

Studying the Relationship between Working Capital Management and Profitability at Tehran Stock Exchange: A Case Study of Food Industry

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Abstract: This study has investigated the relationship between working capital management and profitability at companies of food industry group member at Tehran Stock Exchange. 33 companies were selected for a period of five years from 2006-2011 and the effect of various variables of working capital management including average accounts collection cycle, inventory turnover, medium-term debt payment and the cash conversion cycle on operational net profit of companies. Current ratio, debt ratio and the company size (which has been measured by natural logarithm of sale) was considered as control group (control variable). For data analysis, correlation and regression was used. The results of the study showed that there is a reverse relationship between the variables of working capital management and profitability. It is found out that increasing collection cycle, debt payment period, inventory turnover and cash conversion cycle leads to decreasing profitability in the companies. According to the research findings, managers can create a positive value for stockholders by decreasing collection cycle, debt payment period, inventory turnover and cash conversion cycle to the lowest possible level.

Key words: Average accounts collection cycle, cash conversion cycle, inventory turnover, medium-term debt payments, working capital management

INTRODUCTION

Success in managing companies and economical units of each society is one of prerequisites of prosperity and success in management of society major economy. Regard of advanced economies to management of economical units and companies could show its importance.

Success and prosperity of production corporations is result of some items rooted in operational area of those companies and creation of legal infrastructures and required system by the government. The production enterprises are at least expected to actively and efficiently involve in the economy. Two financial measures power liquidity and profitability can determine amount of involvement in the economy. Profitability and power liquidity are respectively signs of healthiness of corporation and the corporation's survival.

Although both indicators are so important, liquidity is of more importance than profitability. Non-profitable or low profitable corporations can involve longer in the economy. However, corporation with lack of liquidity have less life expectancy. Recent years, many firms are subject to lack of liquidity. Thus, examining the causes of low liquidity is of importance. The researcher believes that although with reform in working capital management, all improvement conditions are not provided but it could be effective. Therefore, the researcher believes in revising the working capital management in the Iranian firms.

The working capital management, from financial managers' point of view, is defined as a simple concept ensuring the firm ability to grasp differences between assets and short-term debts. The major focus of working capital management is to maintain an optimal balance between each of the working capital components (Nazir and Afza, 2009). The success of firms intensively depends on the ability of financial executive managers to effectively manage receivables, inventory and payables (Filbeck and Krueger, 2005). Keeping the liquidity in a desirable level in order to pay debts indicates the working capital management's importance. Practically, working capital management has got due problems covering some issues such as use of appropriate unexpected opportunities to invest (which signs for firm's flexibility) and to access raw materials needed for production enabling the firm to satisfy customers' demand on-time.

Many executive managers involve in identifying the main factors of working capital management and its optimal level. Thus, any decision made in this regard by economical unit's managers can affect remarkably on operational efficiency of economical unit and finally on firm's value and stockholders' wealth. Thus, working capital management plays an important role in managerial firms. It can affect on success and failure of firms because it influences on the enterprise profitability. Present study aims to provide better understanding from the profitability-working capital management relation in order to assist managers to consider solutions for increasing value for stockholders.

Problem statement: Working capital management is one of significant fields in financial management and management of organizations because it influences on liquidity and profitability of firms.

The companies with improper working capital management are subject to bankruptcy although they are profitable. Working capital management deals with assets and current debts. Current assets form large part of total properties of a firm. Extra value of current assets can lead to less than normal investment return. Despite of this, firms with low current assets face lacks and problems in normal operations procedure.

An efficient working capital management includes planning and control of assets and current debts as removes risk of not satisfying short-term commitments and more than enough investment in properties. Many studies such as Neveu (1989), Raheman and Nasr (2007), Nazir and Afza (2008) and Samiloglu and Demirgunes (2008) stress that managers spend much time on daily issues such as decisions on working capital management. That current properties are short-term investments converted continuously to other types of assets is one reason for taking much time on working capital management. Basically, decisions on different levels of working capital management are repetitive, time consuming and great.

One of ultimate goals of each firm is to optimize long-term profitability. However, maintaining the liquidity is also an important goal. The problem may arise is that long-term profitability through loss of liquidity may create troubles for firms. Thus, these two goals should be gained while a balance between them is build. If a firm ignores profitability cannot survive. On the other hand, if a firm does not care about its liquidity, it will face bankruptcy or inability to pay its debts on-time. With regard to above reasons, working capital management must be regarded which ultimately affects on profitability.

