The Relationship between Working Capital Management and Profitability of the Companies (Case Study: Listed Companies on TSE)

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Abstract

The purpose of this research is to study the relationship between working capital management and corporate profitability.

The statistical population includes the listed companies on Tehran Stock Exchange (TSE) and a sample of 101 firms during the period of 2004-2008. Multivariate regression and Pearson correlation are used to test hypotheses.

Findings show a negative significant relationship exists between cash conversion cycle, Number of Days of A/P, Number of Days of A/R and corporate profitability. Although, the relationship between the average period of Inventory retention and profitability was not significant, but confirmation of the three other subsidiary hypotheses which are independent of each other showed the existence of a significant relationship between corporate profitability and working capital management.

Because, cash conversion cycle has been viewed as the key measure of working capital management (Mussawi , Laplaute and Kieschnick, 2006), the relationship between working capital management and corporate profitability was confirmed.

Findings also show that a positive significant relationship exists between logarithm of sales and profitability, and a negative significant relationship exists between Financial Debt Ratio and profitability. Furthermore industry categories affect profitability.

Introduction

In the past, productive-industrial companies made heavy profits out of mass production; which resulted in cash planning and control and subsequently ended in management of working capital transforming into a specialized section in economic entities. The maintenance of cash at a desirable level for the purpose of settling liabilities on maturity and using the investment opportunities that are indicative of the flexibility of the economic entity, moreover the availability of material needed for production in order to enable the entity to provide the needs of its customers is indicative of the importance of working capital. Any decision made by the managers of the entity in this context can significantly affect return of the entity stock which shall transform company value and ultimately increase shareholders wealth (Michalski, 2005).

On the other hand investors look for investments that give the highest yields; this necessitates the compilation of a strategy that helps predict today's market. Managers need a desirable working capital strategy that maximizes shareholder interests and directs them in challenges that the entity faces (Michalski, 2008).

Managers have shortened the cash cycle through shortening the period of receivables collections and inventory turnover and lengthening the period of settling liabilities, in order to increase company profitability (Nobanee and Alhajjar, 2009).

Working Capital is the total of the amounts invested in current assets of the company. Net working capital results from the deduction of current liabilities from current assets; **Working Capital Management** consists of determining the volume and composition of sources and uses of working capital in such a way that would increase the wealth of stockholders. Working capital management is the management of current assets and current liabilities such that would result in the most desirable level of working capital and maximum company profitability. Inadequate working capital leads the company to bankruptcy. On the other hand, too much working capital results in wasting cash and ultimately the decrease in profitability (Chakraborty, 2008).

Working capital strategies result from the combination of current assets and liabilities that play a significant role in the existence and growth of the entity. Working capital management includes the selection of an appropriate strategy in coordination with the entity's financial needs and in lieu with increasing the company yield (Nazir and Afza, 2007).

Working capital strategies include conservative, bold and moderate strategies. In the conservative strategy, companies retain a high amount of current assets with a low return level; and a low level of current assets that leads to the increase of liquidity and decrease in risk. In the bold strategy, the company uses minimum current assets to utilize the highest level of its current liabilities. The moderate strategy retains the optimum level of current assets and liabilities (Ibid.).

Companies must retain an appropriate level of working capital to maximize their value. In other words retention of high inventory levels and too much utilization of credit policies increase sales. High levels of inventories, reduces risk of depletion while credit policies initiate sales; mainly due to the fact that they allow the customer to evaluate the quality of the product prior to purchase (Petersen and Rajan, 1997).

The other portion of working capital would be the payable accounts turnover. Delay in settling invoices received from providers of raw material allows the company to evaluate the quality of materials purchased. Moreover it is an inexpensive and flexible source for financing the company (De Loof, 2000). It is noteworthy for managers to know that the extension of the payment period may damage the reputation and status of the company and negatively affect company profitability (Nobanee and Alhajjar, 2009).

