

Investigating the Effect of Liquidity on the Capital Structure of Listed Companies in Tehran Stock Exchange

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ABSTRACT

Liquidity is one of the factors that reduce equity cost. In this study, the relationship between liquidity and capital structure is studied by calculating the price gap between supply and demand for stocks as the best index of liquidity measurement and financial leverage as an indicator of capital structure. Statistical population is the companies listed in Tehran stock exchange and systematic sampling has been used for sampling. Research method is descriptive-applied and retrospective and statistical F-test (examining the regression), the T-test (examining the significance of the coefficients), the pooled data and SPSS software has been used. The results show that there is a significant relationship between stock liquidity and profitability and market value of asset / book value of asset. Considering the above factors can largely help us to identify and predict the combination of debt and equity.

KEY WORDS: Liquidity, the bid price gap between purchase and sale, capital structure, financial Leverage

INTRODUCTION

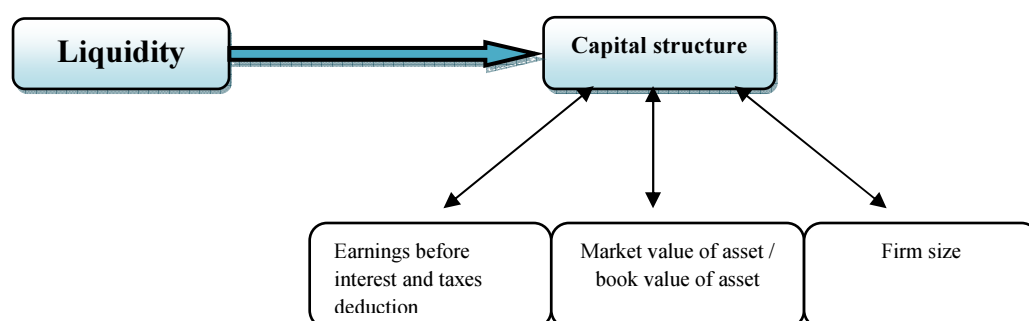
It is very clear that liquidity is a major concern for shareholders; this is because investors are concerned that if they want to sell their assets, is there a good market for selling them or not? (Yahyazadeh Farr and Khorramdin, 2008, 102) Liquidity (in addition to two criteria of return and risk rate) is one of the important factors in investing securities as compared with other investment opportunities. So that Amihud (2002) introduces liquidity power as an index like the risk index and states that the lower the liquidity of a share, the less attractive it will be for investors, unless the return is much for its holder. In the meantime, the company's capital structure looks for the establishment of a systematic framework and appropriate mechanisms for establishing a balanced relationship between the sources of funding for implementing their projects to maximize shareholders' wealth. The task of managers in decisions related to capital structure and the effects of this decision on the reduction of capital cost and maximization of the value of the company and shareholders' wealth has caused the factors affecting capital structure to be important. Studies on liquidity indicators began in the early 20th century. From the beginning it attracted the attention of financial markets. Asset is considered to be liquid that is dealt in a short time without causing loss. By liquidity, it just means the ease in asset purchase and sale and the speed of changing assets or investments to cash (Khorramdin and Yahyazadeh Farr, 2008, p. 102). The difference between the price of buying and selling shares can be noted as one of the factors related to the liquidity of the stock market that is presented as the most important factor influencing liquidity (Fang et al., 2009, 5). So that Chen et al (2007) believe that the degree of this gap largely determines the amount of liquidity. The price that is offered by a trader to buy the securities is called the offered purchase price and the price that is offered for the sale of securities is called the offered sale price of securities. The difference between these two offered prices is also called the offered price of selling and buying of securities. Liquidity reduces the cost of capital transactions and narrows the gap between buyers' and sellers' offered price. Despite this relationship, the researchers are unclear about the direction of the effect of liquidity and factors related to it on the capital structure of a company.

The purpose of this study is to investigate the relationship between liquidity and capital structure. Therefore, the price gap between supply and demand for stocks is studies as the best index of liquidity measurement liquidity and financial leverage is studied as an indicator of capital structure.

