

Effect of Working Capital Management on Operating Cash Flow

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ABSTRACT

The present research investigates the effect of working capital management on operating cash flow. To evaluate the working capital management, three factors were used: size of company, liquidity, and degree of operating leverage. The population studied in this research included the companies listed on Tehran Stock Exchange, out of which about 184 ones during 2009-2013 were selected as statistical samples. In order to analyze the hypothesis in this study, multiple linear regression method was used. The experimental findings obtained from the hypothesis testing showed that variable "liquidity" had a direct effect on the operating cash flows of the companies; however, no significant correlation was observed between the operating cash flow and the variables of "size of company" and "company's degree of operating leverage".

KEYWORDS: Working capital management, size of company, degree of operating leverage, liquidity and operating cash flow.

INTRODUCTION

Working capital is considered an important resource for improving financial performance. Therefore, working capital management is a requirement for organizations' capability to adjust to a challenging economy and aims to provide a delicate balance between maintaining the liquidity for supporting daily operations and maximizing the opportunities for short-term investments (Filbeck et al., 2007). Working capital management plays a vital role in the daily operations of a business unit and is an important element for the financial affairs of companies. It is defined as the optimal integration of working capital items (i.e. current asset and liabilities) such that wealth of shareholders is maximized (Rezazadeh, 2010). Working capital satisfies the short-term financial needs of a business unit. A less significant need for the working capital leads to a less significant need for financial support and decreased capital cost, which in turn would increase cash availability for shareholders (Rezazadeh, 2010). Therefore, companies try to maintain an optimal level for the working capital management so as to maximize their value.

In the organizations with smaller size whose current liabilities and asset form significant parts of the working capital, the applied policies in this field are highly important, because these policies manage the financial interactions of companies with providers and buyers in the financial supply chain (Fathi, 2009). In practice, one of the most important issues in organizations is the working capital management. Many financial managers are making their best to identify the stimuli for working capital management as well as an appropriate level of working capital. Lack of understanding about effects of the required working capital, lack of clarity in determining the working capital management, and incapability of management for planning and controlling elements of working capital management would lead to unprofitability and bankruptcy. Most business failures are related to inability of financial managers in correctly programming and controlling current liabilities and asset of companies (Jose, 1996). Companies are able to minimize risks and to improve their total performance by understanding the role and stimuli of the working capital (Myers, 1984). Therefore, working capital management is highly important for having an optimal level of operating cash flow. In this research, variables namely size of company, liquidity, and degree of financial leverage were used as the criteria for working capital management. Also, the present article aimed to study the relationship between the above-mentioned variables and operating cash flow.

Theoretical Framework

Generating value and increasing shareholders' wealth in a long run are among the most important goals of companies. Maximizing values of companies requires the implementation of a profitable project by them. Increase in the operating cash flow or increase in the wealth is obtained only through an appropriate and satisfactory performance. Also, maximizing value of companies is fulfilled only when they have an acceptable level of financial

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health. Concept of working capital management is the management skill for the economic unit in short-term capital management and the purpose of working capital management includes increased liquidity, increased operating cash flow, and increased shareholder values (Nilsson et al., 2010).

Therefore, to have a desirable level of operating cash flow, effects of various factors must be taken into account, because a significant relationship is assumed to exist between working capital management and operating cash flow. The present research aimed to study effect of these properties on operating cash flow of the companies listed on Tehran Stock Exchange in an attempt to answer this question: "Does working capital management affect operating cash flow of companies?" Therefore, the effect of important factors such as working capital management of companies on operating cash flow and, consequently, effect of these variables on future decisions of users of financial statements, especially shareholders, creditors, and financial analyzers, necessitate the conduct of this research.

Research Background

Aktas et al. (2015) studied the effect of working capital management on the company value of the companies in the USA during 1982-2011. The results showed an optimal level of working capital management in the studied companies; also, approach of the companies to the optimal level (via increasing or decreasing their investments in working capital) improved their shares and operating performance.

In another research, Sabo Muhammad et al. (2014) studied the effect of working capital management on performance of the companies in Nigerian Stock Exchange active in the field of food industries during 2008-2011. Findings of this research indicated a positive relationship between average collection period, current ratio, size of company on the one hand and operation on the other hand. Also, a negative relationship was found between inventory turnover period as well as average payment period and performance.

