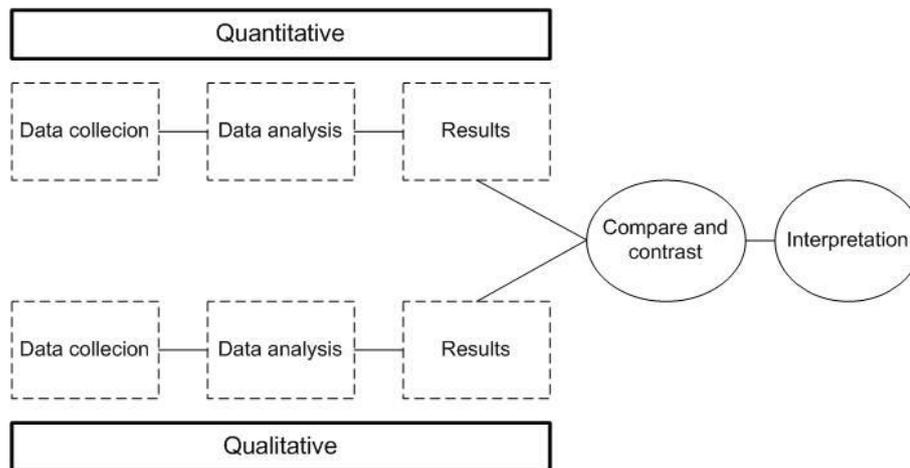


Figure 12. Method triangulation adapted from Creswell 2012

The goal for each research is to produce accurate and reliable results. Reliability can be measured by which extent the study has offered objective results and are the results independent from the researcher. Validity measures the ability of the research method to study the chosen factors. In a quantitative analysis these concepts of reliability and validity are more accurate and conversely these can be only partially fulfilled within qualitative analysis. This is because qualitative analysis in this case is based on interviewees subjective opinions on the matter and the answers could easily vary if the interviews were repeated. Additionally, qualitative research is often criticized by the fact that it involves some risks related to subjective information and interpretation of the researcher. Furthermore, problems may arise when the interviewee is not sharing honest opinions or when the question is not understood and thus the reliability may suffer. (Hirsjärvi, et al., 2009) (Tuomi & Sarajärvi, 2009) However, qualitative research offers the possibility of in-depth motivations and it allows the interviewees to share their feelings. To conclude, qualitative research serves a very different purpose than quantitative research. (McDaniei & Gates, 2013)

6. Data-based analysis of working capital strategies

This chapter focuses on discussing the results from the quantitative part of the study. However, first it introduces how the quantitative data was collected and introduces the companies selected for the analysis. Secondly, the results are discussed in more detail. At the end of this chapter the main findings are summarized.

6.1. Data collection and methodology

The forestry industry data was gathered from S&P Capital IQ database. All companies chosen for the study belonged to the forestry industry peer group in S&P Capital IQ. Peer group included eleven companies of which only nine were chosen due to the fact that two of the companies were lacking data and their figures could not have been fully investigated. Companies that were not selected were Japanese Nippon Paper Industries Co., Ltd. and Finnish Munksjö Oyj. Nippon Paper Industries data is missing from years from 2007 to 2010. Munksjö is missing data from years 2006 and 2007. Removing these two companies enhances the reliability of the data-based analysis since these companies were lacking data and would have not been fully comparable. Summary of the companies is visible in the Table 2 including a small description of the company, where it is located, current amount of employees, total revenue at the end of 2016 and the latest market capitalization.

The amount of employees, total revenue and market capitalization are great indicators of the size of the company. When looking at the amount of employees the largest seems to be Oji Holdings Corporation (Oji Holdings while going forward) with almost 34 000 employees and the smallest is Norske Skogindustries ASA (Norske while going forward) with only 2 500 employees which reveals crucially the different sizing of the companies. However, more than half of the companies have more than 10 000 employees. Additionally, while comparing the companies based on their total revenue it seems that Oji Holdings is the largest with revenues of more than 11 000 million euros and Norske is the smallest with revenues of 1 000 million euros. The results change a little while comparing the companies with market capitalization. It suggests that UPM-Kymmene Oyj (UPM while going forward) with market capitalization of almost 10 000 million euros.

However, Norske seems to be the smallest with this indicator as well with market capitalization of 88 million euros.

Table 2. Summary of the companies

Company	Business Description	Headquarters	Employees	Total Revenue 2015 (mEUR)	Market Capitalization Latest (mEUR)
Holmen Aktiebolag (publ)	Holmen Aktiebolag (publ) manufactures and sells printing paper, paperboard, and saw n timber w orldw ide.	Sw eden	3 186	1 725	2 663
Metsä Board Oyj	Metsä Board Corporation produces folding boxboard and w hite fresh forest fiber linerboards w orldw ide.	Finland	2 762	2 016	1 952
Mondi plc	Mondi plc manufactures and sells packaging and paper products primarily in central Europe, Russia, North America, and South Africa.	United Kingdom	25 000	6 819	8 981
Nine Dragons Paper (Holdings) Ltd.	Nine Dragons Paper (Holdings) Limited, together with its subsidiaries, manufactures and sells packaging paper, recycled printing and w riting paper, pulp, and specialty paper products in the People's Republic of China and internationally.	Hong Kong	17 000	4 004	3 280
Norske Skogindustrier ASA	Norske Skogindustrier ASA, together w ith its subsidiaries, manufactures, distributes, and sells publication paper.	Norw ay	2 500	1 253	88
Oji Holdings Corporation	Oji Holdings Corporation operates in the pulp and paper industry in Japan and internationally.	Japan	33 605	11 722	3 571
Sappi Limited	Sappi Limited manufactures and sells dissolving w ood pulp, paper pulp, and paper based solutions to direct and indirect customers w orldw ide.	South Africa	12 548	4 781	2 382
Stora Enso Oyj	Stora Enso Oyj provides renew able solutions for the packaging, biomaterials, w ood, and paper industries w orldw ide.	Finland	26 000	10 094	6 509
UPM-Kymmene Oyj	UPM-Kymmene Oyj manufactures and sells printing and w riting papers.	Finland	20 711	10 138	9 950

Only the working capital management related financials from the data package retrieved from S&P Capital IQ were analyzed and the companies were divided in three different categories based on their location due to the fact that the purpose is to analyze how Finnish forestry companies are managing their working capital compared to other global competitors. The companies were divided to different categories based on their location such as companies from Finland, companies from Europe (excluding Finland) and companies from Asia and South Africa (referred as Other while going forward). The category Finland includes following companies: Metsä Board, Stora Enso and UPM whereas the category Europe includes one Swedish company Holmen, Mondi from United Kingdom and Norske from Norway. Additionally, the category Other includes Nine Dragons Paper from Hong Kong, Oji Holdings from Japan and Sappi from South Africa.

The following section includes graphs from the whole time range and in addition it includes comparison between 2006 and 2015 with percentage changes. The

annual values from the whole time range are available in Appendix 1 and not presented in the text due to the fact that there is no reason to have a closer look for the whole period. More important is to see that are there any substantial change between 2006 and 2015.

6.2. The results from data-based analysis

This section introduces the results from data based analysis in more detail beginning from working capital strategies. Additionally, cash conversion cycle and its determinants are analyzed. Finally, it is investigated whether the minimized working capital leads to increasing EBIT margin.

6.2.1. Measuring working capital strategy choices

The global trend during the latest years has been that the focus on working capital management has increased substantially after the financial crisis. However, while analyzing has there been any substantial changes within the strategy followed by the companies comparing years 2006 and 2015 it was noticed that based on the Figure 13 and Figure 14, it is clear that there has not been any change. The strategical position was determined with Equations (8) and (9) from the fourth chapter. All the companies are following a moderate working capital strategy with average income and average risk. Only change within the Figure 13 and Figure 14 are that in 2015 Oji Holdings have moved further away from aggressive strategy and on the other hand Mondi and Nine Dragons Paper have moved away from conservative strategy. Otherwise strategies adapted by the companies have been very stable. It would be interesting to compare these figures from forestry industry to for example wholesale, construction and electronics industries to see whether there are any clear trends compared to other industries. Appendix 1 includes both asset management strategy figures and liability management figures for all companies for all periods. The share of current assets compared to

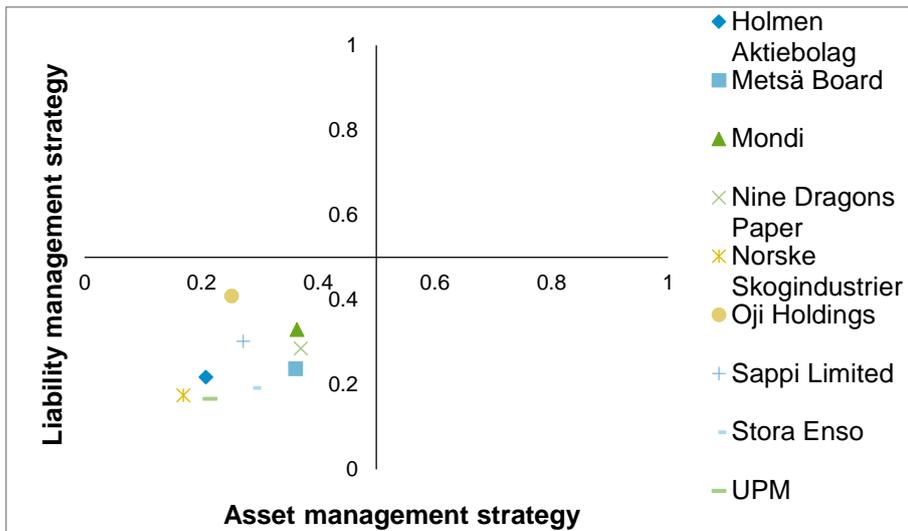


Figure 13. Working capital strategy 2006

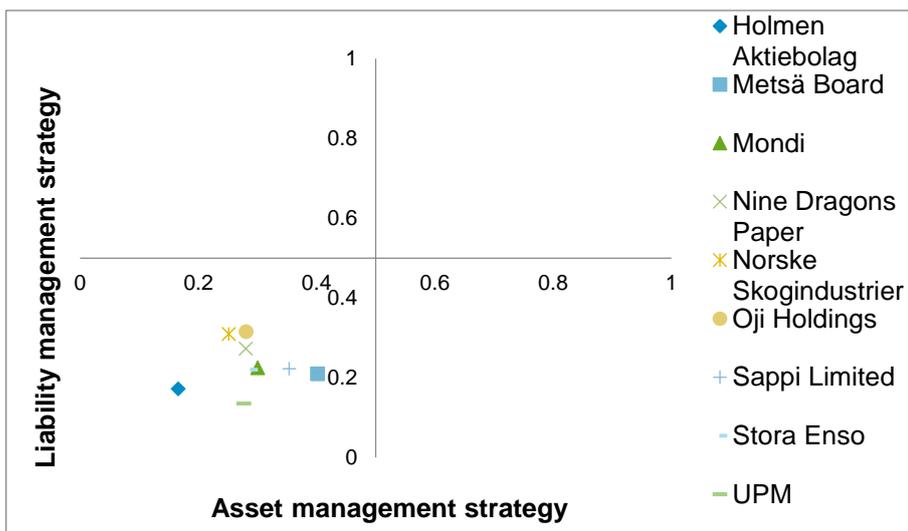


Figure 14. Working capital strategy 2015

Although, Raheman & Mohamed (2007) represented in their study that for a typical manufacturing firm current assets might account over half of its total assets. Figure 15 shows that this statement does not fully hold within the forestry companies since in these companies the share of current assets of total assets does not exceed 40 % within the time frame of 2006 – 2015. It is interesting to notice how different trends all of these location have. In Finland the trend has been increasing until 2012 which means that the share of current assets has been increasing compared to total assets. However, after 2012 the trend starts to decline but still stays in relatively high levels compared to Europe and Other. Since the levels of

current assets started to decline in 2012 it could mean that Finnish forestry companies started to optimize their working capital more effectively. However, this does not mean only that the current assets has been changing since the effect might also come from the fact that the total assets have been varying while current assets have been stable, which in other words would mean changes in non-current assets like machinery and buildings.