If the company is interested in increasing its cash flow, it should increase its working capital as well. However, policies such as these may result in a lower volume of sales, and decrease company profitability once more. Thus companies must select between profitability and cash flow (Narware, 2004).

Companies focusing on cash management, are larger but younger, and face less cash sales, seasonal activities and cash flow problems. Companies focusing more on inventory management are smaller and younger and have more outsourcing and longer production cycles. Companies focusing on credit management methods have less profitability and are interested in growth; moreover they benefit from less credit purchase and cash sales. Lazaridis and Tryfonidis (2006) have suggested that for growth, companies should use credit policies for customers and invest more in inventories (Lazaridis and Tryfonidis, 2006).

In some instances credit policies are used as a tool for attracting customers. One method used for evaluating working capital management is the cash transformation cycle, which is the time period between cash given out for purchase of material and collection of receivables on sales. The longer the time period, the higher the investment made in working capital (Deloof, 2000). The cycle includes the period of collection of receivables, the period of turnover of inventories and the period of settling the liabilities (Schein, 2009) and does not involve cash flow management and marketable securities (Pinkowitz and Williamson, 2005; Faulkender and Wang, 2006). The significance for this cycle is its ability in showing the number of days that the cash flow of the company is limited in operations. A comparison of the cycle in various years indicates the red line that the company faces in its cash flow. A negative time period for this cycle indicates that the company benefits from complete health; this is due to the fact that inventory sales and collection of receivables will be made prior to settlement of liabilities. These conditions exist in companies such as Wal-Mart, where high levels of inventories are sold while no payment has yet been made (Schein, 2009).

Working capital management indicates how much a company shall continue its existence if operations are aborted. Moreover, it gives indications of the time period elapsed between the points of inventory purchase to the point of collection of sales amounts. Retention of inventories at a desirable level and setting credit policies by providers of materials and granting credit to customers significantly affects company profitability (Lazaridis and Tryfonidis, 2006).

In this research, the relationship between working capital management and company profitability, and the impact of various elements of working capital management on profitability was tested.

History of Research

Lazardidis and Tryfonidis (2006) have investigated the relationship between profitability and working capital management in the Stock Exchange Market of Athens throughout 2001-2004. The objective of this research is to study the relationship between profitability and the cycle of cash transformation and its components. Results indicate that a significant relationship exists between gross operational profit and the cash transformation cycle. Moreover managers can generate a good profit for the company using the right management techniques for the cash transformation cycle and its components.

Nazir and Afza (2009), have studied the relationship between profitability and working capital management policies in 208 companies listed in Tehran Stock Exchange throughout the years 1998-2005. Results have shown that managers using conservative strategies have been able to increase the value of their stocks. Findings indicate that in selecting a portfolio, investors choose companies that apply short term credit policies and retain a low level of current liabilities.

Zubiri (2010), studied the impact of working capital management on company profitability in a research performed on the automobile production industry in Pakistan from 2000 to 2008. The researcher has used current ratio as an indicator for working capital management policies and financial leverage as the indicator for capital structure.

Variables in this research were tested using the correlation coefficient and multi variable regression. Results of the research indicate that companies must increase current assets and decrease current liabilities for maximizing profitability. Findings reflect that the increase in cash flow would result in an increase in profitability. Moreover a positive relationship exists between profitability and the financial leverage. The relationship does have its limits; appoint exists where in the increase in financial leverage results in reduced profitability. In this research the relationship between operational leverage and profitability was evaluated as well. Results indicated that an inverse relationship exists between the two variables. The researcher has provided the justification that an increase in company capacity does not necessarily lead to an increase in sales and it may be absolutely possible that the company may have been going through a period of recession.

Nobani, Abdollatif and Alhajjar (2010), studied the relationship between the cash transformation cycle and profitability. To perform this research, they used data gathered from 34771 Japanese companies between the years 1990-2004. Results indicated that a negative relationship existed between profitability and the cash transformation cycle. The result was the same in all sample companies except service providers and commercial companies.

