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An Investigation of the Association between Working Capital Management and Corporate Performance

*[1] V. Taghizadeh Khanqah, [2] M. Akbari Khosroshahi, [3] M. R. Ebrati

[1,2,3] Department of Accounting, Tabriz branch, Islamic Azad University (IAU), Tabriz, Iran

ABSTRACT: Working capital management is an essential part of the short-term finance of a firm. With an efficient working capital management, a firm can release capital for more strategic objectives, reduce the financial costs, and improve profitability. The present research studies the relationship of working capital management on performance of firms Listed in Tehran Stock Exchange (TSE). Average Collection Period, Inventory Turnover in days, Average Payment Period, Cash Conversion Cycle, and Net Trading Cycle were used to assess working capital management, and Net Operating Profitability was used to assess firms' performance. The findings of studying 50 firms during the period between 2006 and 2009 by using an Ordinary Least Square Method (OLS) showed that there would be a negative and significant relationship between the variables of Average Collection Period, Inventory Turnover in day, Average Payment Period, Net Trading Cycle and the performance of firms Listed in Tehran Stock Exchange (TSE). There were no evidences to prove the existence of a significant relationship between Cash Conversion Cycle and the firm's performance (NOP) for all years from 2006 to 2009. The results showed that the increase in Collection Period, Payment Period, and Net Trading will lead towards the reduction of profitability in the firm. In other words, managers can increase the profitability of their firms reasonably, by reducing Collection Period, Inventory Turnover, and Payment Period.

Keywords: *Working capital management, Net operating profitability, Average collection period, Inventory turnover in days, Average payment period*

INTRODUCTION

Management of working capital is an extremely important area of financial management as current assets represent more than half of the total assets of a business. Working capital is defined as the difference between firms' current assets (which include accounts receivable, inventories, and cash) and current liabilities (which include accounts payable and short term debt). It represents the source and use of short-term capital. According to Dewing (1941), it is, along with fixed capital, one of the ''key elements'' of the firm. Kim and Srinivasan (1988) stress the value of individual components of working capital. For instance, holding large inventory stocks enables firms to avoid interruptions in the production process and costly stock-outs. Moreover, granting trade credit to one's clients can stimulate sales, as it enables customers to verify the quality of the product before paying for it, and as it represents an additional source of credit for them (Long et al., 1993; Petersen and Rajan, 1997).

***Corresponding Author, Email:** *Vahid20t@yahoo.com*

Objective of the Working Capital Management

The basic objectives of the working capital management are as follows:

- ✓ To optimize the investment in current asset and to reduce the level of current liabilities so that the company can reduce the locking up of funds in working capital and can improve the return on capital employed in the business;
- ✓ Working capital management is that the company should always be in a position to meet its current obligations which should be properly be supported by the current asset available with the firm. But maintaining excess funds in working capital means locking of funds without return;
- ✓ To manage the firm's current assets in such a way that the marginal return on investment in these assets is not less than the cost of capital employed to finance the current assets.

Working capital is often used to measure a firm's liquidity. Liquidity is a precondition to ensure that firms are able to meet their short-term obligations. Insufficient liquidity can lead to bankruptcy (Dunn and Cheatham, 1993). Yet, too much liquidity can be detrimental to firms' profitability (Bhattacharya, 2001). Good management of working capital therefore requires striking a balance between liquidity and profitability in order to maximize the value of the firm. The advantages of holding inventories and extending trade credit to customers have been outlined above. Yet, the higher the inventories and trade credit, the less money is available to the firm for profitable investment. This suggests that finding the optimal level of working capital may be a difficult task for firm managers (Deloof, 2003).

The investment in working capital involves carrying costs and shortage costs, so the firms have to find the trade off between them. Experiences have shown that one of the main reasons for financial disturbances and bankruptcies in most companies is the mismanagement of working capital (Setayesh, 2009).

Importance of Working Capital Management

The reasons of the importance of working capital management in Iranian companies are as follows:

- ✓ Most Iranian companies prefer to change cash into other assets because of inflation and the reduction in purchase power of the money and this leads to shortage of cash when the time comes to clear liabilities and this result in the disturbances the credibility of the organization.
- ✓ The shortage of working capital in most companies which face financial disturbances leads to bankruptcy and this is one of the main reasons for importance of working capital.
- ✓ The investors are looking for investments which lead towards the highest stock yields and the investors should be assured of the present situation and this assurance should be achieved with consulting and programming to enlighten the route towards a clear investment. Here the investor encounters with two questions; how much and where the capital should be invested, and how the capital should be directed in long-term. To achieve this goal, the company needs to devise a strategy to identify the market's future, regarding the present situation (Jahankhani and Talebi, 1999).

In the present research which has been done in financial management field, the researchers tried to use the concepts and theories of financial management and library studies to recognize and identify the relationship between working capital management and the performance of companies Listed in Tehran Stock Exchange.