Enqvista et al. (2014) conducted a research, entitled "Effect of working capital management on company profitability in different business cycles", to study the roles of business cycles in the relationship between profitability and working capital management. The samples used in this research included Finland companies during an 18-year period. The results showed that the effect of business cycle on relationship between profitability and working capital management during the economic downturn period was more significant than the one during the economic boom period. Their study also demonstrated that inventory management and collection conversion period increased during the economic downturn period.

Mwangi (2014) studied the effect of working capital management on the performance of non-financial companies in Nairobi Stock Exchange (NSE), Kenya, during 2006-2012. The results showed that an offensive policy had a significantly positive effect on the return on asset and return on equity, whereas a conservative investment policy had positive effects on performance.

Jafari and Hematti (2014) studied the relationship between working capital management, performance of company, and operating cash flows. This study worked on all the companies listed on Tehran Stock Exchange during 5 years from 2005 to 2009. The results showed that managers could increase operating cash flow by providing a short-term asset conversion period.

In their research, Hossein Fakhari and Ghasem Rouhi (2013) investigated the effect of maintained cash and working capital management on excess of the stock returns of 84 companies listed on Tehran Stock Exchange during 2007-2011. Findings of their research showed that capital market in Iran, as a new market, considers a high value for cash and working capital. Results of their research indicated a positive relationship between working capital and value of company, and a negative relationship between working capital and excess return of stockholders. They also reported that lack of extensive money and finance markets for Iranian companies caused the lever and its interaction with cash and working capital to have a positive relationship with value of company and excess return. They believed that their findings showed that attention of Iranian stockholders to cash and working capital is a factor which creates value.

Hypotheses

The research hypotheses are explained as the following models and attempts are made to provide statistical evidence in order to confirm them:

Hypothesis 1: Size of company affects operating cash flow.

Hypothesis 2: Liquidity level affects operating cash flow.

Hypothesis 3: Degree of operating leverage affects operating cash flow.

Statistical Population and Sample

Statistical population of this research included companies listed Tehran Stock Exchange and a systematic elimination method was used to determine the statistical sample. For this purpose, the following 5 criteria were

considered. If a company met all of these criteria, it would be selected as the research sample; otherwise, it was eliminated.

- The company should have been admitted to Stock Exchange since 2009 and should have been active in the stock market during 2009-2013.
- The company must not belong to holding companies, investments, financial intermediations, banks, or leasing companies.
- The company must not have changed its fiscal year during 2009-2013, with its fiscal year ending in March 19.
- The company must not have stopped its stock transactions for a long period of time (more than 1 year) during 2009-2013.
- The required information about the company must be available for 2009-2013.

After considering all the above criteria, 184 companies remained as the screened population, all of which were selected as the research samples. Therefore, our observations reached 920 year-company.

Research Models

To study the effect of working capital management on operating cash flow of the companies, multiple linear regression models were presented for testing the three hypotheses as follows:

Model (1):

$$CFO_{it} = \alpha + \beta_1 SZ_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 ICF_{it} + \beta_5 FCF_{it} + \varepsilon_{it}$$

Using Model (1), effect of company size on operating cash flow was determined.

Model (2):

$$CFO_{it} = \alpha + \beta_1 LQ_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 ICF_{it} + \beta_5 FCF_{it} + \varepsilon_{it}$$

Using Model (2), effect of liquidity on operating cash flow of the company was determined.

Model (3):

$$CFO_{it} = \alpha + \beta_1 DOL_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 ICF_{it} + \beta_5 FCF_{it} + \varepsilon_{it}$$

Using Model (3), effect of operating leverage degree on operating cash flow of the company was determined.

In these models, if coefficients β_t (the coefficients related to the independent variables) were significant at 95%, the all 6 hypotheses would be confirmed.

Table-1: Expected Relationships

i: Company and t: year	CFO _{it} : Operating cash flow of company i in year t
ε_{it} : Random error of company i in year t	ROA _{it} : Return on asset of company i in year t
SZ _{it} : Size of company i in year t	ROE _{it} : Return on equity of company i in year t
LQ _{it} : Liquidity of company i in year t	ICF _{it} : Investment cash flow of company i in year t
DOL _{it} : Degree of operating leverage for company i in year t	FCF _{it} : Free cash flow of company i in year t

Research Variables and their Measurement

Dependent Variable:

CFO_{it}= Operating cash flow of company i in year t

Operating cash flow is the cash created due to the company's operations, which is measured using five-segment statement of cash flow (Iranian Accounting Standards, No.2)