Theoretical Principles

The capital structure indicates the level of using debt and equity to finance assets and generally includes the left side of the balance sheet. The relationship between debt and capital in supplying a company's assets is called financial leverage that is used as an indicator of capital that is obtained by (total debt / market value of total assets) or (total debt / book value of total assets). To achieve an optimal capital structure, a balance between the two main sources of funding, i.e. the debt and equity should be created, so that the cost of capital can be minimized and shareholders' wealth can be maximized on a weighted average point. Liquidity is also one of the factors that can reduce the cost of equity and creates a relationship between liquidity and capital structure.

Figure 1



Analytical Model

The research model is derived from the research of Mark Lipson and Sandra Mortal (2009) and the necessary adjustments have been done.

$$\frac{D}{V} = a + b \log RESPRD_{it} + c DR_{it} + d \frac{V}{A} + e \frac{ET}{A} + f \ln(PRC) + g \frac{DP}{A} + k \frac{RD}{A} + j \ln(A)$$

$\frac{D}{V}$: Financial leverage, (indicator of capital structure), book value of debt / book value of assets

$\log RESPRD$: Logarithm of the difference between the sale and purchase price of stock

DR : Debt rate index

$\frac{V}{A}$: Market value of asset / book value of asset

$\frac{ET}{A}$: Earnings before interest and taxes deduction / book value of asset

PRC : The average price of shares during the year

$\frac{DP}{A}$: Depreciation cost / book value of assets

$\frac{RD}{A}$: Research and development cost / book value of assets

$\ln(A)$: Book value of assets that are used to control the firm size.

Research background

In general it can be claimed that most of the scientific research that is done is based on the pillars and the results of previous studies. In studies conducted on liquidity and its effects on the capital structure, the researchers showed that liquidity reduces transaction costs and most investors (with short-term investment horizon) prefer a very high liquid stock over a very low liquid stock due to low transaction cost. Lipson and Mortal (2009) examined the relationship between capital structure and stock liquidity in the NASDAQ stock market and proved the existence of a significant relationship between them and concluded that the cost

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of equity is reduced by increasing the liquidity of shares and companies prefer financing by stock. Chang et al. (2008) attempted to examine the relationship between corporate governance and market liquidity using the index of the characteristics of governance affecting financial and operational transparency. This index is based on the 24 standards of governance elected of the institute of institutional investors that are most relevant to the operational and financial transparency. They also used criteria like price gap, cost effectiveness and (potential) information-based transactions probability to assess liquidity and found that firms with better governance, narrower price gap, have less price impact from the trading turnover and reduction of potential information-based transactions probability. Frieder and Martell (2006) examined the interaction between stock liquidity and capital structure of listed companies in the New York Stock Exchange for the years 1988 to 1998; the criterion of stock liquidity in their research was the difference between the offered selling and purchasing price of the stock and is calculated by obtaining the mean of the daily difference of the stock for the years related to the period of investigation. In their study, they used financial leverage as the dependent variable and the difference between the offered selling and purchasing price (the criterion of the liquidity of shares), return on total assets, the logarithm of total assets, the ratio of market value to book value of equity, cash flow fluctuations and the costs of research and development were used as independent variables and the statistical method used for testing the research hypotheses was two-stage regression model. The results show that 27 percent of changes in financial leverage is explained by the changes in dependent variables; furthermore, one percent increase in the difference between the offered purchase and selling price of shares results in a three percent increase in financial leverage. The results of the hypotheses testing shows that the reduction in stock liquidity (difference increase), financial leverage increases. This issue is consistent with this theory that if financing through releasing equity is expensive, managers go for financing through debt. Douscure (2006) proposed a model for investigating the behavior of liquidity and volatility of stock price. In this model, investors predict the recent changes in the price for the changes of an asset with risk. When the change in asset is high, the risk premium is high and its current efficiency of asset is low, and the rate of return on risk-free assets is low and the market is faced with non-liquidity. Baker and Stein (2004) concluded that high liquidity in the company is very attractive for investors, so that the tendency of unreasonable demand for stock purchase will be a lot and this attraction and false confidence causes the investor to react less to the information stream that focuses on reducing the stock price and this has led to growth of stocks. This factor is escalated despite the restrictions on short selling and uninformed investors. Dennis and Strickland (2003) used the difference between the offered purchasing and selling price of shares as a measure of stock liquidity to related ownership structure during the stock analysis to liquidity. Although they concluded that after the analysis of the stock of the companies, their liquidity increases but the benefits of liquidity depends on the level of organizational ownership. Dennis and Strickland came to the conclusion that liquidity has a negative correlation with the level of institutional ownership.