Conceptual Framework and Previous Literature

As one of the basic decisions in corporate finance, besides the capital structure decisions and capital budgeting decisions, working capital management is a very important component of corporate finance since efficient working capital management will lead a firm to react quickly and appropriately to unanticipated changes in market variables, such as interest rates and raw material prices, and gain competitive advantages over its rivals (Appuhami, 2008). Managers spend a considerable time on day-to-day working of capital decisions since current assets are short-lived investments that are continually being

converted into other asset types (Rao, 1989). In the case of current liabilities, the firm is responsible for paying obligations mentioned under current liabilities on a timely basis. Liquidity for the on-going firm is reliant, rather, on the operating cash flows generated by the firm's assets (Soenen, 1993). As a result, working capital management of a company is a very sensitive area in the field of financial management (Abuzayed, 2012).

Working capital management is concerned with the problems that arise in attempting to manage the current assets, the current liabilities and the interrelationship that exists between them. Not being able to maintain a satisfactory level of working capital, it is likely to become insolvent and may even be forced into bankruptcy. Altman's (1968) multivariate predictor model based on US companies includes working capital as one of the model components. Using data drawn from the UK companies, Taffler (1982) developed a four-variable model of failure prediction. All the four variables include a variant on working capital as a component.

The current assets should be large enough to cover its current liabilities in order to ensure a reasonable margin of safety. Each of the current assets must be managed efficiently in order to maintain the liquidity of the firm while not keeping too high a level of any one of them. Each of the short-term sources of financing must be continuously managed to ensure that they are obtained and used in the best possible way. The basic ingredients of the theory of working capital management focused on the trade-off between profitability and risk which is associated with the level of current assets and liabilities. Subsequently, working capital management decisions are not taken as long-term decisions (Abuzayed, 2012). Managers apply different criteria in decision making: the main considerations are cash flow or liquidity and profitability or return on capital (of which cash flow is probably the more important).

The previous literature of working capital management has concluded that companies can increase their profitability by shortening the CCC (Shin and Soenen, 1998; Deloof, 2003; Lazaridis and Tryfonidis, 2006; Grosse-Ruyken et al., 2011), but there are also arguments against a short CCC. A long cycle time of inventories reduces the risk of delivery interruptions, price fluctuations and business losses due to scarcity of products (Blinder and Maccini, 1991; Wang, 2002), and a company can sometimes achieve higher sales and strengthen its customer relationships with a generous trade credit policy (Long et al., 1993; Deloof and Jegers, 1996; Shah, 2009). Most of the empirical studies support the traditional belief about working capital and profitability that reducing working capital investment would positively affect the profitability of firm (aggressive policy) by reducing proportion of current assets in total assets.

While a large number of studies examined factors affecting working capital management less number directly examined the affect on firms' performance. The empirical question whether a short cash conversion cycle is beneficial for the company profitability has been questioned in the previous literature. Shin and Soenen (1998) argued that firm can have larger sales with a generous credit policy, which extends the cash cycle. In this case, the longer cash conversion cycle may result in higher profitability. However, the traditional view of the relationship between the cash conversion cycle and firms' profitability is that, ceteris paribus, a longer cash conversion cycle hurts the profitability of a firm.

Deloof (2003) found that the way working capital is managed has a significant impact on the profitability of businesses. He used a sample of 1,009 large Belgian non-financial firms for the period of 1992-1996. However, used trade credit policy and inventory policy are measured by number of days accounts receivable, accounts payable and inventories, and the cash conversion cycle as a comprehensive measure of working capital management. He founds a significant negative relation between gross operating income and the number of day's accounts receivable, inventories and accounts payable. Thus, he suggests that managers can create value for their shareholders by reducing the number of day's accounts receivable and inventories to a reasonable minimum. He also suggests that less profitable firms wait longer to pay their bills.

Lazaridis and Tryfonidis (2006) investigated the relationship of corporate profitability and working capital management for firms listed at Athens Stock Exchange. They reported that there

is statistically significant relationship between profitability measured by gross operating profit and the Cash Conversion Cycle. Furthermore, Managers can create profit by correctly handling the individual components of working capital to an optimal level.

Padachi (2006) has examined the trends in working capital management and its impact on firm's performance for 58 Mauritian small manufacturing firms during 1998 to 2003. He explained that a well designed and implemented working capital management is expected to contribute positively to the creation of firm's value. The results indicated that high investment in inventories and receivables is associated with low profitability and also showed an increasing trend in the short term component of working capital financing.

Raheman and Nasr (2007) studied the relationship between working capital management and corporate profitability for 94 firms listed on Karachi Stock Exchange using static measure of liquidity and ongoing operating measure of working capital management during 1999-2004. The findings of study suggested that there exist a negative relation between working capital management measures and profitability.

Losbichler et al. (2008) studied a dataset of 6925 European firms for the period 1995–2004. Their results show that firms were on average able to decrease the CCC only by 2 days between 1995 and 2004. To study whether there are industries or firms which reduce their CCC at the expense of other firms in the value chain, Losbichler et al. linked industries which typically supply to each other. They found out that the leading industry of a value chain was able to shorten its CCC more significantly than its supplying industries.

Sen (2009) examined the ISE (Istanbul Stock Exchange) listed firms and checked out the relationship with the working capital. According to them there is negative relationship among variables. His research uncovered the importance of the finance directors who act as moderators or catalysts to increase the productivity of the firm in other words they positively affect the firm's performance.