Independent Variables

To study the working capital management in the present research, it was required to measure the related criteria including: size of company, liquidity, and degree of operating leverage, as the independent variables of the present research whose effect on the dependent variable, i.e. operating cash flow, was studied. The method used to calculate the independent variables in this research included:

Table-2: Independent Variables

Variable	Measure (proxy)
Size	Log of Sales
Liquidity	Current Assets / Current Liabilities
DOL	% change in EBIT / % change in sales

Control Variables

In this research, return on asset (ROA), return on equity (ROE), investment cash flow (ICF), and free cash flow (FCF) were used as the control variables. The method of calculating these variables was as follows:

Table-3: Control Variables

Variable	Measure (proxy)
ROA	Net income / Total assets
ROE	Net income / Shareholders equity
ICF	Cash Flow Statements
FCF	Cash Flow Operating – capital cost / Total assets

Analysis

Descriptive Statistics

Descriptive statistics for the independent, dependent, and control variables are presented in the table below:

Table-4: Descriptive statistics of the research variables

Variable	Mean	S.D	Kurtosis	Skewness	Max	Min
<i>CFO</i>	0.1296	0.1322	3.959	0.474	0.5985	-0.3025
<i>SZ</i>	13.470	1.569	4.234	0.681	19.722	8.899
<i>LQ</i>	1.3606	0.6602	11.253	2.304	5.5523	0.2232
<i>DOL</i>	0.9324	12.888	52.817	-4.199	75.743	-154.627
<i>ROA</i>	0.1225	0.1232	4.624	0.854	0.6267	-0.2554
<i>ROE</i>	0.2846	0.3037	11.348	-0.256	2.4387	-1.4236
<i>ICF</i>	-0.0402	0.0664	8.038	-0.122	0.3321	-0.3704
<i>FCF</i>	0.1064	0.1095	4.872	1.353	0.5770	0.0000

Testing Normal Distribution of the Dependent Variables

In this research, normal distribution was examined by Jarque-Bera test. If the significance level of this statistic were more than 0.05 ($Prob > 0.05$), then hypothesis H_0 on the normal distribution of the variables would be confirmed.

The null and alternative hypotheses in this test were:

H_0 : Data distribution is normal.

H_1 : Data distribution is not normal.

Table-5: Results of testing normal distribution of the independent variable

Variable	Sig	jarque-bera
<i>CFO</i>	0.0000	66.645

Hypothesis H_1 , stating that the distribution was not normal, was verified at 95% confidence level, which suggested that the variable "operating cash flow" did not follow a normal distribution. Therefore, it was necessary to normalize the data before the test. The data were normalized using Johnson Transfer Function.

Table-6: Results of testing normal distribution of the dependent variable after normalization process

Variable	Sig	jarque-bera
<i>CFO</i>	0/1737	3/499

Hypothesis H_0 was verified at 95% confidence level, which indicated that the dependent variable had normal distribution after normalization process.

Inferential Statistics

Correlation Coefficient:

In this part, the relationship between the research variables and their correlation was studied using Pearson's correlation coefficient. The correlation coefficient matrix for the research variables is presented in Table 7.

Table-7: Pearson's correlation coefficient matrix for the research variable

<i>Correlation</i>								
<i>Probability</i>	<i>CFO</i>	<i>SZ</i>	<i>LQ</i>	<i>DOL</i>	<i>ROA</i>	<i>ROE</i>	<i>ICF</i>	<i>FCF</i>
<i>CFO</i>	<i>1</i>							
<i>SZ</i>	<i>0.146</i>	<i>1</i>						
	<i>0.000</i>							
<i>LQ</i>	<i>0.073</i>	<i>-0.164</i>	<i>1</i>					
	<i>0.028</i>	<i>0.000</i>						
<i>DOL</i>	<i>0.008</i>	<i>0.044</i>	<i>0.042</i>	<i>1</i>				
	<i>0.801</i>	<i>0.189</i>	<i>0.211</i>					
<i>ROA</i>	<i>0.469</i>	<i>0.165</i>	<i>0.437</i>	<i>0.112</i>	<i>1</i>			
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>				
<i>ROE</i>	<i>0.265</i>	<i>0.126</i>	<i>0.146</i>	<i>0.055</i>	<i>0.675</i>	<i>1</i>		
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.100</i>	<i>0.000</i>			
<i>ICF</i>	<i>-0.405</i>	<i>-0.172</i>	<i>0.136</i>	<i>-0.044</i>	<i>-0.205</i>	<i>-0.159</i>	<i>1</i>	
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.187</i>	<i>0.000</i>	<i>0.000</i>		
<i>FCF</i>	<i>0.906</i>	<i>0.119</i>	<i>0.147</i>	<i>0.018</i>	<i>0.456</i>	<i>0.249</i>	<i>-0.168</i>	<i>1</i>
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.588</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	

