AENSI Journals

Advances in Environmental Biology

ISSN-1995-0756 EISSN-1998-1066

Journal home page: http://www.aensiweb.com/AEB/

Investigating the Relationship between Liquidity and Profitability in Listed Companies in Tehran Stock Exchange

Adeleh Azadzadeh

Department Of Accounting, Faculty of Management saveh Science and Research Branch Islamic Azad University Saveh Iran

ARTICLE INFO

Article history:
Received 10 September 2014
Received in revised form
23 October 2014
Accepted 27 November 2014

Keywords:
Working capital management, profitability, liquidity, Industry

ABSTRACT

The major indicators of the financial performance of corporate entities are liquidity and profitability. The study aims to investigate the relationship between profitability and liquidity, as measured by current ratio and cash gap (cash conversion cycle) for 84 industrial companies listed at the Tehran Stock Exchange for a period of 2003-2010. Using correlation and regression analysis the study found significant positive relation between the firm's profitability and liquidity.At the industry level, however, The size variable is also found to have significant effect on profitability. Also it was observed that there was great variation among industries with respect to the significant measure of liquidity. Finally, the results are stable over the period under study.

To Cite This Article: Adeleh Azadzadeh., Investigating the Relationship between Liquidity and Profitability in Listed Companies in Tehran Stock Exchange. ***Adv. Environ. Biol., 8(19),*** *163-169, 2014*

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, anticipate and meet the cash 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.

Liquidity and profitability are two very important and vital aspects of corporate business life. No firm can survive without liquidity. A firm not making profit may be considered as sick but, one having no liquidity may soon meet its downfall and ultimately die. Liquidity management has thus, become a basic and broad aspect of judging the performance of a corporate entity [1]. 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 [9]

Literature Review:

Working capital management is an important component of management of corporate finance; since it directly influences firm's profitability as well as liquidity in everyday activities. In any business organization, it is obvious that there must be sufficient working capital to run day to day operation. Therefore, to operate the business activities smoothly, working capital of firms must be sufficient. In this regard, the concern of working capital management is setting sufficient (optimal) level of working capital and managing short term assets and liabilities of firms within a specified period of time, usually one year. It is obvious that, the importance of efficient working capital management is unquestionable to all business activities given the fact that business capability relies on its ability to effectively use (manage) receivables, inventories and payables[3].

Generally, working capital management is simple and accurate means of ensuring an organization's ability to find the difference between short term assets and liabilities [6]. In practice, working capital management has become one of the most important issues in organizations that many financial managers are competing to identify the main components of working capital and an appropriate level of working capital [7].

Corresponding Author: Adeleh Azadzadeh, Department Of Accounting, Faculty of Management saveh Science and Research Branch Islamic Azad University Saveh Iran

Advances in Environmental Biology, 8(19) Special 2014, Pages: 163-169

Garcia and Martinez [4] had examined the effect of working capital management on profitability of the small and medium enterprises and conclude that managers can with reducing turnover of accounts receivable and goods inventory create value on the company and with shorten up the cash conversion cycle and improve corporate profitability.

Gill and colleagues [5] chose a 88 sample of companies listed on the New York Stock Exchange and with examination of the level of working capital on profitability concluded that a there are a significant relationship between cash conversion cycle and corporates profitability.

Eljelly [2] examined the relation between liquidity and profitability measured by current ratio and cash gap (cash conversion cycle) on a sample of joint stock companies in Saudi Arabia using correlation and regression analysis. They found a negative relationship between profitability and liquidity indicators, and it was found that cash conversion cycle had a bigger impact over profitability then current ratio.

Garcia-Teruel and Solano [6] studied the effects of working capital management over companies ROA. They observed 8872 enterprises and found out that shortening cash conversion cycle had significant effect over companies profitability.

Raheman and Nasr [9] studied the relationship between working capital management and profitability for 94 Pakistanian companies listed on Karachi Stock Exchange. between their finding, it was observed a significant negative relationship between companies liquidity and profitability.