Dong (2010) reported that the firms' profitability and liquidity are affected by working capital management in his analysis. Pooled data are selected for carrying out the research for the era of 2006-2008 for assessing the firms listed in stock market of Vietnam. He focused on the variables that include profitability, conversion cycle and its related elements and the relationship that exists between them. From his research it was found that the relationships among these variables are strongly negative. This denote that decrease in the profitability occur due to increase in cash conversion cycle. It is also found that if the number of days of account receivable and inventories are diminished then the profitability will increase numbers of days of accounts receivable and inventories.

Neab and Noriza (2010) worked on crating the relationship between Working Capital Management (WCM) and performance of firms. For their analysis they chose the Malaysian listed companies. They administered the perspective of market valuation and profitability. They used total of 172 listed companies from the databases of Bloomberg. They randomly selected five year data (2003-2007). This research likewise the researches quoted before studied the impact of the dimensions of working capital component i.e. CCC, current ratio (CR), current asset to total asset ratio (CATAR), current liabilities to total asset ratio (CLTAR), and debt to asset ratio (DTAR) in effect to the firm's performance whereby firm's value dimension was taken as Tobin Q (TQ) and profitability i.e. return on asset (ROA) and return on invested capital (ROIC). They applied two different techniques for analyzing the data that are multiple regression and correlations. They found that there is a negative relationship between working capital variables and the firm's performance.

The Objectives and Hypothesis of the Research

This research objectives and hypothesis is:

- ✓ Studying the impact of working capital management (cash conversion cycle) on firm's performance during 2006-2009.
- ✓ Studying the impact of different components of cash conversion cycle on the performance of the companies.

Statistical Society and the Time Period of the Research

The companies under our investigation belong to Pharmaceutical and Cement industries

on Tehran Stock Exchange (TSE). The total number of companies in these industries is 62, through which 50 were appropriate to be investigated in our research project. The time period for our research was 4 years and the companies' financial statements data of 2006 to 2009 were extracted to do so.

All the companies were listed on Tehran Stock Exchange (TSE). The companies should meet the following requirements.

- ✓ Before the financial year of 2006 are Listed in Tehran stock exchange and not taken out of the quotation boards until the end of financial year 2009.
- ✓ The end of financial year should be the end of years.
- ✓ The companies should not be investing and financial.
- ✓ The data should be accessible.

After obtaining requisite data and gauging the parameters of the research by EXCEL software the results and findings are put before SPSS software.

Measuring the Research Variables

Dependent Variable: several criteria have been utilized to measure and assess the profitability of a business entity in accounting studies and researches and in this research the operating profitability has been used as the profitability criterion and it was extracted from the income statement. This variable has been recognized as the dependent variable of the research.

Independent Variables: Given the number of factors that affect working capital accumulation decisions by firms and the difficulty in determining the optimal level of working capital a firm should hold, the question arises about whether firms are able to efficiently manage their working capital.

In this research five proxies such as; Average Collection Period**,** Inventory Turnover in Days**,** Average Payment Period**,** Cash Conversion Cycle**,** and Net Trading Cycle have been investigated as the independent variables of working capital management.

Controlling Variables: in this research and based on the researches carried out by Deloof (2003), Lazaridis and Tryfonidis (2006), Raheman and Nasr (2007), the variables of Company's size, Sales Growth, Financial Debt to Total Assets Ratio, Current Assets to Total Assets Ratio and Current Liabilities to Total Assets Ratio, which were supposed to affect the research results were considered to be controlling variables. The calculation of each of variables is shown as follows (table 1):

Table 1: Calculation of variables and abbreviation

Variable	Calculation	Abbreviation
Net Operating Profitability	(Earning before Interest and Tax + Depreciation) / Total Assets	NOP
Average Collection Period	Accounts Receivable / Net Sales*365	ACP
Inventory Turnover in Days	Inventory / Cost of Goods Sold*365	ITID
Average Payment Period	Accounts Payable / Purchases*365	APP
Cash Conversion Cycle	ACP +ITID – APP	CCC
Net Trading Cycle	ACP+ (Inventory / Net Sales*365) – (Accounts Payables / Purchases*365)	NTC
Gross Working Capital Turnover Ratio	Net sales / Current Asset	GWCTR
Current Assets to Total Assets Ratio	Current assets / Total assets	
Current Liabilities to Total Assets Ratio	Current Liabilities / Total assets	CATAR
Financial Debt Ratio	Total Financial Debt / Total Assets	CLTAR
Size of firm using Log of Sales	Natural Logarithm of Sales	FDR
Sales Growth	(Current year N. sales-Last year N. Sales) / Last year's N. Sales	LOS SG
Current Ratio	Current Assets / Current Liabilities	CR

RESEARCH METHOD

The present research focuses on the measuring-discovering method of correlation in which regression is used to analyze the results (a curve which connects all the distributions). The resulted curve is regression and the equation is called regression equation. In order to test the hypotheses and analyze quantities, two methods were used in this research. First Pearson's correlation model was used to measure the relationship between the variables of working capital management and profitability. Then regression analysis was used to estimate the cause and effect relationship between the variables of profitability and working capital management. Also by using identification coefficient (R^2), the amount of changes of dependent variable compared with the independent variables was assessed. In this research, Student statistics (t) was used to study the correctness of testing research hypotheses and Fisher's statistics (F) was used to investigate the appropriateness of the model.