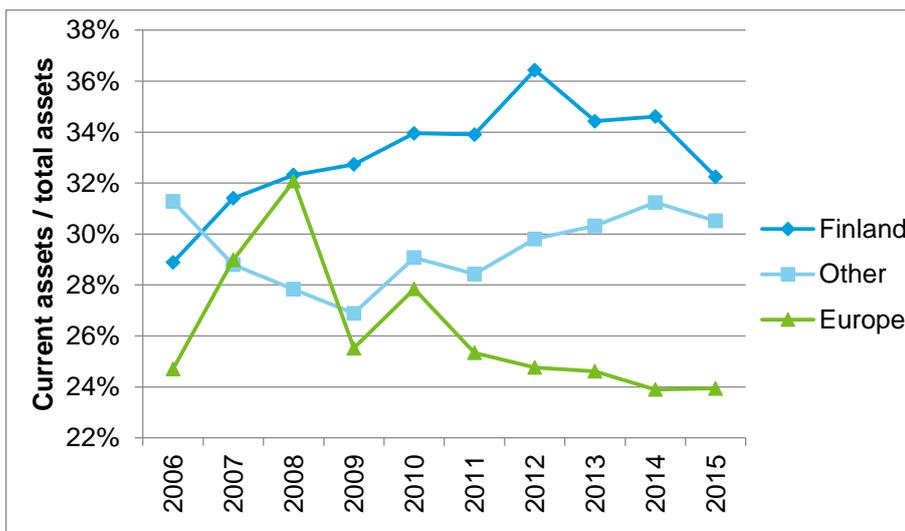


Figure 15. Share of current assets of total assets

6.2.2. Cash conversion cycle

One important factor of the study is to analyze the development of the cash conversion cycle and its determinants. In Figure 16 it is clearly visible that the levels of cash conversion cycle have been very different in 2006 depending on the geographical location. Whereas, in 2015 the variation between average cash conversion cycle levels tends to be smaller and all the average cash conversion cycle changes only from 60 days to 70 days. To be more precise, Table 3 reveals cash conversion cycle for each company and it shows that Finland had the longest cash conversion cycle of 92 days which is almost triple the cash conversion cycle for location Other and Europe stays in between with 56 days. To conclude in 2006 it took Finnish companies about three months to convert their inputs in resources to cash flow from customer whereas companies from Other location are able to convert these little more than in one month and European companies are able to collect the cash flows in about two months.

It seems that Finnish companies have had a cash conversion cycle of about 90 days in 2006 reaching the maximum level in 2007 when the cash conversion cycle was almost 110 days. However, the Finnish companies seem to have been optimizing their working capital the most since the cash conversion cycle has reduced dramatically from 90 days to about 60 days. European companies seem to have an increasing trend in their cash conversion cycle since they began with 55 days and ended up with 70 days whereas also companies from South Africa and Asia (location Other) seem to follow same trend as the European companies but beginning from even lower levels of less than 40 days and ending up with about 60 days. Based on the numbers in Figure 16 it could be stated that only Finnish companies tend to focus on minimizing working capital by reducing cash conversion cycle.

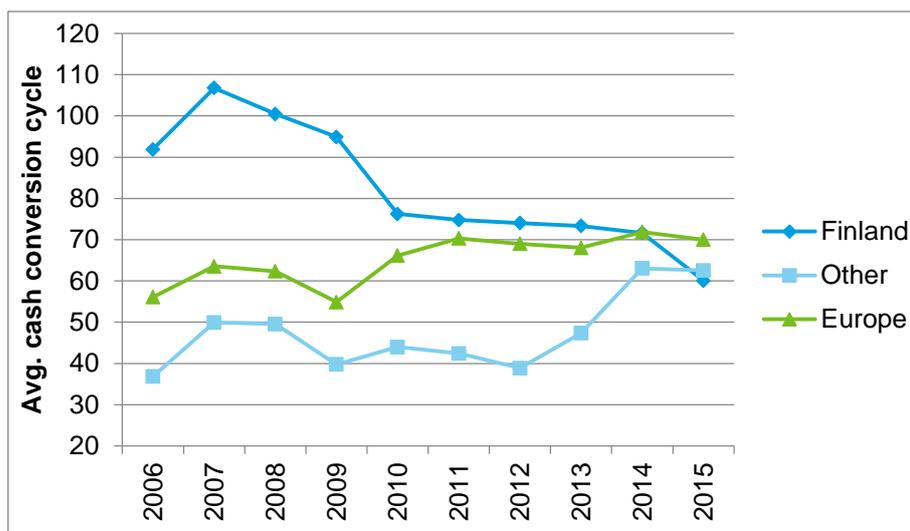


Figure 16. Average cash conversion cycle by locations

Same trends are visible in Table 3 which shows the average cash conversion cycles for each company and location from 2006 and 2015. The table also shows that the Finnish companies are the only ones which have been able to decrease their cash conversion cycle with 34.6 %. Additionally, it can be quickly noticed that the changes come mainly from Metsä Board and Stora Enso whereas the UPM is stable. Stora Enso has been able to decrease their average cash conversion cycle by 54.9 % and Metsä Board by 33.4 %. However, it can be concluded that of course minimizing average cash conversion cycle is easier when the beginning level is high. It is also worth noticing that although Metsä Board and Stora Enso

begin from higher levels they have reached lower levels of average cash conversion cycle than UPM, since both Metsä Board and Stora Enso have average cash conversion cycle of about 55 days whereas UPM has 71 days.

Furthermore, Table 3 also shows an interesting result from location Other. As already mentioned location Other had the shortest cash conversion cycle in 2006. However, it has increased by almost 70 % from 2006 to 2015. The increase comes basically from all of the companies from that region but especially the changes for Nine Dragons Paper are substantial, cash conversion cycle has increased by 130.5 % during the time range. From all of the companies Norske and Sappi have the second highest changes with increased cash conversion cycle more than 90 %. Table 3 also reveals that all these three companies with the largest changes started with the shortest cash conversion cycles in 2006. It raises questions that what has happened – have they been extremely good managing their working capital in 2006 and noticed that they were in two low levels and had purposefully changed their working capital strategy.

Table 3. Average cash conversion cycle and change %

Location	Company	Avg. CCC	Avg. CCC	Change %
		2006	2015	
Europe	Holmen Aktiebolag	69	100	43.5 %
Europe	Mondi	80	74	-7.3 %
Europe	Norske Skogindustrier	19	36	94.5 %
Europe Total		56	70	24.9 %
Finland	Metsä Board	83	55	-33.4 %
Finland	Stora Enso	120	54	-54.9 %
Finland	UPM	73	71	-2.9 %
Finland Total		92	60	-34.6 %
Other	Nine Dragons Paper	29	66	130.5 %
Other	Oji Holdings	56	72	28.6 %
Other	Sappi Limited	25	49	92.5 %
Other Total		37	63	69.8 %

In order to look for answers where these changes come from, the determinants of cash conversion cycle are investigated in more detail.

6.2.3. Determinants of cash conversion cycle

While investigating the determinants of cash conversion cycle one by one starting with average days inventory outstanding a few conclusions could be drawn, see Figure 17. First, Finnish companies have a reducing trend in average days inventory outstanding. Average days inventory outstanding seem to have first decreased substantially from 2006 to 2010 but after 2010 they seem to follow a slightly increasing trend. Second, European companies have a clearly increasing trend beginning from less than 80 days and ending up with about 90 days. Third, the location Other seem to have the smallest average days inventory outstanding and they have managed to keep them at low levels.

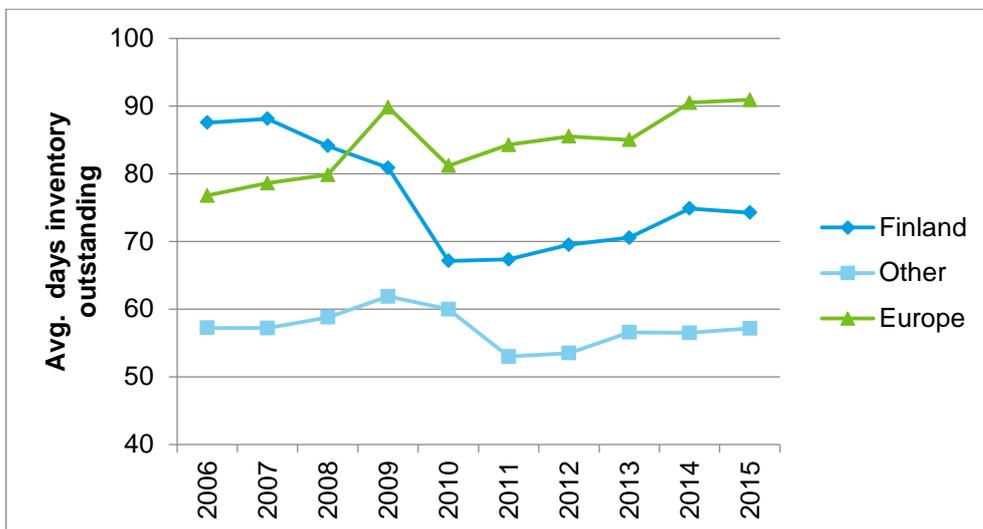


Figure 17. Average days inventory outstanding by locations

From **Error! Reference source not found.** it can be clearly seen that again there has been decrease only in Finland while comparing the data between geographical locations. It is also interesting to notice that there are larger changes inside the location category, meaning that for example in location Other, Sappi Limited has been able to decrease their average days in inventory outstanding by 15 % whereas Oji Holdings' the average days in inventory outstanding has increased by 15 %. For example average days inventories outstanding has decreased in Stora Enso by 29 % between 2006 and 2015 since in 2006 inventories stayed in stock for 119 days before they were sold and in 2015 this has been reduced to 85 days. When a company starts with this high level of days inventory is outstanding, it can be easily affected by removing slack inventory. Still both Stora Enso and Metsä

Board are far away from UPM's levels with only 56 average days inventory outstanding. However, the most efficient company when measured with average days inventory outstanding is Sappi Limited with only 49 average days inventory outstanding.

To conclude, it is clear that none of the locations were able to decrease their days inventory outstanding substantially and the figures seem to be stable or increasing rather than decreasing. This raises questions that are companies actively managing their inventory and do they have practical systems in place.

