

Impact of working capital management on profitability ratios: evidence from Iran

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Abstract

In this research we investigate the effect return on assets, return on equity, profit margin and earnings per share on working capital management. Current ratio and quick ratio used as proxies for working capital management.

The research sample includes 451 year -firm of Tehran Stock Exchange (TSE) listed companies for period 2007-10. The multiple linear regressions were applied to test the research hypotheses.

The results showed that, return on assets and earnings per share have a negative impact on working capital management. The results also show that earnings per share and profit margin positively associated with the firm performance.

Keywords: Working capital management, profitability ratios, current ratio, quick ratio

1. Introduce

Due to the past economic crisis, companies highlight the importance of working capital management as an important part of short-term financial management (Viskari et al, 2011). As without efficient management in this area no company can survive. Working capital can be defined broadly as the net working capital, which is calculated as current assets less current liabilities. A narrower definition of operational working capital leaves financial items, such as cash and short-term liabilities out and concentrates only on process-related items.

Operational working capital can be defined as inventories plus accounts receivable less accounts payable. Working capital is linked with, both, liquidity and profitability of a firm (Alamet al, 2011) Working capital ascertains the firm's ability to continue its operation without endangering the liquidity. Working capital management is comprised of many important decision makings. Maximizing profits, no doubt, is one of the main objectives of a firm but it must not be at the expense of liquidity, the life of the firm. So each manager is required to have a tradeoff between the two essentials of a firm's life (Rahemanand & Naser, 2007).

Aggressive sales campaign may include liberal credit policy and high inventory levels, to avoid inventory shortage but it will inflate the account receivables and demand for more working capital. On the other hand important component of working capital is accounts payables, and if payments are delayed to the vendors, it will be difficult for a firm to continue its operation market value of the firm will also suffer (Alam et al, 2011).

Among short term strategies working capital management plays vital role in increasing the shareholders' value of a firm (Alam et al, 2011). Working capital management is the name of striking balance between two objectives of a firm, i.e. profitability & liquidity (Raheman and Nasr, 2007)

Working capital management plays an important role in a firm's profitability and risk as well as its value (Smith, 1980). There are a lot of reasons for the importance of working capital management. For a typical manufacturing firm, the current assets account for over half of its total assets. For a distribution company, they account for even more. Excessive levels of current assets can easily result in a firm's realizing a substandard return on investment (Dong & Su, 2010).

However, Van Horne and Wachowicz (2004) point out that excessive level of current assets may have a negative effect of a firm's profitability, whereas a low level of current assets may lead to lowers of liquidity and stock-outs, resulting in difficulties in maintaining smooth operations. Efficient management of working capital plays an important role of overall corporate strategy in order to create shareholder value. Working capital is regarded as the

result of the time lag between the expenditure for the purchase of raw material and the collection for the sale of the finished good.

The way of working capital management can have a significant impact on both the liquidity and profitability of the company (Shin and Soenen, 1998). The main purpose of any firm is maximum the profit. But, maintaining liquidity of the firm also is an important objective. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Thus, strategy of firm must be a balance between these two objectives of the firms. Because the importance of profit and liquidity are the same so, one objective should not be at cost of the other. If we ignore about profit, we cannot survive for a longer period.

Conversely, if we do not care about liquidity, we may face the problem of insolvency. For these reasons working capital management should be given proper consideration and will ultimately affect the profitability of the firm.

Working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand (Eljelly, 2004).

Lamberson (1995) showed that working capital management has become one of the most important issues in organization, where many financial managers are finding it difficult to identify the important drivers of working capital and the optimum level of working capital. As a result, companies can minimize risk and improve their overall performance if they can understand the role and determinants of working capital.

A firm may choose an aggressive working capital management policy with a low level of current assets as percentage of total assets, or it may also be used for the financing decisions of the firm in the form of high level of current liabilities as percentage of total liabilities (Afza and Nazir, 2009).

Keeping an optimal balance among each of the working capital components is the main objective of working capital management. Business success heavily depends on the ability of the financial managers to effectively manage receivables, inventory, and payables (Filbeck & Krueger, 2005). Firms can decrease their financing costs and raise the funds available for expansion projects by minimizing the amount of investment tied up in current assets.

Lamberson (1995) indicated that most of the financial managers' time and efforts are consumed in identifying the non-optimal levels of current assets and liabilities and bringing

them to optimal levels. An optimal level of working capital is a balance between risk and efficiency.

It asks continuous monitoring to maintain the optimum level of various components of working capital, such as cash receivables, inventory and payables (Afza and Nazir, 2009). A popular measure of working capital management is the cash conversion cycle, which is defined as the sum of days of sales outstanding (average collection period) and days of sales in inventory less days of payables outstanding (Keown et al, 2003).

The longer this time lag, the larger the investment in working capital. A longer cash conversion cycle might increase profitability because it leads to higher sales. However, corporate profitability might also decrease with the cash conversion cycle, if the costs of higher investment in working capital is higher and rises faster than the benefits of holding more inventories and granting more inventories and trade credit to customers (Deloof, 2003).