Corporations can have optimal level of working capital which maximizes their value. Much inventory and generous credit policy can increase sales. Much inventory reduces the risk of inventory shortage.

As trade credit can provide profitability for customers to evaluate products quality before payment, it can increase sales as well. Another part of working capital is accounts payable that through delaying payments to suppliers enables economical units to evaluate the purchased products. Thus, accounts payable is one flexible and cheap financing source for firms. On the other hand, if the supplier proposes discounts for premature payments, delay in payment could be very costly.

One common indicator to measure working capital management is the cash conversion cycle as the time lag between payment of bought raw materials and receipt of cash for sold products. The more value of this indicator means that more investment has been done in working

capital. Longer cash conversion cycle could increase profitability because it increases sales. However, if cost of more investment in working capital is more than benefits of keeping more inventories or more credit given to customers, profitability of firm can decrease by increase in cash conversion cycle.

In this study, the author is going to analyze following question:

“Does working capital management influence on profitability of companies of food industry group member at Tehran Stock Exchange?”

Research importance and necessity: Working capital management has been studies from 1995 to 2008 in other countries. Lamberson (1995), Deloof (2003), Ghosh and Maji (2004), Filbeck and Krueger (2005a), Filbeck and Krueger (2005b), Raheman and Nasr (2007), Nazir and Afza (2008) and Samiloglu and Demirgunes (2008) are some works on working capital management. General results of these papers in different stock exchanges in USA, Belgium, India, Pakistan and Turkey are almost the same and show that there is significant relationship between profitability and different variables of working capital. Importance of working capital management and lack of studies on this subject in Iran derived the author to investigate on working capital management in Tehran Stock Exchange by using research done in other countries and variables/models applied in previous works.

Working capital management is one part which plays vital role in organization management. Sometimes, working capital and liquidity are resembled to the blood of an economical unit. Also, management of working capital and liquidity is simulated to the heart of economical unit. The present study tries to examine managers' problems. Followings can show the importance of the present research:

- Studies indicate that financial managers spend much time on daily internal operations such as working capital management. Thus, complete studying the working capital management is needed through courses of financial management.
- Regarding changes in current assets, managers have to reconsider their decisions on financing. If high value of short-term loans previously used for finance, the current assets, extra loans and extending due loans need more time and energy for management to take.
- As real and desirable current properties (with regard to changes in real sales and predicted sales) are subject to usual changes, decisions on desirable/expected level of current assets are made continuously (daily).
- Working capital management is especially important for small companies. A small firm can minimize its

fixed properties through renting factories and equipment but there is no way to avoid investment in the fund, accounts receivable, or inventories. Therefore, current assets are of more value for small companies' financial managers. In addition, due to inaccessibility of small companies' financial managers to capital markets and long-term credits, the company should seriously trust in trade credits and bank short-term loans which they affect on net working capital although it increases current debts.

Research objectives: The objectives of the present research are as follows:

- Examining if management policies on working capital have impacts on efficiency and profitability of companies of food industry group member at Tehran Stock Exchange
- Examining if there is any relationship between profitability and different variables of working capital management in companies of food industry group member at Tehran Stock Exchange

LITERATURE REVIEW

Lawrence (2000) examined status of working capital management in 300 companies including 150 companies with high level of sales and 150 companies with low level of sales. Lawrence (2000) aimed to consider different methods of working capital management which are applied in varied size companies and also to provide a general view from common approaches used by all companies. Lawrence (2000) concluded that there are differences between developed working capital, management methods and approaches which are applied in companies.

Fama and French (1998) studies efficiency of working capital management and its relation with profitability using net profit cycle. They concluded that working capital management is only a part in companies. In addition, they concluded that there is a strong relationship between net profit cycle and profitability of companies. Hence, real profit resulting from shortening of net profit cycle period could be obtained through assets cut down not increase in payments.

Soenen (1993), for the first time, examined the relationship between net trade cycle as an indicator of working capital and investment return in American companies. Chai-square test results showed a negative relation between net trade cycle time and properties return. The negative relation is different for different industries. In fact, a significant relationship for almost half of considered companies indicated that the negative relation depends on type of industry.

