The Evaluation of Relationship between Shares Liquidity and Capital Structure

Seyed Ali Lajevardi, Hassan Ghodrati

Accounting & Management Department, Kashan Branch, Islamic Azad University, Kashan, Iran

Abstract: The main goal of this paper is the Evaluation of relationship between shares liquidity and capital structure. We selected 60 corporations from Iranian corporations and gathered Data about these firms for 2006-2010 Financial years. We utilized Data panel Regression for statistical analysis and hypothesis tests. Our analysis showed that: 1. There is a direct relation between liquidities and book- value of liabilities ratio. 2. There is a reverse relationship between shares turn-over and liabilities ratios. 3. There is a reverse relationship between shares liquidity and liabilities ratios.

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1. Introduction

One of the most important financial mangers decisions on the corporation is determination of the combination shares and liabilities. This decision must make so that maximize wealth share holders.

On the classical view of capital structure, we can increase firm value. Modigliani & Miller articles (1958) is beginning of the capital structure modern views they said that: on the certain circumstances (such as: lack of perfect competition, lack of tax, lack of agency and distress cost …) firm value is independent from capital structure. They added tax advantage on 1963 for liabilities usage as a increasing firm value factor. Miller (1977) by adding personal revenue tax to his model showed that tax advantage is eliminated with personal revenue tax.

The ability of firm and management behavior description is increased with development of hierarchy and static parallel theories. The relationship between capital structure and various factors is analyzed after these improvements. Look at shares liquidity as an investment decision criteria is performed, because with liquidity shares increasing, the firm risk is decreasing. Capital structure is an influential factor on the firm risk. The researchers showed that there is a reverse relationship between shares liquidity and leverage ratios. In this research we investigated this relationship on Iran.

1.1. Literature review:

The relationship between capital structure and firm value has been the subject of considerable debate, both theoretically and in empirical research. Throughout the literature, debate has centered on whether there is an optimal capital structure for an individual firm or whether the proportion of debt usage is irrelevant to the individual firm's value. In their seminal article, Modigliani and Miller (1958 and 1963) demonstrate that, in a frictionless world, financial leverage is unrelated to firm value, but in a world with tax-deductible interest payments, firm value and capital structure are positively related. Miller (1977) added personal taxes to the analysis and demonstrated that optimal debt usage occurs on a macro-level, but it does not exist at the firm level. Interest deductibility at the firm level is offset at the investor level. Other researchers have added imperfections, such as bankruptcy costs (Baxter, 1967; Stiglitz, 1972; Kraus and Litzenberger, 1973; and Kim, 1978), agency costs (Jensen and Meckling, 1976), and gains from leverage-induced tax shields (DeAngelo and Masulis, 1980), to the analysis and have maintained that an optimal capital structure may exist. Empirical work by Bradley, Jarrell and Kim (1984), Long and Malitz (1985) and Titman and Wessells (1985) largely supports bankruptcy costs or agency costs as partial determinants of leverage and of optimal capital structure.

DeAngelo and Masulis (1980) demonstrated that with the presence of corporate tax shield substitutes for debt (e.g. depreciation, depletion, amortization, and investment tax credits), each firm will have "a unique interior optimum leverage decision with or without leverage related costs" (p.3). The DeAngelo-Masulis model implies that a firm's optimal capital structure will be industry related in part because of the evidence that tax rates vary across industry (Vanils, 1978; Siegfried, 1984; and Rosenberg, 1969). Masulis (1983) argues further that when firms which issue debt are moving toward the industry average from below, the market will react more positively than when the firm is moving away from the industry average.