Table 4. Average days inventory outstanding and change %

Location	Company	Avg. DIO	Avg. DIO	Change %
		2006	2015	
Europe	Holmen Aktiebolag	98	130	32.8 %
Europe	Mondi	68	78	15.5 %
Europe	Norske Skogindustrier	65	65	0.0 %
Europe Total		77	91	18.4 %
Finland	Metsä Board	89	82	-8.2 %
Finland	Stora Enso	119	85	-29.0 %
Finland	UPM	54	56	3.6 %
Finland Total		88	74	-15.2 %
Other	Nine Dragons Paper	58	58	-0.4 %
Other	Oji Holdings	55	64	15.5 %
Other	Sappi Limited	58	49	-14.8 %
Other Total		57	57	-0.1 %

While analyzing the average days sales outstanding by location, see Figure 18, it seems that Finnish companies and European companies have a clear trend of optimization since their average days sales outstanding have reduced. However, the companies from location Other seem to have a deviating trend beginning from about 55 days and ending up with about 60 days. Figure 18 also reveals a clear peak in Finland and in location Other in 2007 which is just before the financial crisis begun. In 2007 for Finnish companies and companies from location Other it took longer to receive the payment from customer which reveals that the customer might have had some difficulties to pay for the goods delivered at the time of financial crisis. However, it is surprising that the peak is not visible in the European companies' figures.

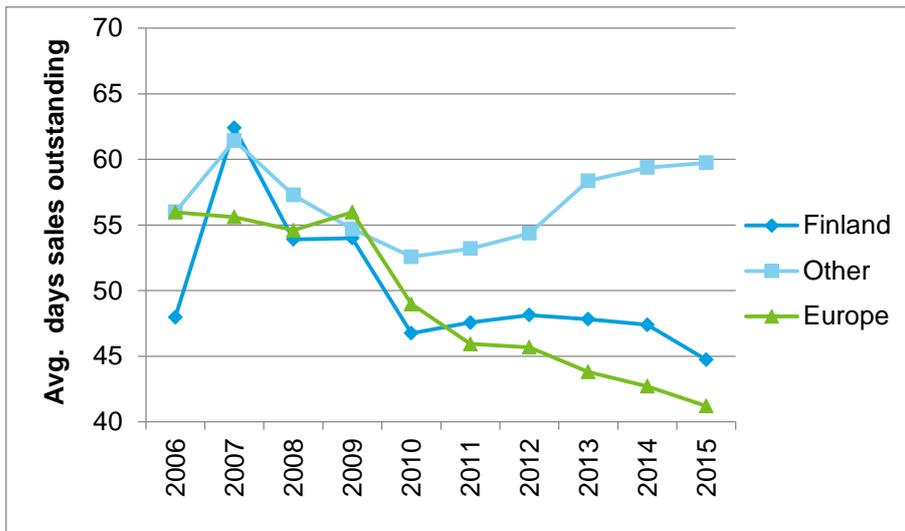


Figure 18. Average days sales outstanding by locations

Table 5 reveals that the changes from 2006 to 2015 are not that substantial compared to the graph since the graph revealed high peaks in 2007. However, when comparing the changes from 2006 to 2015 the change percentage for Finland was only negative 6.8 %. It is surprising to notice that the change from Finland comes mainly from Stora Enso whose days sales outstanding have decreased by 28 % during the time range whereas Metsä Board's and UPM's days sales outstanding have increased. European companies seem to have been the most efficient in managing their accounts receivables since their days sales outstanding have decreased by 26.4 %.

Table 5. Average days sales outstanding and change %

Location	Company	Avg. DSO		Avg. DSO 2015	Change %
		2006	2015		
Europe	Holmen Aktiebolag	53	49		-6.5 %
Europe	Mondi	67	43		-34.9 %
Europe	Norske Skogindustrier	49	31		-36.2 %
Europe Total		56	41		-26.4 %
Finland	Metsä Board	39	43		10.5 %
Finland	Stora Enso	55	40		-28.0 %
Finland	UPM	50	51		3.3 %
Finland Total		48	45		-6.8 %
Other	Nine Dragons Paper	48	62		29.6 %
Other	Oji Holdings	85	78		-8.9 %
Other	Sappi Limited	35	39		13.3 %
Other Total		56	60		6.7 %

While investigating the average days payables there are clear trends visible in all locations, see Figure 19. First, Finnish companies tend to be the only region which is following a trend of optimizing working capital management, since their average days of payables outstanding have increased during the time frame from over 40 days to about 60 days. This means that they have reached a possibility to hold their cash for 20 days longer before paying for the supplier. On the other hand the European and location Other companies seem to have a reducing trend in their average days payable which means that they pay for the supplier promptly. Additionally, it can be seen that for European and location Other companies there is a peak in 2009, which would suggest that during the financial crisis they did not pay as promptly for the suppliers as they used to be.

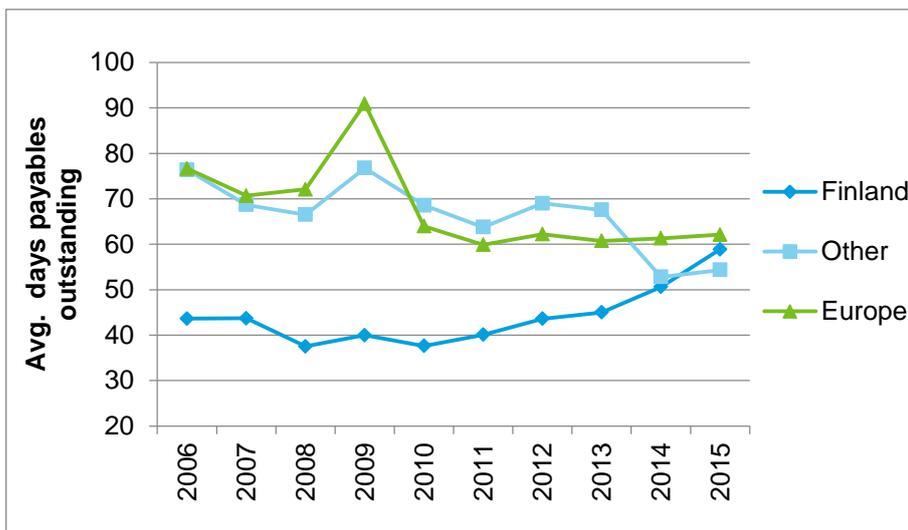


Figure 19. Average days payables outstanding by locations

Figures in Table 6 support what was shown in the graph and reveals that the region Finland has been the only location which has been able to increase the days payables outstanding by 35 % from 2006 to 2015. It is interesting to notice that Metsä Board has been able to increase accounts payable by 53.6 %. Additionally, it is interesting to see the changes between the Finnish companies since Metsä Board and Stora Enso both have average days payables outstanding of 70 days in 2015 which means that they pay after about 70 days when they have received the goods from the supplier. However, UPM has clearly lower levels of average days payables outstanding and they seem to pay for the goods for their supplier after 36 days when the goods have been delivered. Although Finnish

companies seem to be the only ones optimizing their accounts it is visible that they started with the clearly shortest days payables outstanding since in 2006 the average for Finland was 44 days whereas European and companies from location Other paid their suppliers within about 76 days.

Table 6. Average days payables outstanding and change %

Location	Company	Avg. DPO		Avg. DPO 2015	2015
		2006	2015		
Europe	Holmen Aktiebolag	81	79		-2.0 %
Europe	Mondi	54	47		-12.8 %
Europe	Norske Skogindustrier	95	60		-37.0 %
Europe Total		77	62		-19.0 %
Finland	Metsä Board	46	70		53.6 %
Finland	Stora Enso	55	70		28.7 %
Finland	UPM	31	36		18.7 %
Finland Total		44	59		35.0 %
Other	Nine Dragons Paper	77	54		-30.4 %
Other	Oji Holdings	84	69		-17.9 %
Other	Sappi Limited	67	40		-40.7 %
Other Total		76	54		-28.8 %

The trend of working capital optimization is clearly visible in location specific figures Figure 20, Figure 21 and Figure 22 where it can be clearly be seen that for Finland the trend of cash conversion cycle is decreasing whereas for Other and Europe the trend is increasing. For Finland all the determinants seem to show signs of working capital optimization and the trend line is steeply descending.

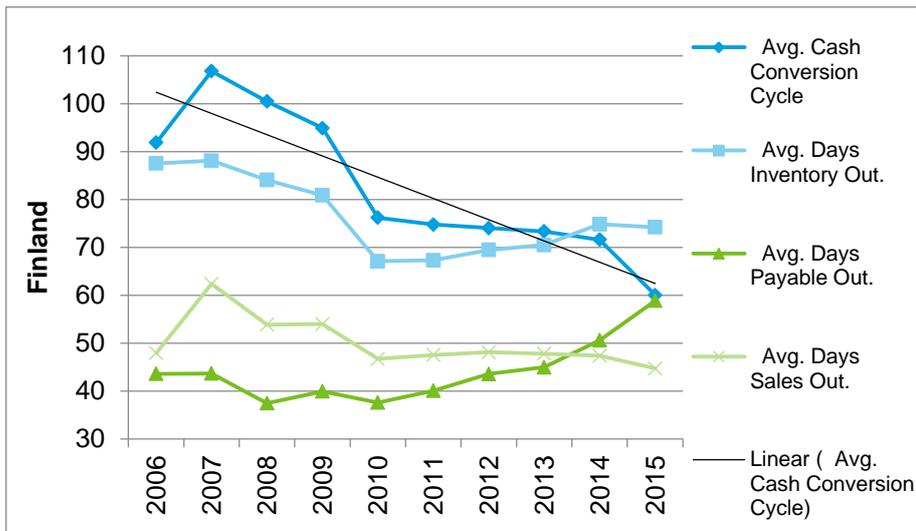


Figure 20. Average cash conversion cycle determinants: Finland

It is also interesting to notice that companies from location Other, Figure 21, have managed to keep the average days inventory outstanding and the average days sales outstanding in about the same level during the time frame. However, the average days payables explain the increasing trend behind the cash conversion cycle since they have deviating but decreasing trend during the time frame.

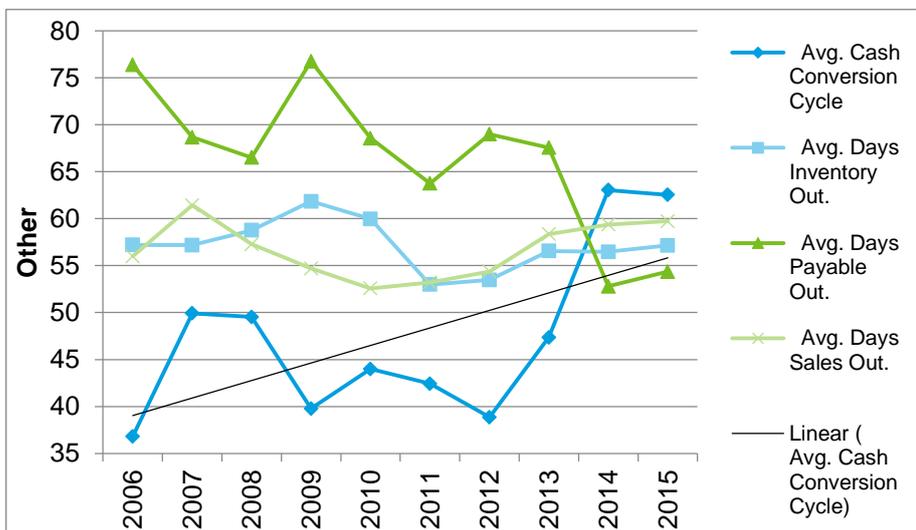


Figure 21. Average cash conversion cycle determinants: Other

Additionally, European companies also have slightly increasing trend in their cash conversion cycle, see Figure 22, although not as sharp as location Other companies. It seems that European companies have been focusing on reducing the average days sales outstanding while average days inventory outstanding and

average days payables outstanding have been moving to the wrong direction from optimization perspective.