Ardekanian (2009) studies the relation between working capital management and profitability. The author applied different financial ratios such as Account Collection Period (ACP), average inventory period,

Average Payment Period (APP) and Cash Conversion Cycle (CCC) to analyze working capital management. To measure profitability, one of profitability ratios was used. 110 companies in 17 industries were selected using screening method and were studied in 6 years. The data required for research were gathered from Tehran Stock Exchange and Pearson correlation coefficient and regression analysis were applied to analyze data. The results indicated that there was a negative relation between working capital management and profitability. Negative relation means that assertive policies in working capital management increase profitability while conservative strategies will lead to cut down of profitability. Talebi (1998) studied status of working capital management in Iranian companies. Methods that Iranian companies use for working capital management were identified. Also, exogenous factors influencing on companies liquidity and impact of working capital management on liquidity were studied. The author concluded that there is vital need to strengthen fundamentals of working capital management in companies.

Mojtahedzadeh *et al.* (2011) investigated the relationship between working capital management and corporate profitability for the listed companies on Tehran Stock Exchange (TSE) and a sample of 101 firms during the period of 2004-2008. Hassanpoor (2007) studied the impact of working capital strategies on stock return during the period of 2001 to 2005. 62 companies and 9 industries were selected from 459 companies active in 34 industries listed in TSE. The investigation of relationship between profitability and working capital management policies in 204 non-financial firms listed in Karachi Stock Exchange for the period 1998-2005 had been studied by Nazir and Afza (2009). The results of their research showed that managers' conservative strategies can increase the value of their stocks. García-Teruel and Martínez-Solano (2007) provided an empirical investigation on the effects of working capital management on the profitability of a sample of small and medium-sized Spanish firms. The results of their studies showed that managers able to create value through decreasing their inventories and the number of days for which their accounts are outstanding. Baños-Caballero *et al.* (2011) analyzed the relationship between working capital management and profitability for small and medium-sized firms listed Iberian Balance Sheets Analysis System from Spain for the period 2002-2007 by controlling for unobservable heterogeneity and possible endogeneity. The results show that there is a nonmonotonic relationship between working capital level and firm profitability. Gill *et al.* (2010) analysed the relationship between working capital management and profitability in 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005 to 2007. The results demonstrated the significant

relationship between the cash conversion cycle and profitability, measured through gross operating profit.

Research theoretical framework: Working capital management, as an operational-financial concept, covers all company's accounts, discusses about sufficiency of current assets and current debts' risk and seeks proper strategies of assets management/current debts and increase in company's benefits. Regarding the importance of working capital management in financing and short-term investments which they lead to company's value increase, the present paper focuses on analysis of relationship between working capital management and profitability of companies member in Tehran Stock Exchange (according to research background). In this paper, four measures average accounts collection period, average inventory turnover period, average payment period and cash conversion cycle as variables of working capital management. To analyze data, two methods are applied. Pearson correlation coefficient is applied to measure variables' correlation. Then, simple regression technique is used to analyze relations between the dependent variable and each independent variable. Afterwards, mentioned control variables are added to the regression functions to study the relation between each dependent variable and each independent variable and control variables. To analyze the relationship between profitability and working capital management, a multiple regression model is applied as well.

Research hypotheses: To analyze the relation between working capital management and profitability, following hypotheses are considered:

- It seems that there is a relation between average account collection period and operational profit of companies of food industry group member at Tehran Stock Exchange
- It seems that there is a relation between average inventory turnover and operational profit of companies of food industry group member at Tehran Stock Exchange
- It seems that there is a relation between average payment period and operational profit of companies of food industry group member at Tehran Stock Exchange
- It seems that there is a relation between cash conversion cycle and operational profit of companies of food industry group member at Tehran Stock Exchange

RESEARCH METHODOLOGY

In this study, two methods are used to analyze the data. In the first method, correlation between variables is measured. A large number of variables are considered to measure profitability and working capital management. Thus, Pearson correlation coefficient method is applied to

measure correlation between one variable with another. Pearson correlation coefficient method is one common technique to measure correlation between variables. The second technique is the regression analysis. First, simple regression model is applied to measure relationship between each dependent variable and each independent variable, separately. Then, control variables are added to regression functions to analyze the relationship between each dependent variable with independent variable accompanying control variables. Multiple regression is applied to analyze working capital management and profitability as well. To do so, variable of working capital management with profitability are studied. Also, control variables are used to show the results when control variables are involved.

Statistical population: The statistical population of the present research includes all companies of food industry group member at Tehran Stock Exchange that have following conditions:

- Their end of fiscal year is March
- They are not investment and financial companies
- Their data are accessible
- They are member since March 2006

195 companies are selected with above conditions. Also, since the statistical population is limited, sample size equals to statistical population ($N = n = 194$).