2. Review of literature

Deloof and Jegers (1996) showed that, there is a clear relationship between short-term financial management and profitability of a firm. Elielly (2004) used current ratio & cash gap to measure the profitability and liquidity of the companies in Saudi Arabia by applying correlation and regression analysis. The research found that cash conversion cycle is more relevant determinant of liquidity than liquid ratio. Literature of financial studies depicts that financial ratios used to be considered for decision making in working capital management in earlier stages but a very few of the researchers discussed Working capital management as a policy (Filbeck and Krueger, 2005).

However some studies pointed out that average of financial ratios tend to vary across the industry and the time (Filbeck and Krueger, 2005).

Ganesan (2007) analyzed impact of working capital management upon the performance of firms in Telecom industry. The variables used were, days sales outstanding, number of days for payment to vendors, average days inventory held, cash conversion efficiency, revenue to total assets, etc. Findings reveal negative & insignificant relationship between profitability and daily working capital requirement in the said industry.

Mullins (2009) showed that, short-term financial management can be used to gain competitive advantage. Alam et al. (2011) showed that, significant correlations exist between working capital components with market value and firm's profitability.

Rehman (2006) investigates the relationship between the ability of firms to effectively manage its working capital components and their profitability. He examines the effect of the average collection period, inventory turnover in days, average payment period and the cash conversion cycle on the firms' profitability.

Using a sample consist of 94 Pakistani firms, he found a negative relationship between working capital components and firm profitability impaling that a firm' profitability is largely affected by the length of its cash conversion cycle.

Lazaridis and Tryfonidis (2006) Using panel data analysis for a sample of 131 corporations listed in Athens Stock Exchange investigate the traditional relationship between firm profitability and working capital management. The results reveal a significant relationship between firms' profitability and the cash conversion cycle. They also suggest that if keeping the cash conversion cycle at the optimal level positively affect the shareholders wealth.

Teruel and Solano (2007) aim at investigating the effect of working capital management on firm profitability, using a sample of 8,872 small and medium size European companies. They found that reducing inventory and average collection periods affect positively the firm value, as reducing the cash conversion cycle improves the firm's profitability.

Raheman and Nasr (2007) use a sample consists of 94 firms listed in Karachi Stock to investigate the effect of the average collection period, inventory turnover in days, Average payment period, Cash conversion cycle and Current ratio on the Net operating profit. They observed a negative relationship between these variables and firms profitability, which implies that increasing the length of the Cash conversion cycle will negatively affect the firm's profitability. They also observed a negative relationship between firms' level of liquidity and f profitability. Moreover, the results suggest that a firm's profitability is affected by its size and its debt level.

Nazir and Afza (2009) investigate the relationship between the policies that firms adopt to deal with the working capital and firms profitability by using data on 204 non- financial firms listed in Karachi Stock Exchange (KSE). The results indicate a negative relationship between firms' profitability and its financing policies, the firm that adopt an aggressive working capital policy generate a lower rate of return than that of those adopting a conservative working capital policy.

In a recent study Mathuva (2010) investigates the relationship between the firms' working capital management components and the firm's profitability. Using data from 30 listed firm in Nairobi market he finds a negative relationship between a firm average collection period and

its profitability, he also observed that the shorter the inventory conversion the higher the firm profitability. Moreover, the longer it takes the firm to pay for its creditors the higher its profitability.

Using a sample of 88 firms listed on New York Stock Exchange Gill et al (2010) investigate the relationship between the level of a firms' working capital and its profitability. They find a significant relationship between the cash conversion cycle and firms' profitability. They postulate that a firm profitability is increased the shorter the accounts receivable collection period.

Dong and Su (2010) investigate the effect of the conversion cycle components on firms' profitability. Using data from Vietnam stock Market, they find a strong negative relationship between firms' profitability and its ability to reduce the cash conversion cycle length. They also postulate that firms can increase the shareholders wealth by keeping the level of its working capital at the optimal level.

Al-Mwalla (2011) investigates the impact of working capital management policies on firm's profitability and value. The results show that following a conservative investment policy has a positive impact on a firm's profitability and value. However following the aggressive financing policy has a negative impact on the firm's profitability and value. Finally, this study finds that firm Size, firm Growth and GDP Growth has a positive impact on the firm's profitability and value with no effect of financial leverage.

3.Hypothesis

H1: There is a significant relationship between return on assets and working capital management.

H2: There is a significant relationship between return on equity and working capital management.

H3: There is a significant relationship between profit margin and working capital management.

H4: There is a significant relationship between earnings per share and working capital management.

4.Research Design

In this research, working capital management is dependent variable. Working capital management has traditionally used the current ratio (CR) and quick ratio (QR) to measure

the liquidity position of a company (Viskari, 2011). In this research, profitability ratios are independent.