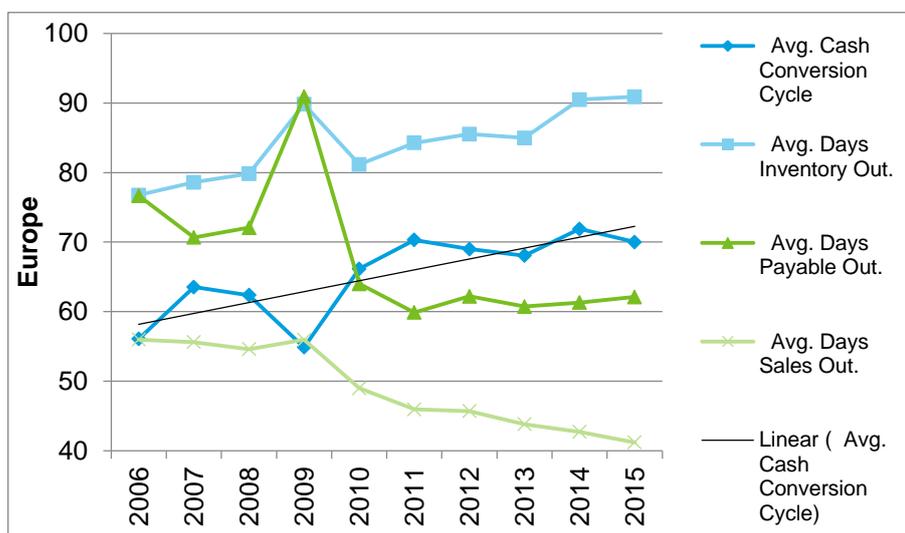


Figure 22. Average cash conversion cycle determinants: Europe

These figures above raise up a few questions, first why Finnish companies seem to be the only ones optimizing working capital management? When looking at the different figures of days outstanding, it is clearly visible that Finnish companies tend to come from the loosest working capital management strategy since in 2006 they had inventories staying still for almost three months before delivered for the customer, days sales outstanding were not that high in 2006 but peaked at 2007 and after 2007 they have been declining by about 20 days. Additionally, it took about 40 days from Finnish companies to pay for their suppliers in 2006 but in 2015 it took about 60 days. Based on this it is clear that some of this working capital optimization could be perhaps explained by the fact that Finnish companies came from the loosest situation and had possibilities to improve their working capital management.

6.2.4. Working capital and EBIT margin

It is interesting to see that how does the working capital optimization effect on the operational profit. This can be investigated trough working capital percentage and EBIT margin by locations. Figure 23, Figure 24 and Figure 25 represent the development of both of these measures and basically it is hard to see any clear

pattern from these figures or at least that kind of pattern which would suggest that while working capital decreases operational result increases. Only Figure 24 seems to show signs of this pattern since from 2013 onwards the working capital percentage has decreased while EBIT margin has improved.

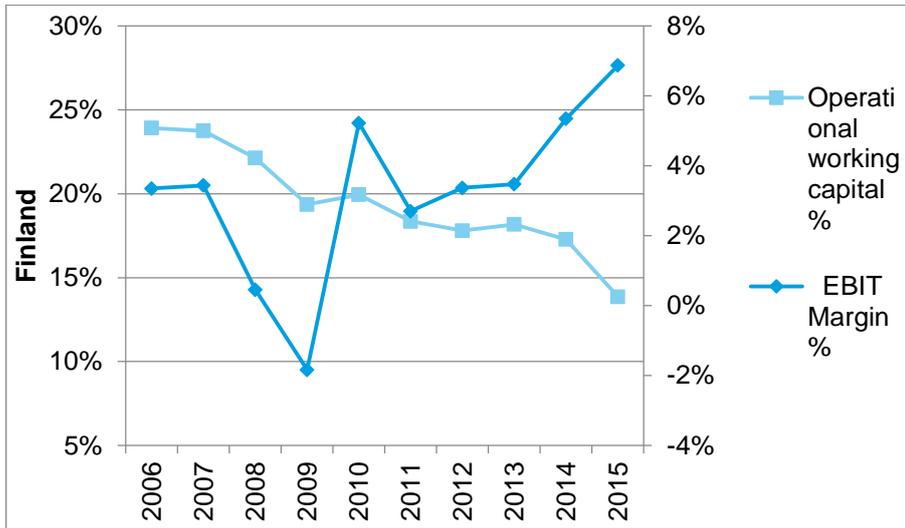


Figure 23. Operational working capital percentage and EBIT margin: Finland

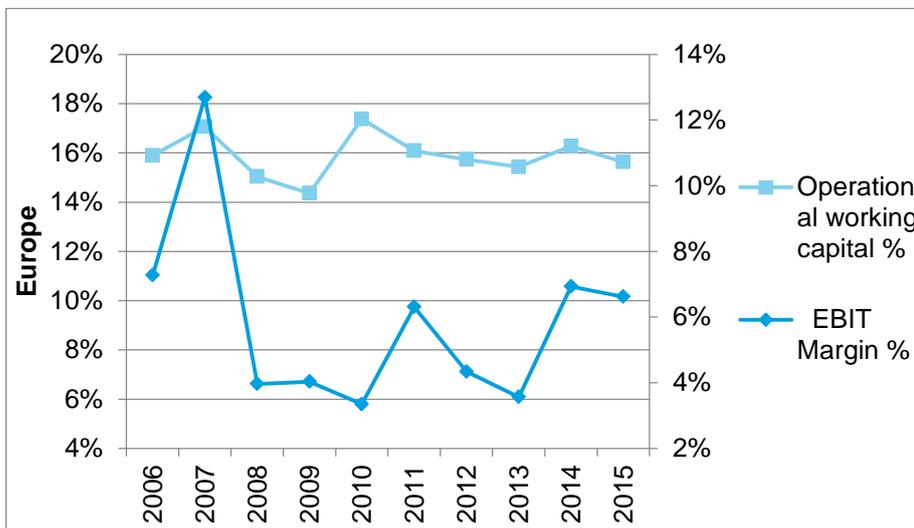


Figure 24. Operational working capital percentage and EBIT margin: Europe

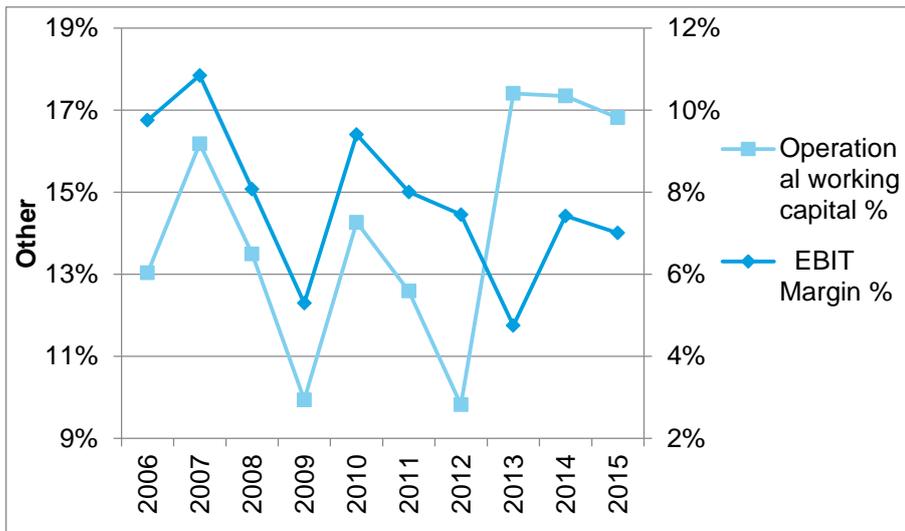


Figure 25. Operational working capital percentage and EBIT margin: Other

Figure 23, Figure 24 and Figure 25 raise questions that why the EBIT margin does not move upwards when operational working capital percentage decreases. Only sign of this movement was visible in the graph from Finland where these measures moved to different directions after 2013. For Europe and location Other both measures seem to always move to the same direction which does not support what theory suggests that optimal level of working capital management tends to enhance profitability. Probably comparing these two measures is not as black and white since there are many other items affecting to profitability such as markets and economic situation, growth, ongoing investments and their start-ups, sales volumes, prices, development of costs, maintenance breaks and shutdowns of mills along with many other items. Perhaps first these other items' effect should be cleaned from EBIT margin and after that it could be compared to working capital development.

6.3. Summary of the main findings of the data-based analysis

This chapter provided new information of the working capital management strategies in Finland compared to global competitors and the most important conclusions are visible in Table 7.

Table 7. Summary of the conclusions from data based analysis

Measure	Conclusions
Working capital strategies	<ul style="list-style-type: none"> No change in the working capital strategies chosen by the companies while comparing data from 2006 and 2015 All the companies in both years seemed to be following a moderate strategy instead of conservative or aggressive strategy Current assets do not exceed 40 % of total assets at any point within the time range for any company in the analysis
Cash conversion cycle	<ul style="list-style-type: none"> Working capital optimization trend only visible in Finland – for other locations CCC has increased CCCs had large deviation between the companies in 2006 compared to 2015 The companies with the largest increases in cash conversion cycle were the ones with the shortest cash conversion cycle in 2006 The most efficient in terms of CCC seem to be Finland with 60 days in 2015 and from the companies the most efficient is Norske (location Europe) with only 36 days in 2015
Days inventory outstanding	<ul style="list-style-type: none"> DIO seems to be the most stable measure of CCC and no clear trends visible DIO has decreased only in Finland and the change comes mainly from Stora Enso where DIO decreased by 29 % from 2006 to 2015 The most efficient in terms of DIO seem to be the location other with 57 days in 2015 and from the companies the most efficient is Sappi Limited (location Other) with only 49 days in 2015
Days sales outstanding	<ul style="list-style-type: none"> A clear trend of optimization visible in Europe and Finland DSO peaks in 2007 which might be due to the fact that the customers have had some difficulties for paying the goods delivered just before the financial crisis begun Decrease in Finland's DSO comes only from Stora Enso with a decrease of 28 % whereas DSO for Metsä Board and UPM has increased The most efficient in terms of DSO seem to be Europe with 41 days in 2015 and from the companies the most efficient is Norske (location Europe) with only 31 days in 2015
Days payables outstanding	<ul style="list-style-type: none"> Clear trends visible in all locations but a trend of optimization only visible for Finland DPO peaks in 2009 in location Other and Europe which could refer to the fact that the companies from these locations were not able to pay for their suppliers as promptly as they have used to DPO has increased by 35 % in Finland and the largest change comes from Metsä Board which has been able to increase DPO by 53.6 % Finland started with clearly shorter DPOs than European companies and companies from location Other The most efficient in terms of DPO seem to be Europe with 62 days in 2015 and from the companies the most efficient is Holmen Aktiebolag (location Europe) with 79 days in 2015
Working capital and EBIT margin	<ul style="list-style-type: none"> Clear pattern where working capital decreased and EBIT margin increased was visible only in Finland after 2013

Although, in general many companies are having more attention on their working capital management, still the data represented in this chapter showed that there is no clear trend of optimization of working capital visible in all location or companies. Conversely, it seems that only in the location Finland the trend of optimization is visible. Additionally, this trend was not even visible in all Finnish companies since one of the Finnish companies, UPM, was already in lower levels and there were basically no changes between the figures of 2006 and 2015. One reason why

Finnish companies were able to optimize their working capital was that at least two of the three companies came from high levels of working capital.

