

UNIVERSITY OF EASTERN FINLAND
Faculty of Social Sciences and Business Studies
Department of Business

**THE RELATIONSHIP
BETWEEN
WORKING CAPITAL MANAGEMENT AND
THE CORPORATE CASH HOLDINGS**

Master's thesis
Junli Zhang
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ABSTRACT

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In recently years, researchers have conducted in-depth studies to discover if working capital management influences the level of corporate cash holdings and findings are supportive. Furthermore, the structure of corporate liquidity has been observed under the changes in recent years, firms hold more cash but fewer inventories and accounts receivable. This study is to investigate the relationship between the working capital management and corporate cash holdings exploring if working capital management affects the level of corporate cash holdings and vice versa to provide further evidence under this subject in context of Finnish firms.

Based on the previous researches' findings and theoretical models of working capital management and corporate cash holdings, the following hypotheses are proposed. By tactically managing the accounts receivable, inventory and accounts payable with the style of highly efficient working capital management, shorten the cash conversion cycle, generate more internal cash to firm and increase the level of cash holdings. However, high efficient working capital management also exposes the firms to the risks of low inventory, accounts receivables and trade credit risk. Firms have to reserve cash to hedge and secure against the risks which it is exposed to.

In the empirical parts of the study, 660 Finnish trading firms and 800 Finnish manufacturing firms are selected and analysed for the period of year 2003 - 2007. The empirical results reveal that it is not found the sufficient the evidence to support the hypotheses that examined Finnish firms applied high efficient working capital management to lead into high corporate cash holdings but on the contrary, trading firms' cash holdings is decreased during examined period and similar findings is presented in cash holdings of manufacturing firms as main trend. Even so, it is observed that the liquid asset and cash conversion cycle in Finnish trading firms are negatively associated with the cash holdings in examined period. Therefore, it could be deducted that working capital management has negative relationship in general with the corporate cash holdings.

PREFACE

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1. INTRODUCTION

1.1 Background

Firms maintain certain percentage of assets as cash, but many firms have increased their cash holding levels. Ferreira & Vilela (2004) investigate European Monetary Union corporations of cash to assets ratio and show that corporations hold 15% of their total assets in cash or cash equivalents. Bates et al(2006) report that the average cash to assets ratio for U.S. industrial firms increases with 129 % from 1980 to 2004 and argue that the change in cash holdings is not the result of recent build-up but a “secular trend”. They use several variables to seek the motivation of US firms for corporate cash holdings and find that in order of importance, the change in net working capital of cash is the most important one.

Working capital, also known as net working capital or NWC, is calculated as current assets minus current liabilities. The major components of working capital are accounts receivable, inventories, cash and cash equivalents and accounts payable. Almeida et al (2004) state the working capital can be a substitute for cash. Therefore the changes in net working capital affect the cash holdings. Besides, the changes in short-term debt could be a substitute for cash, because firms may use short-term debt as financial resource. Shin & Soenen (1998) point out that the more efficient the firm is in managing its working capital, the less the requirements for external financing and the better financial performance.

Working capital as cash substitute has been identified as a determinant of corporate cash holdings in previous studies but not in depth. Opler et al (1999) state that net working capital can be a substitute for cash deferred by their empirical test. Ferreira & Vilela (2004) investigate the corporate cash holdings of EMU countries and disclose that cash held by firm is negatively affected by the amount of liquid asset substitutes. Ozkan & Ozkan (2004) indicate that firms can use their non-cash liquid assets, defined as net working capital minus cash and marketable securities to substitute for cash holdings.

In recent empirical finance literatures, some in-depth studies have been conducted in discovering and providing the alternatives of explaining corporate cash holdings by working capital management. Bates et al (2006) argue that the average cash ratio increases because

firms changes their characteristics, such as firms have riskier cash flow, they hold less inventories and accounts receivable and increase the R & D expenses. Capkun & Lawrence (2007) analyze the operating assets and cash holdings of US manufacturing firms and find a steady decrease in operating assets and an increase in cash holdings. They explain that the increase in cash holdings by firms can be viewed as a “counter balance” by the reduction in accounts receivable and inventory and firms hold more cash reserves to secure against increased trade credit risk.

Abel (2008) examine the Swedish manufacturer SMEs and find that high efficiency in the management of working capital means that current assets are quickly transferred into cash, in this way to move the balance from average investments in inventory and accounts receivable to cash and result in high cash holdings. Teruel & Solane (2008) analyse the Spanish SMEs' Corporate cash holdings and find that firms with more liquid assets intent to reduce their cash levels because these assets can be used as cash substitutes and firms with a higher proportion of short-term debt will hold higher levels of cash, so that it lowers the riskier from non-renewing short-term debts.

Previous and recent studies of corporate cash holdings explained by the working capital management provide an anchor for further researching on this topic, more supportive explanations are desirable. As Abel (2008) remarks that theory on the working capital management perspective explaining the corporate cash holdings is not very developed. In this paper, it is to explore the relationship between the working capital management and corporate cash holdings, investigate the interaction between them, how working capital management and corporate cash holdings affect each other.

1.2 Research problem, limitation and concepts

This paper is to investigate the relationship between working capital management and corporate cash holding in firms exploring if the working capital management influences the level of corporate cash holdings and vice versa. The research is limited to large and SME Finnish industrial and trading firms. The concepts which are to be examined in this study, include the working capital management and its components of inventory, accounts receivable,

accounts payable, cash conversion cycle, days sales of inventory, days sales outstanding, days payable outstanding and corporate cash holdings.

1.3 Research structure

The paper proceeds as followings. Section 2 presents the theoretical models of the corporate cash holdings; Section 3 describes the theoretical background of Working capital management; Section 4 discusses the relationship between the corporate cash holdings and working capital management; Section 5 present the hypothesis and definition of variables; Section 6 data and methodies; Section 7 analysis the empirical results; Section 8 concludes the study

2 CORPORATE CASH HOLDINGS

2.1 Theoretical models

There are three theoretic models in financial literatures providing the explanations to the corporate cash holding's decision including trade-off model, pecking order model and free cash flow model. Trade-off model demonstrates that firms decide their optimal level of cash holding by comparing the marginal cost and benefits of holding cash. Cash holdings reduce the likelihood of financial distress, lowered possibilities of the investment constrained by lack of financial resource and minimizes the cost of raising funds, however the cost of cash holdings is the opportunity cost of capital invested in liquid assets. The pecking order model formulated by Myers and Majluf (1984), further refined by Myers (1984) argue that firms should finance the investment opportunities with internal generated funds, then with low risk debt and finally with equity so that reduces the asymmetric information costs and other financial costs. Peck-order model suggests that cash acts as buffer between retained earnings and investment requirements, firms do not have target cash levels. The free cash flow theory by Jensen (1986) claims that management have an incentive to pile up cash under their control and make the investment decision which might not be the best interest of shareholders. For instance, low-benefit or low-return mergers and takeovers are more likely to destroy, rather than to create value to firms and shareholders. Managers spend cash instead of paying it out to shareholders.

Corporate cash holdings just like a sword has two sides. Firm managers and shareholder's have different viewpoint of cash holdings. Empirical studies by researchers have provided evidences to support different theoretical models. Opler et al (1999) examine the determinants and implications of holdings of cash and marketable securities by studying the publicly traded U.S. firms in the 1971-1994 periods and their evidence support the trade-off model of cash holdings. They find that firms with large amounts of excess cash acquired it through the accumulating the internal funds and firms invest for new projects and acquisitions just slightly higher for firms with more cash. Ferreira & Vilela (2004) investigate the determinants of cash holdings for firms in EMU countries by using panel data for the period 1987-2002 and findings are consistent with the trade-off model that firms identify their optimal level of cash holdings by comparing the marginal costs and marginal benefits of holding cash. Pecking

order considerations are also consistent with the results, however the evidence shows the contradiction with the free cash flow model and it suggests that agency conflicts between managers and shareholders do not play a significant influential role in the exterminating the corporate cash holdings.

Mikkelsen and Partch (2003) examine the operating performance and other characteristics of firms for a period of five-year firms' holding more than 25% of their assets in cash and cash equivalents and find that firms in question "is comparable to or greater than the performance of firms similar by size and industry". The evidence on the role of corporate governance and agency costs in determinant of corporate cash holdings is rather weak in a given country (Opler et al 1999, Ozkan & Ozkan (2004), Bates et al (2006)), but the use of international data cross-country offers certain supportive results of this respect. (Dittmar et al 2003, Kalcheva & Lins 2007) As Ferreira & Vilela (2004) point out that international data from several countries allows the diversifications in several respects, such as legal environments, investor protection, ownership structure and capital markets developments, which are associated with agency costs in various levels.

2.2 Motives of cash holdings

2.2.1 The transaction motive

According to Keynes (1936), firms demand for the cash to "bridge the interval" between the period of business expenditures happens and the earnings of sales receives. Firms hold cash, so not necessarily liquidating assets to perform the payment but using cash to save the transaction costs. Myers and Majluf (1984) state that external financial resourcing is more costly to firms than internal generated financial resources in the presence of asymmetric information and it may be preferable for firms to hold a certain level of cash to meet the demand for investment expenditures. Miller & Orr (1966) introduce the optimal demand for cash when a firm has transaction costs occurring by liquidating substitutes, "non-cash financial assets" into cash. Keown et al (2006) describe that balances keeping for transaction "allow the firm to meet cash needs in the ordinary course of doing business".

2.2.2 The precaution motive

Precaution motive is described by Keynes (1936) as firms need to reserve the cash to secure and hedge for the risks, which are unforeseen and unexpected of cash shortage in the future. Opler et al (1999) argue that firms could hedge against future cash flow uncertainty by using internally generated funds and respond to increasing in cash flow volatility by increasing their cash holdings. Almeida et al (2004) find that financially constrained firm holds more cash for precaution motive, but not in unconstrained firm. Bates et al (2006) state that firms which have riskier cash flows, less access to external capital and better investment opportunities, hold more cash, since the cash shortfalls and financial distress are more expensive for them. Cash holdings provide firms better position to deal with the adverse shocks for accessing to costly capital market, riskier cash flows and less access to external capital. Keown et al (2006) define that precautionary savings are “a buffer stock of liquid assets”. This motivation of holding cash is connected to the maintenance of precautionary balances to “be used to satisfy possible, but as yet unknown, needs”. The firms require a good amount of cash buffer against future shocks, shortage of cash. (Bates et al (2006), Capkun & Weiss (2007), Abel (2008)).

2.2.3 The speculative motive

Keynes (1936) describes that speculative motive is the transformation of a change in the quantity of money. “Speculative-motive usually shows a continuous response to gradual changes in the rate of interest”. Keown et al (2006) write that generally the speculative motive is the “least” important used by firms for liquidity. The transactions and precautionary motives represent for “most of the reasons” why a company holds cash balances. Whalen (1966) remarks that although the precautionary and speculative motives for holding cash both handle the uncertainty, but the precautionary motive for cash is related to the demand for cash in the pattern of receipts and disbursements; the speculative demand, on the other hand, is more directly connected with uncertainties in respect of interest rates.

2.2.4 The agency motive

Dittmar et al (2003) finds that firms in countries where shareholders rights are not well protected holding up two times more cash than firms in countries with good shareholder protection by studying more than 11,000 firms from 45 countries and suggests that agency

problems are an important determinant of corporate cash holdings. Kalcheva & Lins (2007) study 5000 firms from 31 countries and find that when external country-level shareholder protection is weak, firms hold more cash. Further, when external shareholder protection is weak, it is found that firm values are higher when firms pay dividends. “Only when external shareholder protection is strong that cash held by controlling managers is unrelated to firm value, consistent with generally prevailing U.S. and international evidence”.

2.2.5 The taxation motive

Foley et al (2006) provides an additional explanation in their study of U.S. corporations holding large amounts of cash on their balance sheet. These are the U.S. multinational firms holding cash in their foreign subsidiaries “because of the tax costs associated with repatriating foreign income”. Firms encounter the higher repatriation tax costs hold higher levels of cash and in abroad, and “hold this cash in affiliates that trigger high tax costs when repatriating earnings”.

2.3 The determinants of corporate cash holdings

Previous studies and researches have identified several determinants which determinate the corporate cash holdings as followings:

Growth Opportunities

Previous empirical studies suggest that growth opportunities have a positive influence on the cash level of firms. (Kim et al., 1998; Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004, Niskanen and Niskanen 2007, Teruel and Solano 2008) As Teruel and Solano 2008 point out that firms with more investment opportunities are expected to hold higher liquidity in order not to forgo the profitable investment opportunities. Opel et al (1999) argue if the firms are in the shortage of cash, they have to give up the investment opportunities. Ozkan and Ozkan (2004) explain “it may be costly to be short of cash and marketable securities if the firm has to pass up valuable investment opportunities. There is evidence that firms with cash shortfalls do indeed fail to take up some of the valuable growth opportunities.”

Firm Size

Firm size is another important variable influencing the cash holdings of firms. (Kim et al., 1998; Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004, Niskanen and Niskanen 2007, Teruel and Solano 2008) Trade-off model has different prediction on the relationship between cash holdings and firm size than the Pecking order theory and free cash flow theory. Miller and Orr (1966) suggest that there exist economies of scale in cash management, so the larger firms hold less cash than smaller firms. Moreover, it is more expensive for small firms than larger firms to raise funds. Opler et al (1999) suggest in the viewpoint of pecking order theory, larger firms have more cash as they presumably have been more successful. Ferreira and Vilela (2004) explain in the point of free cash flow theory that the managers in larger firms have more discretionary power and larger firms are less likely to be in acquisition, so that larger firms hold more cash.

Probability of Financial Distress (Zscore)

Current empirical literatures provide two different explanations about financial distress and cash holdings. Kim et al. (1998) expect that firms hold less liquidity if they have greater likelihood of financial distress. However, Ferreira and Vilela (2004), Ozkan and Ozkan (2004) suggest that financial distressed firms tend to increase their cash holdings in order to reduce the default risk. Teruel and Solano (2008) argue that financial distress has impact on the decision-making of firm's cash holdings. Because the financial distress is costly if the firm can not meet the payment obligation agreed with the parties in short and long term.

Leverage

Debt ratio may have an effect on firms' cash holdings. Previous empirical studies reveal that firms with increasing leverage decrease their cash levels. (Kim et al., 1998; Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan and Ozkan 2004) Niskanen and Niskanen 2007 report different findings as Finnish SME firms hold more cash as debt increases. This finding is also supported by the study conducted by researching Spanish SME firms. Teruel and Solano (2008) find that SME firms with more short-term debt hold more cash.

Debt Maturity

Debt maturities influence the decision-making of the firms' liquid asset. Teruel and Solano (2008) explain "the use of short-term debt obliges firms to negotiate the renewal of their credits periodically, with the consequent risk of refinancing, therefore firms with a larger proportion of short-term debt will keep higher cash levels in order to avoid the financial distress that they would incur if their loans failed to be renewed."

Bank Debt

Teruel and Solano (2008) mention "Bank debt is the relationship with the financial institutions by considering the debt levels that the firms maintain with their banks." Ferreira and Vilela (2004) point out "firms using more bank debt hold less cash. Close bank relationships provide firms' treasury management some cushion allowing for lower levels of cash holdings".