The relationship between industry membership and capital structure has received considerable attention. In their review of the capital structure

literature, Harris and Raviv (1991) noted that it is generally accepted that firms in a given industry will have similar leverage ratios while leverage ratios vary across industries. Schwartz and Aronson (1967) documented a relationship between industry and capital structure in five industries. Harris and Raviv (1991) have summarized (see Table III, p. 334) findings of four studies [Bowen, Daly, and Huber (1982), Bradley, Jarrell, and Kim (1984), Long and Malitz (1985), and Kester (1986)] which investigated leverage ratios for selected industries. These studies all found that specific industries have a common leverage ratio which, over time, is relatively stable. Hamada (1972), using industry membership as a proxy for risk class, found that levered beta values within different industries varied more than unlevered beta values. He concluded that there was a relationship between the cost of equity and financial leverage. DeAngelo-Masulis (1980) and Masulis (1983) use the documentation of this industry effect as one argument for the presence of an industry-related optimal capital structure and imply that it is the tax code and tax rate differences across industries that cause the inter-industry similarities in leverage ratios.

The correlation of capital structure to industry membership and/or the DeAngelo-Masulis differential tax arguments have received empirical support in Schwartz and Aronson (1967), Scott and Martin (1975), Scott (1972), Bowen, Daley and Huber (1982), Cordes and Sheffrin (1983), and Ben-Horim, Hochman, and Palmon (1987). However, not all of the evidence is unanimous in its support. Boquist and Moore's (1984) findings did not support the tax shield hypothesis at the firm level; however, they did find weak evidence in support of the theory at the industry level. They, however, like other researchers, found that total leverage varies across industry groupings.

In addition to the tax shield hypothesis that explains the large body of empirical evidence relating industry membership and leverage, other arguments may relate industry membership to capital structure decisions. Lev (1974) compared operating leverage to industry membership and to systematic risk and found a positive relationship. Building on Lev's study, Mandelker and Rhee (1984) derived the relationship between beta and both operating leverage and financial leverage. They concluded that the "conjecture that firms engage in trade-offs between DOL and DFL seems to have gained strong empirical evidence in our study" (p.56).

Since industry, to a large degree, influences production processes and therefore operating leverage, and if there is a tradeoff in DOL and DFL as found by Mandelker and Rhee (1984), a firm's industry may have some influence on its capital structure decisions. Specifically, if firms attempt to keep combined leverage at a manageable level, and, if DOL is impacted by industry membership, then firms in an industry with a high DOL may carry less debt while firms in an industry with low DOL may carry more debt. In addition, earnings variability is influenced by DOL and DFL. Bradley, Jarrell and Kim (1984) find that the volatility of earnings is a strong inverse determinant of debt. To the extent that earnings volatility may be industry related, this may also affect the relationship between industry membership and capital structure decisions. Individual firms and industries can be characterized by their growth rates. Rapidly growing firms (and industries) have a surfeit of positive net present value projects while slow-growth firms may have an excess of cash. Jensen and Meckling (JM) (1976) suggest that a particular capital structure can result from using debt as a monitoring and controlling device for managers. Further developing the "free cash flow" argument, Jensen (1986) points out those slow-growth firms will have large amounts of excess cash that managers may decide to use forpersonal perquisites and other non-positive net present value projects. If the firm issues debt, then the manager will own an increasing percentage of the firm's stock. Furthermore, excess cash will be reduced, and the debt covenant and bondholders will act as monitoring and controlling agents over the manager's behavior. Following JM's and Jensen's arguments, low growth firms (and their industries) should demonstrate increasing debt levels in their capital structure. Since numerous studies have documented a relationship between industry and capital structure, investigation of this relationship may uncover determinants of capital structure. Firms in an industry will have similar proportions of individual assets and liabilities. The literature referenced above has investigated tax shield substitutes, tax rates, and operating leverage. Other similar balance sheet items that have been related to capital structure decisions are research and development (R&D), fixed assets, and advertising. From the above discussion, it is apparent that these many different firm characteristics (i.e., non-debt tax shields, R&D, advertising, individual products, fixed assets) are the parts that sum to a whole. That is, there may be many factors that influence an individual firm's capital structure decisions, and the literature that we have cited

relates many of these factors to industry membership. Rather than test each component for its relationship to capital structure, we test the whole (the firm as a member of an industry) for its relationship. As stated above, DeAngelo and Masulis (1980) developed a model that suggested a "unique interior optimum" capital structure for a firm. They stated that their model "predicts that firms will select a level of debt which is negatively related to the ... level of available tax shield substitutes for debt" (p. 3). In a later article, Masulis (1983) summarized [from DeAngelo and Masulis (1980)] that the optimum debt level would be:

