RESEARCH PAPER

Investigation into the Effect of Stock Liquidity on Excess Financial Leverage Emphasizing the Moderating Role of Institutional Shareholders

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Abstract

The present study seeks to influence the impact of stock liquidity on the excess financial leverage emphasizing the moderating role of institutional shareholders. The scope of the study includes the firms listed in the Tehran Securities Exchange over 2012-2018, among which 202 firms were selected through systematic elimination and data was analyzed using a regression model. The present study is considered among applied research and is a correlation study. Desk research has been used to collect information and data while financial statements, explanatory notes, and the stock exchange monthly have been used to collect research data. Variance heterogeneity pre-tests, the F-Limer test, the Hausman test, and the Jarque-Bra test were used first to analyze data, and a multiple regression test was then used to confirm or reject the research hypothesis (Eviews software). Results indicated that stock liquidity has a significant influence on surplus financial leverage, while institutional ownership influenced the relationship between stock liquidity and surplus financial leverage significantly.

Introduction

An asset counts as liquidity if it can be quickly converted into cash. The liquidity of a firm's assets is determined by its real assets in the market if its stock liquidity can be determined in financial markets (Ahmadpour & Baghbani, 2015). The managers of firms with less liquid assets have difficulties turning these assets into other assets. The low liquidity of these assets reduces the agency costs for investors. Lower agency costs for shareholders equals higher dividends or capital gains. Besides, fewer substations and, consequently, less investment along with lower agency costs could be the result of the lower information asymmetry between managers and people working inside the company and the external investors (Xu-Shen, 2014). Portfolio selection involves the allocation of capital among many securities so that the investor seeks the most profitable return while carrying the least risk. Investors in the stock market always make their decisions to choose a portfolio for the future, precisely because of the uncertainty of future markets, it is not easy to predict the realized value of each stock (Dehghan Dehnavi et al., 2020).

On the other hand, a capital structure that increases the firm value or minimizes total capital costs is the optimal structure for the firm. Equity costs are reduced when stocks are highly

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liquid, and firms with highly liquid stocks are more inclined to have lower financial leverage and prefer to finance themselves through stocks. The investors of firms with low stock liquidity expect higher returns since those investing in stocks expect returns because of both the risk of investing in stocks and the exchange costs associated with exchanging stocks, which increases the costs of capital. Financing through liabilities is more desirable for the firm under such circumstances. Thus, lower stock liquidity is expected to result in a higher use of liabilities (Liu & Tian, 2012).

Besides, firm governance reduces agency issues between managers and shareholders by improving the procedure that increases supervision and control over management. This results in a reduced amount of liabilities which is a regulating tool, and the liabilities of the firm thus drop. There are two contradicting theories regarding the relationship between capital structure and firm governance mechanisms. The first hypothesis suggests that increasing the leverage in firms with strong firm governance structures is a positive signal for lenders regarding the quality of the institution, which increases the leverage level. The alternative theory is that leverage can be used as an effective firm governance mechanism to regulate the managers and force them to refrain from wasting the institution's current cash and direct it towards projects with negative current net value. Therefore, higher leverage can reduce the need for a strong firm governance structure (Hassas Yeaneh et al., 2015).

The impact of stock liquidity on corporate governance has been the interest of literature for decades, but few studies directly test the impact of stock liquidity on Excess Financial Leverage policy. Stock liquidity may help to improve the firms' leverage decisions by reducing the controlling shareholders and Institutional Shareholders' incentives to use leverage excessively (Faccio et al., 2010, Liu and Tian, 2012). The research question is interesting as the agency conflicts between controlling shareholders and Institutional Shareholders are common in the Tehran Securities Exchange.

Stock liquidity may reduce the controlling shareholders' and Institutional Shareholders' incentives to use excess leverage by alleviating information asymmetry or amplifying the block holders' threats to exit. Firstly, the increase in stock liquidity encourages the trading of informed investors and therefore increases the price informativeness. Such a decrease in information asymmetry helps to reduce excessive leverage, as the controlling shareholders who use leverage excessively become more easily detected. Secondly, higher stock liquidity facilitates the block holders to liquidate their investment, which strengthens their exit threats for the controlling shareholders and Institutional Shareholders.

We examine the impact of stock liquidity on excess leverage in the setting of the Iran Capital market, a typical market where the protection of minority shareholders is weak.