Cash flow (uncertainty / variability)

Cash flow uncertainty affects the cash holdings. Opler et al (1999) explain "uncertainty leads to situations in which, at times, the firm has more outlays than expected. Therefore, one would expect firms with greater cash flow uncertainty to hold more cash." Ozkan and Ozkan (2004) argue "firms with more volatile cash flows are expected to hold more cash in an attempt to mitigate the expected costs of liquidity constraints. The greater the firm's cash flow variability, the greater the number of states of nature in which the firm will be short of liquid assets." Ferreira and Vilela (2004) suggest "firms with more volatile cash flows face a higher probability of experiencing cash shortage due to unexpected cash flow deterioration."

Cash conversion cycle

Kim et al (1998) explain "the cash cycle is measured as the sum of average inventory age and receivables collection period minus the average payment period for accounts payable. Corporate liquidity is affected by the cash cycle because it measures the average amount of time that cash is tied up in operations. Thus, a firm with a long cash cycle is expected to have lower level of cash and marketable securities." Opler et al (1999) suggest "firms with multiple

product lines and firms with low inventory to sale have short cash conversion cycles hold less liquid assets.”

Liquid asset (Net working capital)

Ferreira and Vilela (2004) explain “to the extent that liquid assets other than cash can be liquidated in the event of a cash shortage, they can be seen as substitutes for cash holdings.” Ozkan and Ozkan (2004) suggest “It is reasonable to assume that the cost of converting non-cash liquid assets into cash is much lower as compared with other assets. Firms with sufficient liquid assets may not have to use the capital markets to raise funds when they have a shortage of cash.” Teruel and Solano (2008) argue “liquid asset can affect a firm’s optimal cash holdings, since they can be considered substitutes for cash.”

Industry sigma

Firms’ industry sigma measures cash flow risk of the firms. Previous empirical studies have used the industry sigma to study the cash holdings. (Opler et al 1999, Ferreira and Vilela 2004, Bates et al 2006, Capkun & Weiss 2007) Bates et al (2006) explained that firms with greater industry cash flow risk are expected to hold more cash for precautionary reason.

Accounts receivable

Accounts receivable is described as the firms sales their goods to the buyers and collect their payment on credit terms agreed with the buyers.

Inventory

Inventory is described as the firms hold the amount of the raw materials and consumable stores and spares, working-in-process and finished goods.

Accounts payable

Account payable is described the firm purchases the raw materials, goods from their suppliers and pay their bills on the credit terms agreed with the suppliers.

Days sales outstanding

Day sales outstanding (DSO) stands for the collection period in days, “if this ratio decreases over time firms have become faster in collecting their trade debt.” (Capkun & Weiss 2007) DSO is a key figure which measures the average amount of time that a company holds its accounts receivable.

Days sales of inventory

Day sales of inventory (DSI) stand for the speed of inventory turnover. “An increase in speed indicates better management of inventories and a lower need for inventory financing.” (Capkun & Weiss 2007) DSI is a key figure which measures the average amount of time that a company holds its inventory.

Days payable outstanding

Days payable outstanding (DPO) stands for the payment of trade credit, “if firms have increased / decreased days payable, they delay / fasten payment to their suppliers.” (Capkun & Weiss 2007) DPO is a key figure which measures the average amount of time that a company holds its accounts payable.

Ferreira & Vilela (2004) summarizes the different determinants of the corporate cash holdings and how it is supported by the Trade-off, Pecking order and free cash flow Theories.

Summary of model predictions

Variable	Trade-off Theory	Pecking Order Theory	Free Cash Flow Theory
Dividend Payments	Negative		
Investment opportunity set	Positive	Positive	Negative
Liquid asset substitutes	Negative		
Leverage	Unknowm	Negative	Negative
Real size	Negative	Positive	Positive
Cash flow uncertainty	Positive		
Cash flow	Negative	Positive	
Debt maturity	Unknowm		

3 WORKING CAPITAL MANAGEMENT

3.1 Working capital & Policies

Net working capital and gross working capital are two major concepts of working capital. The working capital, it is generally referred to net working capital, which is the difference between current assets and current liabilities (Brealey et al (2004), Mathur (2003)). Fazzari & Petersen (1993) explain that the three major components of current assets are accounts receivable, inventories and cash and equivalents. Current liabilities include primarily the accounts payable and debt due in less than one year. Shin & Soenen (1998) define that working capital is the result of the time interval between the paying for the purchase of raw materials and the collecting for the sale of the finished goods, the method in which working capital is managed can have a important impact on both the liquidity and profitability of the firms. The investment in working capital involves carrying costs and shortage costs, so the firms have to find the trade off between them.

As Brealey et al (2004) explains if firms collect earlier their receivables from their customers, the cost invested in the receivables mean the interest which would have been benefited, could be saved and used in business operation. The firm also forgoes the earnings of interest when it holds idle cash balances rather putting the money into use. The cost of holding inventory includes opportunity cost of capital, storage and insurance costs as well as the risk of spoilage or inventories become out of the date. All of these carrying costs urge firms to hold current assets to a minimum level. Carrying costs discourage large investments in current assets, however, too low level of current assets likely make firms to deal with the shortage costs. If the firm runs out of inventory of raw materials, it may lose the sales. If the firm runs out of cash, it may have to access the expensive external financing. The firm may also maintain too low level of accounts receivable. If the firm tries to minimize accounts receivable by restricting credit sale, it may lose customers. In terms of accounts payable, Petersen & Raijan (1997) explain that accounts payable are firms' borrowing from its supplier. The level of accounts payable is interpreted as the credit extended to firms by its suppliers and the firms' demand for funds. "The firm's accounts payable are a function both of the supply of trade credit and how long the firm takes to repay the debt".

Mathur (2003) describes that working capital policy may broadly be divided into three categories as: Conservative policy, Aggressive policy and Moderate policy. Under the conservative policy, the company may prefer to hold rather heavy cash and bank balance in current account or investments in readily marketable securities, meanwhile with higher stocks of raw materials and finished goods, in the preparing for reducing the risks for out of the stock and loss of sales. Aggressive or restrictive working capital policy may result in a disproportionately losses by risks of stock outs and the consequential loss of production as well as losing the sales and negatively influence of the profitability of the company. A moderate policy, the level of working capital will be moderate, neither too high nor too low, but just right.

An approach to aggressive working capital management policy of liquidity management results in a lower cash conversion cycle by reducing the inventory period and the accounts receivables period while stretching the accounts payables period. Aggressive asset management leads to the capital being minimized in current assets versus long-term investments. This would result in higher profitability but greater liquidity risk. As an alternative, a more conservative policy places a larger amount of capital invested in liquid assets, but at the sacrifice of some profitability. Aggressive financing policies “utilize higher levels of normally lower cost short-term debt and less long-term capital. Although lowering capital costs, this increases the risk of a short-term liquidity problem”. Weinraub & Visscher (1998)

3.2 The components of working capital

3.2.1 Current assets

Mathur (2003) explain that there are two major characteristics of current assets. Current assets have comparable shorter life lapse and current assets could be transferred into other forms of assets (and ultimately in cash) much more quickly. Keown et al (2006) describe that firms hold more current assets to keep larger cash and marketable securities in order to lower their risk of illiquidity. However, firms hold larger cash and marketable securities balances results a negative consequence. “Because investments in cash and marketable securities earn

relatively modest returns when compared with the firm's other investments, the firm that holds larger investments in these assets will reduce its overall rate of return".

3.2.2 Accounts receivable

Gentry et al (1990) describes that "receivables represent delay in the inflow of cash, which must be financed by the firm". In another word, if financing sales on credit is not necessary, firms could use these capitals in other purpose of business operation. It means that receivables are an opportunities cost to the firms in economic sense. Shim & Siegl (2000) point out that accounts receivable management includes selecting the good credit customers and speeding up the collections from the customers. Firms have to know that holding accounts receivable occurs the opportunity cost, meanwhile, the funds is tied up in account receivable than benefiting by investing elsewhere. Mathur (2003) remark that the third largest and most important item of assets in firms is the accounts receivable besides the capital investment in plant and machinery, stocks of inventory. Brealey et al (2004) explain that the period between the firms has sold its goods and before the customers pay their bills, is accounts receivable period.

Michalski (2008) defines the accounts receivable as a decision-making if firm decides to grant the trade credit terms to the customers. Accounts receivable is a trade-off between minimizing the risk of allowing the delaying payment from unreliable customers and gaining the new customers by a more generous trade credit policy. The decision whether to extend the trade credit determinants the "level and quality of account receivable". If firms tie up too much funds in accounts receivable due to too generous trade credit policy, this does increase the high opportunity cost to the firm. Moreover, possibilities of bad debts from risky customers occur more costly to firms, although the generous credit policy could increase the sales. However, the firms should decide its level of accounts receivable so that the benefits are more than the expenses.

3.2.3 Inventory

Mathur (2003) explains that inventories include raw materials, consumable stores and spares (working-in-process & finished goods). In general, a manufacturing firm has all three elements of inventories stands for about 25 to 30 percent of the total assets. Brealey et al

(2004) describe that the firms have the raw materials and sell the finished products. The period between the investment in inventories and date of sales is the period of inventory. Inventory is viewed as an asset and a liability. Smith (1980) explains with a case analysing that “the tightened inventory policy reduces necessary borrowing to a lower level than does faster collection of receivables or slower payments of current liabilities.”

Dimitrios (2008) points out that on one hand, too much inventory demand more physical space, could lead to a financial distress, and increases the possibility of inventories’ damages, deterioration and losses. Moreover, holding large amount of inventory frequently indicates for inefficient and careless management, not efficient planned and scheduled, less consideration for process and procedures. On the other hand, too little inventories might lead to the interruption of operation in manufacture, increase the possibility of losing sales and consequently lower the profitability of the firms. “In manufacture cases good customs may become irate and take their business elsewhere if the desired product is not immediately available”.

3.2.4 Current liability

Current liabilities have to compromise between the risk and the return. Current liabilities are one of the flexible financial resources of firms. Current liabilities could be used as short-term financing recourse to meet the firms’ need. However, due to the nature of short-term debt, it has to “be repaid or rolled over more often”, so it increase the possibility that firms’ financial condition may be distressed, because the funds may not be available as it is needed. Keown et al (2006)

3.2.5 Accounts payable

Brealey et al (2004) define the accounts payable that the firm purchase raw materials but does not pay their bills right after. The time interval is called the period of account payable. Delaying payment is described as stretching the accounts payable. Accounts payable is one of source of short-term financing recourse. Shim & Siegl (2000) argue that long-term debt financing has the less liquidity risks than short-term debt financing since the long-term financing’s payment period is longer, but this advantage also present the long-term financing to have higher expenditures than short-term financing due to the greater uncertainties of long-

term financing. “Liquidity risk may be reduced by using the hedging approach to financing, in which assets are financed by liabilities with similar maturity”.

Niskanene & Niskanen (2006) conduct a study on the determinants of corporate trade credit policies in case of Finnish small firms and reveal that the access to capital markets and creditworthiness are two dominant influential of trade credit decision making of suppliers. “The level of purchases is positively correlated with the level of accounts payable. Larger and older firms and firms with strong internal financing are less likely to use trade credit, whereas firms with a high ratio of current assets to total assets, and firms subject to loan restructurings use it more. Other significant determinants of accounts payable include the strength of internal financing as an alternative source of capital, asset maturity, loan restructuring, urban and rural categories. ” Finally, they point out that financially constrained firms take more advantage of taking the trade credit as alternative financial resources.

3.2.6 Cash conversion cycle

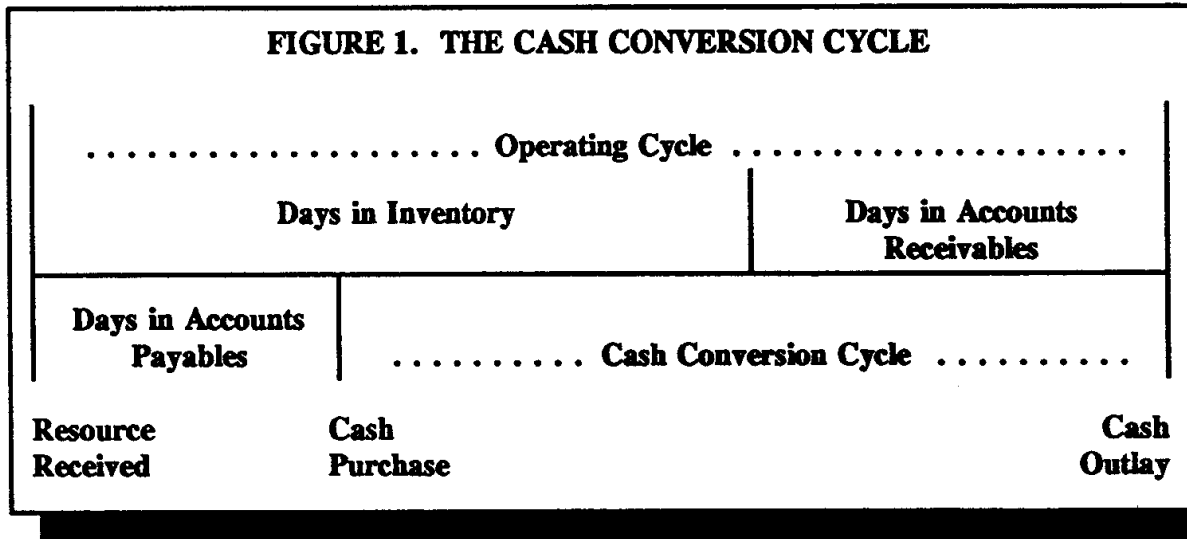
Cash conversion cycle is an important measurement of the working capital management. Gentry et al (1990) describe the cash conversion cycle measure the number of days while the funds are invested in inventories and accounts receivable minus the number of days that payment to suppliers is performed. Kim et al (1998) explain that the cash cycle is measured as average inventory age plus the collecting period of accounts receivable minus the average period of accounts payment. Shin & Soenen (1998) define the cash conversion cycle as the continuing cash flow from suppliers to inventory to accounts receivable and back into cash is usually defined as the cash conversion cycle.

Brealey et al (2004) demonstrate that the total time period starting from initially purchasing the raw materials and finally payment collected from customers is the inventory and accounts receivable period: first the raw materials should be purchased from their suppliers, raw materials are to be manufactured or processed, goods are to be sold and the payment should be collected. “However, the net time that the company is out of cash is reduced by the time it takes to pay its bills”. The time period between the firms purchases its raw materials from the suppliers and the firm collects its payment from the customer is defined as the firm’s cash conversion cycle (CCC). The longer the cash conversion cycle, the more the firm must invest

in working capital. Vice versa, the shorter cash conversion cycle, the less funds are tied up in the working capital.