Chatreji (2010), studied the impact of working capital management on profitability in companies listed in London stock exchange throughout the years 2006-2008. The researcher has used the Pierson correlation coefficient to evaluate the impact of cash transformation cycle, the period of collection of receivables, inventory retention period, liability settlement period, the current to quick ratio, to net operational profit. Results indicated that a negative relationship exists between working capital management and profitability. This means that an increase in cash transformation cycle would result in a reduction in profitability. Moreover results have also stated that a negative relationship exists between liquidity and profitability as well.

Hassanpoor (2007), has studied the impact of working capital strategies on stock return throughout 2001 to 2005. He selected 62 companies from 459 companies active in 34 industries listed in Tehran Stock Exchange and subsequently classified them into 9 industries. In this research, the significance of working capital was emphasized such that when considering the situation of the business entity the best working capital strategies are employed to maximize the interests of the entity and its investors. Moreover the impact of the type of strategy on the average stock return was evaluated and results indicated that a significant difference existed among these averages in various strategies and that bold strategies generate the highest stock return among the industry as a whole.

Research Hypotheses
A study of the research literature and results from previous researches ended in the formulation of the following hypotheses for this study. Also, components of working capital were considered.

Hypothesis 1) A Significant relationship exists between the cash transformation cycle and company profitability.

Hypothesis 2) A Significant relationship exists between the average period of debt settlement and company profitability.

Hypothesis 3) A Significant relationship exists between the average period of collection of receivables and company profitability.

Hypothesis 4) A Significant relationship exists between the average period of inventory retention and company profitability.

The objective of this research is to distinguish the relationship between methods of working capital management and company profitability.

Definition of Research Variables

Independent variables of the research include the period of cash transformation, average period of collection of receivables, average period of inventory retention and average period of the settlement of debts. Equations (1) to (4) reflect the method of calculating independent variables of the model (Lazaridis and Tryfonidis, 2006).

Cash conversion cycle=No. of days A/R[1]+ No. of days inventory retention- No. of days A/P   (1)

Cash conversion cycle: Period of cash conversion

No. of days A/R: Average period of collection of receivables

No. of days inventory retention: average period of inventory retention

No. of days A/P: Average period of debt settlement

Each component of the cash conversion cycle has been extracted from the following equations:

No of days A/R= Accounts Receivables/sales*365   (2)

No of days inventory retention= inventory/cost of goods sold*365   (3)

No of days A/P= Accounts Payables/cost of goods sold*365   (4)

Calculating the Dependent Variable

The dependent variable in this research is the gross operational profit which has been calculated using equation 5:

Gross operating Profit=(Sales – COGS[2])/(Total Asset – Financial Assets)   (5)

Gross operating profit: stands for the gross operating profit

Calculating Control and Dummy Variables

Control variables of the model were obtained using equations 6 to 8.

The first control variable, is company size which has been calculated using natural logarithm.   (6)

Fixed Financial Assets Ratio= Fixed Financial Assets/Total Assets   (7)

The second control variable, has been used for companies where in financial assets compose a significant portion of total assets, and have been considered as a variable for evaluating the impact of investments made by other companies in profitability.

Financial Debt Ratio=(Short Term Loans + long Term Loans)/ Total Assets   (8)

The third control variable is the relationship between financial outsourcing and total assets. Ultimately the impact of industry type which is a dummy variable, on profitability has been studied. Since industry is a qualitative variable, companies have been divided into various categories within the same industry.

Independent Variables						
Debt Settlement Period	The Period of Collection of Receivables		Inventory Retention Period		Cash Conversion Cycle	
Dependent Variable Gross Operating Profit Control Variables						
Ratio of Fixed Financial Assets		Sales Logarithm			Financial Debt Ratio	
Dummy Variables						
D_1	D_2	D_3	D_4	D_5	D_6	D_7
Food and Drink Industries	Pharmaceutical, Chemical & Nuclear Industries	Metal & Organic Industries	Machinery & Equipment Industries	Automobile & Spare Parts Industries	Ceramics, Tiles & Limestone Industries	Other Industries

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[1] Accounts Receivables
[2] Cost Of Goods Sold

Definition of Statistical Population and Sample

The statistical population of the research includes companies listed in TSE, using the following criteria.