Financing projects, economic firms, and capital structure have become among the main concerns of investors and managers over the recent years, and studying the factors affecting them is of great importance, so the present study seeks to answer the substantial question of whether institutional ownership influences the relationship between surplus financial leverage and stock liquidity.

Literature Review

Theoretical Literature

One of the critical factors in deciding to invest in financial markets is the liquidity of assets. This concept can be defined in various markets; in this regard, this research focuses on the stock market, specifically on the Tehran Stock Exchange. In a recent study, Quah et al. examined the association between stock liquidity and investment efficiency for companies with financial constraints and information asymmetry problems. They conclude that the effect of higher stock liquidity on lowering under-investment or over-investment is more pronounced for such

companies. Liquidity is a qualitative concept that means the ability to absorb buy and sell orders. Conducting studies on stock liquidity from a microstructural perspective is essential for improving financial markets' performance and stability. Many researchers have tried to quantify this concept in recent years and introduced several criteria for measuring it. However, liquidity is a multi-dimensional concept that cannot be measured by a single criterion (Doulabi et al, 2020).

In a general classification, the theories on capital structure are divided into two groups: modern and traditional. Traditional theories include net operating Income while modern theories include Static Trade-Off, Dynamic Trade-off, Pecking order Theory, Debt Capacity, Adverse Selection, Agency Costs, and Market Timing theories. According to the equilibrium theory, the financial structure is estimated by the equilibrium between the costs and benefits resulting from liabilities, and the original version of this theory has developed around Modigliani and Miller's (1963) theorem (ShahAlizadeh & Moradzadeh, 2020). Myers & Majluf (1984) reason that financing follows some hierarchy so that new investments are financed using domestic resources in the first place, followed by liabilities and stocks, respectively. Surplus financial leverage is the excess leverage over the desirable and optimal firm leverage. Leverage temporarily deviates from its optimal level due to random shocks and the fact that firms do not resolve the excess or deviated leverage resulting from transaction costs immediately (Caskey et al., 2012).

Stock liquidity can reduce the shareholders' incentives to use extra leverage by reducing information asymmetry. Increased stock liquidity increases the business awareness of investors in the first place and leads to increased information on stock prices; so reduced information asymmetry helps reduce surplus financial leverage since the control investor shareholders who use leverage too much are identified more easily (Jiang et al., 2017). Secondly, higher stock liquidity facilitates the liquidation of the control shareholders' stocks which reinforces the outflow of control shareholders using excess leverage (Zilin et al., 2019).

Williamson and Oliver (1988) argue that more liquid or transferable assets are considered better collaterals and must be financed by liabilities most of the time since banks and public borrowing markets ask for lower costs to finance these assets. For instance, the lower discounts on liquid asset sales facilitate cashing on the assets when needed for banks. Liquid assets are similarly considered better support for bondholders. Thus, higher liquidity increases financial leverage. Morellec & Erwan (2001) suggest that the costs of selling liquid assets are low while their liquidation value is high, so higher asset liquidity reduces uncollateralized liability value. This is why the costs of managers to attract optimal resources drop and the value of collateralized liability increases. Under normal circumstances, managers consider a lower borrowing capacity from non-collateral liquid assets to increase operational flexibility. The mentioned theoretical literature leads to the formation of the first research hypothesis.

On the other hand, the emergence of institutional investors as the owners of firms is one of the effective firm governance mechanisms with increasing significance. This group of investors has a substantial influence considering they own a significant part of the firm stocks, and they can influence firm procedures such as financial policies and procedures (Gillan & Starks, 2003).

The agency theory suggests that managers can make financial policy decisions that are in the interest of themselves and the shareholders. A significant relationship is expected to exist between institutional ownership and the decisions regarding firms' financial structure considering that the presence of institutional investors might result in a change in firm behaviors (including financial policies) due to their ownership and supervision over the manager. Two opposing hypotheses explain this relationship. The "active supervision hypothesis" indicates that institutions probably manage their capital actively because of the volume of the invested wealth. According to this hypothesis, active supervision of institutional investors prevents firm managers from making decisions that would threaten firm flexibility. In contrast, the "personal

interest hypothesis" argues that large institutional investors might be less inclined to encourage managers towards higher flexibility. In other words, the concentration of institutional ownership in the hands of a few numbers of investors reduces firms' financial flexibility (Kim, 1993), according to which the second research hypothesis was formulated.

A Review of the History of Research

Kardan et al. (2020) demonstrated in their study titled "Stock Liquidity" that online transactions have a positive and significant impact on the number and volume of stock transactions and have thus increased market liquidity. Online transactions are also revealed to reduce abnormal stock returns.