Regression Test Assumption Tests

To see if the panel data method was useful for the model estimation, F-Limer test was used, and to identify the more efficient estimation method (fixed effects or random effects), Hausman test was employed. A summary of the tests is presented below:

Table-8: Results of model selection for estimating the research models

	Result	P-Value	d.f	Statistic	Test statistics	Test
1	Panel data model	0.0010	(183.708)	1.417	<i>F</i>	<i>F-Limer</i>
	Fixed effect regression model	0.0000	5	31.735	χ^2	Hausman
2	Panel data method	0.0000	(183.703)	2.673	<i>F</i>	<i>F-Limer</i>
	Fixed effect regression model	0.0000	5	28.592	χ^2	Hausman
3	Panel data method	0.0012	(183.703)	1.407	<i>F</i>	<i>F-Limer</i>
	Fixed effect regression model	0.0000	5	31.111	χ^2	Hausman
Model	Result	P-Value	d.f	Statistic	Test statistics	Test
1	Panel data model	0.0010	(183.708)	1.417	<i>F</i>	<i>F-Limer</i>
	Fixed effect regression model	0.0000	5	31.735	χ^2	Hausman
2	Panel data method	0.0000	(183.703)	2.673	<i>F</i>	<i>F-Limer</i>
	Fixed effect regression model	0.0000	5	28.592	χ^2	Hausman
3	Panel data method	0.0012	(183.703)	1.407	<i>F</i>	<i>F-Limer</i>
	Fixed effect regression model	0.0000	5	31.111	χ^2	Hausman

Hypotheses Test

A summary of the hypothesis test results is presented below:

First Hypothesis Test

Table-9: Results of estimating Model (1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.969174	0.057584	-16.83061	0.0000
SZ	0.001138	0.005334	0.213368	0.8311
ROA	-0.003652	0.093418	-0.039098	0.9688
ROE	0.031635	0.011926	2.652712	0.0081
ICF	-3.963722	0.169867	-23.33422	0.0000
FCF	7.368105	0.191447	38.48640	0.0000
R-squared	0.823443	Mean dependent var		-0.010177
Adjusted R-squared	0.822452	S.D. dependent var		0.987822
S.E. of regression	0.416233	Akaike info criterion		1.091523
Sum squared resid	154.3655	Schwarz criterion		1.123623
Log likelihood	-483.5479	Hannan-Quinn criter.		1.103787
F-statistic	831.1052	Durbin-Watson stat		1.575157
Prob(F-statistic)	0.000000			

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	3.193575	Prob. F(5,891)	0.0073
Obs*R-squared	15.79238	Prob. Chi-Square(5)	0.0075
Scaled explained SS	42.74391	Prob. Chi-Square(5)	0.0000

Based on the results presented in Table9, the significance level (P-value) of t-statistic related to the variable “size of company” was greater than 0.05 (0.8311); therefore, at 95% confidence level, it was possible to conclude that there was no significant relationship between size of company and operating cash flow, and large or small size of the company had no significant effect on the amount of operating cash flows. Therefore, the first hypothesis of the research was rejected at 95% confidence level.

Second Hypothesis Test

Table-10: Results of estimating Model (2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015974	0.002879	5.547713	0.0000
LQ	0.008743	0.001530	5.712483	0.0000
ROA	0.015275	0.004833	3.160638	0.0016
ROE	0.001939	0.001364	1.421707	0.1556
ICF	-0.384293	0.025178	-15.26288	0.0000
FCF	1.011493	0.007667	131.9351	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
	Weighted Statistics			
R-squared	0.985485	Mean dependent var		0.278810
Adjusted R-squared	0.981603	S.D. dependent var		0.404763
S.E. of regression	0.041515	Sum squared resid		1.211640
F-statistic	253.8735	Durbin-Watson stat		2.261522
Prob(F-statistic)	0.000000			
R-squared	0.918467	Mean dependent var		0.128918
Sum squared resid	1.268016	Durbin-Watson stat		2.299498

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	6.212732	Prob. F(5,886)	0.0000
Obs*R-squared	30.21468	Prob. Chi-Square(5)	0.0000
Scaled explained SS	125.8312	Prob. Chi-Square(5)	0.0000

Therefore, according to the results presented in Table10, the significance level(P-value) of t-statistic related to the variable “liquidity” was smaller than 0.05 (0.0000)with a positive coefficient (0.0087); thus, at 95% confidence level, it was possible to state that there was a direct and significant relationship between liquidity level of company and operating cash flow such that increase in liquidity increased operating cash flows. According to the above results, the second hypothesis of the research was confirmed at 95% confidence level, suggesting that liquidity level had a direct and significant effect on the operating cash flow of the companies active in Iranian Capital Market.