> Where the expected marginal tax effect a* just equals the expected marginal cost of leverage b, so that a* is always positive. If a* >b, a firm could increase its value by increasing its debt; and, if a* < b, its value could be increased by decreasing debt... (p. 115).

Substantial prior research (as enumerated above) has documented similarities for tax rates within separate industries. Drawing on DeAngelo and Masulis (1980) and Masulis (1983), we let a* represent the industry's leverage ratio (i.e., industry tax rates and the expected marginal tax effect) and b represent the firm's leverage ratio (i.e., the marginal cost of leverage to the firm). We test the market's reaction to a firm's issuing debt as measured by its relation to the industry. Following Masulis (1983), if a* > b , then the firm can increase its value as it increases debt because it is moving towards the industry average. On the other hand, if a* < b, then decreasing debt would increase firm value. We hypothesize that the market reaction will be positive when issuing debt moves a firm towards the industry average and less positive when it moves a firm away from the industry average.

Jenson & Meckling (1976) evaluated theoretical reasons for capital structure selection base on agency theory. They developed static balance theory. They said that we can reach to optimum capital structure with balancing between liabilities advantages and liabilities agency costs. Allen (1991) studied capital structure of 48 Austrian firms. He accepted suitable liabilities and rejected presumption of static balance theory. Braian (2010) investigated the influence of financial flexibility on capital structure. He used American firms' data from 1971 to 2006. He showed when final flexibility value is surveyed, other influential variables on capital structure are loosed their importance. On the other words flexibility is the most influential on capital structure. He said; those firms which they have high flexibility final value, tend to save their liabilities capacity for next years. These results are same as De - Angelo & Withed (2010) founding's. They found that the firms which have high flexibilities final value, tended to increase equity than liabilities. Triantis & Andrea (2009) measured flexibility on their researches. They found that flexibility value is depended on external financial cost, firm tax rate, firm potential growth opportunities & return of investment. They showed also that disturbed firms must take and give loan same. Byoun (2007) found that small firms have smaller leverage ratio. He showed that small firm keeps their leverage ratios at down level until they maintain their flexibility. Sundder & Myers (1999) companioned the assumptions of static balance and modern theories. They selected 157 American firms and gathered their performance data for 1971-1989 years. Their research's result showed that modern theory is more reliable than classic theory. Adeji (2002) companioned modern & ecstatic theory by selection 608 English firms. He gathered data about these firms for 1994-2000 years and used periodic data for his analysis. He found that classic theory variables (such as advantage tax, expected growth, size & leas able assets) are important for new liabilities same as modern theory. If we use these theories together, they have powerful explanation capability. This capability related with expected growth and size. These variables have direct relation with liabilities. Caud et al. (2003) surveyed determinable factors of capital structure. They selected 106 Switzerland firm and used performance data for 1994-2000 years. They showed that both classic & modern theory have important role on capital structure Explanation. Drobetz & Fix (2003) showed that according to both theory firms with high investment chances utilize lower leverage. According to modern theory, reverse classic theory, profitable and high liquidity utilize lower leverage.

Chen & Hammers (2004) selected their sample from 7 countries including; Canada, Denmark, Germany, Italy, Switzerland, United king down and USA. They showed that tangible assets and size have direct relationship with leverage. These variables have reverse relationship with profit. Their founding was according to classic & modern theories.