Shahalizadeh & Moradzadeh (2020) discovered a positive relationship between firm structure and tangibility and a significant and negative relationship between firm structure and depreciation tax shields as well as the firm structure and financial health in their study entitled "The influence of depreciation tax shields, financial health, and tangibility of financial firm structure".

Zilin et al. (2019) concluded in the study entitled "Stock Liquidity and Surplus Leverage" that higher stock liquidity reduced the excess leverage of firms significantly by reducing information asymmetry and increasing the probability of block shareholders.

Zerik et al. (2018) studied the influence of risky sensitive information on stock liquidity indices and discovered that extreme risk tone and uncertainty in annual reports and information reduce liquidity.

Chiu et al. (2018) investigated the emotional inclination of investors to liquidity indices including market depth, relative price gap, and net buying pressure, and discovered that investors' emotional inclination had an asymmetrical influence on liquidity indices and the trading behavior of shareholders.

Wruck & Wu (2017) examined the relationship between stock incentives, information disclosure quality, and stock liquidity risk, and discovered a negative relationship between CEO options and future management disclosure policy quality. Besides, information disclosure quality is an important channel through which CEO options influence stock liquidity risk.

Ibrahimabadi et al. (2017) investigated the relationship between ownership structure and financial leverage in their study and demonstrated that managerial and institutional ownership of stocks significantly influences financial leverage which is also true in the case of companies with low levels of managerial ownership.

Zied Ftiti et al. (2017) examined the influence of confidential information on stock liquidity risk and liquidity and demonstrated that it increased stock liquidity risk. Other results indicated that confidential information plays a significant part in creating stock liquidity.

Mustapha & Chyi (2016) studied the factors determining the relationship between cash flow and leverage ratio and reported no significant relationship between them.

Udomsirikul et al. (2016) investigated the relationship between capital structure and stock liquidity and figured out that firms with less liquid stocks experience fewer capital costs and are more encouraged to use stock issuance rather than liabilities in their capital structure.

Research Methodology

Population and Sample

The present study is considered applied research and is a correlation study in terms of method and a descriptive study in nature. Desk research has been used to collect information and data while financial statements, explanatory notes, and the stock exchange monthly have been used to collect research data. Variance heterogeneity pre-tests, the F-Limer test, the Hausman test, and the Jark-Bra test were used first to analyze data, and multiple regression test was then used

to confirm or reject the research hypothesis using the Eviews software. The statistical population includes the firms listed in the Tehran Security Exchange over 2012-2018, which includes 532 firms. The statistical sample was selected from the statistical population through systematic elimination using the following inclusion criteria:
- The firms must have been listed in the Stocks Exchange before April 2012 and must not have exited the list before March 2019.
- The firms must not have changed their financial year during the research and their financial years must end on March 19th to facilitate comparability.
- The firms must not be among investment and financial intermediation companies.
    2020 firms were selected accordingly as the research sample and a total of 1414 data-years were collected for each research variable to test the statistical hypotheses.

Research Hypotheses
    Research hypotheses are as follows based on the presented theoretical framework:
    First research hypothesis: Stock liquidity influences excess leverage
    Second research hypothesis: Institutional ownership influences the relationship between stock liquidity and financial leverage.

Research Variable Measurement and Model
    In the present study, Model 1 is estimated to test the first hypothesis:

$$Exc\_Lev_{i,t} = \alpha + \beta_1 Liq_{i,t} + \beta_2 ROA_{i,t} + \beta_3 Size_{i,t} + \beta_4 OCF_{i,t} + \beta_5 Growth_{i,t} + \beta_6 Independence_{i,t} + \beta_7 B.Size_{i,t} + \varepsilon_{i,t}$$