Research variables:

Profitability indicator measurement: In studies and research done upon accounting, to measure the profitability of a company, different indicators are used. In this study, operational profit, extracted from the profit and loss statement, is used to measure profitability. The operational profit is considered as dependent variable in the present research.

Working capital management indicator measurement:

In the present paper, four indicators are considered as variables of working capital management as follows: Average accounts collection period: as an independent variable is calculated by (average accounts receivable/sales amount) ³⁶⁵.

- **Average Inventory Turnover Period in Days (ITID):** As an independent variable is calculated by (average inventory/final price of sold product) ³⁶⁵.
- **Average Payment Period (APP):** As an independent variable is calculated by (average accounts payable/final price of sold product) ³⁶⁵.
- **Cash Conversion Cycle (CCC):** As an independent variable is calculated by (average accounts collection period + average Inventory Turnover Period in Days (ITID)-average payment period).

The present research considers the relationship between working capital management and profitability in the companies of food industry group member at Tehran Stock Exchange. As there may be other factors influencing on profitability, they have to be considered as well. In the current study, three variables including company size, liquidity and leverage are controlled.

Previous research shows that stockholders of small companies have less return on stock than big companies. Thus, company size has extensively been used as control variable in profitability studies. In the present research, company size is considered as a control variable. To operationalize this variable, natural logarithm of sales (Los) is used. The leverage is another factor that can affect on profitability through creditors' supervision and its role in forming the structure of capital. In the current paper, leverage is calculated by dividing total debts on total assets (DR). In addition, according to studies, liquidity has impacts on profitability. Basically, firms with high liquidity are low profitable. Thus, in the present research, current ratio (current assets/current debts) is used as an indicator to measure liquidity.

Research model: Following models are used to test the research hypotheses:

- To test the first hypothesis, following regression equation is estimated:

$$NOP_{it} = B_0 + B_1(ACP_n) + B_2(LOS_{it}) + B_3(CR_{it}) + B_4(DR_{it}) + \epsilon \quad (1)$$

- To test the second hypothesis, following regression equation is estimated:

$$NOP_{it} = B_0 + B_1(ITLD_n) + B_2(LOS_{it}) + B_3(CR_{it}) + B_4(DR_{it}) + \epsilon \quad (2)$$

- To test the third hypothesis, following regression equation is estimated:

$$NOP_{it} = B_0 + B_1(APP_n) + B_2(LOS_{it}) + B_3(CR_{it}) + B_4(DR_{it}) + \epsilon \quad (3)$$

- To test the fourth hypothesis, following regression equation is estimated:

$$NOP_{it} = B_0 + B_1(CCC_n) + B_2(LOS_{it}) + B_3(CR_{it}) + B_4(DR_{it}) + \epsilon \quad (4)$$

RESULTS OF DATA ANALYSIS

Results of the first hypothesis test: The calculated correlation coefficient (-0.76), calculated p-value (p-value = 0.012 ≤ 0.05) and hypothesis test indicates a significant

Table 1: The results of the first hypothesis

Dependent variable	Type of test	Correlation coefficient between NOP and ACP	Significance level	Test's result
NOP	Correlation	-0.76	0.012	Significant
	ANOVA	F	15.657	Significant and reverse
			0.000	Significant

Table 2: correlation test of the second hypothesis

Dependent variable	Type of test	Correlation coefficient between NOP and ITIDN	Significance level	Test's result
NOP	Correlation	-0.941	0.000	Significant and reverse
	ANOVA	F	15.579	Significant
			0.000	Significant

Table 3: The results of the third hypothesis

Dependent variable	Type of test	Correlation coefficient between NOP and APP	Significance level	Test's result
NOP	Correlation	-0.096	0.015	Significant and reverse
	ANOVA	F	15.580	Significant
			0.000	Significant

Table 4: The results of the fourth hypothesis

Dependent variable	Type of test	Correlation coefficient between NOP and CCC	Significance level	Test's result
NOP	Correlation	-0.180	0.012	Significant and reverse
	ANOVA	F	15.595	Significant
			0.000	Significant

negative (reverse) relation between average accounts collection period and net operational profit (Table 1). It means that increase in average accounts collection period, the net operational profit decreases and vice versa. Following table shows the summary of statistical tests.