Pour Heidari (2006) evaluated the relationship between industry, size, profitability and loan able assets with financial leverage. He founded a meaningful reverse relation between profitability and financial leverage. The relation between industries, loan able assets with financial leverage. Bagherzade (2004) selected 158 Iranian firms. He gathered data about 1999 to 2003 years. He founded a positive relation between profitability, tang able assets, size

and leverage ratio. His foundlings were according to classic theory.

2.1. Research Hypothesis:

The main hypothesis of this research was:

There is a reverse relation between shares liquidity and leverage ratios.

Other hypotheses based on main Hypothesis were:

1. There is a reverse relation between Amie Hood shares liquidity criteria and book-value leverage ratio.
2. There is a reverse relation between shares transaction criteria and book-value leverage ratio.
3. There is a reverse relation between adjusted liquidity share ratio and book – value leverage ratio.
4. There is a reverse relation between Amie Hood shares liquidity criteria and market – value leverage ratio.
5. There is a reverse relation between adjusted transition share and market – value leverage ratio.
6. There is a reverse relation between adjusted liquidity criteria and market – value of leverage ratio

2. Material and Methods

This research is a practical based on its goal. Analysis method is correlation descriptive method. The research design is Ex-pose facto.

a) Sample selection

Statistical population was 158 Iranian corporations that there was complete information about their performances. We selected 60 firms of these randomly.

Their performances information gathered for 2005 to 2010 years.

b) Research Model:

In this research we selected 2 liabilities ratios as dependant variables. These ratios were:

1. Total liabilities to total assets ratio
2. Firm market value to total liabilities

Two liquidity criteria and one in – liquidity criteria were selected as in – dependant variables.

These were as follows:

1) In – liquidity Amie – Hood criteria that computed as follows:

$ILQ_{it}=|R_{it}|\div vol_{it}$

That was shares return absolute to transaction volume for a period.

2) adjusted transaction criteria that were computed as follows:

$MT_{it}=Vol_{it}\div[N*Volatility]$

That was divided total shares volume to total shares number on a period.

3) Adjusted liquidity ratio divided by shares return absolute multiple shares volatility.

$MLR_{ij}=Vol_{ij}\div[|R_{i,t}|*Volatility_{i,t}]$

And volatility per share calculated as:

$$Volatility=\sqrt{\frac{1}{2}*\sum_{k=1}^{3}\frac{(EPS_{t-k}-EPS_{t-k-1}}{|EPS_{t-k-1}|}}$$

R or return on share was share return divided by share price.

The variables that affected on capital structure were:

NDTS: Depreciation to total assets ratio

SIZE: firm size that was sale logarithm

Sale: sales revenue per year

TANG: tang able assets or fixed assets to total assets

GROWTH: was growth opportunities ratio that was market value to book value ratio

3. Results

We processed data selected with SPSS software and in this section in the first described sample and variables and then explained analytical founding.

1.3. Distribution founding:

The book-value liabilities ratio average was 0.673, It means that more than 67 percent of firms assets was related-with liabilities. The maximum of this ratio was 1.9 and the minimum of liabilities ratio was 0.21. The market-value liabilities ratio average was 0.53. The maximum of this ratio was 0.97. Amie-Hood ratio average was 1 percent. The maximum for this ratio was 3.7 percent.

The adjusted liquidity ratio average was 1.5 percent for our sample. Fixed assets average was 25 percent of total assets and its maximum was 88 percent of total assets. Size firm average (sales logarithm) was 5.68 that related to 478 billion Rails, Maximum of sales revenue was 83,176 billion Rails.

Profitability ratio average was 21 percents. That means a profit before tax was 21 percents of total assets. Tax coverage ratio related to defecation was 2 percents averagely. The maximum of this ratio was 9 percents.

Growth opportunities ratio average was 2.85 percents and the maximum of this ratio was 67 percents.

2.3. Founding Analysis:

We selected multi-variables linear regression: we use Data – Panel Regression because of variables number and sample size. In the first we evaluated pre – assumptions of multi-variables linear regression. The results of this evaluation were summarized on table 1.