Hosseini et al (2010) analyzed the relationship between corporate performance criteria and liquidity of the shares on the basis of two theory of agency and feedback and suggested that better performance will lead to higher liquidity. The better performance on the basis of the agency theory is due to the solutions that are used to align the interests of owner and manager. On the other hand, based on the feedback theory and in the absence of agency problems, better performance leads to demand by aware investors and stock liquidity increase. Again, this factor as a positive feedback will affect corporate performance. Fakhari and Noori Tabar Nedshli (2008) evaluated the liquidity and return on stock. In this study, measures of liquidity were included in the regression model after standardization and their impact on stock returns were measured with statistical methods. The study period is from March 2000 until the end of 2005. The results showed that there is a significant relationship between the ability of liquidity for each share and stock returns in companies listed in emerging stock markets. Namazi (2005) examined the impact of capital structure on profitability of listed companies in Tehran Stock Exchange in different resources. Their sample consists of 108 firms and research period is 1996 and 2000. The dependent variable is profitability ratio (ROA) and the independent variables is financial leverage (the ratio of debt to total assets). The results indicate that in general, there is a positive relationship between capital structure and profitability of companies listed in Tehran Stock Exchange, but the relationship is statistically weak. The relationship between capital structure and profitability depends on the industry type and determines the optimal capital structure in various industries. The relationship between capital structure and profitability depends on the definition of profitability. Salvati and Rasaeian (2004) examined the relationship between capital structure and liquidity of shares. In line with these objectives, 60 companies that provide information required for a 4-year period of the study (from 2001 to 2004) were selected from this population. The combination regression is used to test the research hypotheses. In this study, the raised hypotheses that there is a significant relationship between financial leverage as the dependent variable and liquidity of shares (the difference between the offered purchase and selling price of shares), firm size, the ratio of market value to book value of equity, net property of machinery and equipment and income before receivable loans' interest, taxes and depreciation as independent variables were examined. The results of the research indicate that more than 58% of changes in financial leverage is explained by the variables of liquidity of shares, firm size, and the ratio of market value to the book value of equity, net property of machinery and equipment and income before receivable loans' interest, and taxes and depreciation. There is no significant relationship between liquidity of firm's stock and capital structure. Research results showed that the significant and negative relationship between firm size and capital structure is in 99 percent confidence level. There is a significant positive correlation between the ratio of market value to book value of equity and capital structure in 99% confidence level. There is a significant positive correlation between net machinery and equipment and capital structure in 99% confidence level. There is no significant correlation between earnings before receivable loans' interest, taxes and depreciation (profitability) and capital structure in 95%. Ahmadpoor and Rasaeian (2004) examined the relationship between measures of risk and the difference between the offered price of purchasing and selling of stock; in this study, they selected a sample of 156 shares in the period from 2002 to 2004 to investigate the relationship between measures of market risk and accounting risk measures with the difference between the offered purchasing and selling price of shares on the Tehran Stock Exchange. Models that just included market risk measures or just the accounting risk measures explained about 51% of changes in the difference between the offered purchasing and selling price of shares. But a comprehensive model that included both market risk measures and the accounting risk measures explained more than 68% of changes in the difference between the offered purchasing and selling price of shares.

RESEARCH METHOD

The research method according to its objective is applied and its results can be useful for a wide range of users. In terms of its time dimension, this study is a retrospective study. In terms of data collection method, this research is descriptive and correlational and in terms of its procedure, it is a quantitative research that approaches quantitative data collection and analysis with an objective approach. The study includes two types of tests including descriptive: mean and standard deviation for comparing coefficient of variation to each other, and inferential statistics: multivariate regression analysis to examine the relationship or lack of relationship of variables with each other and the coefficient of determination for describing changes of variables to each other and to prove the hypothesis.