Kim et al (1998) describe that firm's cash cycle / cash conversion cycle is measured as the average period of inventory age and average period of collecting the accounts receivable minus the average period of paying the accounts payable. Corporate liquidity is influenced by the cash cycle because cash cycle measures the average amount of time that cash is tied up in operations process. Therefore, "a firm with a short cash cycle is expected to have higher levels of cash and marketable securities, all else being equal". As Gentry et al (1990) state that "the shorter the cash conversion cycle, the more efficient the internal operations of a firm and closer the availability of net cash flow, which suggest a more liquid condition of the firm". Soenen (1993) points out that the length of cash conversion cycle decides the extent to which the firm must rely on the resource of external financing. In order to reduce the cash conversion cycle, "firms can reduce number days of inventories, shorten the number days of accounts receivables and prolong number of days in accounts payables."

Even though Shin & Soenen (1998) write that the real benefits from shortening the cash conversion cycle (net trade cycle) come from reduction in assets rather than by an increase in payables, however, the role of accounts payable should not be neglected either. Almeida et al (2004) state that changes in short-term debt could be a substitute for cash, or because "firms may use short-term debt to build cash reserves". Petersen & Raija (1997) also explain that suppliers may have more cost advantages than financial institutions in terms of financing their customers. It is an inexpensive source of financial funds for customers. Jose et al (1998) remark that "one principle of finance is to collect cash as quickly as possible and postpone the outflow as long as possible, an increase in the payable effect casus a reduction in both the time and amount of funds tied up in the working capital". Extending accounts payable is a strong feature of aggressive working capital management.



Belt, Brian. "The Trend of the Cash Conversion Cycle and its Components."

$CCC = \text{Days in Inventory} + \text{Days in Receivables} - \text{Days in Payables}$

$\text{Days in Inventory} = \text{Inventory} / (\text{Costs of Goods Sold}/365)$

$\text{Days in Receivables} = \text{Accounts Receivables} / (\text{Sales}/365)$

$\text{Days in Payables} = \text{Accounts Payables} / (\text{Costs of Goods Sold}/365)$

3.3 Portfolio of working capital management

Working capital management includes the portfolio combination management of the cash management, inventory management and trade credit policy management. Mathur (2003) suggest that firms manage their working capital more efficiently and skilfully by holding it "at a minimal level to reduce the quantum of interest outgo and the corresponding rise in their profit". Previous researches provide also the evidence that firms have pursued more on aggressive working capital management to reduce the investment in current assets. (Jose et al 1998, Shin and Soenen, 1998, Bates et al 2006, Capkun & Weiss 2007, Abel 2008)

3.3.1 Cash management

Cash is an important element of corporate liquidity in firms. Shim & Siegl (2000) explain that the ideal of cash management is to have the idle cash invested for return and meanwhile have the sufficient liquidity. "Cash management involves accelerating cash inflow and delaying

cash outflow”. For example, it could speed up the payment collection from the buyer by extending shorter payment terms, so that accelerates the cash inflow. Negotiating a favourably paying condition from the supplier for prolong the time between the time firms buy the goods and pay their bills in order to delaying the outflow of cash.

There are advantage and disadvantage of cash holdings. Brealey et al (2004) clarify that the advantages to “holding large amounts of ready cash, they reduce the risk of running out of cash and having to borrow more on short notice”. On the other hands, there is an expenditure to keep excessive cash balances rather than investing the money to earn the interest. Keown et al (2006) describe that cash management is a trade-off of risk-return. A large cash investment minimizes the chances of liquidity risk, but it decreases the profitability of company. “A small cash investment free excess balances for investment, this enhances company profitability and the value of the firm’s common shares, but it increases the chances of running out of cash”.

3.3.2 Inventory management

Brealey et al (2004) explain that firms store the inventories to minimize the risk of running out of the stock and losing sales as well as customers. However, holding inventories causes the costs, such as the funds which are tied up in inventories, could not have the interest earnings instead, storage and insurance have to be paid, furthermore, spoilage, damage and loss of goods lead to the costs to firms. Bhattacharya (2006) points out that inventory management has become to an important key point in a firm’ the working capital management. Running out of stock is risky for production and marketing consequences in shortage cost. Excessive stocking reduce the profitability of firms results in holding cost. In recently year’s firms have benefited from the material requirements planning systems (MRP), just-in-time (JIT), ERP management and lean management to reduce significantly their inventory amount to free up the tied up the investment in the inventory.

Keown et al. (2006) remark that the importance of the investment management to decide the scope of the inventory management. Decision-making of inventory management is a compromise between risk and return. If the level of inventory is too low, it causes the delay in production and delivery to customers which encounter the firms to risk but meanwhile the firms save the funds or holding costs to have low inventory in stock. If the size of inventory

increase, consequently holding costs of inventory increases, such as storage, insurance, cost of goods deterioration, damage and losses, moreover the demand of return on capital investment in inventory is expected more. So the inventory of firm is increases, the risk of running of stock is reduced, but cost of holding inventory rises.

3.3.3 Trade Credit management

Trade Credit management involves the following steps: first, firms should decide the sales terms on which firms sell their goods to their customers. Second, firms should have decision-making on what evidence firm requires from their customer who owes the payment. Third, firms should analysis the risky customers and non-risky customers are likely to perform their bills, this is called credit analysis. Fourth, firms should draw up the credit policy, it means to what extent the firms allow their customers to pay their bills on credit terms. Fifth, Firms make the sales on credit and have the problem collecting the payment when the bills become due which is called collection policy. Brealey et al (2004)

Cunat (2005) explains that the trade credit occurs when supplier make the sales on credit to their customers and allow them to postponed their payment when goods are already delivered. “The trade credit is described to be the suppliers as debt collectors and insurance providers”. On the one hand, the suppliers might be in a better position than banks or institute in terms of financing to their customers because suppliers could stop supplying the goods to their customers to alert the borrower. On the other hand, suppliers might act as liquidity providers insurance the liquidity adverse shock which might danger the survival of their customer relationships. However, “The supplier uses their extra enforceability power to lead on the basis of returns that are non-verifiable and stochastic. Therefore, this makes trade credit riskier than bank debt.

3.3.4 Aggressive working capital management

Aggressive working capital management is described as maximizing the profitability of the firms. Jose et al (1998) examines the relationship between profitability and management of ongoing liquidity needs by measuring a cross-section of firms during the period of over r twenty-years and find the strong evidence that aggressive working capital policies improve the profitability of the firms. The aggressive liquidity management leads to a shorter cash

conversion cycle by reducing the inventory period and the accounts receivables period while increasing the accounts payables period. Abel (2008) explains that “A strong efficient working capital management implies that inventory and accounts receivable are quickly converted to cash and stretching accounts payable leads to a decreased cash conversion cycle and increased cash availability”.

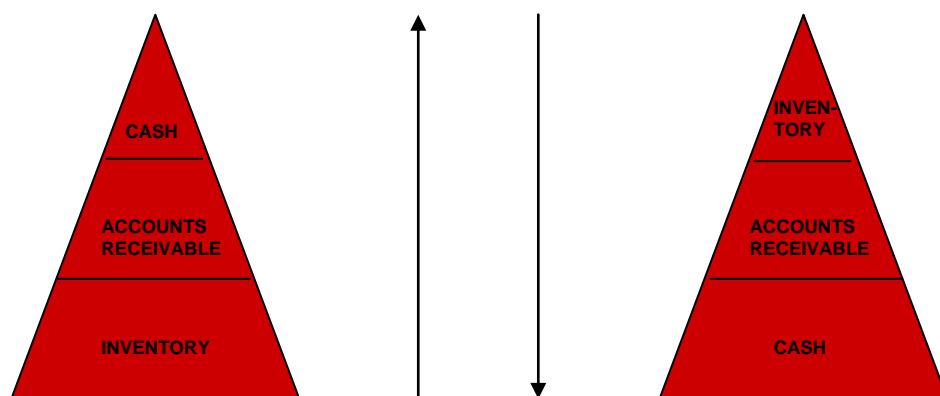
As Weinraub & Visscher (1998) argue that the goal of aggressive working capital management is to minimize the capital in current assets comparing with the long-term investments, however, in this way, firm is expected to have higher profitability but greater liquidity risk. Smith (1980) point out that working capital management is important because of its effects on the firm’s profitability, risk and its value. Working capital investment involves a trade-off between profitability and risk, decisions of firm pursues the increase of profitability, increase also the risk. (Teruel & Solano 2008) Therefore firms have to reserve the cash as security to the risk and uncertainty which firm is exposed to. Firms reducing inventories would increase the risk of out of stocks and sale losses; rely on more suppliers’ just in time delivery which increase the risk. Shortening days of accounts receivable collections from or ungenerous credit terms to firm’s buyers might lead to the lower volume of sales and consequence increase the risk of decreasing the profitability. Extending the accounts payable might forego the discounts for early payments and increasing the probability of financial cost.

Firms prefer more aggressive working capital management than conservative working capital management to manage the inventories, accounts receivable and accounts payable. As Deloof (2003) addresses if the expenditure of holding higher investment in working capital increase faster than the benefits of holding more inventory and extending more trade credit to customer, it decreases the corporate profitability. Shim & Siegl (2000) demonstrate that liberal credit policy increases the bad debts possibilities and higher opportunity cost of investing the capitals in accounts receivable as profitable customers wait longer to pay. Bhattacharya (2006) point out that high inventory reduces the firms’ profitability in respect of funds and expenses. Comparing the advantages and disadvantage of aggressive and conservative style of working capital management, firms favour the aggressive working capital management, which manages the individual and integrative components of working capital efficiently.

4 RELATIONSHIPS BETWEEN WORKING CAPITAL MANAGEMENT AND CORPORATE CASH HOLDINGS

Recently researchers have conducted in-depth studies of working capital management and corporate cash holdings providing supportive evidence between them. Abel (2008) studies 13,287 Swedish manufacturing SMEs and finds that high efficiency in the management of working capital accelerates the current assets quickly being transferred into cash so that the balance from average investments in inventory and accounts receivable are converted into cash leading to high cash holdings. Capkun & Weiss (2007) examine the operating assets and cash holdings of US manufacturing firms in the 1980-2005 periods and find a decrease in operating assets and an increase in cash holdings. They explain the increase of corporate cash holdings by the reduction in inventory and the increase in accounts payable during the examined period and firms' manager hold more cash as security towards increased exposure to trade credit risk.

Bates et al (2006) research the U.S. industrial firms from 1980 to 2004 and find that the average cash ratio increases because of the changes of the firms' characteristics, such as firms' cash flow becomes riskier, firms hold less inventories and accounts receivable, more investment in R & D. In their study, they use several variables to identify the motivation of US firms for corporate cash holdings and find that in order of importance, the change in net working capital of cash is the most determinant one among others. No wonder Bhattacharya (2006) argue that the "corporate liquidity has undergone considerable changes with the advances in financial management during the recent years. Corporate liquidity has so far been defined as a pyramid of current assets in descending order of realizability with cash holding the top position and inventory the last. However, the pyramid is now upside down with inventory at the top".



Firms have been observed to reduce their inventories, accounts receivable and speed up their cash conversion cycle in large and SME firms. Deloof (2003) examine 1009 large Belgian non-financial firms for 1992-1996 periods and find that managers can increase the profitability of firms by reducing the days in accounts receivable and inventories. According to his research, less profitable firms stretch their accounts payable. Teruel & Solano (2007) test the effects of working capital management on SME profitability by using 8,872 small and medium-sized enterprises of period 1993-2002 and demonstrate that managers can create value to firms and shareholders by reducing the number of days in inventory and accounts receivable, shortening the cash conversion cycle also improves the firms' profitability.

Kytönen (2005) conducts the empirical study on the determinants of corporate liquidity holdings for a sample of Finnish firms listed on Helsinki Stock Exchange and it is found that that firms' size, growth opportunities, opportunity costs, cash flows, efficiency of working capital management, leverage, dividend policy and the probability of financial distress are important in determining liquidity holdings in Finnish firms. He points out that a firm with more efficient liquidity management operations is expected to have higher level of liquidity holdings. Niskanen & Niskanen (2007) examines the determinants of cash holdings in a sample of Finnish small and micro firms, which have multiple or long-term relationship with banks, hold less cash. Comparing with the small and micro firms, larger firms, confront financial constraints, have high debt to assets ratios and hold more cash.

Working capital management is an important financial management in large and SME firms, no exceptional in SME firms. Just as Teruel & Solano (2008) argue that previous studies have focused their analysis on larger firms, but the management of current assets and liabilities is important issue in the case of small and medium-sized companies. Most of these companies' assets are in the form of current assets and current liabilities are one of their main sources of external finance since SME have the difficulties in obtaining funds and accessing to the long-term capital markets. Abel (2008) explains that SME's access to external finance is likely to be limited, SME firms have to rely on the funds which are generated internally, for instance the cash flow. These financial funds depend heavily on the efficiency of working capital management as it handles the management of current assets in order to maximize availability while lowering the costs; The cost of running out of cash can be extremely severe for SMEs

as credit worthiness can be influenced when account payable are stretched because of lack of external finance. Worse creditworthiness could cause the whole enterprise at risk.

Teruel & Solane (2008) analyse the Spanish SMEs' Corporate cash holdings and find that firms with a higher amount of short-term debt will hold higher levels of cash. Because it might lower the risks of the non-renewal the short-term debt. Acharya et al (2006) reveal that credit spreads are positively instead of negatively related with cash holdings, moreover, the positive correlations shows higher in riskier firms. "In the presence of financing constrains and cost of financial distress, riskier firms may choose to maintain higher cash reserves in order to reduce the possibility of a cash shortage in the future".

Previous studies suggest that aggressive working capital management increase the corporate cash availability but meanwhile firms has to be prepared against the risk of holding less inventories, accounts receivable and increasing accounts payable. It is arguable that this is why the firms' working capital management policy represents aggressive working capital management with also the characteristic of conservative working capital management. Because aggressive working capital management is defined as minimizing the current assets, inventory and accounts receivables as well as holding less cash and cash equivalents and stretching the accounts payable, but firms has been observed increasing cash holdings instead of reducing the cash levels which implies the characteristic of conservative financial policy. Weinraub & Visscher (1998) suggest that aggressive liquidity policy combine the higher levels of normally lower cost short-term debt and less long-term capital. Although capital costs are reduced, this increases the risk of a short-term liquidity problem.

It is arguable that aggressive working capital management generates more internal cash reserve, but it arise greater liquidity risk. Moreover, firms have to reserve cash to secure the risk due to the lower level of inventories and accounts receivable which are the most liquid and cash convertible assets as well as the hedge against the risk aroused from the shortage of these assets and increased exposure to trade credit risk to suppliers. Harris (2005) states that it is important to understand the role and drivers of working capital management so that to reach the "right" levels of working capital, "firms can minimize risk, effectively prepare for uncertainty and improve overall performance, it minimizes the adverse effects of unforeseen events and provide financial flexibility in uncertain times by having working capital as a ready source of cash". In the empirical parts of this study, it is to use the data to test if the

relationship between working capital management and corporate cash holdings are supported by the empirical data.