A study from PwC (2014) suggested that the working capital performance is weak in Nordics and that they have one of the highest days of working capital. Results from this study are not fully comparable with the PwC's study since they included all the industries and their focus was in Nordic companies whereas this study focused only Finnish forestry companies. However, some conclusions can be made since PwC (2014) suggested that management within accounts receivables is worse and inventory management has not improved. However, they suggested that accounts payables have been improved. In this study days in sales outstanding there were no large changes in Finland whereas days in inventory outstanding have decreased in Finland but the change came mainly from only one company. However, Finland have had substantial change in the days payables outstanding which means that PwC's (2014) suggestions can be only partially supported.

Lazaridis & Tryfonidis (2006) noticed that companies tend to focus on different determinants of working capital. They suggested that larger companies with fewer sales and more seasonality tend to have more cash flow problems and thus focus on cash management and smaller companies tend to focus on stock management while less profitable companies focus on credit management. Based on the data it was noticed that different companies from different locations seemed to have very different days outstanding depending on the item in question. It would be interesting to analyze this data more deeply to see whether the actions taken with determinants of working capital were due to some certain issues within the forestry industry.

7. Analysis of interview data from Finnish forestry company

This chapter focuses on discussing the results from the qualitative part of the study. However, first it introduces how the qualitative data was collected and analyzed and after the results are discussed in more detail. At the end of this chapter the main findings are summarized.

7.1. Collection of qualitative data

Half-structured interviews are the most common used method of collecting qualitative data (Koskinen, et al., 2005) and when qualitative analysis aims for finding out 'what', 'how' and 'why', non-structured interviews, such as half-structured interviews are recommended (Saunders, et al., 2007). In half-structured interviews the research template was prepared beforehand around a few themes and communicated to the interviewees. It is allowed to deviate from the order of the themes and the form of questionnaire and let the topics related to the themes be discussed. The template assists the interviewer in directing the interview and in ensuring that all the themes and questions are asked. (Koskinen, et al., 2005)

Data for the qualitative part was collected through half-structured theme interviews since the purpose is to look for opinions what the working capital experts in Finnish forestry companies have. The interviews included three different themes which were: strategy, commitment and challenges. The interviews were structured so that the question pattern was followed but the discussion was able to flow freely around the subjects. The questions related to strategy focus on finding out whether there is a clear working capital strategy implemented and is it linked it the whole business strategy and which measuring instruments are used and what are the views about the future. Furthermore, the second theme focus on commitment and personnel related matters such as is the top management committed to the target setting and in motivating other employees, are the targets of working capital management generally known across the organization and is the development progress shared across the company. Additionally, the questions related to challenges consist of the following matters: what are the challenges and how are these tackled. The full question pattern is available in the Appendix 1.

The interviewees were chosen from once case company within the forestry industry. All the interviewees came from different positions and departments and had different backgrounds. To be more precise half of the interviewees came from Group functions the other half came from divisions with more operational expertise. Some of the interviewees had more experience on the operational side whereas some had more strategical or financial point of views. The interviewees were chosen so that different point of views would be covered but the most important factor while choosing the interviewee was that the interviewee was an expert on the field which would secure the reliability of the results.

The interviews were held in English or in Finnish depending on the interviewees' wishes and capability. All the interviews were transcribed for further analyzing. The interviews included total of 46 pages of transcribed speech written with Arial 12 and with a spacing of 1.5. The transcription was done with discretion and thus meaningless filling words were left out of the transcription. The reason for transcribing the interviews was that it facilitates the analysis and improves the reliability. If interview was held in Finnish, only the parts which have been cited in the study have been translated to English.

7.2. Results from the interviews

Interviews revealed that there are substantially different views of how working capital should be managed. Some of these differentiating views could be explained by the fact that from which field they came from and their background but some of the opinions were just affected by the experts personal views. Experts from the business side with more experience on production, operations and customers tend to argue on the fact that the working capital should not be reduced to extreme minimum whereas the experts from group functions with more on strategical experiences supported that business operations should be harmonized and that there is still lot to work on with working capital management. The business side's arguments were that the loose working capital should be removed but no minimizing actions should be made in the expense of the customer. In the following sections the themes are discussed in more detail.

7.2.1. Strategy

The first theme of the interviews, strategy, was the most time consuming theme for several reasons. First, the theme included the most questions compared to other themes. Secondly, this was the first theme introduced in the interviews. Third reason for the time consumption was that the due to benefits of semi-structured interviews, all the interviews seemed to be the most interested on this topic.

The first questions focused on investigating whether a company is following a working capital strategy and whether this is attached to the business strategy. No unified reply was received and all the interviewees saw this quite differently. Experts from the business side viewed that there is perhaps no need to have a working capital strategy. In their minds working capital strategy should be treated more as an action plan or as a road map whereas the experts from the group functions either felt that there is a working capital strategy or that it could be said that there is one since there are strategical targets set which are followed continuously along with other business measures.

While investigating whether the working capital strategy and business strategy are attached and do not have conflicting targets, one interviewee felt that the working capital strategy and business strategy are deeply attached whereas other interviewee felt that they are not attached at all since the working capital is only led by the divisions and that the importance of the working capital matters is determined by those divisions. Thus it depends on the divisions' views of working capital management whether they make strategical decisions which go hand-in-hand with business strategy. Additionally, one interviewee argued that the compactness has increased during the years but he did not see it too tight since there are industry specific matters affecting to the compactness. The interviewee viewed that the importance of the compactness is not as important within the forestry industry compared to for example wholesale business where the importance of the working capital is substantial. The interviewees graded the compactness as 5.8 from scale of 1 to 10, where 1 implied that working capital strategy and business strategy are not related at all and 10 implied that working capital strategy and business strategy are highly related. The replies for the grading had some deviation.

It seems that all the interviews had unified view that all the components of working capital management defined earlier in the second chapter of this study, cash management, inventory management, credit management and management of short term liabilities. However, there was discussion that the management of different components is not balanced and that the management of these different sub--sections is shattered around the organization. Lately, more focus has been on the short-term liability side where payment terms extensions has been negotiated actively. Additionally, one of the interviewees mentioned that there has been more focus on the inventory management, where slack inventory has been investigated by focusing on obsolete stock and slow moving stock. Two of the interviewees felt that the inventory management has plenty of space for improvements. One of the interviewees felt it as a challenge that the sub-sections do not have a natural owner whereas other interviewee felt that it is not a challenge after the working capital management projects with their respective project managers have been set up.

Interviewees agreed on the fact that working capital development is measured and followed on monthly basis. However, there was only one key measure operational working capital to sales, which is referred as working capital percentage in this study. This one key measure describes how working capital management is measured on top management, but there are probably different measures when drilled down in the organization. However, all the interviewees emphasized that there is only one core measure. Additionally, when discussing about how strategic is the measure, the average grade was 8.1 in a scale of 1 to 10 with a minor deviation. Within the scale 1 implied that the measure is not strategic at all and 10 implied that the measure is extremely strategic. The measure was treated as a strategic measure since the top management gives a target for each division and all the divisions make their own action plans based on that target.

While requesting opinions regarding the fact that are sustainable improvements solutions searched for in a continuous basis, all the interviewees seemed to have unified opinions and concerns. All mentioned that since the working capital focus increased several years ago, improvement solutions have been constantly searched for. As an example the payment term extensions were recognized as a

general trend and mentioned that there is an ongoing project and the short-term liability management is working actively with these. One interviewee mentioned that the forestry industry in general has quite short payment terms compared to other industries, which is mostly due to the fact that the suppliers tend to be quite small and would suffer from too long payment terms. Additionally, it was mentioned that within the payment term extension process it is not only important to reach longer payment terms but to harmonize the payment terms in general. The interviewees graded the strategic level of decisions as 6.0 from scale of 1 to 10, with relatively large deviation. Within the scale 1 implied that the decisions are not strategic at all and 10 implied that the decisions are extremely strategic. The arguments included that there is still room for more operational improvements and that it should be continuously investigated how to work leaner. In addition the importance of the overall harmonization and simplification of processes was emphasized.

All the interviewees were concerned of the increasing trend of using financial instruments in publicly traded companies such as supply chain financing and factoring in order to manage working capital. All the experts felt that all the time and money used in these programs could be invested in operational improvements. One of the interviewees even mentioned that credit rating agencies will also take into account the possibility of factoring or supply chain financing in a company and adjust financial so that this fictive management will be removed. In addition to these trends digitalization and the possibilities of IT was mentioned that there is still plenty of room for improvements.

7.2.2. Commitment

The commitment theme included questions that were related to looking for answer on the following questions: Is top management involved in working capital management target setting? Is top management motivating employees? Are the personnel aware of the targets and are they informed about the development? It was interesting to notice that the replies related to these questions had some variation especially when discussing whether the personnel know the targets and the development of working capital. However, based on these varying replies it could be concluded that more could be done. In order to motivate employees it is

important to share openly the common targets and perhaps the reasons for setting these targets. Additionally, important is that the individual employee is aware how he/she can have an effect.

All the interviewees were confident that top management is highly involved in determining the working capital targets and actually the interviewees graded the commitment of top management as 8.1 from a scale from 1 to 10 with very small deviation in the replies. Within the scale 1 implied that top management does not take part in determining the targets for working capital and 10 implied that the top management is highly involved in target setting. The interviewees argued that the top management is committed to the target since they are the ones behind determining the target. In other words, the target is determined for the group and split for the divisions and after the target has been set, the information flows from top-down. However, the top management is not involved in determining the action plans for each division to reach their target since these are determined the division by itself. Additionally, top management only determines the overall working capital target and does not drill down to its sub-sections; cash management, inventory management, credit management and management of short-term liabilities. The interviewees also argued that top management seems to be committed since working capital is high on the agenda within top management and they are pushing the target.

When it comes to the fact that does the personnel know the targets and about the amount and quality of the information delivered of the development of the working capital, interviewees seemed to have very different views which could not be explained by the interviewees' business function. Both of these questions received the most deviating replies of all the questions. First, the level of knowing the targets reached a grade of 7.3 from a scale from 1 to 10 which included two replies that the targets are very well known and one reply from the other end of the scale that they are not well known at all and more should be done. Additionally, one interviewee was not able to describe the level of knowing within the scale, just mentioned that at least in the financial organization the targets are well known. Additionally, while discussing about the amount and quality of information sharing, the conclusion was that although the personnel would know the targets they are

not very well informed of the development. The amount and quality of information sharing received a grade of 6.0 from the scale of 1 to 10. Within the scale, 1 implied that the amount and quality could be improved and 10 that the amount and quality is extremely high. One interviewee argued that only the top management and core players are informed about the development but the information could be shared within more vast audience via telcos and internal news. Additionally, the concern was that although it is known through the organization that working capital is an important target, it is not perhaps clear what does it really mean. Furthermore, it should be clarified which are the determinants and how can the employee have an effect on the development. Interviewees also argued that the information of the development is probably shared within the mill level and with their head of productions but they had no idea how this is done. In the other words, the information sharing is not transparent and harmonized within all the divisions. As already mentioned within the strategy theme, the divisions' interest and the market pressure has a great effect on the fact that how information is shared and how hard the targets are pushed.