Research hypotheses

The main hypothesis: There is a significant relationship between stock liquidity and capital structure id companies listed in Tehran Stock Exchange.

The first sub-hypothesis: There is a significant relationship between capital structure and earnings before interest and tax deduction (EBIT).

The second sub-hypothesis: There is a significant relationship between capital structure and market value of asset/book value of asset (MV/BV).

The third sub-hypothesis: There is a significant relationship between capital structure and firm size.

Statistical population and sample

The statistical population of this research includes all the companies listed in Tehran Stock Exchange and the sample has been chosen using systematic elimination method and according to the following limitations:

1. It should not be banks, financial and insurance institution; because they have different financial disclosure and corporate structure.
2. It should not be holding.
3. The required information of the firm should be available.
4. Companies that have been active during the research period.
5. Companies that have found their way into stock before the study period.
6. All of the company's fiscal year end should be March; since in the beginning of each year, we will be faced with an increase in general price level.

Research variables calculation method

This research has 2 main variables:

1. Liquidity of the stocks of companies listed in Tehran Stock Exchange
2. The capital structure of companies listed in Tehran Stock Exchange

Stock liquidity calculation method

Liquidity ratio of each stock is calculated based on the price gap between demand and supply of shares as follows.

$$SPREAD_{it} = \frac{(AP - BP)}{(AP + BP)^2} * 100$$

$LogRESPRD$ = Logarithm of the difference between the offered purchasing and selling price of stock that price gap is calculated as follows:

t = Time period under investigation

i = the sample under investigation

SPREAD = The difference range between the purchasing and selling price of shares

¹ *AP* = The average sales price of shares
² *BP* = The average purchasing price of shares

Capital structure

Usually the capital structure is obtained through the following ratios: the ratio of debt to total assets, the ratio of equity to total assets, debt-to-equity ratio and the ratio of equity to liabilities (John and Eugene, 1975,25). In this study, financial leverage (debt's book value / book value of assets) is used as capital structure and indicates how much the company has used debt for financing (Sinai, 2007, 69)

Financial leverage =
$$\frac{\text{book value of total liabilities}}{\text{book value of total assets}}$$

Market value of asset / Book value of asset (MV/BV)

Market value of assets = liabilities' book value + market value of equity
To calculate the market value of equity, the market price of stock at the end of the fiscal period has been used and this value is calculated by multiplying the market value of stock in its number (Namazi and Heshmati, 2007, 149-147).

Firm size

Four criteria are used to measure the firm size and volume. These four criteria are: total sales, total sales log, the log of total assets and total assets; in this study we use the logarithm of total assets (It is obtained through book value of assets)

Earnings before interest and tax deduction / value of asset

The ratio of earnings before interest and taxes deduction over total assets is called profitability in the financial literature.

Data analysis

Data analysis includes two descriptive statistics (describing data) and inferential statistics (data analysis) sections, the results of which is presented in the following tables:

Table 1: descriptive data

Variables	numbers	Mean	Mode	SD	Skewness	Standard error of skewness coefficient	elongation	Standard error of elongation coefficient	Minimum	Maximum
LN_A Book value of asset (firm size)	1312	13/1725	13/0358	1/62189	0/660	0/068	0/591	0/135	9/78	19/52
V_A Market value of asset / book value of asset	1310	1/4851	1/1884	1/41411	4/734	0/068	37/830	0/135	0/00	19/69
ET_A Earnings before interest and tax deduction / book value of asset	1312	0/1411	0/0980	0/54779	31/369	0/068	1076/806	0/135	-0/38	19/01
SPREAD (Liquidity index)	1335	16/3570	8/7311	24/02706	2/378	0/067	8/476	0/134	-0/53/80	197/61
d_v The index of capital structure	1323	0/6681	0/972	0/27214	3/281	0/067	27/930	0/134	0/01	3/64