Model Specification

To test the hypothesis of the research, 5 models have been used to analyze the relationship between the variables. We develop an empirical framework first used by Deloof (2003) and subsequent work of Padachi (2006) which are explained below:

The First Model: the first hypothesis test model; the relation of Average collection period and Net Operating Profitability.

$$NOP_{it} = \beta_0 + \beta_1 (ACP_{it}) + \beta_2 (GWCTR_{it}) + \beta_3 (CATAR_{it}) + \beta_4 (CLTAR_{it}) + \beta_5 (FDR_{it}) + \beta_6 (LOS_{it}) + \beta_7 (SG_{it}) + \beta_8 (CR_{it}) + \varepsilon_{it}$$

The Second Model: the second hypothesis test model; the relation of Inventory turnover in days and Net Operating Profitability.

$$NOP_{it} = \beta_0 + \beta_1 (ITID_{it}) + \beta_2 (GWCTR_{it}) + \beta_3 (CATAR_{it}) + \beta_4 (CLTAR_{it}) + \beta_5 (FDR_{it}) + \beta_6 (LOS_{it}) + \beta_7 (SG_{it}) + \beta_8 (CR_{it}) + \varepsilon_{it}$$

The Third Model: the third hypothesis test model; the relation of Average Payment Period and Net Operating Profitability.

$$NOP_{it} = \beta_0 + \beta_1 (APP_{it}) + \beta_2 (GWCTR_{it}) + \beta_3 (CATAR_{it}) + \beta_4 (CLTAR_{it}) + \beta_5 (FDR_{it}) + \beta_6 (LOS_{it}) + \beta_7 (SG_{it}) + \beta_8 (CR_{it}) + \varepsilon_{it}$$

The Fourth Model: the fourth test model; the relation of cash conversion cycle and Net Operating Profitability.

$$NOP_{it} = \beta_0 + \beta_1 (CCC_{it}) + \beta_2 (GWCTR_{it}) + \beta_3 (CATAR_{it}) + \beta_4 (CLTAR_{it}) + \beta_5 (FDR_{it}) + \beta_6 (LOS_{it}) + \beta_7 (SG_{it}) + \beta_8 (CR_{it}) + \varepsilon_{it}$$

The Fifth Model: the fifth test model; the relation of Net Trading Cycle and Net Operating Profitability.

$$NOP_{it} = \beta_0 + \beta_1 (NTC_{it}) + \beta_2 (GWCTR_{it}) + \beta_3 (CATAR_{it}) + \beta_4 (CLTAR_{it}) + \beta_5 (FDR_{it}) + \beta_6 (LOS_{it}) + \beta_7 (SG_{it}) + \beta_8 (CR_{it}) + \varepsilon_{it}$$

Where, Net Operating Profitability (NOP) is used as a measure of firm's performance. WCM is Working Capital Management, which is a key variable of the study used as a vector of Average Collection Period (ACP), Inventory Turnover in Days (ITID), Average Payment Period (APP), Cash Conversion Cycle (CCC) and Net Trading Cycle (NTC) of the firm. It is expected that WCM has negative relationship with the corporate profitability. If we reduce number of days in receivables (ACP), inventory (ITID), Cash Conversion Cycle (CCC) and Net Trade Cycle (NTC), it will enhance the corporate profitability. Furthermore, Average Payment Period is directly associated with profitability. Other explanatory variables typically assumed to affect firm performance are GWCTR is the Gross Working Capital Turnover Ratio which is expected to have positive relationship with profitability, CATAR is the Current Assets to Total Assets Ratio and CLTAR is the Current Liabilities to Total Assets Ratio are used to check the investing and financing policy of working capital management respectively. Financial Debt Ratio (FDR) representing leverage is expected to have negative relationship and natural logarithm of sales (LOS) representing size has positive relationship with corporate profitability. SG is sales growth which represent the investment growth opportunities while CR is Current Ratio to measure liquidity of firm.

For these objectives, we formulate the following hypotheses and will attempt to find statistical evidences to support the hypotheses.

H_1: There is a significant relationship between ACP and NOP.
H_2: There is significant relationship between ITID and NOP.
H_3: There is a significant relationship between APP and NOP.
H_4: There is a significant relationship between CCC and NOP.
H_5: There is a significant relationship between NTC and NOP.

Statistical Analysis

The results of different criteria of working capital and companies' performance including: Average Collection Period**,** Inventory Turnover in Days**,** Average Payment Period**,** Cash Conversion Cycle**,** and Net Trading Cycle have been shown below. First the descriptive analysis of the data has been studied. Second and third parts deal with coefficient correlation analysis and statistical testing related to the variables, respectively.

Descriptive Statistics

The mean, minimum and maximum values with standard deviation of different variables in the model during the period 2006 to 2009 are presented in the Table 2. Pharmaceutical and Cement industries on average has 117 days of Cash Conversion Cycle and 109 days of Net Trade Cycle with standard deviation of 238 and 237 days respectively. The firms have an Average Collection Period of 84 days, Inventory Turnover in Days of 171 days and Average Payment Period of 136 days. The sample firms have on average about 54% of the total assets in current form and sales growth of almost 28% annually while on average 28% of the assets are financed with debt. The performance measure used in the analysis is Net Operating Profitability of the firms, which is on average about 27% with a standard deviation of 0.120.