7.2.3. Challenges

The last theme concerned the challenges within the working capital management field. The aim was to search for issues that the experts feel as a challenge and how do they tackle these issues. Additionally, it was discussed that which working capital management tools and opportunities have not been used which definitely should be fully exploited in the future. The challenge theme was probably the one in where the interviewees shared the most unified opinions.

The IT's role in here was extremely important, or in other words, its absence. The question where the interviewees were asked to grade how well they had taken advantage of IT, received the lowest grade of all the questions. From the scale from 1 to 10, usage of IT was graded as 4 with a minor deviation. Within the scale, 1 implied that the role of IT has not been fully exploited and 10 that it has been fully exploited. The low grade with small deviation indicates that all the interviewees saw that there are plenty of advantages that have not been taken into advantage. A few of the interviewees mentioned the digitalization and the usage of big data as a future trend but which cannot still be fully implemented due to the

fact that there are still plenty to do within the harmonization and simplifying of the processes. It was mentioned that there are electronic interphases in use but no harmonized systems not to mention full automatization and system dynamics.

A consistent theme was also the fact that none of the interviewees were not aware of the term bullwhip effect which theory suggest to be an important challenge for forestry industry. Even the interviewees' from business functions were not aware of the definition of the bullwhip effect and thus it was concluded that this is not an issue for the company. Although, a few of the interviewees stated that the bullwhip effect is a fair assumption and if this would be faced as a challenge it would not be the bullwhip effect itself, more likely the issue would be transparency in the value chain.

The interviewees were able to name a lot of different challenges but none of those were represented in the theory since they all were really practical issues. From the other challenges which were discussed, one of the most important one was the fact that how the optimal level of working capital is determined and all of the interviewees were somewhat concerned of this challenge. Some of the interviewees felt that this should be tested so that working capital management would always be taken further and further until alerts go on and it is noticed that there is our breaking point. However, others thought that only loose working capital should be removed but not to do any optimization in the expense of the customer.

While discussing of the tools which are used in managing working capital the interviewees had extremely unified views and most often some tool which improve operational efficiency were selected from the list. The interviewees argued that focus should be increased within efficient production planning and forecasting techniques. Additionally, while investigating the development dashboards and benchmarks became the most important items along with specific measurement. Furthermore, focus should be enhanced within setting the targets and on the follow-up of the determined measures.

7.3. Summary of the main findings

This chapter provided new information of the working capital management in Finnish forestry company. The qualitative analysis was divided into three different themes which were strategy, commitment and challenges. The most important conclusions of the qualitative analysis are visible in Table 8.

Table 8. Summary of the conclusions from the qualitative analysis

Theme	Summary
Strategy	<ul style="list-style-type: none"> No unified reply while requesting whether a clear working capital strategy exists It became problematic to define strategy since some interviewees viewed working capital strategy more like as action plan or road map When the comments on the compactness of working capital strategy and business strategy were requested there were some deviation One interviewee felt that the compactness depends on the divisions' views of working capital management and whether they make strategical decisions which are in line with business strategy One interviewee argued that the compactness of working capital strategy and business strategy is not as important for forestry industry compared to for example whole sale industry All interviewees agreed with the fact that working capital is managed within all of the sub-section (cash management, inventory management, credit management and management of short-term liabilities) but it changes how much effort is put to each section Interviewees agreed with the fact that the working capital development is measured and followed actively but with only one key measure – working capital percentage All interviews seemed to share the common concern of the increasing trend of using costly financial instruments in the public companies in order to manage working capital
Commitment	<ul style="list-style-type: none"> All interviewees argued that top management is highly involved in setting the targets for working capital but they are not involved in determining the action plans The replies related to the fact that whether employees know the targets and are they informed of the development had plenty of deviation Interviewees somewhat felt that employees know the targets at least on certain levels but they are not really informed about the development One interviewee argued that only the top management and other core players are informed but the information should be shared with more vast audience Information sharing is not transparent and harmonized in all divisions
Challenges	<ul style="list-style-type: none"> It was very clear that all the interviewees felt that the possibilities of IT has not been fully exploited and it was felt that there are plenty of improvement possibilities Bullwhip effect as a term was not recognized at all and they did not really recognize it as an issue but they argued that the issue could be the lack of transparency in the supply chain Interviewees felt that one of the greatest issues within the working capital management is that how to determine the optimal level The views related to the fact that how the optimal level should be determined had some deviation since some of the interviewees felt that this should be tested always going further whereas some felt that none of the testing should be done in the expense of the customer satisfaction The interviewees had somewhat unified opinions of which tools for improving working capital should be used more actively and especially the efficient production planning and forecasting techniques and benchmarking were often raised by the interviewees

Theory suggests that the working capital optimization program should begin from the top management and they should clearly announce that the working capital improvement efforts are companywide priorities and that it has a link with business and individual performance. Additionally, the theory suggests that the importance of setting proper metrics cannot be highlighted enough. Furthermore, the incentives should be clearly announced and shared across the organization. (Deloitte, 2014) The interviewees arguments related to the commitment section were deviating and conclusions were hard to draw. However, it seems that there are still plenty to work to do within the commitment section since at least the information was not shared enough. Although top management was involved in setting the targets and the subject was high on their agenda it seems that the importance of working capital was still not pointed out enough. It is clear that there are imbalances within the information sharing within the organization. The amount of sharing could have been affected by the fact that how interested the head of some organization on the subject. Clearly a head of some production site might not be interested in sharing their development in the optimization program if he/she is not personally interested in the optimization or he/she does not see the benefits of the optimization.

EY's report (2015) suggests that working capital performance has improved both in US and Europe and that companies tend to focus on streamlining manufacturing and supply chains, more collaboration with the suppliers and customers, more efficient payment term management for customers, improvements in billing and cash collection, extending supplier payments terms and more efficient procurement and payable process. Based on the qualitative data in this study the working capital experts' focus was also on these exactly same items. However, experts mentioned that related to some of these items there is an optimization program ongoing and these are progressing well but some of these were just noticed as items which should gain more focus and improvements should be done.

8. Discussion and conclusions

This chapter summarizes the findings from the empirical section of the research and ties up the introduced literature. Additionally, potential future research subjects are represented shortly.

This study first introduced the concept of working capital management. The study discussed about determinants of working capital, measuring working capital, different strategies for managing working capital and some challenges involved with working capital management. This study increased the knowledge of working capital within Finnish forestry industry. Furthermore, it aimed in filling the gap previous literature of working capital management concerning strategical matters.

8.1. Summary of the findings

The main focus of the study was to investigate the working capital management within the forestry industry in Finland. This was completed by analyzing quantitative data from Finnish forestry companies and from their global competitors. Additionally, the study was structured in a way that the financial data would be supported by qualitative analysis which was done with half-structured theme interviews in Finnish forestry company. The data analysis aims in providing background information for the main research question whereas the analysis of the interviews focus on replying the sub-questions.

“In which extent working capital is managed within Finnish forestry companies?”

First approach in order to analyze the quantitative data the strategical positioning was investigated and it was shown that all the forestry companies seem to follow a moderate strategy with average income and risk. Additionally, it was noticed that there were basically no changes compared the strategical positioning in 2006 and 2015.

Secondly, cash conversion cycle and its determinants were studied first by locations and then also more precisely focusing on Finnish forestry industries. While comparing the cash conversion cycles in different locations, it could be noticed promptly that the Finnish companies have had the longest cash conversion cycle but on the other hand they seemed to be the only ones having a

clear trend of optimization. The determinants of cash conversion cycle were investigated also separately in order to see where the optimization was generated.

It could be concluded that the Finnish forestry companies had been the efficient within all the determinants of the cash conversion cycle. Average days inventory outstanding and average days sales outstanding had decreased by 15.2 % and 6.8 % respectively from 2006 to 2015. On the other hand, average days payables outstanding changed the most since they had increased by 35 % from 2006 to 2015. The changes were very different depending on the company since UPM seemed to be quite stable although its average days payables increased by 12.7 % from 2006 to 2015 whereas the average days inventory outstanding and average days sales outstanding increased by 3.6 % and 3.3 % respectively from 2006 to 2015. The greatest changes came from Stora Enso which average days inventory outstanding and average days sales outstanding had decreased almost 30 % from 2006 to 2015 whereas average days payables outstanding had also increased by almost 30 %. Metsä Board had smaller changes in average days inventory outstanding and average days sales outstanding but its average days payables had increased by almost 55 %. At least two clear conclusions can be drawn. Firstly, based on these figures it seems that one reason for why Stora Enso has been able to improve their figures more than its Finnish competitors is that it started with the loosest situation. Secondly, UPM has not been as active in lengthening the payment terms with their suppliers as its Finnish competitors. It still pays for its suppliers in 36 days which is almost a month faster than Stora Enso and Metsä Board pay for their customers.

The results also showed that Finnish companies tend to focus on optimizing working capital more than their global competitors. However, the optimization is partly due to the fact that Finnish companies came from the loosest situation which increases questions like have the competitors outside the world noticed the importance of the working capital management earlier than the Finnish companies? Additionally, although the working capital management figures have improved it does not reveal which have been the solutions – is the improvement a result of a continuous and strategical simplification and harmonization of business operation or is it a result of quick fixes. Based on the quantitative analysis, it could

be concluded that from the Finnish companies UPM tends to have more focus on the inventories and production side since they had the smallest average days inventory outstanding with a clear stable trend. Stora Enso and Metsä Board seem to have started to focus on the inventory side later than UPM and are thus still quite far from UPM's levels.

Due to the fact that the main question is as such is wide, it has been divided into following sub-questions:

Q1: Do Finnish forestry industry companies follow a clear strategy with long-term targets while managing working capital?

The strategy theme clearly was divided into two sections which included the working capital strategy and the sustainable improvement. Related to the working capital strategy part and its sub-questions, it seemed that all the interviewees tend to have different opinions and any conclusions was extremely hard to draw. It was clear that there was no clear strategy since the opinions and comments were different. However, it could be concluded that the commenting was affected by each individual's vision of strategy and some interviewees mentioned that working capital should not have a strategy – it should be more like a road map or action plan. On the other hand, all the interviewees seemed to share the common concern related to the increasing usage of financial instruments within the working capital management. The interviewees in general supported searching for sustainable improvement solutions including harmonization of processes, transparency within the supply chains and more efficient production planning. Simple operational long-term improvements were supported instead of quick fixes and fictive improvements done with financial instruments.

Q2: Are the objectives of the working capital management known across the company and are personnel committed to them?