Table 2: The matrix of correlation coefficient

Variables	numbers	Mean	Mode	SD	Skewness	Standard error of skewness coefficient	elongation	Standard error of elongation coefficient	Minimum	Maximum
LN_A Book value of asset (firm size)	1312	13/1725	13/0358	1/62189	0/660	0/068	0/591	0/135	9/78	19/52
V_A Market value of asset / book value of asset	1310	1/4851	1/1884	1/41411	4/734	0/068	37/830	0/135	0/00	19/69
ET_A Earnings before interest and tax deduction / book value of asset	1312	0/1411	0/0980	0/54779	31/369	0/068	1076/806	0/135	-0/38	19/01
SPREAD (Liquidity index)	1335	16/3570	8/7311	24/02706	2/378	0/067	8/476	0/134	-0/53/80	197/61
d_v The index of capital structure	1323	0/6681	0/972	0/27214	3/281	0/067	27/930	0/134	0/01	3/64

Table 3: hypotheses testing using multivariate regression

Variables	numbers	Mean	Mode	SD	Skewness	Standard error of skewness coefficient	elongation	Standard error of elongation coefficient	Minimum	Maximum
LN_A Book value of asset (firm size)	1312	13/1725	13/0358	1/62189	0/660	0/068	0/591	0/135	9/78	19/52
V_A Market value of asset / book value of asset	1310	1/4851	1/1884	1/41411	4/734	0/068	37/830	0/135	0/00	19/69
ET_A Earnings before interest and tax deduction / book value of asset	1312	0/1411	0/0980	0/54779	31/369	0/068	1076/806	0/135	-0/38	19/01
SPREAD (Liquidity index)	1335	16/3570	8/7311	24/02706	2/378	0/067	8/476	0/134	-0/53/80	197/61
d_v The index of capital structure	1323	0/6681	0/972	0/27214	3/281	0/067	27/930	0/134	0/01	3/64

Table 4: the relationship and significance level of variables under question

Variables	numbers	Mean	Mode	SD	Skewness	Standard error of skewness coefficient	elongation	Standard error of elongation coefficient	Minimum	Maximum
LN_A Book value of asset (firm size)	1312	13/1725	13/0358	1/62189	0/660	0/068	0/591	0/135	9/78	19/52
V_A Market value of asset / book value of asset	1310	1/4851	1/1884	1/41411	4/734	0/068	37/830	0/135	0/00	19/69
ET_A Earnings before interest and tax deduction / book value of asset	1312	0/1411	0/0980	0/54779	31/369	0/068	1076/806	0/135	-0/38	19/01
SPREAD (Liquidity index)	1335	16/3570	8/7311	24/02706	2/378	0/067	8/476	0/134	-0/53/80	197/61
d_v The index of capital structure	1323	0/6681	0/972	0/27214	3/281	0/067	27/930	0/134	0/01	3/64

The main hypothesis testing

This hypothesis states that there is a significant relationship between stock liquidity and capital structure in companies listed in Tehran Stock Exchange. As can be seen in this table, by investigating the significance of coefficients, it can be found that there isn't a significant relationship between these two variables. (the hypothesis is rejected)

The first sub-hypothesis testing

In this hypothesis, the significance of the relationship between capital structure and earnings before interest and tax deduction (EBIT) is tested. According to the results of the table 4, it can be concluded that there is a significant relationship between capital structure and earnings before interest and tax deduction. (the hypothesis is confirmed)

The second sub-hypothesis testing

In this hypothesis, the significance of the relationship between capital structure and market value of asset/book value of asset (MV/BV) is tested. According to the results of the table 4, it can be concluded that there is a significant relationship between capital structure and market value of asset/book value of asset (MV/BV), which confirms the effect of market value of asset/book value of asset on capital structure.

The third sub-hypothesis testing

In this hypothesis, the significance of the relationship between capital structure and firm size is tested. According to the results of the table 4, it can be concluded that there is a significant and negative relationship between capital structure and firm size and smaller firms choose higher leverage.

Conclusion

Predicting financial leverage (capital structure) and its changes as an economic event has been of interest for investors, managers, financial analysts, researchers and creditors. The most important information resource for investors, creditors and other users is the liquidity and capital structure prediction proposed by companies. Given the importance of capital structure and liquidity disclosed by companies, the present study attempted to identify the factors affecting the precision of capital structure prediction. The results indicate that there is a significant relationship between the capital structure of profitability and market value of assets/bok value of assets and firm size. Considering the above factors can largely help us to identify and predict the composition of liabilities and equity.