1) Company should be listed on TSE until the end of 2003.
2) Fiscal year must end on 21 March.
3) No changes must have been made in company fiscal year throughout the period of research
4) Company should not have reported loss throughout the period of research.

Sample selection has been made using the screening method through which 101 companies have ultimately been selected.

Data Collection

Data for this research has been collected from text resources, the company information data bank at the official website of the TSE and from information software of Rahavand Novin. Moreover theoretical principles of research have been collected from professional texts and magazines in both Farsi and English.

Research Findings

Results obtained from testing research hypothesis offer the following:

Hypothesis 1) A significant relationship exists between the cash conversion period and company profitability.

To test this hypothesis, the following regression equation was used at 95% significance level and the relationship between cash conversion period and profitability was approved.

$$\text{Gross Operating Profit} = a_0 + a_1 \text{ FIXED FA} + a_2 \text{ FIN DEBT} + a_3 \text{ CCC} + a_4 \text{ LNSANES} + a_5 D_1 + a_6 D_2 + a_7 D_3 + a_8 D_4 + a_9 D_5 + a_{10} D_6$$

Hypothesis 2) A significant relationship exists between debt settlement period and company profitability

To test hypothesis 2 the following regression equation was used at 95% significance level and the relationship between average debt settlement period and company profitability was confirmed.

$$\text{Gross Operating Profit} = a_0 + a_1 \text{ FIXED FA} + a_2 \text{ FIN DEBT} + a_3 \text{ A/P} + a_4 \text{ LNSANES} + a_5 D_1 + a_6 D_3 + a_7 D_5 + a_8 D_6 + a_9 D_7 + a_{10} D_8$$

Hypothesis 3) A significant relationship exists between the average period of collection of receivables and company profitability.

To test hypothesis 3 the following regression equation was used at 95% significance level and the relationship between average period of collection of receivables and company profitability was confirmed.

$$\text{Gross Operating Profit} = a_0 + a_1 \text{ FIXED FA} + a_2 \text{ FIN DEBT} + a_3 \text{ A/R} + a_4 \text{ LNSANES} + a_5 D_1 + a_6 D_3 + a_7 D_5 + a_8 D_6 + a_9 D_7 + a_{10} D_8$$

The results coordinate with those in researches performed in Belgium by De Loof (2000), Greece (Athens) buy Lazarides and Tryfonidis (2006), Pakistan by Amirshah (2006), in the United States in New York Stock Exchange by Nowbani and Alhajjar (2009), in Japan by Nobanee, Abdollatif and Alhajjar (2010) and in Londom Stock exchange by Chaterji (2010).

Hypothesis 4) A significant relationship exists between the average period of inventory retention and company profitability.

To test hypothesis 4 the following regression equation was used at 95% significance level and the relationship between average period of inventory retention and company profitability was rejected.

$$\text{Gross Operating Profit} = a_0 + a_1 \text{ FIXED FA} + a_2 \text{ FIN DEBT} + a_3 \text{ INV} + a_4 \text{ LNSANES} + a_5 D_1 + a_6 D_3 + a_7 D_5 + a_8 D_6 + a_9 D_7 + a_{10} D_8$$

Regression Coefficient of Hypothesis 1

Coefficient	Stimation evaluation	SE Coefficient	t	P–Value
a_0	0/383	0/21	1/819	0/070
a_1	-0/234	0/165	-1/42	0/156
a_2	-0/522	0/113	-4/632	0/000
a_3	-0/019	0/164	-5/531	0/000
a_4	0/022	0/015	1/441	0/15
a_5	-0/085	0/073	-1/171	0/242
a_6	-	-	-	-
a_7	-0/114	0/064	-1/781	0/076
a_8	0/263	0/061	4/281	0/000
a_9	-0/166	0/050	-3/345	0/001
a_{10}	0/020	0/051	0/383	0/702
a_{11}	-0/065	0/090	-0/717	0/474