In this study, it is explored the relationship between the working capital management and corporate cash holdings. High efficient working capital management do increase the corporate cash level by releasing the capital investment in inventories, accounts receivable and stretching the accounts payable to speed up the cash inflow and delaying the cash outflow. Cash conversion cycle is the measurement of the working capital efficiency. The shorter the cash conversion cycle, the less time is needed to invest in working capital. Highly efficient working capital management is characterized as aggressive working capital policy and conservative working capital management. Aggressive working capital management is defined as minimizing the capital invested in current assets and stretching payment period of the current liability. It is to clarify if the firms reduce the inventories and accounts receivable, prolong the accounts payable but increase the corporate cash holding level which present the characteristic of conservative working capital policy.

It is argued that firms with highly efficient working capital management increase the level of cash holdings and cash has to be reserved to hedge the possibility of risks exposed by the low inventory and accounts receivable as well as increasing accounts payable. Firms have to have the resources to secure these uncertainties, unforeseen and unknown future cash shortfalls, and also for investment opportunities which might be forgone if fund are not available. Meanwhile, it is argued that firms use the internally generated funds to finance their future opportunity projects, so as to reduce the cost of external financing and interest cost, particularly to SME firms which are considered to have less access to external financing. As Gamble (2004) cites “cash obtained today from better working capital management, could be benefited to profitably reinvest in the business”. As long as financial institutions are cautious about whom they grant the credit, “Firm will appreciate having some cash of their own to protect them from trouble and to help them capitalize on opportunities”. Harris (2005) concludes that it is important for organization to understand the company’s true working capital needs, companies can successfully lower their financial risk, prepare for uncertainty and create a ready cash reserve that will provide flexibility and security during difficult times”.

5. HYPOTHESIS AND DEFINATION OF VARIABLES

5.1 Hypothesis

Ryan et al (2002) explain in the majority of empirical research in accounting and finance areas, the clarification of the research questions involves the testing of a statistic hypothesis or set of hypotheses. That is what is preceded in this research. In the empirical part of this study is to examine the following hypothesises:

Hypothesis 1: Aggressive working capital management, shorter cash conversion cycle, converts the non-components of working capital quickly into cash and increase the level of corporate cash holdings. The components of liquid asset substitute and cash conversion cycle are to have following hypothesis with the cash holdings:

- (a) inventory and DSI have negative relationship with cash holdings;
- (b) accounts receivable and DSO have negative relationship with cash holdings
- (c) accounts payable and DPO have positive relationship with cash holdings

Hypothesis 2: Aggressive working capital management exposes the firms to risks of lower non-cash substitute's components of working capital, the period of inventory, the period of account receivables and stretched the period of accounts payable. The changes in accounts receivable, inventory and increasing account payable demand the firms to reserve the cash availability to secure and hedge towards these risks.

5.2 Definition of variables

Dependent variables:

The cash ratio to assets is defined as cash and cash equivalent divided by the total assets. (Opler et al 1999, Ozkan & Ozkan 2004, Bates et al 2006, Niskanen and Niskanen 2007, Capkun & Weiss 2007, Teruel and Solano 2008)

Independent variables:

Growth Opportunities is measured by the ratio $\text{sales}_0 / \text{sales}_{-1}$ Sherr and Hulburt (2001) as no information available for book-to-market value in the data (Niskanen and Niskanen 2007, Teruel and Solano 2008) It is expected that coefficient between cash holdings and growth opportunities is positive.

Firm Size is the natural logarithm of the assets. (Opler et al 1999, Ferreira and Vilela 2004, Ozkan & Ozkan 2004, Bates et al 2006, Capkun & Weiss 2007) The relationship between this variable and cash holdings is expected to be negative.

Possibility of Financial distress is $ZSCORE = 0.012 * X_1 + 0.014 * X_2 + 0.033 * X_3 + 0.006 * X_4 + 0.999 * X_5$, where X_1 = working capital/total assets; X_2 = retained earnings/total assets; X_3 = earnings before interest and taxes/total assets; X_4 = book value of capital (instead of market value equity) / book value of total liabilities; X_5 = sales / total assets (Altman 1968, Kim et al 1998) The positive coefficient is expected between the probability of financial distress and cash holdings.

Leverage is the ratio of total debt of total assets. (Opler et al 1999, Ozkan & Ozkan 2004, Bates et al 2006, Niskanen and Niskanen 2007, Capkun & Weiss 2007) The expected relationship between the cash holdings and leverage is positive.

Debt Maturity is the measure of long-term debt divided the total debts. (Ferreira and Vilela 2004, Niskanen and Niskanen 2007, Teruel and Solano 2008) The positive coefficient is expected between the cash holdings and debt maturity.

Bank Debt is measured as the ratio of bank borrowings to total debt. (Ozkan & Ozkan 2004, Ferreira and Vilela 2004, Niskanen and Niskanen 2007) The relationship between bank debt and cash holdings is expected to be negative.

Cash Flow is defined as the pre-tax profits plus depreciation divided the total assets. (Ferreira and Vilela 2004, Ozkan & Ozkan 2004, Teruel and Solano 2008) The relationship of cash flow (uncertainty / variability) and cash holdings is expected to be positive.

Industry Sigma is calculated as the mean of standard deviation of industrial cash flow. (Opler et al 1999, Ferreira and Vilela 2004, Bates et al 2006, Capkun & Weiss 2007) It is expected that cash holdings has the positive coefficient with industry sigma.

Liquid asset (Net Working Capital) is measured as the current assets minus the current liability and minus the cash divided the total assets (Opler et al 1999, Ferreira and Vilela 2004, Ozkan & Ozkan 2004, Niskanen and Niskanen 2007, Teruel and Solano 2008) Liquid asset (net working capital) have a negative relationship with the cash holdings.

Accounts receivable is measured by account receivable / total assets. (Capkun & Weiss 2007, Abel 2008) Relationship between accounts receivable and cash holdings is expected to be negative.

Inventory is calculated by Inventory / total assets. ((Capkun & Weiss 2007, Abel 2008) Inventory and cash holdings are expected to have a negative relationship.

Accounts payable is measured as Accounts payable / total assets ((Capkun & Weiss 2007) Cash holdings are expected to have a positive relationship with accounts payable.

Days sales outstanding is calculated by $365 / (\text{Accounts Receivables} / \text{Sales})$ (Abel 2008) DSO is expected to be negatively associated with cash holdings.

Days sales of inventory is measured by $365 / (\text{Inventory} / \text{Costs of Goods Sold}/365)$ (Abel 2008) Relationship between DSI and cash holdings is expected to be negative.

Days payable outstanding is defined as $365 / (\text{Accounts Payable} / \text{Costs of Goods Sold}/365)$ (Abel 2008) It is expected that DPO has a positive relationship with the cash holdings.

Cash conversion cycle is calculated as the Days sales of inventory plus Days Sales of outstanding minus Days payable outstanding. (Kim et al 1998, Abel 2008) It is expected that firm with a shorter cash conversion cycle, hold more cash than others.

6. DATA AND METHDOLOGIES

The empirical data is analysed by the statistic methods which include descriptive method, univariate, bivariate (correlatin matrix), in another words Person correlation and regression. Similar methodologies are used by some of the previous empirical researches. The methods are applied in Opeler et al 1999, Ferreira and Vilela 2004, Capkun & Weiss 2007, Teruel & Solane 2008 and Abel 2008's empirical studies. The univariate analysis is based on the comparison of the inspected variables' means by cash level quartile. The bivariate analysis consists of a correlation analysis between dependent and independent variables. As Abel (2008) describes that "univariat and bivariate analysis are the simple but significant tools in order to describe and analyse statistical relationships between the dependent variable and the independent variables".

6.1 Reliability

This research uses the quantitative descriptive method. According to Sarma & Misar (2006), descriptive research is defined as "Fact finding studies conducted to know the state of affairs as it exists, are called descriptive research. In descriptive research the researcher has no control over the variables, report only objectively what had happened and tries to find out the causes of the variables and their behaviour. " In this study, it is particularly useful to investigate the relationship and strength between the dependent and independent variables.

Sarma & Misar (2006) describe "in the case of cross-sectional data, the researchers observe a set of variables at a given point of time across space or other units of analysis. In cross-sectional data the time element is not taken into account. In the method of time series data, the same unit of analysis are observed but over a serious of time points, months, years or days. The time series analysis takes into account the change over time. The analysis of time series shows the trend of the movement of variables over time." In this research, the panel data are used.

6.2 Sample description

Finnish manufacturing firms (SIC 15-37) and trading firms (SIC 50-52) have been selected from the registration database according to the following limitations. 1. Finnish industrial

manufacturing firms and Trading firms; 2. Turnover limit is over 25,000,000 Euros; 3. Public firms and private firms included SME and large firms. 4. The selection period is from year 2003 to 2007. With above mentioned limits, 660 trading and 800 manufacturing firms' samples have been chosen. The firms, which the figures are uncompleted, are excluded. The manufacturing and trading firms are to be compared between the sectors.

6.3 Descriptive Statistics

Table 1 and 2 present the key variables of this research by applying the descriptive statistics. The ratio of cash to total (net) assets in average Finnish manufacturing and trading firms during 2003-2007 are 5.5% and 6.0% respectively and their median figures are 2.1% and 2.8%. Ferreira and Vilela (2004) study the EMU countries publicly traded firms in year 1987-2000 holding 15% cash or cash equivalents, Finnish firms cash holdings was 15.1% of total (net) assets EMU level and median value is 10.6% in their research. Niskanen and Niskanen (2007) conduct their study on 2672 Finnish small and micro firms over the period of 1994-1997 and find the cash holdings of these firms was in average 23% to its assets. Ozkan & Ozkan (2004) research the 839 UK publicly traded firms over period of 1995-1998 and reveal that the mean cash ratio was 9.9% to total asset and median figures is 5.9%.

Opler et al (1999) study the U.S. public traded firms during 1971-1994 and find that cash to asset ratio was 17% and median value was 6.5%. Kim et al (1998) examine the U.S. industrial firms in period of 1975-1994 and disclose that the cash to assets ratio was 8.1% and median value was 4.7%. Teruel and Solano (2008) analyzed 860 Spanish SME firms during the period of 1996-2001 and their cash ratio to total assets was 6.6% and median value was 3.8%. Abel (2008) investigates the 13.287 Swedish manufacturing SME firms for the accounting year of 2006 and average cash holdings was 15.01% to its assets and median figure was 8.5%. Capkun & Lawrence (2007) examines US manufacturing firms from years 1980-2005 and find the cash holdings increase from 5% to 17%. Comparing speaking, Finnish manufacturing and trading firms examined during period of 2003 – 2007 hold lower cash reserves.

Table 1 and 2 report the descriptive statistics for the growth opportunity, firm size, Zscore, leverage, debt maturity, bank debt, cash flow, industry sigma, liquid assets, inventory, accounts receivable, accounts payable, days sales of inventory, days sales outstanding, days payable outstanding and cash conversion cycle besides the cash ratio. The table reports that

Finnish manufacturing firms hold 12.94% liquid assets, 19.09% inventory, 17.04% accounts receivable and 9.7% accounts payable. According to Abel (2008) Swedish manufacturing SME have inventory 21.37%, accounts receivable 24.43% and short-term liability 42.35%. Finnish manufacturing firms' up to 2/3 debts are short-term because the long-term debt represents for 37.82% of their external financing. Bank debt make up only 39.46% of these manufacturing firms' debt. Finnish manufacturing firms have less liquid asset (net working capital) and its non-cash components inventory, accounts receivables and account payable than trading firms, particularly the cash conversion cycle is shorter. The average Days sales of Inventory, Days sales Outstanding and Days payable outstanding as well as cash conversion cycle are 12.40 days, 40.54 days, 42.30 days and 10.66 days respectively. Days payable outstanding is rather longer than the days sales outstanding, it means that the Finnish manufacturing firms collect their payment faster than paying their bills to their suppliers.

The probability of financial distress (Zscore), leverage, industry sigma of trading firms are greater than the Finnish manufacturing firms during the research period. Finnish trading firms hold more liquid asset than manufacturing firms as 21.61, 36.03% inventory, 23.74% accounts receivables and 20.12% accounts payable. Finnish trading firms have less long-term debt with 23.16% and parentally more short-term debt than manufacturing firms. Bank debt of the Finnish trading firms is 19.31%. Finnish trading firms has obviously shorter average collection 31.83 days, slightly longer inventory period of 13.12 days and shorter payable period 30.79 days than the Finnish manufacturing firms which makes the Cash conversion cycle 14.16 days which is longer than manufacturing firms' CCC. Finnish trading firms pay their bills quicker than collecting their payments. Comparing with the trading firms, Finnish manufacturing firms have higher cash flow and slightly larger size, but lower growth opportunities than the Finnish trading firms during the examined period of 2003 - 2007. In the statistically test, the standard deviations are moderate.

Table 1 - Description statistics of Finnish manufacturing firms during year 2003 -2007

Key variables	Mean	25th Percentile	Median	75th Percentile	Standard Deviation	Valid N
Cash Ratio	.055	.004	.021	.067	.0890	N=788
Growth Opportunities	11.25	.90	7.90	17.88	21.71	N=792
Firm Size	10,533	9.806	10,25	11,04	1.13	N=800
Zscore	1.663	1.187	1.564	2.05	.714	N=800
Leverage	.534	.404	.521	.668	.199	N=800
Debt Maturity	.378	.180	.372	.534	.272	N=639
Bank Debt	.395	.218	.418	.578	.227	N=555
Cash Flow	.139	.069	.129	.194	.108	N=800
Industry Sigma	.0577	.029	.043	.076	.050	N=800
Liquid asset s	.129	.007	.118	.251	.197	N=800
Inventory	.191	.101	.172	.256	.116	N=800
Accounts Receivable	.170	.093	.153	.230	.110	N=800
Accounts Payable	.097	.053	.087	.129	.058	N=800
Days Sales of Inventory	12.40	7.30	11.20	15.60	8.24	N=800
Days Sales Outstanding	40.54	24.13	36.31	52.15	25.25	N=800
Days Payable Outstanding	42.30	26.25	37.00	52.00	27.07	N=800
Cash Conversion Cycle_	10.66	-3.35	12.55	27.65	33.30	N=800

Table 2 - Description statistics of Finnish trading firms during year 2003 -2007

Key Variables	Mean	25th Percentile	Median	75th Percentile	Standard Deviation	Valid N
Cash Ratio	.060	.0061	.0276	.081	.0820	N=648
Growth Opportunities	13.23	.20	6.60	14.30	51.53	N=657
Firm Size	10,07	9.08	9.89	10.95	1.23	N=660
Zscore	3.30	2.12	2.94	4.22	1.65	N=660
Leverage	.590	.401	.618	.767	.245	N=660
Debt Maturity	.232	.081	.208	.355	.181	N=386
Bank Debt	.193	.061	.156	.293	.164	N=238
Cash Flow	.117	.037	.097	.174	.124	N=660
Industry Sigma	.062	.026	.049	.070	.062	N=660
Liquid asset s	.216	.082	.224	.339	.205	N=660
Inventory	.360	.188	.358	.514	.199	N=660
Accounts Receivable	.237	.095	.189	.329	.177	N=660
Account Payable	.201	.072	.158	.282	.167	N=660
Days Sales of Inventory	13.12	6.63	11.85	17.18	15.89	N=660
Days Sales Outstanding	31.83	11.00	28.00	41.00	31.87	N=660
Days Payable Outstanding	30.79	14.00	29.00	40.00	26.79	N=660
Cash Conversion Cycle	14.16	-2.00	9.85	24.43	33.77	N=660

6.4 Univariate test

Table 3 and 4 present the results of the univariate tests of variables by cash to assets quartiles. The purpose of univariate tests is to examine if the characteristics of companies which keep high level of cash in the fourth quartile, are different from the companies in the first quartile which hold less cash. The first quartile stands for the firms which hold low level of cash and fourth quartile represents for the firms which keep the high level of cash. The first quartile of Finnish manufacturing firms' cash ratio to assets ranges from -0.00926 to 0.02875. The fourth quartile of cash ratio to assets with comparable high cash holdings are from 0.64897 to 0.827349. In Finnish manufacturing firms' characteristics, as cash holdings increases from first quartile to fourth quartile, the cash flow risk and debt maturity of Finnish manufacturing firms also increase monotonically. In terms of firm size, firms in the fourth quartile are smaller than firms in first quartile. It indicates that smaller firms hold more cash than larger firms which is as expected. However, the change between cash holdings and firm size is not monotonic from first to fourth quartile which is also reported in Oper et al (1999) study.