Table 1: pre – assumptions of multi-variables linear regression

Test type	Fisher	Watson	Ramsey	Pagan	Cameron	R^2
Test statistic	2797	2.2268	0.8791	0.0041	0.3452	0.9977

Pre – assumptions of multivariable linear regression were tested. Foundlings of these tests were as follows: Normality of reminders: The significance level of Carmon van miss was 0.3452 and more than 5 percent (test level) then distribution of reminders is normal. Homogeneous of variances: significance level of pagan test was 0.0041 that less than 5 percent and our variances were not homogeneous. We used Data – panel regression instead of common regression. Durbin Watson test statistic was 2.2268 then Ho hypothesis or auto – correlations of dependant variables was rejected.

The significance level of Ramsey test was 0.8791. It was more than 5 percent then the model must not adjust.The determination coefficient or R^2 was 0.997728 that it was near to 1 or 100 percent. Then our estimated regression was explained more than 99 percents of variables variations. We used Chavez-test was summarized on table 2:

Table 2: Chavez-test summarize

Test type	Test statistic Distribution	Test statistic	Degree of freedom	P-value
Chavez	Fisher	5.716072	59, 414	0.00000
Housman	Chi-square	67.788676	6	0.00000

Chavez –Test statistic was 5.71 that were meaningful at 5 percent level. Then we used Housman test for use of data panel with constant influences. Significant level (P- value) of this test was less than 5 percent. We analyzed the relationship between main variable (model variables) with data-panel linear regression estimation. Founding of this estimation was explained on 1-6 relations.

1) Relation between in-liquidity & Book-value leverage ratio.

2) We used data-panel multi-variable linear Regression for estimation of this relation. We summarized estimated model on table 3.

Table 3: Relation between in liquidity and book-value leverage ratio

Parameters	Significance level	T-Test statistic	Coefficient
Constant	0.0000	82.67836	0.491552
In Liquidity criteria	0.0082	2.658333	0. 000123
Tang able assets	0.8718	0. 161494	0.004587
Profitability	0.0000	-364.9731	-0.132696
Size	0.0000	29.76645	0.029294
Deforestation	0. 0002	3.790841	1.072902
Growth opportunity ratio	0.0000	22.83940	0.004353

The coefficient of in-liquidity variable on the table 3 was positive and meaningful at 5 percent level, then relation between variables was accepted. The signification assets were meaningful. Signs of coefficient and table showed that relation between liabilities ratio and profitability was reverse and for other variables was direct.

Relation between shares liquidity & Book-value leverage Ratio: We used data-panel multi-variable linear Regression for estimation of this relation. Estimation founding's summarized as table 4.

Table 4: Relation between liquidity and Market leverage ratio

Parameters	Significance level	T-Test statistic	Coefficient
Constant	0.0000	101.4314	0.498335
In Liquidity criteria	0.0198	-2.339098	-0.352650
Tang able assets	0.8879	0.141105	0.003872
Profitability	0.0000	-227.8719	-0.131763
Size	0.0000	33.85623	0.028457
Deforestation	0. 0001	3.978951	1.088391
Growth Opportunity ratio	0.0000	34.13720	0.003991

The coefficient of liquidity variable on the table 4 was negative and its significance level was less than 5 percent so its relation was meaningful. Except of tangible assets other variables relations were meaningful. Except of profitability other variables had direct relation with leverage ratio.

3) Relation between liquidity shared & Book-value liabilities ratio: We used data –panel multi-variables linear regression for estimation of this relation. Estimation founding was summarized as table 5.

Table 5: Relation between liquidity and Book-value liabilities ratio

Parameters	Significance level	T-Test statistic	Coefficient
Constant	0.0000	63.55363	0.492179
In Liquidity criteria	0.6375	-0.471573	-0.004258
Tang able assets	0.8791	0.152224	0.004292
Profitability	0.0000	-241.1163	-0.132575
Size	0.0000	22.72926	0.029638
Deforestation	0. 0001	3.831291	1.076971
Growth opportunity ratio	0.0000	16.20385	0.004074

The coefficient of liquidity variable on the table 5 was negative but its significance level was more variables than 5 percent. So the relation between was rejected. Except liquidity and tangible assets relations of other variables with liabilities ratio was

meaningful. Except of profitability other variables relation were direct.