Third Hypothesis Test

Table-11: Results of estimating Model (3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006872	0.002282	3.011528	0.0027
DOL	-0.000120	0.000106	-1.134349	0.2570
ROA	-0.044102	0.021279	-2.072615	0.0386
ROE	0.000638	0.003159	0.201974	0.8400
ICF	-0.416590	0.027670	-15.05577	0.0000
FCF	1.047268	0.012757	82.09471	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.917793	Mean dependent var		0.129204
Adjusted R-squared	0.895809	S.D. dependent var		0.132188
S.E. of regression	0.042668	Akaike info criterion		-3.285059
Sum squared resid	1.279876	Schwarz criterion		-2.269403
Log likelihood	1654.136	Hannan-Quinn criter.		-2.896905
F-statistic	41.74776	Durbin-Watson stat		2.277062
Prob(F-statistic)	0.000000			
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	5.339706	Prob. F(5,886)		0.0001
Obs*R-squared	26.09305	Prob. Chi-Square(5)		0.0001
Scaled explained SS	106.8170	Prob. Chi-Square(5)		0.0000

Based on the results presented in Table11, the significance level(P-value) of t-statistic related to the variable "degree of operating leverage" was larger than 0.05 (0.2570); therefore, at 95% confidence level, it was possible to conclude that there was no significant relationship between the companies 'degree of operating leverage and operating cash flow such that increased or decreased degree of operating leverage had no significant effect on the operating cash flow of the companies. According to the above results, the third hypothesis was rejected at 95% confidence level, indicating that the degree of operating leverage had no significant effect on the operating cash flow of the companies' active in Iranian Capital Market.

Conclusion and Suggestions

Based on the experimental findings, it is possible to imply that size of companies has no significant effect on their operating cash flows; also, increase in liquidity level would increase operating cash flow. Therefore, there is a direct and significant relationship between companies' level of liquidity and their operating cash flow. The change can be explained in this way that, by increasing liquidity level, the company is able to fulfill its obligations before third parties, such as suppliers of raw materials and their own staff, and to expedite the value chain of the company that includes purchasing raw material (which requires paying cash to suppliers), transferring raw materials for production, producing, and finally selling productions and receiving cash. Thus, a raise in the liquidity level can help the company reach operating cash flow via accelerating the value chain. This result is in agreement with the results reported by Nobani and Alhajar (2010). Result of the third hypothesis also show that the degree of operating leverage has no significant effect on operating cash flow of the companies active in Iran Capital Market. This result can be analyzed as follows: Since numerous factors affect the ratio of profit changes before deduction of interest and taxes to sale changes, the sale price used from the companies 'income statement which is used in the operating leverage calculations includes the cash and credit sales; thus, it is possible for the receivable turnover period to take

more than 1 year and there may be no significant changes in the operating cash; but, the operating leverage may experience some variations. Also, it is possible for debtors to pay their debts from previous years during one year. These payments would change the operating cash, but not degree of operating leverage.

According to the above relations, investors, managers, and researchers are recommended to pay attention to liquidity criteria when investing or buying stock, because according to such a direct relationship, by increase in liquidity level, the cash flow resulting from the operations would also increase. Under these conditions, investors can select the criteria for quality evaluation of the earnings near the operating cash flow. If the earning is close to the operating cash flow (indicating high quality of profit), then the companies do not face liquidity deficiency and would give more profits to stockholders. Also, managers must define an optimal level of liquidity when preparing their company's fiscal budget for future periods, which is necessary for supporting the commercial and manufacturing activities. An optimal level is a level compatible with the current level of commercial and manufacturing activities of the company, at which it is able to reach its goals and adjust to changes in the market. In order to grow the operating cash flow, managers of companies must also increase the current asset compared to debts, e.g. they must invest the operating cash funds in the projects with positive net present value so as to increase the returns and decrease the need for external financial supply, use of financial leverage, and consequently financial costs such as interest.

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