REFERENCES

1. Ahmed Poor, A. and Rasaeian, Amir. (2006), The relationship between measures of risk and the difference between the purchasing and selling price of shares on the stock exchange, Tehran: A review of accounting and auditing, No. 46, 41-46

2. Hussein, Ali. Karami, Gh. (2010), Relationship between corporate performance and liquidity of the stock market, Stock Exchange Quarterly, No. 11, page 42-25

3. Rasaeian, A. (2010), the liquidity of the stock and its associated factors. CPA Journal, No. 10

4. Rasaeian, A. And Mehrani, S. (2009), The relationship between stock liquidity measures and annual returns of stocks in Tehran Stock Exchange. Journal of Accounting of University of Shiraz, the first issue, page 222

5. Salvati, Sh. and Rasaeian, Amir. (2007), Investigating the relationship between capital structure and liquidity in Iran. Economic Letter, Number 63, Pages 144-160

6. Fakhari, H. and Fallah Mohammadi, N. (2009), Investigating the effect of information disclosure on the liquidity of shares of companies listed in Tehran Stock Exchange. Accounting Research, Issue 4, Pages 148-163

7. Namazi, M. and Heshmati, M (2007), Investigating the effect of delay constructs and variables on capital structure of companies listed in Tehran Stock Exchange, Review of accounting and auditing, Number 49, Pages 147-149

8. Yahya Zadeh Farr, M. and Khoramdin, J. (2008), The role of liquidity and illiquidity risk factors in excess stock returns in the stock market. Tehran: A review of accounting and auditing, Number 55, Pages 102-108

9. Amihud, Y., Mendelson, H ,(2008) , Liquidity, the Value of the Firm, and Corporate Finance. **Journal of Financial Applied, Corporate Finance**47, pp:112-145

10. Baker ,M, and j. Stein , (2004), liquidity as a Sentiment Indicator,**Journal of Financial Markets** 7 , pp:271-299

11. Bevan , A and Jo Danbolt ,(2002), Capital Structure and its Determinants in the uk A Decompositional Analysis, **Applied Financial Economics** vol ,12 issue3, pages: 159-70

12. Chan, Kalok, Yue-Cheong Chan and Wai- Ming Fong.(2002).Free Float and Market Liquidity: Evidence from Hong Kong Governments Intervention, Hong Kong: Published of Department of Finance Hong Kong University of Science &technology,27,pp:179-97.availablefrom <http://home.ust.hk/kachan/research/HKliquidity.pdf>.

13. Chung Kee H, John Elder, and Jang-Chul Kim. Corporate Governance and Liquidity. **European Financial Management Association Journal** 2008

14. Dennis PJ, J Weston. Who’s informed? An analysis of stock ownership and informed trading 2001; working paper. <http://ssrn.com/>

15. Deuskar, P., (2006), Extrapolative Expectations: Implications for Volatility and Liquidity, AFA 2007 Chicago Meetings Paper

16. Fang , Noe and Tice, (2009), Stock market liquidity and firm value,**Journal of Financial Economics**, pages: 5-94

17. Fama , Eugena F . and Kenneth R . French, (2002), Testing Tradeoff and pecking order predictions about Dividends and Debt ,**Review of Financial Studies** 15, pages: 1-33

18. Frieder, and Martell .(2006). " On Capital Structure and the Liquidity of a Firm's Stock", www.ssrn.com
19. Giddy Ian H .,(2001), Capital Structure : How Much debt ,New York University, [www. Stenn . nyn . edu /igiddy / copyfin / ibmcf6.pdf](http://www.Stenn.nyn.edu/igiddy/copyfin/ibmcf6.pdf), pages: 16-20
20. Lipson Marc l . , Mortal, Sandra (2009), Liquidity and capital structure,**Journal of Financial Markets** **12** , pages: 611-644
21. Ross , Westerfield , Jaffe and Jordan, (2008) , Modern financial management , Mc-Graw.hill , pages: 358
22. Udomsirikul, Jumreornvong, and Jiraporn . (2010). " Liquidity and Capital Structure: The Case of Thailand". www.ssrn.com