As the level of cash holdings increase in the fourth quartiles, the Zscore, leverage, bank debt, inventory, accounts receivable, accounts payable and days payable outstanding are smaller than the first quartile, but the growth opportunity, industry sigma, liquid asset s, days sales of inventory, days sales outstanding and cash conversion cycle are bigger than the first quartiles. The first quartile of Finnish trading firms' cash ratio to assets low cash level ranges from 0.000006 to 0.006022. The fourth quartile of high cash holdings, cash ratio to assets is from 0.087685 to 0.549577. The Finnish Trading firms' characteristics, as the level of cash increase from the first quartile to the fourth quartile, the firm size, leverage and cash conversion cycle of the Finnish trading firms get smaller monotonically, meanwhile, the cash flow risk of the Finnish trading firms get bigger monotonically. In the fourth quartile, the cash holdings of trading firms is the highest, but the debt maturity, bank debt, liquid asset s, inventory, accounts receivable, accounts payable , days sales of inventory, days sales outstanding, days payable outstanding are the smaller than their first quartile. Meanwhile, the growth opportunity, Zscore and industry sigma are the larger than their first quartile. The results of table 2 and 3 show that not all firm's characteristics change monotonically with the level of cash which is consistent with the previous empirical studies by Opler et al (1999), Ferreira and Vilela (2004), Ter uel and Solano (2008).

Table 3 - Univariate tests of Finnish manufacturing firms in the period of 2003 -2007

Key variables		CashR	GrowthOp	FirmS	Zscore	Leverage	DebtM	BankD	CashF	IndustryS	LiquidityA	Inventory	AccountR	AccountP	DSI	DSO	DPO	CCC
First Quartile	Minimum	-0,009	-44,900	8,469	0,352	0,103	0,000	0,000	-0,195	0,000	-0,659	0,005	0,002	0,009	1,000	0,542	5,000	-158,600
	Maximum	0,003	197,700	14,371	5,304	1,296	0,870	0,841	0,450	0,230	0,771	0,568	0,589	0,290	32,800	163,600	197,000	127,000
	Mean	0,001	10,607	10,544	1,758	0,596	0,365	0,414	0,111	0,049	0,103	0,205	0,161	0,109	11,953	37,999	46,413	3,556
	Median	0,000	7,400	10,342	1,660	0,599	0,377	0,441	0,104	0,043	0,106	0,194	0,143	0,105	11,300	33,027	38,000	7,600
Second Quartile	Minimum	0,003	-38,600	8,713	0,218	0,109	0,000	0,000	-0,185	0,000	-0,482	0,004	0,007	0,008	0,900	4,874	1,000	-81,700
	Maximum	0,019	242,000	15,525	4,364	0,941	1,075	0,845	0,730	0,424	0,582	0,528	0,598	0,315	29,300	159,287	179,000	123,500
	Mean	0,010	10,902	10,721	1,658	0,525	0,371	0,417	0,133	0,064	0,139	0,186	0,181	0,097	11,761	44,312	41,770	14,271
	Median	0,010	7,450	10,373	1,551	0,522	0,371	0,444	0,108	0,047	0,133	0,165	0,166	0,087	11,650	38,145	36,000	14,800
Third Quartile	Minimum	0,019	-28,800	8,746	0,307	0,081	0,000	0,007	-0,139	0,000	-0,336	0,006	0,009	0,014	0,800	2,569	6,000	-80,600
	Maximum	0,065	83,100	14,661	3,806	1,327	2,721	0,838	0,467	0,239	0,660	0,536	0,865	0,314	47,600	184,186	162,000	115,800
	Mean	0,038	11,796	10,471	1,662	0,542	0,386	0,411	0,135	0,056	0,144	0,189	0,173	0,099	12,433	40,976	41,861	11,639
	Median	0,037	8,650	10,269	1,585	0,517	0,390	0,448	0,126	0,042	0,121	0,167	0,148	0,084	11,100	36,198	38,000	11,100
Fourth Quartile	Minimum	0,065	-43,500	8,737	0,323	0,025	0,011	0,000	-0,121	0,001	-0,628	0,003	0,002	0,003	0,500	0,593	2,000	-87,800
	Maximum	0,827	221,300	13,970	3,564	1,144	2,502	0,805	0,443	0,221	0,616	0,637	0,772	0,260	88,500	140,966	134,000	96,000
	Mean	0,164	11,613	10,414	1,570	0,481	0,397	0,341	0,172	0,060	0,121	0,184	0,160	0,083	13,432	38,161	39,667	11,932
	Median	0,124	8,250	10,152	1,504	0,470	0,365	0,348	0,163	0,046	0,108	0,166	0,137	0,076	10,450	35,327	35,000	13,400
Total	Minimum	-0,009	-44,900	8,469	0,218	0,025	0,000	0,000	-0,195	0,000	-0,659	0,003	0,002	0,003	0,500	0,542	1,000	-158,600
	Maximum	0,827	242,000	15,525	5,304	1,327	2,721	0,845	0,730	0,424	0,771	0,637	0,865	0,315	88,500	184,186	197,000	127,000
	Mean	0,055	11,255	10,535	1,659	0,534	0,380	0,396	0,139	0,057	0,127	0,190	0,169	0,097	12,416	40,401	42,305	10,534
	Median	0,021	7,900	10,258	1,557	0,520	0,376	0,419	0,128	0,043	0,116	0,172	0,151	0,087	11,200	36,080	37,000	12,400

Table 4 - Univariate tests of Finnish trading firms in the period of 2003 -2007

Key variables		CashR	GrowthOp	FirmS	Zscore	Leverage	DebtM	BankD	CashF	IndustryS	LiquidityA	Inventory	AccountR	AccountP	DSI	DSO	DPO	CCC
First Quartile	Minimum	0,000	-36,700	7,815	0,452	0,098	0,000	0,000	-0,173	0,000	-0,340	0,008	0,018	0,012	0,300	2,000	1,000	-61,800
	Maximum	0,006	243,700	14,289	7,988	0,993	0,832	0,832	0,389	0,200	0,820	0,800	0,905	0,808	62,400	218,000	130,000	209,800
	Mean	0,002	11,453	10,435	3,271	0,636	0,215	0,170	0,089	0,061	0,212	0,360	0,266	0,238	12,410	38,248	32,565	18,093
	Median	0,002	7,200	10,421	2,858	0,717	0,168	0,138	0,048	0,060	0,187	0,348	0,204	0,185	11,700	30,000	32,000	9,800
Second Quartile	Minimum	0,006	-33,300	8,287	0,966	0,126	0,001	0,000	-0,244	0,000	-0,315	0,009	0,016	0,004	0,400	2,000	1,000	-67,500
	Maximum	0,030	1132,300	13,526	9,196	1,753	0,693	0,675	0,369	0,250	0,808	0,841	0,892	0,788	48,800	174,000	91,000	173,600
	Mean	0,016	15,426	10,255	3,325	0,617	0,231	0,199	0,095	0,052	0,235	0,390	0,228	0,187	13,563	30,511	28,705	15,370
	Median	0,014	4,900	10,111	2,932	0,621	0,224	0,185	0,074	0,047	0,240	0,413	0,181	0,166	12,300	27,000	29,000	9,800
Third Quartile	Minimum	0,030	-43,100	7,183	0,155	0,093	0,001	0,000	-0,434	0,000	-0,398	0,010	0,023	0,013	0,300	2,000	2,000	-127,700
	Maximum	0,087	177,000	12,405	10,067	0,979	0,717	0,717	0,600	0,385	0,642	0,726	0,857	0,805	368,100	467,000	449,000	386,100
	Mean	0,055	11,630	10,001	3,303	0,573	0,263	0,225	0,124	0,053	0,225	0,352	0,217	0,183	14,381	29,175	31,619	11,938
	Median	0,053	6,000	10,054	2,983	0,596	0,264	0,183	0,111	0,038	0,253	0,359	0,158	0,143	11,700	20,500	28,500	8,500
Fourth Quartile	Minimum	0,088	-50,100	7,180	0,950	0,059	-0,007	0,004	-0,534	0,000	-0,384	0,018	0,024	0,009	0,400	3,000	2,000	-95,600
	Maximum	0,550	326,400	11,781	9,526	2,363	0,719	0,666	0,747	0,455	0,727	0,726	0,770	0,840	31,200	96,000	163,000	87,600
	Mean	0,180	14,483	9,520	3,302	0,521	0,209	0,160	0,169	0,088	0,193	0,328	0,239	0,199	11,925	29,563	30,868	10,621
	Median	0,150	8,800	9,498	2,893	0,519	0,186	0,115	0,155	0,059	0,198	0,323	0,202	0,152	10,900	29,000	29,000	12,200
Total	Minimum	0,000	-50,100	7,180	0,155	0,059	-0,007	0,000	-0,534	0,000	-0,398	0,008	0,016	0,004	0,300	2,000	1,000	-127,700
	Maximum	0,550	1132,300	14,289	10,067	2,363	0,832	0,832	0,747	0,455	0,820	0,841	0,905	0,840	368,100	467,000	449,000	386,100
	Mean	0,060	13,290	10,066	3,301	0,588	0,231	0,193	0,118	0,063	0,217	0,358	0,237	0,202	13,097	31,883	30,887	14,092
	Median	0,028	6,600	9,892	2,932	0,616	0,204	0,156	0,100	0,049	0,223	0,357	0,187	0,158	11,750	27,000	29,000	9,850

6.5 Correlation Matrix / Person correlation

Table 5 presents the correlation coefficient between the cash to assets ratio of Finnish manufacturing firms and its main variables. Growth opportunities have a negative relationship with the cash holdings which are in opposite direction with the expectation and coefficient is not significant. Firm size has a positive correlation with the cash holdings which is not in line with the expectation and the statistic coefficient is not significant either. Zscore is negatively related with the cash to assets ratio which is not in consistent with the expectation and statistically significant at 10% level. Firms' leverage has a negative statistically significant at level 1% correlation with cash holdings. It tells that the firms with high leverage level hold less cash, but it is not confirmed with the expectation. Debt maturity has positive relationship with cash holdings but statistic coefficient is not significant.

The relationship between bank debt and cash holdings of firms is negatively statistically significant at 1% level. In another words, the firms holding less bank debt keep more of cash which is significant consistent with the expectation. Cash holdings have higher positive and statistically correlation with cash flow risk than other variables. It could be explained that firm hold more cash as their cash flow risk increases which is confirmed the expectation. The relationship between cash holdings and liquid asset (net working capital), inventory and accounts receivable are negative and statistically significant at 10% level. The firms holding less liquid asset s, inventory and accounts receivable keep more cash. Correlation matrix shows that accounts payable and Days payable outstanding are negatively related at coefficient 1% and 5% level respectively with the cash holdings, but the result are not as anticipated. CCC is not negatively related with the cash holdings as expected, but positive and the absolute value is not statistically significant. Days sales of inventory is positively related with the cash ratio to assets which is not in line with the expectation and it is not statistically significant. Days sales outstanding is negatively related with the cash ratio to assets which is consistent with anticipation but the statistically absolute value is not significant.

Table 6 reports that Finnish trading firms have a positive relationship with cash ratio to assets but the absolute value is not significant. Finnish trading firms' cash holdings is obviously strong related and negatively significant correlated with the firm size with the high coefficient value of 0.27 among variables with 1% level. It tells that the smaller firms hold more cash

than larger firms in a group of Finnish trading firms. The finding contradicts with the Finnish manufacturing firms' characteristics but is in line with the expectation. Zscore is negatively related with the cash to assets ratio but not significant absolute value.

The relationship between leverage and cash holdings is negatively statistically significantly correlated with 1% level. As cash holdings increases, leverage decreases. Same as found in Finnish manufacturing firms, the cash flow risk is positively statistically significant related with cash holdings at the 1% level. Moreover, the industry sigma, in another word, industry cash flow risk is also positive and strong with the highest coefficient 0.279 and statistically significant related with the cash holdings at 1% level. The liquid asset and inventory both have negative and statistically significant coefficient with cash holdings at 1% level which are in line with the expectation. Accounts receivable is negatively related with the cash ratio to assets which is in line with the expectation but not statistically significant. Accounts payable have a negatively relationship with the cash to assets ratio which is not as expected and the absolute value is not significant. Days sales of inventory and days sales outstanding have negative relationship with the cash to assets ratio as expected but the absolute value is not strong. Days payable outstanding is positively related with the cash holdings as expected, but their absolute value is not significant. CCC is in line with the expectation negatively related with the cash holdings and the absolute value is at the 5% level.