    Model 2 is also estimated to test the second hypothesis:

$$Exc\_Lev_{i,t} = \alpha + \beta_1 Liq_{i,t} + \beta_2 Inst_{i,t} + \beta_3 Liq \times Inst_{i,t} + \beta_4 ROA_{i,t} + \beta_5 Size_{i,t} + \beta_6 OCF_{i,t} + \beta_7 Growth_{i,t}$$
$$+ \beta_8 Independence_{i,t} + \beta_9 B.Size_{i,t} + \varepsilon_{i,t}$$

where Exc_Lev$_{i,t}$ represents the excess leverage of firm i at year t, calculated as a firm's leverage minus the industry median leverage (Liu and Tian, 2012).
    In all the analyses, we use two measures for stock liquidity: Amihud's liquidity ratio (Amihud) and the negative log value of the annual relative effective spread (LIQ). We define the measure following Amihud (2002):

$$Amihud_{i,t} = -\frac{1}{D} \sum_{d=1}^{D_i} \log\left(\frac{|R_{i,t,d}|}{Volume_{i,t,d}}\right)$$

    we include the following control variables:
(1) return on assets (*ROA*), operating income scaled by total assets;
(2) firm size (*Size*), the natural logarithm of total assets;
(3) operating cash flow (*OCF*), operating cash flow scaled by total assets;
(4) sales growth (*Sales Growth*), annual revenue growth from year *t-1* to year *t*;
(5) board independence (*Independence*), the proportion of independent directors on the board;
and (6) board size (*Board Size*), the natural logarithm of the number of board directors.

Data Analysis

Descriptive Statistics
    Before testing the hypotheses, Table 1 demonstrates a summary of the variables:

Table 1. Descriptive statistics of research hypotheses

Industry	Mean	Median	Max	Min	Standard Dev.	Skewness	Kurtosis
Excess Leverage	-0.0022	0.0021	0.5490	-0.4572	0.1610	0.0729	3.1169
Liquidity	1.0888	0.0699	78.606	0.0001	5.4309	9.1630	102.29
Institutional Ownership	0.6759	0.7100	0.9900	0.0559	0.1850	-0.8687	3.5052
Return on Assets	0.0985	0.0876	0.7051	-1.0632	0.1541	-0.8315	11.347
Firm Size	13.856	13.746	19.722	8.8997	1.5453	0.6366	4.2318
Operational Cash Flow	0.1166	0.1010	1.0488	-0.4600	0.1350	0.5809	5.6524
Firm Growth	0.2291	0.1491	26.921	-0.9722	0.8514	22.479	3.44
Independence	0.6567	0.6000	1.0000	0.0000	0.1939	-0.2557	2.8557
Board Size	1.6141	1.6094	1.9459	1.0986	0.0608	1.3941	35.303

According to Table 1, the average of the financial leverage variable which is a good indicator of data centrality and indicates the equilibrium point and the center of gravity of data distribution is -0.002 which shows that half of the data are smaller than this value and the other half are larger. Besides, the average excess financial leverage was 0.002.

Dispersion indices are criteria to determine the amount of dispersion of data from one another and their dispersion from the average. Standard deviation is among the most important dispersion indices which had a value of 0.16 and fit the variable of excess financial leverage. Skewness refers to the asymmetry of the frequency curve, which had a positive value close to zero for the variable of specific return fluctuations, which indicates a normal data distribution and an insignificant skewness to the right. The dispersion index of elongation demonstrates the protrusion or inclination of the curve compared to the normal curve. All variables had positive elongations in the present study.

Comprehensive Statistics

Testing Research Hypotheses

Table 2 demonstrates the results of testing the first research hypothesis.

Table 2. Summary of the results of the first research hypothesis model

Descriptive Variables Names	Variable Symbols	Coefficients	T-Value	Statistical Probability	VIF	Test Result
Intercept	C	0.111737	1.330368	0.1836	---	---
Liquidity	Liq	-0.000971	-2.187115	0.0289	1.17253	Accept/Negative
Return on Assets	ROA	-0.431321	-39.30372	0.0000	1.11980	Accept/Negative
Firm Size	Size	-0.003162	-1.986980	0.0472	1.61451	Accept/Negative
Operational Cash Flow	OCF	-0.017034	-2.168592	0.0303	1.01287	Accept/Negative
Firm Growth	Growth	0.002090	3.115067	0.0019	1.58036	Accept/Positive
Independence	Indep	-0.027993	2.715590	0.0067	1.36158	Accept/Negative
Board Size	B.Size	-0.004155	-0.081475	0.9351	1.21892	Reject
-------	R^2:0.7273	R^2-Adj: 0.6802	D-W: 1.7516	F-test Statistic's Prob.: 0.0000		

According to Table 2, the t-statistic probability is lower than 5% for the fixed coefficient and the coefficient of stock liquidity, firm size, operational cash flow ratio, firm growth, and board independence in relation to excess leverage, so these variables have a significant relationship with financial leverage. The coefficient of the relationship between stock liquidity and excess leverage is significant and negative, and the t-statistic probability for the coefficient of the relationship between board size and excess leverage is over 5%. This means this

relationship is not statistically significant. The variable of board size is insignificant in the model with a confidence of 95%. The adjusted coefficient of determination demonstrates that independent variables can explain 68% of the changes in the dependent variable. The F-statistic probability indicates that the whole model is statistically significant. The Durbin-Watson statistic is 1.75 which confirms the independence of model residuals. Since the variable of stock liquidity turned out to have a significant and negative influence on financial leverage, the H0 hypothesis is rejected and stock liquidity is revealed to influence excess leverage significantly as indicated in the first research hypothesis.