Data And Methodology:

Since the aim of this study is to examine the relation between profitability and liquidity, the study makes a set of testable hypotheses. First, this study assumes that there may be a relationship between profitability of the company and its liquidity profile, since the later effects the former in a direct way, as a result of the external financing costs or saving thereof. Due to these elements of costs and cost saving this relationship is most likely be negative. Thus, the first hypothesis of this study can be stated as follows:

Hypothesis 1:

There is a possible negative relation between liquidity of a company and its profitability.

Companies with relatively high levels of liquidity are expected to post low levels of profitability and vise versa.

Secondly, profitability, on the other hand, may be a function of the size of companies (measured in terms of sales or total assets).The company size may affect liquidity, cash gaps and, hence, profitability in different ways. On the one hand, large companies may be able to buy inventory in large quantities in order to get quantity discounts. Further, because of their size, large companies may qualify for discounts from suppliers with relatively small inventory levels. On the other hand, large companies may be able to get favorable credit terms from their suppliers in terms of longer credit periods. Moreover, large companies may have more success in their receivables collection efforts relative to small companies. All these factors may push liquidity levels and cash gaps of large companies to levels lower than that of small companies. On the contrary, small companies are usually not able to obtain as much inventory to qualify for quantity discounts as their large counterparts do.

Additionally, small companies make efforts to pay within discount periods in order to benefit from cash discounts and to avoid severing their relations with their suppliers. These factors may force small companies to have higher liquidity levels and larger cash gaps. Accordingly, this study states the following hypothesis:

Hypothesis 2:

A positive relation may exist between the company size and its profitability. This may be due to the ability of large companies to reduce liquidity levels and cash gaps.

Third, 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.

Thus, this study states the following hypothesis:

Hypothesis 3:

Need for working capital and liquidity is influenced by the industry in which the company operates.

Capital intensive industries require low levels of working capital and tend to have smaller cash gaps than their labor-intensive counterparts. Accordingly, liquidity requirement is expected to have no significant negative impact on profitability of capital- intensive industries.

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)

Advances in Environmental Biology, 8(19) Special 2014, Pages: 163-169

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. Correlation analysis to identify the association between profitability and liquidity indicators and other related variables
3. Regression analysis to estimate the causal relationship between profitability variable, liquidity and other chosen variables.

Population And Sample:

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 be ending March 29 of each year. Surveyed companies have been joined stock before 2003.Sample companies have an operational losses 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 which are eligible above conditions has been investigated in the period 2003 to 2010.

RESULTS AND ANALYSIS

The following notations are used throughout this study:
S= net sales
TA= Total assets
CG= Cash gap in days
CR= Current ratio
LOGS= Logarithm of net sales
LOGTA= Logarithm of total assets
CGS= Cash gap in days/100
NOI= Net operating income + depreciation / net sales

Tab.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 1: Descriptive Statistics (n =672).

	NOI	CG	CR	LOGS	LOGTA	CGS
Number of observations	672	672	672	672	672	672
Average	.2583	203.0331	1.1744	13.0296	13.2851	2.0303
Median	.2254	188.7946	1.1090	12.7602	13.0322	1.8879
Std. Deviation	.20342	209.03117	.55128	1.35368	1.37930	2.09031
skewness	2.041	9.895	4.142	1.152	1.064	9.895
Kurtosis	13.061	180.396	33.850	1.704	1.314	180.396
Range	2.57	4986.92	7.35	8.50	8.62	49.87
Minimum	-.47	-905.07	.06	9.91	9.70	-9.05
Maximum	2.10	4081.85	7.41	18.41	18.32	40.82

The study first examines the relationship that exists between the variables of profitability and liquidity.

Table 2 shows the Pearson correlation coefficients between NOI, CGS, LOGTA, LOGS, CR, CG, and TA for the whole sample of 672 company-year observations.