Table 2: Descriptive statistics of variables

Variables	Mean	Std. Dev	Minimum	Maximum
ACP (in days)	84	91	0.000	348
APP (in days)	136	178	0.000	1160
ITID (in days)	171	107	0.000	601
CCC (in days)	117	238	-1664	660
NTC (in days)	109	237	-1600	580
CATAR (ratio)	0.538	0.266	0.066	0.950
CLTAR (ratio)	0.46	0.169	0.158	0.846
CR (ratio)	1.161	0.543	0.221	3.509
FDR (ratio)	0.281	0.170	0.000	0.841
GWCTR (ratio)	1.422	0.590	0.533	4.428
LOS (ln)	5.623	0.274	4.62	6.295
SG	0.279	0.457	-0.303	5.212
NOP	0.268	0.119	0.029	0.712

Correlation Analysis

Correlation matrix of all variables included in the analysis is presented in Table 3 which is calculated based on data of 50 firms from 2006-2009. The table shows that Operating Profitability is negatively associated with measures of working capital management (Average Collection Period, inventory turnover in days, Average Payment Period, Cash Conversion Cycle and Net Trade Cycle).
correlation coefficients for most measures of working capital management are significant. These results are consistent with the view that making payment to suppliers, collecting payments form customers earlier and keeping product or inventory in the stock for lesser time are associated with increase in profitability. A negative relation between Average Payment Period and Net Operating Profitability suggests that less profitable firms wait longer to pay their accounts payables. These three variables jointly form Cash Conversion Cycle and there exists negative relationship between CCC and operating profitability but it is not significant. It might not be a surprise because all the three components of CCC has negative association with the profitability and Average Payment Period is subtracted from sum of ACP and ITID to form Cash Conversion Cycle. Similar result was found for study conducted by Deloof (2003) for Belgian firms. Another measure of working capital management is the Net Trade Cycle which has also a significant negative relationship with profitability. It implies that if a firm is able to reduce the Net Trade Cycle period, it can enhance the profitability for the firm and will ultimately create value for the shareholders.

Findings Resulted from Hypotheses Testing

Financial debt ratio is negatively associated with Net Operating Profitability which means increase in the financial leverage leads to decrease in the operating profitability of firm. This finding is in support of Myers and Majlof (1984), Rajan and Zingales (1995), shin and Soenen (1998) and Deloof (2003) who predicted a negative relationship between leverage and profitability.

Table 3: Pearson correlation coefficients between variables

	NOP	ACP	ITID	APP	CCC	NTC
NOP	1					
Sig. (2-tailed)						
ACP	-0.162	1				
Sig. (2-tailed)	(0.028)					
ITID	-0.269	-0.103	1			
Sig. (2-tailed)	(0.000)	(0.166)				
APP	-0.334	0.057	0.270	1		
Sig. (2-tailed)	(0.000)	(0.439)	(0.000)			
CCC	-0.046	0.327	0.302	-0.606	1	
Sig. (2-tailed)	(0.532)	(0.000)	(0.000)	(0.000)		
NTC	-0.197	0.327	0.055	-0.418	0.768	
Sig. (2-tailed)	(0.007)	(0.000)	(0.458)	(0.000)	(0.000)	1

The gross working capital turnover ratio has significant positive impact on Net Operating Profitability which implies that as a firm is able to increase the working capital turnover, it will enhance the profits of the firm as well. To check the working capital investment policy and financing policy, two variables as current assets to total assets ratio and current liabilities to total assets ratio are also included in the regression.

Current Assets to Total Assets Ratio show a positive relationship with the profitability but it is not significant. On the other side current liabilities to total assets ratio is also do not showing a significant relationship with profitability.

Size is also positively related to profitability but insignificant which implies that the size does not have an impact on corporate profitability. Sales growth is also included in the model to see the impact of growth on the performance. It indicates a firm's business opportunities. This variable is significantly affecting the performance of firm in a positive way. The growth in sales of firms increases the performance of firms. Shin and Soenen (1998) and Deloof (2003) also concluded that sales growth had a positive relation to changes in accounting measure of profitability.

The Current Ratio which is a theoretical measure of liquidity has significant impact on profitability in case of Iranian firms. This means that companies with high liquidity do better performance and result profitability is high in firms.

Hypotheses Testing 1: In ACP model, (see tables 4,5,6,7) Net Operating Profitability (NOP) is regressed on the Average Collection Period as a measure of collection policy. The coefficient of Average Collection Period is negative and implies that an increase in the number of days of accounts receivable by 1 day is associated with as decrease of profit by 1.62% for all years from 2006 to 2009. Most of the studies (Deloof 2003, Padachi 2006, Raheman and Nasr 2007, Dong 2010, Neab and Noriza, 2010) found a relationship of significant negative between working capital and performance of firms. Our results are inconsistent to the results Raheman et al, 2010), they show that there is a relationship of insignificant positive relationship the between ACP and NOP.