Theory suggests that working capital optimization facilitates when the personnel and especially the top management is motivated. All the interviewees stated that the top management is involved and that the subject is especially important within the agenda. They thought this mainly because the top management is basically the ones who set the target and inform about these targets. However, there were some deviation within the replies that is the personnel aware of the targets and the

importance of the subject. Additionally, there were arguments that although the personnel would know the targets, they would still have no understanding that how they could have true effect on these ratios.

Q3: What are the main challenges in managing working capital and how companies tackle them?

An important conclusion which could be made in relation to the challenges is that although theory suggests that bullwhip effect is a generally known challenge for forestry industry, none of the interviewees seemed to recognize the term without explanation. Additionally, none of the interviewees seemed to recognize the issue as a challenge. Furthermore, they suggested that the challenge would really be the lack of transparency within the supply chain instead of the bullwhip effect. Additionally, it was interesting to notice that the company seemed to lack expertise within the IT tools, since all the interviews mentioned that the advantage of IT, digitalization and system dynamics has not been taken.

To conclude the most clear challenge noticed within the discussions was that how to determine the optimal level of working capital. There were also deviating opinions how this should be searched for since some of the interviewees suggested that it should be just tested by going always going further and further until something goes wrong whereas some of the interviewees thought about taking the more safe strategy and just getting rid of the slack but keeping a buffer that nothing goes wrong. These suggestions were clearly different when discussing with an expert from the business side and more near the customer and compared to the expert from group functions with more strategical views.

As a final conclusion one of the interviewees summarized the idea of working capital nicely by referring it to a fridge. With efficient working capital management, the products in the fridge are rotated so that nothing goes off in other words there are no excessive amounts of the products. However, even worse is when in need there are no products in the fridge at all. Key take away in here is that how hard it is to determine the optimal level and that the working capital ratios should not become too important targets at profitability's expense. When working capital ratios are pushed too hard and too low levels it will have a negative effect elsewhere and when it becomes more important than profitability, quality,

relationships with suppliers or customers, the targets and values of the company should be rethought.

8.2. Discussion of the conclusions

One important result from the study is that the companies are struggling in determining the optimal level of working capital. This issue is also highlighted often in previous literature and it seems that there is yet no common solution existing since all the industries and companies are very different. Some differences compared to previous literature were also recognized. Firstly, there were no recognized issues that would have arisen from bullwhip effect and the interviewees did not know the definition of the term. The theory suggests that bullwhip effect is a common challenge in the forestry industry. Secondly, theory also suggests that optimally minimized working capital should increase profitability. This was not clearly supported by the data analysis since only signs of this pattern was visible in Finland during the latest two years.

Quantitative and qualitative data seem to provide same kind of results for a few reasons. Firstly, it is visible from the interviews that more attention has been in working capital management and improvement programs have been set. The quantitative data also suggests that the working capital has improved since cash conversion cycle has decreased by 34.6 % in Finland from 2006 to 2015. Secondly, the interviews revealed that there has been work done actively on the accounts payable side by negotiating better payment terms and doing harmonization in general which is also visible in the quantitative data. Average days payables have increased by 35 % in Finland from 2006 to 2015. Thirdly, interviews revealed that inventory management is lacking improvements and only loose capital has been removed but no other actions have been taken. Based on the quantitative data average days inventory outstanding has decreased by 15.2 % in Finland from 2006 to 2015. However, based on the date compared to other competitors, more could still be done.

Table 9 summarizes the most important lessons learned from the study and provides information that companies should take into account while managing working capital.

Table 9. Most important lessons learned

Key items	Details
Focus on sustainable improvement solutions instead of financial instruments	Companies should focus on searching for sustainable improvement solutions by improving production planning, setting up proper systems in place which allow more accurate estimation, harmonizing and streamlining processes, improving supply chain management by increasing transparency, setting up proper measurement and negotiating better payment terms with suppliers and customers. These sustainable solutions should come before costly financial instrument related programs.
Harmonization of measurement and information sharing within the divisions	Although top management determines the target for the group which is then divided for the divisions, the top management should be involved in determining the action plans for each division. Currently divisions are managing their working capital independently which is then affected by the division heads' personal views of working capital management and the programs set and tools chosen for might not be harmonized within all the divisions. If common programs would be set and a project group brought together, they could find solutions which would be beneficial for all the divisions instead of one division only driving a hard bargain. Furthermore, information should be shared more often and with better quality. All the employees should be aware of the targets, see the development and understand how he/she can have an effect.
Inventory management should be improved	It seems that the least has been done within the inventory management compared to other sub-sections of working capital management. The focus on inventory management has been so far at the stage that only the loose capital has been removed but it seems that no other actions have been implemented. It seems that the digitalization and IT's role have not been fully exploited.

8.3. Limitations to the interpretability of the results

The empirical section was supposed to be only qualitative and it was supposed to include only interviews from three different companies. The reliability would have been secured by having an extensive sample size. Additionally, the interviewees would have been carefully divided with the three different companies and selected based on their expertise on the working capital field. However, at the time the first interviews had been held in one Finnish forestry company it was noticed that other companies were not interested in participating this study. It seems that the subject, working capital management, is still quite sensitive and the companies refused the interview requests. Since the interviews were not able to be carried out as the original plan intended, the study ended up having interviews only from one

company. To tackle the issue of lacking data and in order to increase the reliability the research method was changed from qualitative research to the triangulation method by including also quantitative data analysis to the empirical section. Triangulation method increases the reliability when the data analysis and interviews lead to the same conclusions. To conclude reliability of the interview results could be still improved by increasing the sample size but since it is qualitative data it will never become as reliable data as quantitative data due to the fact that the data consists of the interviewees' subjective opinions.

8.4. Further research questions

This study focused on investigating working capital management in Finnish forestry companies by analyzing global competitor financial data and through interviews held in one case company. However, I would encourage a future researcher to carry on a study including only qualitative data based on interviews from Finnish forestry companies. This is because now based on the quantitative data it seems that these different companies might have very different approaches and focus areas while managing working capital. These interviews would provide extensive and interesting data to be analyzed in the future. Additionally, this kind of qualitative analysis would be even more fruitful if the companies are able to develop and take advantage from the possibilities digitalization has to offer.

Another interesting topic would be to investigate the opinions in relation to the sustainable improvements versus financial instruments within the working capital management since this was raised as a concern. It would be interesting to investigate the pros and cons of using these instruments and also to really see the costs of using those tools. Within this type of analysis it would be interesting to also include opinions from credit rating companies to see how they deal with companies who are fictively increasing affecting to their trade receivables or trade payables for example.

Future researchers could also study the fact that is it beneficial for companies minimize their working capital in the world of negative interest rates. It would be interesting to notice that how companies are tackling these issues since it is not probably the best option for companies to deposit cash flows from working capital

optimization with a negative interest rate. Additionally, it would be interesting to study working capital management in other industries such as construction, wholesale and electronics and to search for common themes within different industries.

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Operational working capital		Year										Grand Total
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Europe	Holmen Aktiebolag	354	393	453	385	359	344	344	341	384	333	369
Europe	Mondi	1 198	1 300	1 112	918	989	868	1 071	1 035	1 131	1 159	1 078
Europe	Norske Skogindustrier	276	323	154	120	312	321	187	150	110	127	208
Europe Total		609	672	573	474	553	511	534	509	542	540	552
Finland	Metsä Board	1 305	968	761	463	565	451	412	420	355	228	593
Finland	Stora Enso	2 829	2 833	2 406	1 652	1 815	1 916	1 748	1 573	1 508	1 157	1 944
Finland	UPM	1 877	1 976	1 995	1 589	1 830	1 961	1 858	1 894	1 914	1 895	1 879
Finland Total		2 004	1 926	1 721	1 235	1 403	1 443	1 339	1 296	1 259	1 093	1 472
Other	Nine Dragons Paper	153	304	352	98	514	499	184	795	822	658	438
Other	Oji Holdings	1 785	2 055	1 818	1 947	1 645	1 743	1 704	1 899	2 130	2 502	1 923
Other	Sappi Limited	334	315	308	312	280	350	462	728	663	607	436
Other Total		757	891	826	786	813	864	783	1 141	1 205	1 256	932
Grand Total		1 123	1 163	1 040	831	923	939	886	982	1 002	963	985
Avg. Cash Conversion Cycle		Year										Grand Total
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Europe	Holmen Aktiebolag	69	82	93	94	92	82	79	91	103	100	88
Europe	Mondi	80	80	76	77	70	65	71	68	74	74	74
Europe	Norske Skogindustrier	19	29	19	-7	36	64	56	46	38	36	34
Europe Total		56	64	62	55	66	70	69	68	72	70	65
Finland	Metsä Board	83	135	113	99	81	81	84	86	80	55	90
Finland	Stora Enso	120	112	108	98	73	72	70	64	62	54	83
Finland	UPM	73	74	80	88	74	72	69	70	73	71	74
Finland Total		92	107	100	95	76	75	74	73	72	60	82
Other	Nine Dragons Paper	29	70	73	39	57	57	37	44	80	66	55
Other	Oji Holdings	56	56	55	57	58	56	56	57	61	72	59
Other	Sappi Limited	25	24	20	23	16	15	24	41	48	49	28
Other Total		37	50	50	40	44	42	39	47	63	63	47
Grand Total		62	73	71	63	62	63	61	63	69	64	65

Avg. Days Inventory Out.		Year										
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Grand Total
Europe	Holmen Aktiebolag	98	103	110	122	115	125	126	128	134	130	119
Europe	Mondi	68	68	67	73	69	70	73	71	76	78	71
Europe	Norske Skogindustrier	65	66	62	74	59	59	57	56	61	65	62
Europe Total		77	79	80	90	81	84	86	85	90	91	84
Finland	Metsä Board	89	104	95	80	65	68	75	78	85	82	82
Finland	Stora Enso	119	105	98	96	79	79	78	79	83	85	90
Finland	UPM	54	55	59	67	58	56	55	54	56	56	57
Finland Total		88	88	84	81	67	67	69	71	75	74	76
Other	Nine Dragons Paper	58	61	70	74	68	57	54	60	63	58	62
Other	Oji Holdings	55	55	55	56	60	56	58	60	59	64	58
Other	Sappi Limited	58	55	51	55	51	46	49	49	48	49	51
Other Total		57	57	59	62	60	53	53	57	56	57	57
Grand Total		74	75	74	78	69	68	69	71	74	74	73
Avg. Days Payable Out.		Year										
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Grand Total
Europe	Holmen Aktiebolag	81	76	76	87	77	90	94	86	82	79	83
Europe	Mondi	54	52	49	53	50	52	50	50	47	47	50
Europe	Norske Skogindustrier	95	84	91	133	65	38	42	47	55	60	71
Europe Total		77	71	72	91	64	60	62	61	61	62	68
Finland	Metsä Board	46	55	45	37	31	35	39	39	51	70	45
Finland	Stora Enso	55	45	38	48	50	52	55	60	66	70	54
Finland	UPM	31	31	29	35	32	33	37	36	35	36	33
Finland Total		44	44	38	40	38	40	44	45	51	59	44
Other	Nine Dragons Paper	77	48	45	76	47	46	60	70	49	54	57
Other	Oji Holdings	84	91	88	81	85	78	79	80	72	69	81
Other	Sappi Limited	67	67	66	74	74	68	68	52	37	40	61
Other Total		76	69	67	77	69	64	69	68	53	54	66
Grand Total		66	61	59	69	57	55	58	58	55	58	60
Avg. Days Sales Out.		Year										
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Grand Total
Europe	Holmen Aktiebolag	53	55	58	59	54	48	48	49	51	49	52
Europe	Mondi	67	64	58	57	51	48	48	46	45	43	53
Europe	Norske Skogindustrier	49	48	48	51	42	43	41	36	33	31	42
Europe Total		56	56	55	56	49	46	46	44	43	41	49
Finland	Metsä Board	39	86	63	56	47	48	48	47	46	43	52
Finland	Stora Enso	55	52	49	50	45	46	46	45	44	40	47
Finland	UPM	50	49	50	56	48	49	50	51	52	51	51
Finland Total		48	62	54	54	47	48	48	48	47	45	50
Other	Nine Dragons Paper	48	57	48	41	36	45	43	54	66	62	50
Other	Oji Holdings	85	92	89	81	83	78	77	77	74	78	81
Other	Sappi Limited	35	36	35	42	39	37	43	44	38	39	39
Other Total		56	61	57	55	53	53	54	58	59	60	57
Grand Total		53	60	55	55	49	49	49	50	50	49	52