In Table 2 the correlation coefficients indicate a significant positive relationship between current ratio (CR) and cash gap (CG/CGP) and Net Operating Income (NOI). One should not overlook the positive significant association that exists between NOI and the two measure of size, LOGS and LOGTA , which in turn indicates a positive relation between size and profitability. This has to be viewed in light of the highly significant negative correlation that exists between these two variable and the CR. Similarly, a negative relation exists between LOGS and LOGTA and CG. Finally, one should observe the strong highly positive relation that exists between sales and total assets which show that they are substitute measures of size.

To investigate the association between profitability and liquidity further, the study estimates the following regression equation for the whole sample and for four equation for the whole sample and four sub-samples. The sub-samples are by products of dividing the sample into four sub-samples, based on CR and CG.

Table 2: Pearson Correlation Coefficients Matrix.

	TA	CG	CR	LOGS	LOGTA	CGS	LNNOI
S	.977** .000	-.048 .216	-.024 .541	.221** .000	.185** .000	-.048 .216	-.155** .000
TA	1	-.041 .285	-.033 .397	.236** .000	.202** .000	-.041 .285	-.156** .000
CG		1	.104** .007	-.232** .000	-.130** .001	1.000** .000	.197** .000
CR			1	-.043 .269	-.104** .007	.104** .007	.164** .000
LOGS				1	.930** .000	-.232** .000	-.112** .004
LOGTA					1	-.130** .001	.031 .424
CGS						1	.197** .000

**. Correlation is significant at the 0.01 level (2-tailed).

The first two sub- samples are created by dividing the sample into two sub- samples, one with CR≤ 2 and the other with CR>2. The reason for this split is to examine whether the effect on profitability is a function of the level of liquidity. The other two samples are created by dividing the sample into two sub- samples, one with CG ≤ 150 days and the other with CG >150 days.

The purpose in this case is to examine whether the relation between profitability, liquidity level and cash gap is a function and cash gap is a function of the efficiency of managing cash cycle. for the sample and each of the sub-samples the following regression equation is estimated:

NOI= B0+B1 CR+B2CGS+B3LOGS+e

Where:

B0, B1, B2 B3, the coefficients of the regression equation; and the other variables are as defined before.

Table 3: NOI= B0+B1 CR+B2CGS+B3LOGS+eRegression (1): The general regressions.

	Intercept	CR	CGS	LOGS	R2	F	N
Pooled β t ToleranceVIF	-1.410* (-4.960)	.191* (3.865) .989 1.011	.057* (4.281) .944 1.059	-.037 (-1.774) .951 1.051	.065	15.146*	654
Sub- sample CR≤ 2 β t ToleranceVIF	-1.421* (-4.608)	.158 (3.189) .971 1.030	.093* (4.042) .859 1.164	-.035 (-1.625) .882 1.133	**.065**	14.366	622
Sub- sample CR> 2 β t ToleranceVIF	-3.286* (-4.789)	.365 (.985) .669 1.494	.142* (3.763) .442 2.263	.040 (.758) .601 1.664	.554	11.594*	31
Sub- sample CG≤150 β t ToleranceVIF	-3.341* (-7.088)	.213* (3.968) .898 1.113	.220* (7.292) .835 1.198	.093* (2.584) .825 1.211	.259	30.158	262
Sub- sample CG>150 β t ToleranceVIF	-.875* (-2.175)	-.096 (-1.075) .958 1.043	.061* (2.129) .875 1.143	-.058* (-2.127) .877 1.141	.033	4.445*	391

VIF= Variance Inflation Factor.
(*) indicates significance at all levels

Table 3 shows the results of estimating the regression equation for the pooled sample and for each of the four sub-sample. The results of the pooled regression and the sub- samples, in general, show that the model fits the data very well shown by the high R2 and F statistics. However, the pooled regression shows that the current ratio with a positive and very significant slop coefficient confirming the results of the earlier correlation analysis. Similarly, the coefficient for the CGS is positive and significant. The size variable LOGS is negative, but also not significant.