Hypotheses Testing 2: In ITID model, (see tables 4,5,6,7), we have same set of independent variables as in ACP model, except for substitution of Average Collection Period (ACP) with Inventory Turnover in Days (ITID). ITID has significant negative impact on Net Operating Profitability for all years from 2006 to 2009. This implies that profitability can be improved by reducing the Inventory Turnover in Days or by keeping inventory for lesser time can improve profitability of firm. Most of the studies (Deloof 2003, Padachi 2006, Raheman and Nasr 2007, Dong 2010, Neab & Noriza 2010) found a significant negative impact of Inventory Turnover in Days on the profitability of firms.

Hypotheses Testing 3: In APP model, (see tables 4,5,6,7) the coefficient of Average Payment Period is negative which implies that lengthening the payment period decrease the profitability all years from 2006 to 2009. This result is significant and negative sign does make economic sense because shorter a firm takes time to make payments to credit suppliers, the higher level of working capital it reserves and use to improve profitability.

Hypotheses Testing 4: In CCC model, (see tables 4,5,6,7), Cash Conversion Cycle is included with other variables. This model provides an evidence of negative relationship between Cash Conversion Cycle (a comprehensive measure of working capital management) and corporate profitability where the coefficient is negative and but is not significant for all years from 2006 to 2009. It might not be a surprise because all the three components of CCC has negative association with the profitability and Average Payment Period is subtracted from sum of ACP and ITID to form Cash Conversion Cycle. Our results are contrary to the results (Neab and Noriza 2010, Raheman et al, 2010), they show that there is a relationship of significant negative relationship the between CCC and NOP. Their results are consistent with the view that decreasing the Cash Conversion Cycle will generate more profits for the company. Thus firms can create value for their shareholders by keeping the Cash Conversion Cycle to minimum.

Hypotheses Testing 5: In NTC model, (see tables 4,5,6,7), another comprehensive measure

of the working capital management which is Net Trade Cycle (NTC) is used as included by Shin and Soenen, (1998). We have included Net Trading Cycle instead of Cash Conversion Cycle in this model, while all other variables are same as in the previous models. The results of this model provide a strong evidence of negative relationship between Net Trade Cycle and profitability of firms as the coefficient of NTC is negative for all years from 2006 to 2009. It implies that a firm with relatively shorter NTC is more profitable. Further, by reducing NTC to increase the efficiency of working capital management results in increased operating income. Therefore, it can be said that by reducing NTC firm can create additional value for the shareholders. These results are consistent with the findings Raheman et al, 2010 on Karachi Stock Exchange.

Table 4: Working capital management corporate performance – OLS Estimation (2006)

Dependent Variable	**Net Operating Profitability**				
Regression Model	**Ordinary Least Square Method**				
Models	1	2	3	4	5
	ACP	ITID	APP	CCC	NTC
Constant	-0.172	-0.087	-0.081	-0.148	-0.072
	(0.119)	(0.437)	(0.435)	(0.211)	(0.557)
LOS	0.026	0.022	0.012	0.015	0.017
	(0.133)	(0.201)	(0.428)	(0.354)	(0.347)
FDR	-0.141	-0.133	-0.145	-0.133	-0.133
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CATAR	0.111	0.015	0.033	0.057	0.055
	(0.130)	(0.724)	(0.551)	(0.482)	(0.493)
CLTAR	-0.020	0.017	-0.011	0.008	0.019
	(0.647)	(0.808)	(0.787)	(0.873)	(0.731)
GWCTR	0.082	0.087	0.089	0.093	0.092
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SG	0.038	0.034	0.033	0.034	0.030
	(0.000)	(0.001)	(0.001)	(0.001)	(0.003)
CR	0.132	0.174	0.159	0.166	0.157
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ACP	-0.168	-	-	-	-
	(0.004)	-	-	-	-
ITID	-	-0.131	-	-	-
	-	(0.002)	-	-	-
APP	-	-	-7.471	-	-
	-	-	(0.005)	-	-
CCC	-	-	-	-.078	-
	-	-	-	(0.121)	-
NTC	-	-	-	-	-6.413
	-	-	-	-	(0.002)
R-Square	0.410	0.385	0.398	0.425	0.433
Adjusted R-Square	0.398	0.374	0.387	0.412	0.421
Durbin-Watson Stat	1.618	1.715	1.746	1.802	1.809
F-statistics	72.410	69.402	71.520	71.512	71.219
Prob (F-statistic)	0.000	0.000	0.000	0.000	0.000

Table 5: Working capital management corporate performance – OLS Estimation (2007)