Regression Coefficient of Hypothesis 2

Coefficient	Stimation evaluation	SE Coefficient	t	P–Value
a_0	-0/080	0/187	-0/426	0/670
a_1	-0/105	0/163	-0/642	0/521
a_2	-0/664	0/111	-5/986	0/000
a_3	-0/019	0/187	-5/858	0/000
a_4	0/053	0/163	-3/696	0/000
a_5	-0/011	0/111	-0/154	0/877
a_6	-	-	-	-
a_7	-0/097	0/000	-1/525	0/128
a_8	0/188	0/014	3/174	0/002
a_9	-0/141	0/071	-2/864	0/004
a_{10}	-0/067	0/064	-1/308	0/192
a_{11}	-0/055	0/059	-0/611	0/542

Regression Coefficient of Hypothesis 3

Coefficient	Stimation evaluation	SE Coefficient	t	P–Value
a_0	0/146	0/202	0/722	0/471
a_1	-0/225	0/168	-1/344	0/180
a_2	-0/534	0/115	-4/657	0/000
a_3	-0/001	0/003	-4/186	0/000
a_4	0/035	0/015	2/369	0/018
a_5	-0/071	0/074	-0/953	0/341
a_6	-	-	-	-
a_7	-0/138	0/066	-2/081	0/038
a_8	0/158	0/061	2/604	0/009
a_9	-0/172	0/051	-3/409	0/001
a_{10}	-0/051	0/052	-0/979	0/328
a_{11}	-0/082	0/091	-0/895	0/371

Regression Coefficient of Hypothesis 4

Coefficient	Stimation evaluation	SE Coefficient	t	P–Value
a_0	0/377	0/196	1/922	0/055
a_1	-0/151	0/160	-0/942	0/347
a_2	-0/612	0/109	-2/632	0/000
a_3	-0/002	0/204	-1/813	0/061
a_4	0/026	0/014	1/820	0/069
a_5	-0/052	0/070	-0/749	0/454
a_6	-	-	-	-
a_7	-0/070	0/062	-1/116	0/265
a_8	0/355	0/063	5/656	0/000
a_9	-0/138	0/048	-2/867	0/004
a_{10}	0/051	0/050	1/024	0/307
a_{11}	-0/033	0/088	-0/369	0/712

Conclusion

Results confirm an inverse yet significant relationship between the cash conversion cycle, debt settlement period and the period of collection of receivables with profitability. Even though a significant relationship between the average period of inventory retention and profitability was not confirmed, yet the confirmation of the three independent subsidiary hypotheses leads to confirming the relationship between working capital management and company profitability. Moreover since the cash conversion cycle is the most important criterion for evaluating working capital management (Mussawi and Laplaute and Kischnick, 2006), the relationship with profitability was confirmed and it was thus concluded that a significant relationship exist between working capital management and profitability.

Suggestions Based on Research Findings

The following suggestions have been made based on research findings:

1. Results from testing the hypotheses reflect that the cash conversion cycle impacts company profitability. Thus it is suggested that financial managers of the company focus more on the time period between raw material purchases used for production and collection of receivables rising from sales of finished products.

2. Investors look for investment opportunities with the highest yields; thus they would need information to predict company policies. It is suggested for the Stock Exchange to request information from companies related to the level of risk acceptance in current asset and current liability management (AFP-AIP), the average period of collection of receivables, the average period of debt settlement and average period of inventory retention within two categories namely the company and industry and to disclose the same in complimentary notes.

3. Moreover based on research results, the average period of collection of receivables, average period of debt settlement and average period of inventory retention have inverse impacts on profitability. Thus it is suggested to financial managers of the company to calculate the average period of collection of receivables, average period of debt settlement and average period of inventory retention for three month periods to ensure the selection of an appropriate strategy in accordance with industry type and economic status.

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