The sub- sample regression, however, show different results. For the sub-sample with CR≤ 2 the coefficients of CR and CGS are both positive, but are for CGS is significant and the coefficients of LOGS is negative, but is insignificant.

Advances in Environmental Biology, 8(19) Special 2014, Pages: 163-169

This indicates that when liquidity levels are low, denoted by low current ratios, the effect on profitability is not significant. However, when CR>2,the effect on profitability is not significant. Similarly, when the sample is divided on the basis of cash gap, the results for the subsamples where CG≤150 show that CR has a positive, but significant coefficients indicating significant effect on profitability. This means that when the cash conversion cycle is short the current ratio increase its importance and impact on profitability. However, since the cash conversion cycle (cash gap) replaces the current ratio as a liquidity parameter, the cash gap coefficient is positive and highly significant pointing to the positive impact of relatively short cash gaps on profitability. When the cash gap is greater than 150 days the CR coefficient is negative insignificant. This indicates that when the cash conversion cycle is long, then the liquidity level (as measured by current ratio) becomes a insignificant parameter and impacts profitability in a insignificantly negative way.

However, it is highly possible that the independent variables, CR, CGS, and LOGS are highly related to each other , and inclusion of all of them will thus be unjustified. To test for this possibility the study used two methods recommended by econometricians, which are Tolerance and Variance Inflation Factor (VIF) tests [6].The tolerance is a statistical measure used to determine how much the independent variables are linearly related to each other. A variable with very low tolerance contributes little information to the model. It is measured as (1-r2) for the variable, or simply as a reciprocal of the Variable Inflation factor, 1/VIF. When the variable is highly collinear the tolerance level is zero or close to zero. If, on the other hand, it is not related to other variables the tolerance level is 1. The VIF, on the other hand, is a measure that is used to determine collinearity. Large VIF value is an indication of multicollinearity. As a rule of thumb, if VIF of a variable exceeds 10 that variable is said to be highly collinear. It is evident from Table 3 that the independent variables are independent and there is no collinearity among them. Thus, the regression results together with the correlation results support the first hypothesis of this study on the overall positive relation between profitability and liquidity. It is evident, however, that this effect depends on the level of liquidity and the size of cash gap.

On the other hand, the sector regressions show different patterns than the pooled regression. For the Chemical and Food except sugar and Automobile sectors both CGS and CR coefficients are positive and highly significant, while the LOGS coefficient is not significant.

This may explain the relative importance of the cash gap and current ratio as a measure of liquidity, in the capital intensive industries such as Chemical and Food except sugar and Automobile. the results confirm hypothesis II and III on the influence of both industry and size on profitability within economic sectors.

Table 4: NOI= B0+B1 CR+B2CGS+B3LOGS+eRegression (2): 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
Pharmaceutical 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
Automobile 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 ToleranceVIF	-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 ToleranceVIF	-.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 except sugar β t ToleranceVIF	2.366* (-2.087)	.443* (2.087) .896 1.116	.097* (3.349) .915 1.093	.055 (.834) .829 1.206	.214*	5.251*	61

VIF= Variance Inflation Factor, (*) indicates significance at .05 level

Advances in Environmental Biology, 8(19) Special 2014, Pages: 163-169

There is an important question concerning the stability of the regression results over time.

To examine this issue a regression is conducted for each individual year in the sample period.

The results shown in Table 5 for the individual years further support the assumed relations of this study and their stability over time. First, the high R2 shows that a large variation of the dependent variable is explained by the model. The size coefficient for all years is not significant indicating that size matters when considered within sectors or industries. The CR coefficients for most of the years are positive as expected and insignificant for most of the time period, while CGS coefficients are positive for most of the years but significant.

Table 5: NOI= B0+B1 CR+B2CGS+B3LOGS+e Regression (2): Sector Regressions.