Table 5 - Correlation Matrix of Finnish manufacturing firms in the period of 2003 -2007

Key Variables		CashR	GrowthOp	FirmS	Zscore	Leverage	DebtM	BankD	CashF	IndustryS	LiquidityA	Inventory	AccountR	AccountP	DSI	DSO	DPO	CCC
CashR	Pearson Correlation	1,000	-0,024	0,013	-0,066	-0,153	0,044	-0,162	0,164	0,061	-0,068	-0,060	-0,062	-0,145	0,057	-0,054	-0,085	0,042
	Sig. (2-tailed)		0,496	0,720	0,065	0,000	0,264	0,000	0,000	0,087	0,057	0,093	0,083	0,000	0,111	0,128	0,017	0,243
GrowthOp	Pearson Correlation	-0,024	1,000	-0,037	0,003	0,101	-0,038	-0,069	0,114	-0,025	0,033	0,057	0,070	0,025	0,050	0,077	-0,017	0,085
	Sig. (2-tailed)		0,496	0,304	0,942	0,004	0,338	0,103	0,001	0,480	0,352	0,111	0,048	0,482	0,163	0,031	0,640	0,017
FirmS	Pearson Correlation	0,013	-0,037	1,000	-0,526	-0,125	0,117	-0,104	-0,157	-0,075	-0,144	-0,425	-0,323	-0,314	-0,091	0,035	0,123	-0,097
	Sig. (2-tailed)		0,720	0,304	0,000	0,000	0,003	0,015	0,000	0,035	0,000	0,000	0,000	0,000	0,010	0,319	0,000	0,006
Zscore	Pearson Correlation	-0,066	0,003	-0,526	1,000	0,150	-0,288	-0,128	0,189	0,173	0,122	0,373	0,401	0,427	-0,218	-0,256	-0,375	0,057
	Sig. (2-tailed)		0,065	0,942	0,000	0,000	0,000	0,003	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,106
Leverage	Pearson Correlation	-0,153	0,101	-0,125	0,150	1,000	0,209	0,156	-0,472	-0,131	-0,412	0,100	0,082	0,358	-0,023	-0,017	0,116	-0,111
	Sig. (2-tailed)		0,000	0,004	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,005	0,020	0,000	0,516	0,637	0,001	0,002
DebtM	Pearson Correlation	0,044	-0,038	0,117	-0,288	0,209	1,000	0,303	-0,189	-0,074	0,064	-0,097	-0,187	-0,171	0,080	0,051	0,052	0,018
	Sig. (2-tailed)		0,264	0,338	0,003	0,000	0,000	0,000	0,000	0,062	0,107	0,014	0,000	0,000	0,043	0,200	0,189	0,649
BankD	Pearson Correlation	-0,162	-0,069	-0,104	-0,128	0,156	0,303	1,000	-0,148	-0,150	-0,035	-0,050	-0,050	-0,042	-0,031	0,064	0,024	0,016
	Sig. (2-tailed)		0,000	0,103	0,015	0,003	0,000	0,000	0,000	0,000	0,405	0,235	0,243	0,325	0,466	0,130	0,565	0,701
CashF	Pearson Correlation	0,164	0,114	-0,157	0,189	-0,472	-0,189	-0,148	1,000	0,351	0,248	0,041	0,068	-0,115	-0,037	-0,057	-0,104	0,032
	Sig. (2-tailed)		0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,250	0,053	0,001	0,290	0,110	0,003	0,365
IndustryS	Pearson Correlation	0,061	-0,025	-0,075	0,173	-0,131	-0,074	-0,150	0,351	1,000	0,161	0,052	0,070	0,025	-0,035	-0,038	-0,081	0,027
	Sig. (2-tailed)		0,087	0,480	0,035	0,000	0,062	0,000	0,000	0,000	0,000	0,139	0,047	0,475	0,326	0,278	0,023	0,444
LiquidityA	Pearson Correlation	-0,068	0,033	-0,144	0,122	-0,412	0,064	-0,035	0,248	0,161	1,000	0,365	0,339	0,007	0,314	0,247	-0,242	0,461
	Sig. (2-tailed)		0,057	0,352	0,000	0,001	0,000	0,107	0,405	0,000	0,000	0,000	0,000	0,845	0,000	0,000	0,000	0,000
Inventory	Pearson Correlation	-0,060	0,057	-0,425	0,373	0,100	-0,097	-0,050	0,041	0,052	0,365	1,000	0,212	0,274	0,730	-0,057	-0,161	0,268
	Sig. (2-tailed)		0,093	0,111	0,000	0,000	0,005	0,014	0,235	0,250	0,139	0,000	0,000	0,000	0,000	0,109	0,000	0,000
AccountR	Pearson Correlation	-0,062	0,070	-0,323	0,401	0,082	-0,187	-0,050	0,068	0,070	0,339	0,212	1,000	0,409	-0,040	0,684	0,004	0,506
	Sig. (2-tailed)		0,083	0,048	0,000	0,000	0,020	0,000	0,243	0,053	0,047	0,000	0,000	0,000	0,264	0,000	0,914	0,000
AccountP	Pearson Correlation	-0,145	0,025	-0,314	0,427	0,358	-0,171	-0,042	-0,115	0,025	0,007	0,274	0,409	1,000	-0,021	0,073	0,353	-0,236
	Sig. (2-tailed)		0,000	0,482	0,000	0,000	0,000	0,325	0,001	0,475	0,845	0,000	0,000	0,000	0,549	0,038	0,000	0,000
DSI	Pearson Correlation	0,057	0,050	-0,091	-0,218	-0,023	0,080	-0,031	-0,037	-0,035	0,314	0,730	-0,040	-0,021	1,000	0,103	0,022	0,308
	Sig. (2-tailed)		0,111	0,163	0,010	0,000	0,516	0,043	0,466	0,290	0,326	0,000	0,264	0,549	0,000	0,004	0,528	0,000
DSO	Pearson Correlation	-0,054	0,077	0,035	-0,256	-0,017	0,051	0,064	-0,057	-0,038	0,247	-0,057	0,684	0,073	0,103	1,000	0,265	0,569
	Sig. (2-tailed)		0,128	0,031	0,319	0,000	0,637	0,200	0,130	0,110	0,278	0,000	0,109	0,000	0,038	0,004	0,000	0,000
DPO	Pearson Correlation	-0,085	-0,017	0,123	-0,375	0,116	0,052	0,024	-0,104	-0,081	-0,242	-0,161	0,004	0,353	0,022	0,265	1,000	-0,605
	Sig. (2-tailed)		0,017	0,640	0,000	0,000	0,001	0,189	0,565	0,003	0,023	0,000	0,914	0,000	0,528	0,000	0,000	0,000
CCC	Pearson Correlation	0,042	0,085	-0,097	0,057	-0,111	0,018	0,016	0,032	0,027	0,461	0,268	0,506	-0,236	0,308	0,569	-0,605	1,000
	Sig. (2-tailed)		0,243	0,017	0,006	0,106	0,002	0,649	0,701	0,365	0,444	0,000	0,000	0,000	0,000	0,000	0,000	0,000

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 6 - Correlation Matrix of Finnish trading firms in the period of 2003 -2007

Key variables		CashR	GrowthOp	FirmS	Zscore	Leverage	DebtM	BankD	CashF	IndustryS	LiquidityA	Inventory	AccountR	AccountP	DSI	DSO	DPO	CCC
CashR	Pearson Correlation	1,000	0,009	-0,270	-0,018	-0,164	0,002	-0,047	0,232	0,279	-0,125	-0,156	-0,003	-0,043	-0,049	-0,028	0,038	-0,080
	Sig. (2-tailed)		0,820	0,000	0,641	0,000	0,964	0,473	0,000	0,000	0,001	0,000	0,948	0,277	0,216	0,470	0,337	0,042
GrowthOp	Pearson Correlation	0,009	1,000	-0,075	-0,005	0,001	-0,033	-0,008	0,045	-0,001	0,029	0,057	0,042	0,011	0,054	0,051	0,024	0,055
	Sig. (2-tailed)	0,820		0,056	0,898	0,987	0,516	0,897	0,251	0,970	0,461	0,144	0,287	0,781	0,170	0,189	0,548	0,159
FirmS	Pearson Correlation	-0,270	-0,075	1,000	-0,320	-0,111	0,095	0,311	-0,043	-0,105	-0,021	-0,248	-0,121	-0,134	0,006	0,048	0,021	0,031
	Sig. (2-tailed)	0,000	0,056		0,000	0,004	0,061	0,000	0,275	0,007	0,583	0,000	0,002	0,001	0,887	0,223	0,592	0,429
Zscore	Pearson Correlation	-0,018	-0,005	-0,320	1,000	0,274	-0,279	-0,241	-0,043	-0,015	-0,069	0,232	0,179	0,514	-0,270	-0,342	-0,224	-0,272
	Sig. (2-tailed)	0,641	0,898	0,000		0,000	0,000	0,000	0,271	0,696	0,078	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Leverage	Pearson Correlation	-0,164	0,001	-0,111	0,274	1,000	0,150	0,003	-0,444	0,093	-0,515	0,139	0,353	0,428	-0,074	0,120	0,152	-0,042
	Sig. (2-tailed)	0,000	0,987	0,004	0,000		0,003	0,958	0,000	0,016	0,000	0,000	0,000	0,000	0,058	0,002	0,000	0,276
DebtM	Pearson Correlation	0,002	-0,033	0,095	-0,279	0,150	1,000	0,765	-0,078	0,087	0,218	-0,074	-0,188	-0,389	0,033	0,012	-0,088	0,121
	Sig. (2-tailed)	0,964	0,516	0,061	0,000	0,003		0,000	0,125	0,088	0,000	0,146	0,000	0,000	0,517	0,817	0,086	0,017
BankD	Pearson Correlation	-0,047	-0,008	0,311	-0,241	0,003	0,765	1,000	-0,102	-0,118	0,108	-0,196	-0,243	-0,353	-0,053	-0,045	-0,088	0,002
	Sig. (2-tailed)	0,473	0,897	0,000	0,000	0,958	0,000		0,118	0,069	0,096	0,002	0,000	0,000	0,419	0,485	0,178	0,975
CashF	Pearson Correlation	0,232	0,045	-0,043	-0,043	-0,444	-0,078	-0,102	1,000	0,354	0,161	-0,161	-0,071	-0,278	-0,060	-0,011	-0,160	0,088
	Sig. (2-tailed)	0,000	0,251	0,275	0,271	0,000	0,125	0,118		0,000	0,000	0,000	0,068	0,000	0,122	0,777	0,000	0,024
IndustryS	Pearson Correlation	0,279	-0,001	-0,105	-0,015	0,093	0,087	-0,118	0,354	1,000	-0,092	-0,103	0,087	-0,053	-0,052	0,069	0,031	0,016
	Sig. (2-tailed)	0,000	0,970	0,007	0,696	0,016	0,088	0,069	0,000		0,018	0,008	0,026	0,172	0,181	0,075	0,428	0,673
LiquidityA	Pearson Correlation	-0,125	0,029	-0,021	-0,069	-0,515	0,218	0,108	0,161	-0,092	1,000	0,258	-0,102	-0,282	0,170	0,008	-0,168	0,221
	Sig. (2-tailed)	0,001	0,461	0,583	0,078	0,000	0,000	0,096	0,000	0,018		0,000	0,009	0,000	0,000	0,836	0,000	0,000
Inventory	Pearson Correlation	-0,156	0,057	-0,248	0,232	0,139	-0,074	-0,196	-0,161	-0,103	0,258	1,000	-0,375	0,128	0,339	-0,344	-0,004	-0,161
	Sig. (2-tailed)	0,000	0,144	0,000	0,000	0,000	0,146	0,002	0,000	0,008	0,000		0,000	0,001	0,000	0,000	0,910	0,000
AccountR	Pearson Correlation	-0,003	0,042	-0,121	0,179	0,353	-0,188	-0,243	-0,071	0,087	-0,102	-0,375	1,000	0,337	-0,203	0,599	0,096	0,393
	Sig. (2-tailed)	0,948	0,287	0,002	0,000	0,000	0,000	0,000	0,068	0,026	0,009	0,000		0,000	0,000	0,000	0,013	0,000
AccountP	Pearson Correlation	-0,043	0,011	-0,134	0,514	0,428	-0,389	-0,353	-0,278	-0,053	-0,282	0,128	0,337	1,000	-0,110	-0,056	0,442	-0,455
	Sig. (2-tailed)	0,277	0,781	0,001	0,000	0,000	0,000	0,000	0,000	0,172	0,000	0,001	0,000		0,005	0,153	0,000	0,000
DSI	Pearson Correlation	-0,049	0,054	0,006	-0,270	-0,074	0,033	-0,053	-0,060	-0,052	0,170	0,339	-0,203	-0,110	1,000	0,424	0,603	0,393
	Sig. (2-tailed)	0,216	0,170	0,887	0,000	0,058	0,517	0,419	0,122	0,181	0,000	0,000	0,000	0,005		0,000	0,000	0,000
DSO	Pearson Correlation	-0,028	0,051	0,048	-0,342	0,120	0,012	-0,045	-0,011	0,069	0,008	-0,344	0,599	-0,056	0,424	1,000	0,446	0,789
	Sig. (2-tailed)	0,470	0,189	0,223	0,000	0,002	0,817	0,485	0,777	0,075	0,836	0,000	0,000	0,153	0,000		0,000	0,000
DPO	Pearson Correlation	0,038	0,024	0,021	-0,224	0,152	-0,088	-0,088	-0,160	0,031	-0,168	-0,004	0,096	0,442	0,603	0,446	1,000	-0,089
	Sig. (2-tailed)	0,337	0,548	0,592	0,000	0,000	0,086	0,178	0,000	0,428	0,000	0,910	0,013	0,000	0,000	0,000		0,022
CCC	Pearson Correlation	-0,080	0,055	0,031	-0,272	-0,042	0,121	0,002	0,088	0,016	0,221	-0,161	0,393	-0,455	0,393	0,789	-0,089	1,000
	Sig. (2-tailed)	0,042	0,159	0,429	0,000	0,276	0,017	0,975	0,024	0,673	0,000	0,000	0,000	0,000	0,000	0,000	0,022	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

6.6 Regression

Table 7 and 8 report the results of the regression analysis. The Finnish manufacturing firm's regression result is analysed first. It is estimated that the growth opportunity has negative relationship with firms' cash holdings. Firms with the better investment opportunities hold more cash, but the result is not in line with the expectation. The growth opportunity has negative coefficient and less statistics significant with cash holdings in regression analysis. **Firm size** is expected to be negative related with the cash holdings which are confirmed with the findings of the regression analysis and the result is statistic significant at 1% level. The smaller Finnish manufacturing firms hold more cash than larger firms. This result is in line with the previous empirical studies by Ferreira and Vilela (2004)'s EMU countries, Niskanen and Niskanen (2007) Finnish small and micro firms.

The expected relationship between cash holdings and **probability of financial distress (Zscore)** is positive, but the result shows a negative connection with strong statistical significant coefficient at the 1% level. The findings support the Kim et al. (1998) viewpoint that firms hold less cash with greater financial distress. Leverage is found to be negatively related with the cash holdings not as anticipated and not statistically significant either. **Debt maturity** is found to be positively related with the cash holdings which are not in line with expectation and it is not statistically significant either. **Bank debt** is estimated to have a negative relationship with the cash holdings which is in line with the results founded in regression. The coefficient of this variable and cash holdings is statistically strong at the 1% level. This result is in line with previous empirical studies Ferreira and Vilela (2004) etc.

The expected relationship between **Cash flow** variability/uncertainty and cash holdings is positive which is consistent with the regression result and the coefficient is statistically significant at the 1% level. It means that the firms with high cash flow variability/uncertainty hold more cash level. The finding is consistent with the previous empirical research such as Ferreira and Vilela (2004). Finnish manufacturing industry sigma is positively related with the cash ratio but the coefficient is not significant. **Liquid asset of** manufacturing firms is shown the negative relationship with cash holdings which is confirmed with the expectation, but the it is not statistically significant. Previous empirical studies also find that the liquid asset have a negative relationship with cash holdings. Ferreira and Vilela (2004), Niskanen

and Niskanen (2007). Finnish manufacturing **inventory** is estimated to have negative relationship with the cash holdings and the regression result confirm this expectation and the coefficient is statistic significant at the 1% level. This result is in line with several previous empirical studies Bates (2006), Capkun & Weiss (2007), Abel (2008).

