The Effect of Working Capital Level and Liquidity on Profitability of the Companies Listed In Tehran Stock Exchange

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ABSTRACT

The purpose of this study was to evaluate the effect of working capital level and liquidity on the profitability of the companies listed in Tehran Stock Exchange. To this end, a total of 84 companies were chosen during 2003-2010.CGS is used in this study as the working capital index and current ratio is used as an indicator of liquidity and the impact of liquidity and the amount of working capital on the profitability was studied in 1 main hypothesis and 2 secondary hypotheses. To test the hypotheses, multiple regression was used. Results show that the amount of working capital and liquidity affect the profitability of firms in different industries, and these results are fixed in the timeframe being investigated.

Keywords: Working Capital Level, Liquidity, Profitability, Industry

1. INTRODUCTION

Currently, one of the most important issues in financial management is working capital management that is discussed on the types of current assets and liabilities. For efficient working capital management in a company, anticipating and meeting the cash flow required by the company is as a fundamental objective. In general, management of working capital means that cash, accounts receivable and goods inventory are maintained at a level to can be adequate to pay short-term bills and ongoing obligation.

Efficient liquidity management involves planning and controlling current assets and current liabilities in such a manner that eliminates the risk of the inability to meet due short-term obligations, on one hand, and avoids excessive investment in these assets, on the other. This is due in part to the reduction of the probability of running out of cash in the presence of liquid assets. The working capital approach to liquidity management has long been the prominent technique used to plan and

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control liquidity(Bardia,2004). It is thus, essential to maintain as adequate degree of liquidity of smooth running of the business operations. The liquidity should be neither excessive nor inadequate. Excessive liquidity indicates accumulated idle funds, which do not earn any profit for the firm, and inadequate liquidity not only adversely affect the credit worthiness of the firm, but also interrupts the production process and hampers its earning capacity to a great extent. Thus, the need for efficient liquidity management in corporate businesses has always been significant for smooth running of the business (Chandra, 2001). However, the ultimate measure of the efficiency of liquidity planning and control is the effect it has on profits and shareholders' value. Thus, this study attempts to examine the effect working capital Level and liquidity on profitability using a sample of Tehran Stock Exchange. Second, the study aims at directing the attention to the importance of active management of liquidity. This aspect is more important given the number of companies, and the dire need to improve profitability.

To carry out these objectives the remainder of this paper is organized as follows: the next section reviews the literature for relevant theoretical and empirical work on liquidity and cash management and its effect on profitability. Section three describes the sample and the methodology followed in this study. Section four portrays and discusses the statistical results and the final section concludes the paper.

2. LITERATURE REVIEW

Working capital represents a safety cushion for providers of short-term funds of the company, and as such they view positively the availability of excessive levels of working capital and cash. However, from an operating point of view, working capital has increasingly been viewed at as a restraint on financial performance, since these assets do not contribute to return on equity (Sanger, 2001). Furthermore, liquidity management is important in good times and it takes further importance in troubled times. The efficient management of the broader measure of liquidity, working capital, and its narrower measure, cash, are both important for a company's profitability and well being. In the words of Fraser (1998) "there may be no more financial discipline that is more important, more misunderstood, and more often overlooked than cash management." However, as argued vividly by Nicholas (1991,) companies usually do not think about improving liquidity management before reaching crisis conditions or becoming on the verge of bankruptcy.

Survey of working capital and cash management literature, however, shows that instead of linking liquidity and cash management to a known efficiency or profitability measures, the majority of research, especially the earlier efforts, attempts to develop models for optimal liquidity and cash balances, given the organization's cash flows.

The cash gap, known also as cash flow cycle or cash conversion cycle, measures the length of time between actual cash expenditures on productive resources and actual cash receipts from the sale of products or services. Thus, this definition for cash conversion cycle indicates that a shorter cash cycle or gap is desirable since the larger the cash cycle or gap the greater the need for external financing and the greater the financing costs to be borne in form of explicit interest costs or implicit costs of other financing sources, such as equity (Eljelly, 2004).

The direct effect of liquidity is not only on the cash position and the troubles it may cause to financial managers, but it rather effects the company's profits in a more direct way. This direct effect stems from the need of the company to borrow to finance the working capital requirements and cash gaps. For example, if a company has a cash gap of 100 days, this means that the company has to borrow an amount equivalent to 100 times the daily cost of sales. The borrowing cost reduces both pretax and after-tax profits by equal amounts (Eljelly, 2004).

Shin and Soenen (1998) investigated the relation between the firm's net trade cycle and its profitability, using a large sample of American firms during 1975-1994. The study found a strong negative relation between the length of the firm's net trade cycle and various measures of profitability, including market measures, such as stock returns, and operating profits. Similarly, this study attempts to examine the relationship between operating profitability and liquidity measures. Unlike previous studies, an attempt is made here to study the effects of various levels of liquidity, in its broader or narrow sense, on a company's profitability.

3. DATA AND METHODOLOGY

Liquidity and cash gaps may differ among industries and among countries and may depend on the prevailing economic conditions. Sometimes traditions and the nature of business set the typical working capital requirements and the cash gap in a given industry. Some industries have inherently high levels of working capital requirements and large cash gaps than others, while some may require low levels of working capital and shorter or even negative cash gaps, which indicate their ability to obtain cost-free capital from their customers (Eljelly, 2004).

Main hypothesis: The amount of working capital and liquidity affect the profitability of firms.

1- The amount of working capital and liquidity affect the profitability of firms in different industries

2- The amount of working capital and liquidity affect the profitability of firms in the period being investigated.