4) Relation between liquidity share & market leverage ratio:

We used data-panel multi- variables linear regression for estimation of this relation. Estimation founding was summarized on the table (6).

Table 6: Relation between In-liquidity and Market leverage ratio

Parameters	Significance level	T-Test statistic	Coefficient
Constant	0.8067	-0.244789	-0.048604
In Liquidity criteria	0.0080	2.664543	0.000204
Tang able assets	0.7117	0.369879	0.042393
Profitability	0. 0004	-3.586855	-0.151859
Size	0.0017	3.158533	0.108469
Deforestation	0.3559	0.924214	1.179897
Growth opportunity ratio	0.0000	8.369423	0.015496

The coefficient of In-liquidity was positive and its significance – level was less than 5 percent. So the variables relation was accepted. Except of tang able assets and depreciation other variables relation were meaningful at 5 percent. The profitability relation with market-leverage ratio was reverse and for others was direct. 5) Relation between shares liquidity and market leverage ratio:

We used data-panel multi-variables linear Regression for estimation of this relation. Estimation founding was summarized on table 7:

Table 7: Relation between liquidity and Market leverage ratio

Parameters	Significance level	T-Test statistic	Coefficient
Constant	0.0060	-2.763670	-0.446823
In Liquidity criteria	0.0803	-1.753414	-2.941374
Tang able assets	0.5656	0.574946	0.102549
Profitability	0.0000	-5.618706	-0.226848
Size	0.0000	6.255875	0.174515
Deforestation	0.8602	0.176192	0.295736
Growth opportunity ratio	0.0000	4.136784	0.000903

The liquidity coefficient is negative and its significance level was less than 10 percent. Then at 90 percent the relation between variables was accepted. 6) Relation between validity shares & liquidity:

We used data-panel multi-variables linear-regression for estimation of this relation. Estimation founding was summarized on table 8.

Table 8: Relation between liquidity and validity

Parameters	Significance	T-Test statistic	Coefficient
Constant	0.0095	-2.606739	-0.442089
In Liquidity criteria	0.7853	-0.272597	-0.004158
Tang able assets	0.6795	0.413407	0.076227
Profitability	0.0000	-5.673657	-0.226651
Size	0.0000	5.897783	0.173579
Deforestation	0.7796	0.280003	0.485657
Growth opportunity rati	0. 0001	4.037142	0.000919

The liquidity coefficient was negative. Its significance level was 0.7853 and more than 5 percent so the relation was rejected. Except tang able assets and deforestation the other variables relation were meaningful.

4. Discussions

We selected 60 firms among 159 Iranian corporations. In this research was utilized data – panel multi- variable linear- regression for relation evaluation – In the first we tested pre – assumptions of multi-variable regression and then we estimated variables relations. Test of the first hypothesis showed that. There is a reverse relation between liquidity (validity) shares and book-value liabilities ratio. Test of the third hypotheses showed that:

There is a reverse relation between shares liquidity (adjusted liquidity criteria) and capital structure.

Test of the fourth hypothesis showed that: there is a direct meaningful relation between in – liquidity and capital structure.

Test of the fifth hypothesis relation between liquidity (adjusted shares validity) and market – value leverage ratio (capital structure).

Test of the sixth hypothesis showed that: there is a week reverse relation between shares liquidity (adjusted criteria) and capital structure. This relation is not meaningful at 5 percent.

We prose that other criteria and other sample or community will test.

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Corresponding Author:

Seyyed Ali Lajevardi

Accounting & Management Department, Kashan Branch, Islamic Azad University, Kashan, Iran

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