It is expected that the cash holdings is negatively related with the **accounts receivable**, but regression result indicates that the relationship between this variable and cash holdings is positive with strong coefficient at the 1% level. The finding is different from the previous empirical studies such as Bates (2006), Capkun & Weiss (2007), Abel (2008). **Accounts payable** is negatively instead of positively related with cash holdings which is not in line with the expectation but Abel (2008) has similar findings. It is interesting to find out in regression analysis that the **Days sales of inventory (DSI)** is positive related with the cash holdings with coefficients statistically significant with 1% level, but the figures are relatively smaller.

Days sales outstanding (DSO) is found to be negatively associated with the cash holdings which are in line with the exception and previous studies Bates (2006), Capkun & Weiss (2007), Abel (2008). **Days payable outstanding (DPO)** is negatively associated with the cash holdings and it is statistically significant at the 1 % level. **Cash conversion cycle** is positively related with the cash holdings which are not in line with the expectation and its statistical value is not significant.

Finnish trading firms' regression results are similar to those in manufacturing firms' regression analysis that **growth opportunities** has a negative relationship with the cash holdings which is either in line with expectation and nor statistically significant. **Firm size** as expected is negatively related with the cash level which is consistent with the expectation with statistically significant at the 5% level. The regression reveals that **the Zscore** is negatively not positively related the cash holdings and the statistical significance is 5 % level. **Leverage and debt maturity** of Finnish trading firms are both negatively related with the cash ratio which is not as anticipated and their absolute value are not significant. **Bank relationship** of Finnish trading firms are positively related with the cash ratio but not statistically significant.

Cash holdings have positive relationship with **cash flow** and **industry sigma** which are in line with the expectation and the statistical significance reaches the 1% level. **Liquid asset** is

found to have a negative relationship with the cash holdings as expected and the result is statistically significant at the 1% level. **Inventory** is negatively related with cash holdings but the is not statistically significant. **Accounts receivable** has a positive relationship with the cash holdings with statistically significant at 5 %. Positive relationship with cash holdings is not consistence with the expectation. A similar finding of **accounts payable** is presented in trading firms' regression that accounts payable is negatively not positively related with the cash holdings. It is interesting to find that both **DSI** is positively associated with the cash ratio which is not as anticipated. It is statistically significant at 1 % level. **DSO** is as expected to have negative relationship with the cash holdings and it is statistically significant at 1% level **DPO** is statistically significant at 1% level, but DPO is negatively related with the cash holdings which are not in line with the expectation. **Cash conversion cycle** is statistically significant at 1% level with the cash holdings and is negatively related with the level of cash ratio as expected.

Table 7 – Regression of Finnish manufacturing firms in the period of year 2003 - 2007

Key variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	,225	,038		5,947	,000
Growth Opprtunity	-4,45	,000	-,015	-,342	,732
Firm size	-,010	,003	-,217	-4,032	,000
Zscore	-,023	,009	-,263	-2,683	,008
Leverage	-,025	,020	-,081	-1,236	,217
Debt maturity	,016	,011	,068	1,355	,176
Bank debt	-,040	,011	-,153	-3,462	,001
Cash flow	,087	,032	,145	2,724	,007
Industry sigma	,089	,056	,067	1,597	,111
Liquidity asset	-,036	,022	-,106	-1,629	,104
Inventory	-,190	,051	-,386	-3,740	,000
Accounts receivable	,238	,071	,359	3,367	,001
Accounts payable	-,067	,069	-,065	-,980	,327
DSI	,002	,001	,358	3,594	,000
DSO	-,001	,000	-,441	-4,434	,000
DPO	-,001	,000	-,522	-4,419	,000
CCC	1,66	,000	,008	,124	,901

a Dependent Variable: Cash ratio

Table 8 - Regression of Finnish trading firms in the period of year 2003 - 2007

Key variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	,140	,046		3,018	,003
Growth Opprtunity	-2,22	,000	-,029	-,539	,591
Firm size	-,008	,003	-,172	-2,388	,018
Zscore	-,008	,003	-,228	-2,373	,018
Leverage	-,061	,040	-,200	-1,516	,131
Debt maturity	-,003	,035	-,009	-,080	,936
Bank debt	,047	,031	,131	1,525	,129
Cash flow	,202	,044	,339	4,611	,000
Industry sigma	,311	,081	,235	3,831	,000
Liquidity asset	-,079	,045	-,250	-1,757	,080
Inventory	-,003	,052	-,009	-,050	,960
Accounts receivable	,152	,067	,399	2,275	,024
Accounts payable	-,017	,048	-,042	-,348	,728
DSI	,003	,001	1,178	3,629	,000
DSO	-,001	,000	-,731	-3,094	,002
DPO	-,001	,000	-,707	-3,094	,002
CCC	-,001	,000	-,738	-3,778	,000

a Dependent Variable: Cash ratio

The estimated and regression tested relationship between cash holdings and the factors affecting the level of cash holdings of Finnish manufacturing and trading firms listed below:

	Estimated	Manufacturing	Trading
Growth Opportunities	+	-	-
Firm Size	-	-	-
Probability of Financial Distress (Zscore)	+	-	-
Leverage	+	-	-
Debt Maturity	+	+	-
Bank Debt	-	-	+
Cash flow (uncertainty / variability)	+	+	+
Cash conversion cycle	-	+	-
Liquid asset (Net working capital)	-	-	-

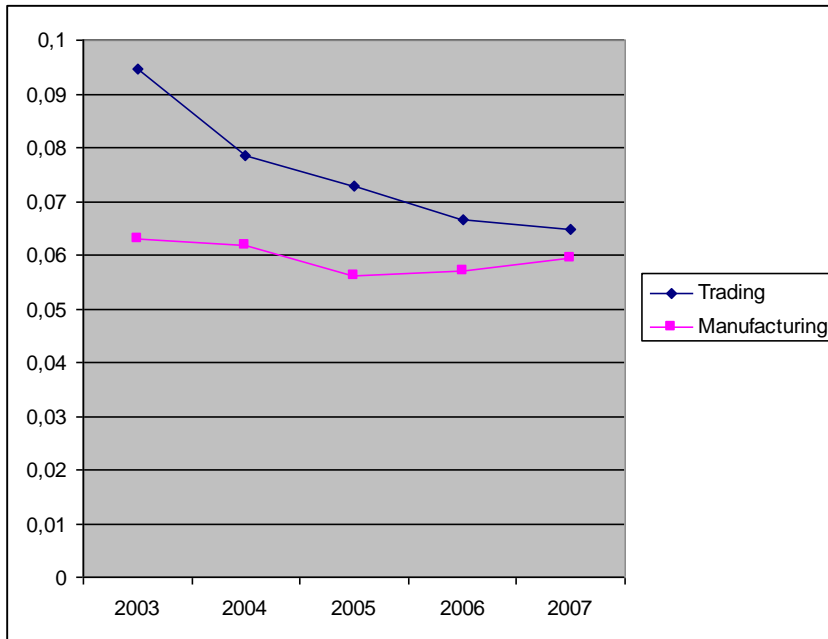
Industry sigma	+	+	+
Accounts receivable	-	+	+
Inventory	-	-	-
Accounts payable	+	-	-
Days sales of inventory	-	+	+
Days sales outstanding	-	-	-
Days payable outstanding	+	-	-

According to the summary above, the determinants of the following factors are examined by the empirical test of Finnish manufacturing and trading firms during the period of 2003-2007. Parts of the determinants are as expected and in line with the predictions in theoretical parts, but others are not as anticipated. As expected determinants factors are firm size, cash flow (uncertainty / variability), liquid asset (net working capital), industry sigma and inventory. The factors, which are opposite with the prediction in theoretical part, are the growth opportunities, probability of Financial distress (Zscore), leverage, accounts receivable, accounts payable and days sales of inventory. Certainly, it is good to point out that some determinants do also have opposite explanations which have empirical supported and proved. Such as probability of financial distress (Zscore), Leverage, accounts payable.

6.7 The level of cash holdings during year 2003 - 2007

As shown in table 9, the mean of cash to assets ratio is calculated during the year 2003-2007 for Finnish manufacturing and trading firms. According to the result of the calculation, the development and trend of the cash holdings in Finnish manufacturing and trading firms are shown in below drawings. The cash level of the Finnish trading firms started to decrease in year 2003. From year 2004 to 2007, the cash holdings of trading firms slowly decreased, but the ration of cash holdings to asset keep just under the 7% of total assets. The cash level of the Finnish manufacturing firms had lower level of cash holdings comparing with the trading firms in year 2003 and gently reduced in 2004. The level of cash holdings in manufacturing firms reached to its lowest point in 2005 during the period in 2003-2007. After year 2005, the cash holdings started to increase in 2006 and continued to increase in 2007. The ratio of cash holdings to total asset is around 6% throughout the research period.

Table 9 – Finnish manufacturing and trading firms’ level of cash holdings during examined year 2003 – 2007



According to the study conducted by the Ferreira & Vilela (2004) “European corporations, at the end of the year 2000 as listed in Datastream, held 15% of their total book value of assets in cash or cash equivalents.” and they report that Finnish corporation holds ratio cash to assets of 15.1%. Niskanen & Niskanen (2007) study the Finnish small and medium sized companies of total 2672 observations and report that the ratio of cash to assets in the average firms is 23%. Teruel & Solane (2008) analysis Spanish SME firms with 5160 observations corresponding to 860 firms and discover that the Spanish firms holds 6.57 % ratio of cash to assets during period of 1996-2001. Bates et al (2006) investigate the U.S firms large industrial firms during period of 1980-2004 and find that the cash ratio to asset more than doubled from 10,48% in 1980 to 24,03% in 2004. Abel (2008) examines the 13,287 Swedish manufacturing SMEs and find their average cash to ratio 15% in year 2006. In this research, the observation period is 5 years during period of 2003 – 2007. The percentage of cash ratio to assets in this study is similar with the findings of cash ratio reported in Teruel & Solane (2008) studying Spanish SME firms.

Based on table 9, it is observed that cash holdings of Finnish manufacturing and trading firms during period of 2003-2007 are in the similar trend, in another word, the result of cash holdings is decreasing. Finish manufacturing firms during the examined period fluctuates but the main trend is decreasing. The level of cash holdings in Finnish trading firms is reduced

rather sharply during the test period. During the period of 2003 – 2007, Finnish trading firms hold more cash than Finnish manufacturing firms and change its characters of cash holdings rather faster than Finnish manufacturing firms which are rather constant in their level of cash holdings during the analysing period.

6.8 Trend of collection, inventory and payment

As table 10 and 11 presents the analysis of trend. In the year 2003-2007 periods, the comparison of mean presents the development trend of Finnish manufacturing and trading firm's working capital and its components. The trend of Finnish trading firms' cash holdings is reduced instead 2% from 2003-2007. Accounts receivable increases monotonically as cash holdings decrease. The trend of inventory, accounts payable increase but not monotonically. Cash conversion cycle, DSI, DSO and DPO are decreasing, but the changes are not monotonically as trading firms' cash holdings decrease. In the term of Finnish manufacturing firms' comparison of mean, it is not observed that the cash holdings decrease monotonically, like the trading firms, but the main trend is the decreasing of cash holdings.

Inventories increase monotonically as cash holdings decrease. The trend of accounts receivable, accounts payable, liquid asset increase as cash holdings decrease. It is interesting to mention that accounts payable, DSO and DPO are increasing monotonically from period of 2003-2006. Inventory of Finnish manufacturing firms is slightly increasing in given period. The main trend of CCC is decreasing during 2003-2006. Capkun & Lawrence (2007) examines the period of collection, inventory and payment of US firms during period of 1980-2005 and find that inventory is shortened from 95-75 days and days payables is prolonged from 36-47 days. In their study, it is not considered if the changes of variables during examined period are monotonic. Teruel & Solano (2008) study the Spanish SME during period of 1996-2002 and find that on average the number of days of inventory is 77,21 days, number of days accounts receivables is 96,83, number of days of accounts payable is 97,81 days and cash conversion cycle is 76,21 days.

In this context, let's recheck the comparison of mean by the data of Finnish manufacturing and trading firms. It is found that inventories increase by 2%, accounts receivable increase less than 1%, accounts payable increased 1% and liquid asset increased almost 2.7%. Days

sales of inventory slightly increase by less than 1 day, Days sales outstanding increase by 2 days and Days payable is prolonged 6 days, cash conversion cycle decrease 4 days in Finnish manufacturing firms. Finnish trading firms' inventory increase slightly by 0,7%, accounts receivable increase by 2.7%, accounts payable increase by less than 1% and liquid asset decrease 0.89%. Days sales of inventory, Days sales outstanding and Days payable outstanding decrease by 2 days, by 1 day and by 3 day respectively. Cash conversion cycle decrease by 1 days. According to Abel (2008) study of Swedish industry manufacturing SME in year 2006, the average DSI, DSO and DPO are 46.74 days, 46.19 days and 28.64 days. CCC is in average 64.29 days in Swedish manufacturing firms.

Finnish manufacturing and trading firms have rather shorter DSI, DSO and CCC but longer DPO comparing with the Swedish manufacturing firms. If comparing with U.S firms, Finnish manufacturing and trading firms have more efficient working capital management and particularly the period of cash conversion cycle is almost 1/7 of U.S firms' cash conversion cycle. As shown in table 8 and 9, Finnish manufacturing firms has average 12.4 days DSI, 40.55 days DSO, 42.30 DPO and 10.66 days CCC. In terms of Finnish trading firms present average 13.12 days DSI, 31.83 days DSO, 30.78 days DPO and 14.16 days CCC. The changes in the DSI, DSO, DPO and CCC are not so obvious comparing with the US firms and Swedish firms, certainly it is to be considered the fact that in US firms' study which examined period is rather long 25 years during 1980-2005, so it could be observed the changes more apparently of working capital and its components. In Swedish study, the examined year is 2006.

7. ANALYSIS OF EMPIRICAL RESULTS

Based on the statistic analysis of descriptive, univariate, correlation and regression, it is observed that both Finnish manufacturing and trading firms' **growth opportunities** do not show the statistically supportive evidence in its association with the cash holdings. Empirical statistical tests do not provide clear relationship on this determinant with cash holdings. The findings are different from the empirical studies of Kim et al (1998), Opeler (1999), Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Teruel and Solano (2008), in which the growth opportunities have strong influences on cash holdings, however, in Niskanen and Niskanen (2007) empirical study of Finnish micro and small firms' growth opportunities are found not to be a statistically significant factor of cash holdings.

The statistic tests reveal that the Finnish manufacturing and trading firms' **firm size** is strong statistically significant and negatively related with the cash holdings in regression test. Furthermore, in correlation matrix the Finnish trading firms has the strong negative statistically significant relationship with the cash holdings, but not in Finnish manufacturing firms. Univariate test also proves that the firm size of the Finnish trading firms decreases monotonically. Therefore, the relationships between the both Finnish manufacturing and trading firms' firm size and corporate cash holdings is confirmed with the previous empirical studies by Kim et al (1998), Opeler (1999), Ferreira and Vilela (2004), Niskanen and Niskanen (2007). The smaller Finnish firms hold more cash than larger firms which supports the trade-off theory indicating a negative relation between the size and cash holdings.