Profitability ratios in this study are included return on assets (ROA), return on equity (ROE), profit margin (PM) and earnings per share (EPS). Operational definitions of research variables in <Table 1> are presented.

Table1. Variables

Test Variables	Operationalization
Dependent variables	
Current Ratio (CR)	current assets / current liabilities;
Quick Ratio (QR)	(current Assets – inventories) / current liabilities;
Independent variables	
Return on Assets (ROA)	Net Income / Total Assets;
Return on Equity (ROE)	Net Income / Stockholders' Equity;
Profit Margin (PM)	Net Income / Sales;
Earnings Per Share (EPS)	Net income / Number of Common Shares Outstanding;

Research samples are companies listed on Tehran Stock Exchange (TSE) during 2007 to 2010. In this study to determine the sample size, random sampling method based on the judgment in used. Finally companies considering the following features were selected:

- They were accepted on TSE before 2007
- In terms of increase comparability, their fiscal year ends to march
- They are manufacturing companies
- During the research period the Company is not omitted from TSE.

The total 430 companies listed in Tehran Stock Exchange during the four-year period 2007 until 2010, a total of 451 year -firm with all required conditions and variables, and study samples were selected as the final sample. The empirical models used to test the hypotheses are as follows:

$$CR = \alpha + \beta_1 ROA + \beta_2 ROE + \beta_3 PM + \beta_4 EPS + \epsilon$$

$$QR = \alpha + \beta_1 ROA + \beta_2 ROE + \beta_3 PM + \beta_4 EPS + \epsilon$$

Where CR is current ratio, QR is quick ratio, ROA is return on assets, ROE is return on Equity, PM is profit margin, EPS is earnings per share and ϵ is error.

5. Empirical Analysis

In order to test the data we first of all check the data type by descriptive statistics, results of which are presented in the following table:

5.1. Descriptive Statistics

Descriptive stat below shows the mean values, Std. Deviation, median and minimum and maximum values of the series of dependent and independent data.

Table 2. Descriptive Statistics

	CR	QR	ROA	ROE	PM	EPS
Mean	1.0923	0.6542	0.1215	0.3926	0.1574	0.0088
Median	1.0987	0.6325	0.1026	0.3471	0.1234	0.0065
Std. Deviation	0.27835	0.23393	0.08340	0.24096	0.11823	0.00782
Minimum	0.44	0.16	0.00	0.00	0.00	0.00
Maximum	1.86	1.45	0.38	1.25	0.55	0.04

5.2. Inferential Statistics Results

In regression model the effect of independent variables (return on assets, return on equity, profit margin and earnings per share) on dependent variables (current ratio and quick ratio) have been investigated. To test research hypotheses the multiple linear regression analyze to methods of "Enter", "Stepwise", "Backward" and "Forward" in 5 percent error level have been used. Finally with regard to lack significant difference in mentioned methods results and better representation of model result in Enter method, to interpret model outputs the Enter method results was used.

In present research presence of regression infra-structure data test including variance congruous, normality, residuals independence and non-co linearity was supported. We also checked problem of multi-co linearity. <Table 3> below shows the results of models applied to find out the impacts of working capital management on profitability ratios.

Table3. Regression Results

Dependent variables	Current Ratio			Quick Ratio		
	B	t	Sig.	B	t	Sig.
Independent variables						
Return on Assets	2.358	8.027	0.000	1.372	5.437	0.000
Return on Equity	-0.558	-6.799	0.000	-0.288	-4.082	0.000
Profit Margin	-0.639	-3.982	0.000	-0.267	-1.941	0.050
Earnings Per Share	7.954	3.567	0.000	7.409	3.868	0.000

Result research show is positive association between return on assets and working capital management (current ratio and quick ratio). The evidence, therefore, is consistent with H1.

Return on equity is significantly related to the working capital management. The results reveal that, there is negative association between return on equity and working capital management. The evidence, therefore, is in line with H2.

The results also show that there is negative association between profit margin and working capital management. The evidences, therefore, is consistent with H3.

Relationship between the earnings per share and working capital management being issued is significant leading us to conclude that earnings per share seems to have influence on working capital management. It is therefore concluded that our evidence accepted H4.

6. Conclusion

This paper examines the roles of working capital management on profitability ratios. In particular, this paper examines the roles of return on assets, return on equity, profit margin and earnings per share on working capital management.

We use current ratio and quick ratio as proxy for working capital management. To test research hypotheses the multiple linear regressions have been used.

We have come to the conclusion that:

1. Return on assets has positive relationship with working capital management.
2. Return on equity has negative relationship with working capital management.
3. Profit margin has negative relationship with working capital management.
4. Earnings per share have positive relationship with working capital management.

There is a main limitations identified in this study.

The sample only covers four years of Iranian data and an external validity problem exists that the results may not be transportable over different time periods and locations.

Future research should include the examination of the association other financial ratios such as activity ratios and market ratios on working capital management.

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