Operational working capital %		Year										Grand Total
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Europe	Holmen Aktiebolag	18.0 %	19.5 %	22.2 %	20.2 %	19.4 %	17.5 %	18.3 %	19.9 %	22.8 %	19.7 %	19.8 %
Europe	Mondi	20.8 %	20.7 %	17.5 %	17.5 %	17.6 %	15.1 %	18.5 %	16.0 %	17.7 %	17.0 %	17.8 %
Europe	Norske Skogindustrier	8.8 %	11.0 %	5.4 %	5.4 %	15.1 %	15.6 %	10.4 %	10.4 %	8.4 %	10.2 %	10.1 %
Europe Total		15.9 %	17.1 %	15.0 %	14.4 %	17.4 %	16.1 %	15.7 %	15.4 %	16.3 %	15.6 %	15.9 %
Finland	Metsä Board	28.3 %	27.7 %	23.5 %	19.0 %	21.7 %	18.1 %	19.5 %	20.8 %	17.7 %	11.4 %	20.8 %
Finland	Stora Enso	24.7 %	23.9 %	21.8 %	18.5 %	17.6 %	17.5 %	16.2 %	14.9 %	14.8 %	11.5 %	18.1 %
Finland	UPM	18.7 %	19.7 %	21.1 %	20.6 %	20.5 %	19.5 %	17.7 %	18.8 %	19.4 %	18.7 %	19.5 %
Finland Total		23.9 %	23.8 %	22.1 %	19.4 %	19.9 %	18.4 %	17.8 %	18.2 %	17.3 %	13.9 %	19.5 %
Other	Nine Dragons Paper	14.6 %	23.2 %	18.7 %	5.6 %	21.5 %	15.4 %	5.1 %	20.8 %	21.3 %	16.4 %	16.3 %
Other	Oji Holdings	16.9 %	18.7 %	15.8 %	17.7 %	16.5 %	17.0 %	16.1 %	17.6 %	18.4 %	21.3 %	17.6 %
Other	Sappi Limited	7.6 %	6.7 %	5.9 %	6.6 %	4.8 %	5.4 %	8.2 %	13.9 %	12.3 %	12.7 %	8.4 %
Other Total		13.0 %	16.2 %	13.5 %	9.9 %	14.3 %	12.6 %	9.8 %	17.4 %	17.3 %	16.8 %	14.1 %
Grand Total		17.6 %	19.0 %	16.9 %	14.6 %	17.2 %	15.7 %	14.5 %	17.0 %	17.0 %	15.4 %	16.5 %
EBIT margin %		Year										Grand Total
Location	Company	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Europe	Holmen Aktiebolag	11.3 %	10.5 %	5.4 %	8.6 %	5.6 %	9.9 %	6.9 %	5.3 %	8.8 %	6.5 %	7.9 %
Europe	Mondi	6.3 %	7.3 %	6.1 %	4.9 %	7.5 %	9.8 %	9.0 %	10.4 %	11.3 %	13.4 %	8.6 %
Europe	Norske Skogindustrier	4.2 %	20.2 %	0.4 %	-1.4 %	-3.0 %	-0.8 %	-3.0 %	-5.0 %	0.6 %	0.0 %	1.2 %
Europe Total		7.3 %	12.7 %	4.0 %	4.0 %	3.3 %	6.3 %	4.3 %	3.6 %	6.9 %	6.6 %	5.9 %
Finland	Metsä Board	-1.9 %	-0.2 %	-1.9 %	-10.0 %	2.9 %	-1.1 %	1.7 %	3.2 %	4.6 %	5.6 %	0.3 %
Finland	Stora Enso	5.2 %	4.6 %	0.1 %	1.5 %	6.4 %	5.7 %	4.6 %	3.1 %	5.8 %	8.5 %	4.6 %
Finland	UPM	6.8 %	5.9 %	3.2 %	2.9 %	6.4 %	3.5 %	3.8 %	4.1 %	5.6 %	6.5 %	4.9 %
Finland Total		3.4 %	3.4 %	0.5 %	-1.8 %	5.2 %	2.7 %	3.4 %	3.5 %	5.3 %	6.9 %	3.2 %
Other	Nine Dragons Paper	20.7 %	22.3 %	15.3 %	13.4 %	17.4 %	13.0 %	11.5 %	11.6 %	12.5 %	11.0 %	14.9 %
Other	Oji Holdings	6.1 %	5.0 %	3.1 %	2.4 %	6.2 %	5.5 %	4.4 %	4.2 %	4.7 %	3.5 %	4.5 %
Other	Sappi Limited	2.4 %	5.3 %	5.8 %	0.1 %	4.6 %	5.5 %	6.4 %	-1.6 %	5.1 %	6.6 %	4.0 %
Other Total		9.8 %	10.8 %	8.1 %	5.3 %	9.4 %	8.0 %	7.5 %	4.8 %	7.4 %	7.0 %	7.8 %
Grand Total		6.8 %	9.0 %	4.2 %	2.5 %	6.0 %	5.7 %	5.1 %	3.9 %	6.6 %	6.8 %	5.6 %

Appendix 2. The half-structured theme interview

Theme 1. Strategy

1. Are you following a working capital strategy?
 - Yes: Is the working capital strategy attached to your business strategy? **Could you describe the compactness of the relationship of working capital strategy and business strategy with a scale from 1 to 10, when 1 is that they are not related at all and 10 is that they are closely related**
 - *Compactness is referred to the fact that working capital strategy has been taken into account in the business strategy and the decisions walk in hand-in-hand – no separate or conflicting targets*
 - *Is working capital strategy managed in all of the following sub-sections: cash management, inventory management, credit management and management of short-term liabilities?*
 - *Cash management aims to guarantee that a company can meet its payments and other obligations on time and ensures that the company is financially stable and solvent*
 - *Inventory management means overseeing and controlling of the ordering, storage and use of inventory*
 - *Credit management refers to managing the credit risk of accounts receivable and it focus on ensuring that buyers pay on time, credit costs are kept on low levels and poor debt payments are received without damaging relationship with the buyer*
 - *Management of short-term liabilities refers to management of accounts payable*
 - No: Have you been thinking about implementing a working capital strategy?

2. How strategic are the decisions related to the working capital management?

Could you describe the strategic level of the decisions in a scale from 1 to 10, when 1 is that they are not strategic at all and 10 is that they are very strategic

- *Strategic level means that the decisions and/or actions are based on a long-term plan*
- Are sustainable improvement solutions searched for on a continuous basis?
 - Are long-term targets/decisions set or is the focus only on quick fixes? Example: Are you actively negotiating for example longer payment-terms for future or are you paying for factoring services?

3. Are you measuring the realization/development of working capital management?

- Yes: In which sub-sections of working capital management: cash management, inventory management, credit management and management of short-term liabilities?
 - Which are the measures?
 - Are the measures attached to strategy? **Could you describe the strategic level of the measures in a scale from 1 to 10, when 1 is that they are not strategic at all and 10 is that they are very strategic**
 - *Strategic refers to the fact that the measures are names as key measures in working capital management strategy and/or they are followed actively and they support management decision-making*

4. What are the thoughts about the **future**? How will the working capital management develop and which will be the future trends? Are these thoughts already taken into account in the working capital management strategy?

- Do you see the trend that the payment terms are getting longer?
- Are these trends visible in your management of working capital?

- Yes: How? Have you been negotiating payment terms longer on a continuous basis?
- Are your customers negotiating also longer payment terms?

Theme 2. Personnel

5. Is the top management of the company participated in the defining the targets of working capital management?
 - Yes: Working capital management as a whole or within some sub-sections: cash management, inventory management, credit management, management of short-term liabilities
6. How committed the top management is to the targets of working capital management? Could you describe the level of commitment of the top management in a scale from 1 to 10, when 1 is that they are not committed at all and 10 is that they are very committed
 - *Commitment is described as that the top management is actively involved in determining the targets and/or discussing about working capital in blogs/articles in the company intranet on a continuous basis*
 - Is the top management heavily involved in motivating other personnel to this common target and does the information flow with top-down approach?
7. Are the targets of working capital management well known within the finance and production personnel?
 - Yes: Could you describe the level of knowing the targets in a scale from 1 to 10, when 1 is that they are not known at all and 10 is that they are very well known within the finance and production personnel
 - No: Should the information be shared more?
8. Is the finance and production personnel informed of the working capital management development?
 - Yes: How?
 - internal news, in telcos, in email newsletters, elsewhere?
 - How often? Weekly, monthly, quarterly?

- Could you describe the amount and quality of the information flow in a scale from 1 to 10, when 1 is that the information is not shared at all or the quality is uninformative and 10 is that the information is shared often and the quality is informative
 - No: Should the amount/quality of the information be increased/improved?
9. Who/which departments are taking part to the management of the working capital? Is the field very shattered?
- Name departments who are taking part to the management of working capital in practice or who are taking part to the decision-making

Theme 3. Challenges

10. What challenges there are related to working capital management?
- Name some challenges related to working capital management in general or related to some of the sub-sections: cash management, inventory management, credit management, management of short-term liabilities
 - How are these challenges tackled or how have you survived from these challenges?
11. How important role IT has? Are the opportunities of IT taken advantage?
- Could you describe how well you have taken advantage of the IT in a scale from 1 to 10, when 1 is that all the opportunities It has to offer has not been taken advantage and 10 is that almost all IT has to offer has been taken into account
 - Is modeling and system dynamics taken into account while managing working capital?
 - Are you able to tackle some challenges by using IT/automation/system dynamics?
12. Are you aware of bullwhip effect? Do you experience it as a challenge?
- *bullwhip-effect: Information which transfers as orders from member to its upstream member can considerably misguide decision makers*

due to the fact that the variance of orders tends to be larger than the variance of sales (see figure below)

- Yes: Have you used any results from data systems to tackle/manage it?

13. To which factors/items from below you are taking notice?

- Pick for example 5 most important ones
 - factoring
 - supply chain financing
 - inventory management
 - forecasting techniques
 - production planning
 - payment terms
 - benchmark against competitors
 - specific metrics of measurement
 - dashboard, which would show the effects of a optimization program for cash flow and working capital
 - management collaboration