To test these hypotheses this study uses the following methodology:

1. The study first estimates the cash gap for each company and for each year of the sample period as follows:

Cash Gap = Days in Inventory (DII) + Days in Accounts Receivable (DIR) – Days in Accounts Payable (DIP)

The components of the cash gap are calculated as follows:

- Inventory turnover = cost of goods sold/ average inventory
- Number of days in inventory= 365/ inventory turnover
- Number of days in Receivables= Receivables/ average daily sales
- Number of days in Payables = Payables / average daily purchases

2. Regression analysis will be used in this study for quantitative analysis and to test the hypotheses. (A curve that connects all distributions' averages to each other) The obtained curve is called regression and the regression equation.

3. The population of this study is all listed companies in Tehran Stock Exchange during the period 2003 to 2010. Companies surveyed are selected by the systematic elimination or targeted based on the following criteria:
Their fiscal year is ending March 29 of each year. Surveyed companies have been joined stock before 2003.Sample companies have an operational loss during the period under the review. These companies should have information such as items of current assets, total assets and current liabilities during the period 2003 to 2010.It was not among investment firms and financial intermediation.
According to studies conducted, 84 companies in 7 different industries (Chemical, Pharmaceutical, Automobile, Ceramic & Tiles, Cement, Basic metal, Food except sugar) which are eligible above conditions have been investigated in the period 2003 to 2010.

Table1: Sample Distribution and Description

Chemical	Pharmaceutical	Automobile	Cement	Basic metal	Foodexcept sugar	Ceramic &Tiles
14	18	18	8	9	8	9

4. RESULTS AND ANALYSIS

The following notations are used throughout this study:

S= net sales
CG= Cash gap in days
CR= Current ratio
LOGS= Logarithm of net sales
CGS= Cash gap in days/100
NOI= Net operating income + depreciation / net sales

Table.1 shows the measures of central tendency and dispersion for the basic variables used in this study; NOI, CR, CG, and S. The table shows wide variation for these variables, especially sales (S) and cash gap (CG). Thus these two variables are transformed in the analysis that follows, by taking the logarithm of sales (to satisfy normality) and divide CG by 100, to get a new scaled variable CGS.

Table 2: Descriptive Statistics (n =672)

	NOI	CG	CR	LOGS	CGS
Number of observations	672	672	672	672	672
Average	.2583	203.0331	1.1744	13.0296	2.0303
Median	.2254	188.7946	1.1090	12.7602	1.8879
Std. Deviation	.20342	209.03117	.55128	1.35368	2.09031
skewness	2.041	9.895	4.142	1.152	9.895
Kurtosis	13.061	180.396	33.850	1.704	180.396
Range	2.57	4986.92	7.35	8.50	49.87
Minimum	-.47	-905.07	.06	9.91	-9.05
Maximum	2.10	4081.85	7.41	18.41	40.82

5. TESTING HYPOTHESES

The test of working capital level and liquidity effectiveness on the profitability of firms in different industries (Table 2)

Table 3: NOI= B0+B1 CR+B2CGS+B3LOGS+e
Sector Regressions

	Intercept	CR	CGS	LOGS	R2	F	N
Chemical β t Tolerance VIF	-3.561* (-4.543)	.380* (3.840) .862 1.160	.128* (2.050) .816 1.225	.096 (1.615) .839 1.191	.220	10.147*	111
Pharmace utical β t Tolerance VIF	-3.059* (-6.368)	.070 (1.447) .913 1.095	.227* (8.088) .929 1.076	.090* (2.377) .894 1.118	.339	25.327*	151
Automobil e β t Tolerance VIF	-3.365* (-6.583)	.395* (2.982) .795 1.258	2.982* (1.632) .789 1.267	.057 (1.992) .707 1.415	.087	4.404*	141
Ceramic &Tiles β t Tolerance VIF	-2.320 (-1.689)	.315* (2.011) .958 1.044	.016 (.509) .976 1.025	.046 (.407) .941 1.063	.079	1.740	64
Cement β t Tolerance VIF	-1.284 (-1.497)	.059 (.976) .990 1.010	-.003 (-.466) .998 1.002	.049 (.755) .988 1.012	.25610	.541	62
Basic metal β t Tolerance VIF	-.723 (-.514)	.430 (1.896) .931 1.074	-.127 (- 1.324) .949 1.054	-.110 (- 1.053) .915 1.093	.100	2.030	58
Food	2.366*	.443*					

except sugar β t Tolerance VIF	(-2.087)	(2.087) .896 1.116	.097[*] (3.349) .915 1.093	.055 (.834) .829 1.206	.214[*]	5.251[*]	61

The results of the estimation show that t test probability for constant coefficient and coefficient of liquidity variables (CR) and the working capital (CGS) to profitability were only less than 5% in 2004. Therefore, the estimated coefficients of liquidity variables (CR) and the working capital (CGS) are only positive and significant to profitability in 2004. And the working capital variable (CGS) was significant in 2005, 2008 and 2009; and the liquidity variable (CR) was significant in 2006.

Conclusions

This study examined the effect of working capital level and liquidity on the profitability of a sample of 84 firms in 7 different industries during 2003-2010.

The results of this study have important implications for liquidity management in various Iranian companies. The study also revealed that there is great variation among industries with respect to the significant measure of liquidity.

Although certain liquidity levels are desirable and sometimes unavoidable, the study points to the lost profits and the unnecessary costs that are borne by companies as a result of holding excessive liquidity.

These losses or costs could be reduced or eliminated by adopting active liquidity management strategies.

The results showed that the amount of working capital and liquidity were effective on the profitability of firms in chemical, automotive and food (except sugar) industries, however this effectiveness is constant over the study period.

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