Probability of Financial Distress (Zscore) exerts the negative impact on the cash holdings which is shown in both Finnish manufacturing and trading firms' statistical tests and results are statistically significant in regression but not as anticipated. The correlation matrix further provides evidence that the Finnish manufacturing firms' Zscore is negatively related with cash holdings. The finding is not as expected, but consistent with the Kim et al (1998)'s result in their empirical study that Zscore has a negative relation with the cash holdings. So if the firms have a high Zscore, they hold less cash. In Teruel and Solano (2008), the financial distress of Spanish SME firm is not statistically significant.

Leverage of Finnish manufacturing and trading firms is negatively related with the cash holding. This result is not as predicted and is in line with the previous empirical studies Opler et al (1999), Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Teruel and Solano (2008) that leverage increase as cash holdings also increase. Either manufacturing or trading firms' the results are statistically significant in the regression model. However, in the correlation matrix both Finnish manufacturing and trading firms have strong negative relationship with the corporate cash holdings and statistically significant. In univariate test, it further proves that Finnish trading firms' leverage decrease as level of cash increases. There is not sufficient evidence to support the expectation and indicate the Finnish manufacturing and trading firms' relationship with cash holdings. However, the findings is confirmed with the Niskanen and Niskanen (2007) studying the Finnish SME firms and Teruel and Solano (2008) researching the Spanish SME firms that cash holdings increase, leverage decreases.

It is not found the obvious evidence in of Finnish manufacturing and trading firms' **Debt Maturity**' s relationship with the cash holdings in either the regression and correlation matrix. In univariate test, the Finnish manufacturing firms' debt maturity increases monotonically as the cash increases. **Industry sigma** of Finnish trading firms have positive relationship with the cash holdings in regression which is confirmed with the previous studies Opler et al (1999), Ferreira and Vilela (2004), Bates et al (2006), Capkun & Weiss (2007). In the correlation matrix, it is further proved that Finnish trading firms is positively related with the corporate cash holdings.

Manufacturing firms' **bank debt** is negatively related with the cash holdings as predicted and statistically significant at 1% level in regression. The findings is in consistent with the previous researches Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Niskanen and Niskanen (2007), Teruel and Solano (2008). In correlation matrix, it is further proved that Finnish manufacturing firms' bank debt has negatively and statistically significant relationship with the cash holdings. Both Finnish manufacturing and trading firms' **cash flow** have positive relationship with the cash holdings as expected and the statistics significant are at 1% level in regression, in correlation matrix and univariate tests. The findings is in consistent with the previous empirical researches Opler et al (1999), Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Teruel and Solano (2008) Riskier cash flows make the firms hold more cash. As Ozkan and Ozkan (2004) point out "The greater the firm's cash

flow variability, the greater the number of states of nature in which the firm will be short of liquid assets”

Both Finnish manufacturing and trading firms’ **liquid asset** are negatively associated with the cash holdings as predicted and Finnish trading firms’ result in regression is statistically significant at the 1%, but manufacturing firms’ regression result is not significant. In correlation matrix, manufacturing and trading firms’ liquid asset both negatively related with the cash holdings with statistical significant bit over 5% and at 1%. The findings suggest that liquid asset is considered as the substitute for cash in terms of trading firms. The result is confirmed the previous studies Opler et al (1999), Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Teruel and Solano (2008), but is on contrary to the findings from small and micro Finnish firms’ study made by Niskanen and Niskanen (2007). **Inventory** of manufacturing and trading firms have a negative relationship with cash holdings which is in line with the previous studies Capkun & Weiss (2007), Abel (2008). However, the statistical significant of manufacturing firms is reached to 1% level of absolute value but not in trading firms. In correlation matrix the trading firms show more strong negative relationship with the cash holdings with absolute value at 1% but manufacturing firms at 10%.

It is interesting to find that both manufacturing and trading firms’ **accounts receivable** have positive relationship with the cash holdings which is not in line with expectation and previous studies Capkun & Weiss 2007, Abel (2008). Both of them have good statistic significance at the 1% and 5% level respectively. In the correlation matrix, both trading and manufacturing firms’ accounts receivable are negatively related with the cash holdings, but only manufacturing firms’ absolute value is at the 10% level. In regard of **accounts payable**, either manufacturing or trading firms have a negative relationship with the cash holdings which is not in line the expectation and in line with the previous researches Capkun & Weiss (2007), Abel (2008). In the correlation matrix, both manufacturing and trading firms’ accounts payable are negatively related with cash holdings but only manufacturing firms has statistically significant coefficient at the 1% level.

Day sales of inventory (DSI) of both manufacturing and trading firms are positively associated with the cash holdings and statistically significant at 1% level. The findings are not line with Abel (2008). In the correlation matrix, both manufacturing and trading firms’ DSI have negatively related with cash holdings, but it is not significant. Manufacturing firms’ **Day sales outstanding (DSO)** is as expected negatively related with the cash holdings and

statistically significant at the 1% level in both manufacturing and trading firms' regression analysis. The finding is in line with previous research Abel (2008), In the correlation matrix DSO of manufacturing firms is negatively related with the cash holdings at 10% level. DSO of trading firms is also negatively related but not statistically significant in correlation matrix.

Manufacturing and trading firms' **Days payable outstanding (DPO)** is not as predicted positively but negatively associated with the cash holdings and statistically significant at 1% level. The result is in line with the finding by Abel (2008).. In correlation matrix, manufacturing firms DPO is negatively related with cash holdings at 5% level. Kim et al (1998) find that a negative relation between **cash conversion cycle (CCC)** and cash holdings. The similar finding is shown in this research at Finnish trading firms' regression analysis and it is statistically significant. However, in Finnish manufacturing firms' CCC is found the positive related with cash holdings and not statistical significantly related with cash holdings. In the correlation matrix, it is further proved that trading firms' CCC is negatively related with the cash holdings at statistically significant 5% level. In univariate test, it is shown that as cash increases, the CCC of trading firms also decreases monotonically.

At theoretical part, it is introduced three theoretical models of cash holdings Trade-off model, Pecking order theory and Free cash flow theory. In the empirical part, it is found that **investment opportunities set** and cash holdings supports the Free cash flow theory instead of Trade-off model and Pecking order theory. **Firm size** of both Finnish manufacturing and trading firms are to have a strong relationship with cash holdings. As firm size decreases, the firms hold more cash. The findings of relationship between firm sizes with cash holdings supports the Trade-off model. Finnish manufacturing and trading firms' **Liquid asset** is influential factors to the cash holdings and are statistically significant. Liquid asset could be regarded as the cash substitute which are to be converted into cash quickly and easily in shortage of cash. Therefore, firms with less liquid asset hold more cash. The empirical results of this study support the Trade-off model.

Leverage of both Finnish manufacturing and trading firms' in statistical test are not significant, therefore it could not be addressed clearly which theories it supports. **Cash flow** of Finnish manufacturing and trading firms' statistically proves its strong relationship with the cash holdings. Firms with high cash flow have correspondingly high level of cash which support the Trade-off model and Pecking order theory. **Debt maturity** of Finnish

manufacturing firms' empirical result show the supporting to the Trade-off theory, but the statistically absolute value is not significant. It is not found the similar prove in Finnish trade firms in terms of debt maturity to cash holdings.

It is reported in previous empirical studies that precautionary motives are supportive to explain the corporate cash holdings. (Opeler et al (1999), Ferreira and Vilela (2004), Bates (2006,) Capkun & Weiss (2007)) Bates et al (2006) argue that “average cash ratio increase over the sample period because firms changes, their cash flow becomes riskier, they hold fewer inventories and accounts receivables, and are increasingly R & D intensive. The Precautionary motive for cash holdings appears to explain the increase in the average cash ratio.” The similar results are found in this empirical study for Finnish manufacturing and trading firms. Several statistically results provide evidence, as corporate cash holding increase, the cash flow also increases. Both of Finnish manufacturing and trading firms' inventory decrease as cash holdings increase, particularly observed in the manufacturing firms, but it is not supportive results found in regard to accounts receivable. Because both account receivable of manufacturing and trading firms are positively not negatively related with the cash holdings which are different from the expectation.

8. CONCLUSION

The topic of corporate cash holdings could be dated back to 80th. It has been an interesting issue to investors, managers, practitioners and academics. Generally, there are three theories used to explain the cash holdings as trade-off theory, peaking order theory and free cash flow theory. Trade-off theory and peaking order theory are more significant than free cash flow theory based on the previous studies and researches, but the free cash flow theory is also shown its importance in international scope of study and research. Economist Keynes describes the transactional motive, precautionary motive and speculative motive which motivate the firms for cash holdings. As reported in previous empirical studies, supportive evidence is found of trade-off theory and peaking order theory which both are mostly explainer of the corporate cash holdings and determinates which is also proved in this study. Furthermore, the precautionary motive is found to describe better the level of corporate cash holdings and its determinants.

It is quite interesting to find in empirical results that the level of Finnish trading firms' cash holdings level is decreasing instead of increasing during the examined period. This may be because of the different time periods. The empirical results report that the corporate cash levels of Finnish manufacturing and trading firms hold less and have the trend of decreasing the cash holdings which are different from the other studies in Opeler (1999), Ferreira and Vilela (2004), Bates et al (2006), Niskanen and Niskanen (2007), Capkun & Weiss (2007), Abel (2008) which find the firms in their studies increasing the level of cash holdings. Even so, I still observed the changes and trends of Finnish firms' cash holdings development during examined period. Comparatively speaking, Finnish trading firms have a sharp drop in their development of cash holdings and Finnish manufacturing firms have more constant but slightly changing corporate cash holdings during tested period, but either of them is found to have large increased but decreased cash holdings during the examined period.

There are two hypothesis defined in this empirical study. In terms of hypothesis 1, the following conclusion is deducted. It is not observed from the results of empirical tests that there are supportive signs of aggressive working capital management in Finnish manufacturing and trading firms during the examined period 2003 – 2007. It is not found the sufficient evidence to support the hypothesis that tested Finnish firms applied a strong working capital management of shorter cash conversion cycle with reducing the inventory,

accounts receivables period meanwhile increase the accounts payable period during the tested period. It is found in the empirical studies that both Finnish manufacturing and trading firms during the tested period in regression, liquid asset are negatively related with the cash ratio to assets in both manufacturing and trading firms, particularly in Finnish trading firms with strong statistical significant. Even so it is not sufficient enough to explain the relationship because the components of liquid asset are not so clearly support the hypothesis. Similar finding is obtained with the cash conversion cycle and its components. Although, it is observed that Finnish trading firms' cash conversion cycle decreases and has negative strong relationship with the cash holdings.

In terms of hypothesis two, as discussed in theoretical parts, firms with less inventory and account receivable are to keep more cash because of shorter cash substitute which can be converted into cash quickly if cash is scarce. Inventory and account receivable are the non-cash components of working capital. If firms have less non-cash components of working capital, correspondingly it possesses more cash holdings. It is supposed that the account payable is stretched, so that firms have a higher level of cash for financial flexibilities and hedge the risks. As observed in the first hypothesis both Finnish manufacturing and trading firms' days sales of inventory is increased during the examined period, but **DSO** is decreases. Similar observation is in the Finnish trading firms, so we could not find the strong support evident to prove that firms have few inventories, accounts receivable holdings more cash. Moreover, **DPO** in empirical test of Finnish manufacturing and trading firms don't provide evidence that they have stretched their DPO as the financial resources and results at the high level of cash holdings. On the opposite, accounts payable is decreased and negatively related with the cash holdings. It could be explained by the previous studies on working capital management made by the Deloof (2003) that firms which stretch their accounts payable are less profitable. From empirical results, we could not find that the Finnish firms increase their account payable period.

Based on hypotheses discussed and proved by the empirical test, hereby it is to conclude that both hypotheses are to be rejected because it is not found the corresponding and supportive evidence in the empirical statistical tests. As it is found that both examined Finnish manufacturing and trading firms' level of cash holdings get decreased instead of increased during the examined year 2003-2007 and correspondingly, it is revealed also that working capital and its components are changed. In terms of liquid asset and cash conversion cycle in

Finnish trading firms' empirical tests, it could be argued that corporate cash holdings and working capital management have negative relationships. It means if level of cash holdings increase, the working capital would be decreased as the non-cash components are converted into cash quickly and easily. The theory works vice versa that the working capital management gets more, the level of cash holdings get less as proved by this empirical study.

In this empirical study, except the working capital and its components as the determinants of corporate cash holdings it is also examined the other influential determinants. It is found that in both Finnish manufacturing and trading firms' cash flow risk are increased monotonically as level of cash holding are increased. Therefore, it could be concluded that cash flow risk has a strong impact on the corporate cash holdings. Cash flow risk could consequence the firm to unexpected and unforeseen situation. Finish manufacturing and trading firms' firm size influence its corporate cash holdings. As small firms have more financial constrains than larger firms. Kim et al argue that firms have high Zscore, hold less cash. In average, Finnish trading firms has 3.29 Zscore which are higher it in the Kim et al (1998) study and Finnish manufacturing firms, therefore the trading firms hold more cash than manufacturing firms as proved in the empirical tests. It also provides the evidence that the size of trading firms is smaller than the manufacturing firms in the test.

Consequently, Finnish manufacturing firms has better relationship with the bank and access easily to the funds from bank, therefore it has more bank debt comparing with Finnish trading firms and hold less corporate cash. Bate et al (2006) argue that firms have greater industrial cash flow, hold more cash. In this empirical study, this empirical study proves that Finnish trading firms has more industrial sigma than Finnish manufacturing firms, so the trading firms comparable hold more level of cash than manufacturing firms as empirical test show that Finnish trading firms hold more cash balances than manufacturing firms, even though the Finnish trading firms has reduced their cash reserved sharply during the examined period and increased the amount of working capital reserves, in another words, the liquid asset substitutes during 2003 -2007.

It would be interesting to discuss few lines in regard of why Finnish manufacturing and trading firms reduce their cash holdings during the examined period instead of holding high levels cash. As presented and discussed before in this study, examined Finnish firms hold in general low cash ratio to assets and have efficient working capital management. As reported

by the Danske Bank and Ernst & Young (2009) which conduct a survey of Nordic countries to investigate the situation of Nordic company's working capital management. It is found that half of the participating Finnish companies are production companies and the trend of general working capital management among the Finnish companies are faster invoicing process, faster delivery of goods, shorter payment deadlines for customers; faster approval of creditor invoices; below average DPO comparing with others. Some of the characteristics are also proved in this study.

In general, the examined Finnish manufacturing and trading firms during 2003 -2007 hold moderate cash holdings and working capitals which is either aggressive or conservative in terms of working capital management. The working capital management have a negative relationship with the level of corporate cash holdings in general, particularly in Finnish trading firms. The trend of working capital management and corporate cash holdings in tested period is clear and their relationship is to be interpreted as the negatively related as statistically tests disclosed.

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