Dependent Variable	**Net Operating Profitability**				
Regression Model	**Ordinary Least Square Method**				
Models	1	2	3	4	5
	ACP	ITID	APP	CCC	NTC
Constant	-0.110	-0.072	-0.079	-0.151	-0.092
	(0.119)	(0.477)	(0.443)	(0.236)	(0.457)
LOS	0.026	0.015	0.010	0.025	0.031
	(0.241)	(0.325)	(0.545)	(0.366)	(0.503)
FDR	-0.143	-0.152	-0.150	-0.141	-0.126
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CATAR	0.112	0.008	0.016	0.023	0.031
	(0.154)	(0.924)	(0.596)	(0.509)	(0.549)
CLTAR	-0.015	0.011	-0.021	0.021	0.011
	(0.947)	(0.806)	(0.987)	(0.693)	(0.886)
GWCTR	0.085	0.090	0.091	0.095	0.094
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SG	0.030	0.030	0.036	0.035	0.037
	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
CR	0.240	0.175	0.181	0.165	0.168
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ACP	-0.172	-	-	-	-
	(0.002)	-	-	-	-
ITID	-	-0.143	-	-	-
	-	(0.001)	-	-	-
APP	-	-	-7.010	-	-
	-	-	(0.005)	-	-
CCC	-	-	-	-.062	-
	-	-	-	(0.223)	-
NTC	-	-	-	-	-5.412
	-	-	-	-	(0.005)
R-Square	0.452	0.456	0.462	0.456	0.461
Adjusted R-Square	0.444	0.446	0.445	0.451	0.449
Durbin-Watson Stat	1.938	1.852	1.890	1.910	1.912
F-statistics	71.421	71.652	71.052	69.521	71.831
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000

Table 6: Working capital management corporate performance – OLS Estimation (2008)

Dependent Variable	**Net Operating Profitability**				
Regression Model	**Ordinary Least Square Method**				
Models	1	2	3	4	5
	ACP	ITID	APP	CCC	NTC
Constant	-0.285	-0.196	-0.188	-0.199	-0.201
	(0.015)	(0.024)	(0.029)	(0.024)	(0.020)
LOS	0.016	0.014	0.021	0.011	0.017
	(0.325)	(0.484)	(0.285)	(0.394)	(0.308)
FDR	-0.156	-0.155	-0.149	-0.134	-0.145
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CATAR	0.122	0.004	0.039	0.051	0.083
	(0.154)	(0.924)	(0.596)	(0.419)	(0.315)
CLTAR	-0.005	0.019	-0.001	0.000	0.011
	(0.947)	(0.806)	(0.987)	(0.993)	(0.886)
GWCTR	0.088	0.082	0.080	0.086	0.084
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SG	0.030	0.031	0.033	0.034	0.030
	(0.002)	(0.002)	(0.000)	(0.000)	(0.002)
CR	0.141	0.167	0.168	0.152	0.159
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ACP	-0.241	-	-	-	-
	(0.000)	-	-	-	-
ITID	-	-0.158	-	-	-
	-	(0.001)	-	-	-
APP	-	-	-6.452	-	-
	-	-	(0.008)	-	-
CCC	-	-	-	-.075	-
	-	-	-	(0.156)	-
NTC	-	-	-	-	-6.415
	-	-	-	-	(0.003)
R-Square	0521	0.501	0.536	0.534	0.541
Adjusted R-Square	0.420	0.400	0.424	0.430	0.439
Durbin-Watson Stat	1.926	1.901	1.911	1.909	1.922
F-statistics	71.630	67.521	69.564	69.241	68.210
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000

Table 7: Working capital management corporate performance – OLS Estimation (2009)

Dependent Variable	Net Operating Profitability				
Regression Model	**Ordinary Least Square Method**				
Models	1	2	3	4	5
	ACP	ITID	APP	CCC	NTC
Constant	-0.352	-0.325	-0.285	-0.221	-0.311
	(0.000)	(0.000)	(0.001)	(0.009)	(0.000)
LOS	0.045	0.030	0.048	0.037	0.041
	(0.018)	(0.026)	(0.014)	(0.022)	(0.020)
FDR	-0.121	-0.143	-0.162	-0.136	-0.138
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CATAR	0.102	0.007	0.031	0.041	0.039
	(0.154)	(0.923)	(0.584)	(0.500)	(0.524)
CLTAR	-0.009	0.025	-0.006	0.008	0.017
	(0.931)	(0.716)	(0.981)	(0.973)	(0.829)
GWCTR	0.090	0.094	0.092	0.096	0.091
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SG	0.031	0.031	0.036	0.032	0.031
	(0.002)	(0.002)	(0.000)	(0.002)	(0.002)
CR	0.145	0.168	0.149	0.161	0.161
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ACP	-0.162	-	-	-	-
	(0.004)	-	-	-	-
ITID	-	-0.120	-	-	-
	-	(0.002)	-	-	-
APP	-	-	-7.331	-	-
	-	-	(0.006)	-	-
CCC	-	-	-	-.082	-
	-	-	-	(0.117)	-
NTC	-	-	-	-	-6.225
	-	-	-	-	(0.003)
R-Square	0.520	0.532	0.524	0.533	0.512
Adjusted R-Square	0.418	0.430	0.423	0.432	0.401
Durbin-Watson Stat	1.615	1.676	1.726	1.802	1.701
F-statistics	67.360	66.203	68.358	69.251	69.952
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000

The final model of the first, second, third and fifth hypotheses testing are as follows:

The final model of the first for the year 2006:
NOP = -0.168 (ACP) + 0.082 (GWCTR) - 0.141 (FDR) + 0.038(SG) + 0.145 (CR)