Results of the second hypothesis test: The calculated correlation coefficient (-0.941), calculated p-value (p-value = 0.000 ≤ 0.05) and hypothesis test indicates a significant negative (reverse) relation between average inventory turnover period in days and net operational profit (Table 2). It means that increase in average accounts collection period, the net operational profit decreases and vice versa. Following table shows the summary of statistical tests.

Results of the third hypothesis test: The calculated correlation coefficient (-0.180), calculated p-value (p-value = 0.012 ≤ 0.05) and hypothesis test indicates a

Table 5: Summary of results

Hypothesis	Description	Test' result
The first	There is a significant relation between n accounts collection period and net operational profit.	Approved
The second	There is a significant relation between inventory turnover period and net operational profit.	Approved
The third	There is a significant relation between average payment period and net operational profit.	Approved
The forth	There is a significant relation between cash conversion cycle and net operational profit.	Approved

Table 6: Relationship between dependent variable and independent variables

Dependent variable	Independent variable			
	ACP	ITID	APP	CCC
Net operational profit (NOP)	Negative profit (reverse)	Negative profit (reverse)	Negative profit (reverse)	Negative profit (reverse)

significant negative (reverse) relation between cash conversion cycle and net operational profit (Table 3). It means that increase in average accounts collection period, the net operational profit decreases and vice versa. Following table shows the summary of statistical tests.

Results of the forth hypothesis test: The calculated correlation coefficient (-0.76), calculated p-value (p-value = 0.012 ≤ 0.05) and hypothesis test indicates a significant negative (reverse) relation between average accounts collection period and net operational profit (Table 4). It means that increase in average accounts collection period, the net operational profit decreases and vice versa. Following table shows the summary of statistical tests.

Following Tables (Table 5 and 6) show the summary of results of test for the aim of the study.

CONCLUSION

The present research analyzes impacts of working capital management on profitability. Regarding the literature review, variables of working capital management and how it affects on profitability were analyzed and some hypothesis tests were designed. The results showed that average accounts collection period, average inventory turnover period in days, average payment period and cash conversion cycle have reverse relation with profitability.

In science, nothing could be proven with uncertainty. In fact, a theory is neither provable nor refutable nor non-probabilistic (Khorshidi and Ghoreishi, 2002). Followings are the limitations of the present study:

- One limitation of the present research is the limited number of companies with applied conditions. This limitation may damage the generality of the research.

On the other hand, differences in accounting methods for measurement and report of financial events in different companies can impact on the results.

- The present research did not consider credit, sales and economical conditions and governmental policies dominant on companies. For instance, companies' conditions about sales on credit, which influences on inventory in the accounts receivable, were not considered.
- Generalizing the results to non-member corporations should be done continuously.
- As the statistical population of the present research was set of companies of food industry group member in Tehran Stock Exchange, the results of the research may differ for other industries.

RECOMMENDATIONS

- Public and specialized awareness on working capital management methods is low. Therefore, followings are proposed:
 - Promotion and elaboration of working capital management culture through seminars and workshops
 - Providing suitable environmental infrastructures for working capital management including financial tools and institutions
 - Presenting financial management services on working capital management to firms
- It is proposed that companies' managers have more notice to management of current debts and assets
- According to the first hypothesis and its results, managers can make positive value and profitability for stockholders through shortening of accounts collection period. This can be done by proper management of accounts receivable.
- According to the second hypothesis and its results, managers can make positive value and profitability for stockholders through shortening of inventory turnover period. This can be done by proper management of inventory.
- According to the third hypothesis and its results, managers can make positive value and profitability for stockholders through shortening of average payment period. This can be done by proper management of payments and use of creditors' conditions.
- According to the forth hypothesis and its results, managers can make positive value and profitability for stockholders through shortening of cash conversion cycle. This can be done by proper management of payments and collections, liquidity planning and suitable use of opportunities for finance and investment.

Future research recommendations: Any research creates opportunities for future research. In the present research, the relationship between working capital management and profitability was examined. Followings are proposed for future research:

- Examining relationship between return on stock and working capital management variables in various industries
- Examining reasons of long inventory turnover, accounts collection period and cash conversion cycle in various industries
- Examining reasons for insufficient concern to working capital management in companies member in Tehran Stock Exchange
- Examining the roles of working capital management in continuity of profit if units' activities
- Examining affects of inventory management on shortening the inventory turnover period and on profitability and efficiency of firms
- Conducting a research similar to current study in big companies with experienced personnel in financial management and especially working capital management
- Forming a portfolio of companies with different cash conversion cycle and comparing risk and efficiency of this portfolio

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