	Intercept	CR	CGS	LOGS	R2	F	N
2003 β t Tolerance VIF	-2.445* (-2.719)	.157 (.608) .955 1.047	.050 (1.140) .941 1.063	.061 (.983) .910 1.099	.025	.657	81
2004 β t Tolerance VIF	-1.697* (-2.206)	-.633* (-2.572) .916 1.091	.212* (3.166) .750 1.333	.036 (.656) .811 1.233	.146	4.518*	82
2005 β t Tolerance VIF	-2.559* (-3.215)	-.124 -.640 .963 1.039	.169* (3.045) .833 1.201	.065 1.143 .863 1.159	.105	3.092*	82
2006 β t Tolerance VIF	-1.747* (-2.550)	.283* (3.132) .997 1.003	.025 1.658 .994 1.006	-.012 -.227 .995 1.005	.135	4.072*	81
2007 β t Tolerance VIF	-1.494 (-1.852)	.194 (1.484) .954 1.048	.074 (1.142) .905 1.105	-.028 (-.483) .947 1.056	.061	1.704	82
2008 β t Tolerance VIF	-2.275 (-1.996)	.211 (.977) .840 1.191	.220* (2.480) .737 1.356	-.003 (-.042) .823 1.214	.138	4.011*	78
2009 β t Tolerance VIF	-1.279 (-1.352)	.139 (1.566) .965 1.036	.111* (2.030) .749 1.334	-.052 (-.781) .773 1.294	.140	4.108*	79
2010 β t Tolerance VIF	-2.032 (-1.913)	.394 (1.964) .888 1.126	.087 (1.770) .866 1.155	-.027 (-.384) .873 1.146	.125	3.752*	82

(*) indicates significance at .05 level

Conclusions:

The results of this study have important implications for liquidity management in various Iranian companies.

This study has attempted to empirically examine the relation between profitability and liquidity in a sample of 84 joint stock companies that represent the major economic sectors in Tehran Stock Exchange over the period 2003-2010.

The study reveals that there exists a significant and positive relation between profitability and liquidity measures such as current ratio and cash gap. Size is also found to bear some influence over profitability within economic sectors, but not in the overall sample. These two influences are more profound in capital- intensive sectors, such as manufacturing.

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.

Furthermore, the study highlights and reviews briefly the importance of using the various measures and techniques that measures and techniques that contribute towards an efficient management of liquidity and, hence, improve profitability. These techniques include the JIT system, and factoring of receivables, to mention a few.

REFERENCES

[1] Bardia, S.C., 2004.Liquidity Management: A case Study of Steel Authority of India Ltd, The Management Accountant, ICWAI, Kolkata,. 463.
[2] Eljelly, A., 2004. Liquidity – profitability tradeoff: an empirical investigation in an emerging market. IJCM, 14(2): 48-61
[3] Filbeck, G., T. Krueger, 2005. An Analysis of Working Capital Management Results Across Industries. American Journal of Business, 20(2): 11-18.
[4] Garcia-Truel, P.J. and Martinez-Solano, 2007. Effect Of working capital management on SME profitability. International journal of managerial of finance, 3: 164-1777.
[5] Gill, A., N. Biger and N. Mathur, 2010. The relationship between working capital management and profitability: evidence from the United States. And economics Business Journal, 10: 1-9.
[6] Gujarati, N., Damodar, 1990. Basic econometrics. McGraw-Hill, international Edition, Economic series.
[7] Harrris, A., 2005. Working capital management: Difficult, but Rewarding. Financial Executive, 21(4): 52-53.
[8] Lamberson, M., 1995. Changes in Working Capital of Small Firms in Relation to Changes in Economic Activity. Mid-American Journal of Business, 10(2): 45-50.
[9] Rahman, Abdul, Nasr, Mahamed, 2007. Working capital management and profitability - Case of Pakistani Firms. International Review of Business Research papers, 3: 1279 -300.
[10] Valshney, Safish–Chandra, 2001. Trade credit and company liquidity, The Management Accountant, 36(10): 738-756.