The final model of the first for the year 2007:
NOP = -0.172 (ACP) + 0.085 (GWCTR) - 0.143 (FDR) + 0.030(SG) + 0.240 (CR)

The final model of the first for the year 2008:
NOP = -0.285(C) - 0.241 (ACP) + 0.088 (GWCTR) - 0.156 (FDR) + 0.030(SG) + 0.141 (CR)

The final model of the first for the year 2009:
NOP = -0.352 (C) - 0.162 (ACP) + 0.090 (GWCTR) - 0.121 (FDR) + 0.031(SG) + 0.145 (CR)

The final model of the second for the year 2006:
NOP = -0.131 (ITID) + 0.087 (GWCTR) - 0.133(FDR) +0.034 (SG) + 0.174 (CR)

The final model of the second for the year 2007:
NOP = -0.143 (ITID) + 0.090 (GWCTR) - 0.152(FDR) + 0.030 (SG) + 0.175 (CR)

The final model of the second for the year 2008:
NOP = -0.196 (C) -0.158 (ITID) + 0.082 (GWCTR) - 0.155(FDR) + 0.031 (SG) + 0.167 (CR)

The final model of the second for the year 2009:
NOP = -0.325 (C) -0.120 (ITID) + 0.094 (GWCTR) - 0.143(FDR) + 0.031 (SG) + 0.168 (CR)

The final model of the Third for the year 2006:
NOP = -7.471(APP) + 0.089 (GWCTR) - 0.145 (FDR) + 0.033 (SG) + 0.159(CR)

The final model of the Third for the year 2007:
NOP = -7.471(APP) + 0.089 (GWCTR) - 0.145 (FDR) + 0.033 (SG) + 0.159 (CR)

The final model of the Third for the year 2008:
NOP = -0.188 (C) - 6.452 (APP) + 0.080 (GWCTR) - 0.149 (FDR) + 0.033 (SG) + 0.168 (CR)

The final model of the Third for the year 2009:
NOP = -0.285 (C) -7.331 (APP) + 0.092 (GWCTR) - 0.162 (FDR) + 0.036 (SG) + 0.149 (CR)

The final model of the Fifth for the year 2006:
NOP = -6.413 (NTC) + 0.092 (GWCTR) - 0.133 (FDR) + 0.030 (SG) + 0.157 (CR)

The final model of the Fifth for the year 2007:
NOP = -5.412 (NTC) + 0.094 (GWCTR) - 0.126 (FDR) + 0.037 (SG) + 0.168 (CR)

The final model of the Fifth for the year 2008:
NOP = -0.201 (C) -6.415 (NTC) + 0.084 (GWCTR) - 0.145 (FDR) + 0.030 (SG) + 0.159 (CR)

The final model of the Fifth for the year 2009:
NOP = -0.311 (C) - 6.225 (NTC) + 0.091 (GWCTR) - 0.138 (FDR) + 0.031 (SG) + 0.161 (CR)

In Model 4, the significant level of cash conversion period for all years is shown as (P = 0.121, 0.223, 0.156, 0.117 > 0.05). In fact it shows that there is not any significant relationship between cash conversion period and net operating profitability. Thus, the 4th hypothesis is rejected.

CONCLUSION

The primary aim of working capital management in a firm is to manage short term funds required for day to day business activity of a firm. The firm requires effective working capital management policy for a smooth uninterrupted production and sale activity.

In this research have studied the effect of different variables of working capital management including the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle, Net Trade Cycle, on the Net operating profitability of Iranian Companies and Current ratio, financial leverage, sales growth, Current Assets to Total Assets Ratio, Current Liabilities to Total Assets Ratio, Gross Working Capital Turnover Ratio and size of the firm (measured in terms of natural logarithm of sales) have been used as control variables.

The table shows that Operating Profitability is negatively associated with measures of working capital management (Average Collection Period, inventory turnover in days, Average Payment Period, Cash Conversion Cycle and Net Trade Cycle). The correlation coefficients for all measures of working capital management are significant except for Cash Conversion Cycle. These three variables jointly form Cash Conversion Cycle and there exists negative relationship between CCC and operating profitability but it is not significant. It might not be a surprise because all the three components of CCC have negative association with the profitability and Average Payment Period is subtracted from sum of ACP and ITID

to form Cash Conversion Cycle. It means that as the average collection period, inventory turnover in days, Net Trading Cycle and Average payment period increases it will lead to decreasing profitability of the firm, and managers can create a positive value for the shareholders by reducing the, average collection period, inventory turnover in days, Net Trading Cycle and Average payment period to a possible minimum level.

Research-based Recommendations

- ✓ Managers can reduce the Average Collection Period and enhance the profitability for the firms which ultimately create value for the shareholders with proper management of accounts receivable and appropriate managed of collection.

- ✓ Managers can reduce the Inventory Turnover in Day and enhance the profitability for the firms which ultimately create value for the shareholders with proper management of Inventory.

- ✓ Managers can reduce Average Payment Period and enhance the profitability for the firms which ultimately create value for the shareholders. This requires appropriate management of payments and using credit conditions of Creditors.

- ✓ Managers can reduce the Net Trade Cycle period and enhance the profitability for the firms which ultimately create value for the shareholders.

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