The Second Research Hypothesis
Table 3 demonstrates the results of the second research hypothesis:

Table 3. Summary of the results of the second research hypothesis model

Descriptive Variables Names	Variable Symbols	Coefficients	T-Value	Statistical Probability	VIF	Test Result
Intercept	C	0.133611	1.502240	0.1333	---	---
Liquidity	Liq	-0.004227	-4.113560	0.0000	1.17253	Accept/Negative
Institutional ownership	Inst	0.001114	0.163922	0.8698	1.41302	Reject
Liquidity* Institutional ownership	Liq*Inst	-0.005314	-3.689772	0.0002	1.09885	Accept/Negative
Return on Assets	ROA	-0.432744	-40.36511	0.0000	1.11980	Accept/Negative
Firm Size	Size	-0.002993	-1.993980	0.0464	1.61451	Accept/Negative
Operational Cash Flow	OCF	-0.015668	-2.115278	0.0346	1.01287	Accept/Negative
Firm Growth	Growth	0.002034	3.297437	0.0010	1.58036	Accept/Positive
Independence	Indep	-0.026833	-2.902539	0.0038	1.36158	Accept/Negative
Board Size	B.Size	-0.020022	-0.371124	0.7106	1.21892	Reject
-------	R^2:0.731260	R^2-Adj: 0.6843	D-W: 1.741256	F-test Statistic's Prob.: 0.0000		

According to Table 3, the t-statistic probability is smaller than 5% for the relationship between excess leverage and the variables of stock liquidity, institutional ownership in interaction with stock liquidity, return on assets, firm size, operational cash flow ratio, firm growth, and board independence, so these relationships are statistically significant. The coefficient estimated by the software for the relationship between institutional ownership in interaction with stock liquidity and excess leverage is significant and negative. Besides, the t statistic probability is higher than 5% for the relationship between excess leverage and the variables of board size and institutional ownership. This means that these relationships are not significant and the mentioned variables are insignificant in the model with a confidence of 95%. The adjusted coefficient of determination indicates that the independent variables explain 68% of the changes in the dependent variable. The F-statistic probability indicates that the whole model is statistically significant. The Durbin-Watson statistic is 1.75 which confirms the independence of model residuals. Since the variable of stock liquidity turned out to have a significant and negative influence on financial leverage, the H0 hypothesis is rejected and institutional ownership is revealed to influence excess leverage significantly and negatively as indicated in the first research hypothesis.

Conclusion

The present study sought to investigate the influence of stock liquidity on excess financial

leverage emphasizing the moderating role of institutional owners. Eventually, the results of testing the first hypothesis indicated that stock liquidity impacts excess leverage, and the stock liquidity's negative coefficient of determination indicates a significant and inverse relationship between stock liquidity and excess leverage. Therefore, the costs of equity reduce when stocks are highly liquid as expected, and the firms with highly liquid stocks tend to have lower financial leverage. Stock liquidity helps improve firms' leverage decisions by reducing the incentives of controlling shareholders to use leverage excessively. Stock liquidity is argued to reduce the incentives of controlling shareholders to use leverage excessively by reducing information asymmetry. In this regard, Emamalizadeh & Mohammadi (2019) demonstrated that liquidity influences financial leverage significantly; Udomsirikul et al. (20110 showed a significant relationship between capital structure and stock liquidity; and Zilin et al. (2019) argued that higher stock liquidity reduces firm excess leverage significantly through reducing information asymmetry and increasing the probability of block shareholders to exert their investment out of the firm, all of which are consistent with the results of the present study. The results of the second hypothesis of the research are the same as the results of the research of Zied et al. and Ibrahimabadi et al. Besides, the results of testing the second hypothesis indicated that institutional ownership has a significant impact on the relationship between excess financial leverage and stock liquidity. The firm governance's (institutional ownership in this case) negative coefficient of determination indicates a significant and inverse relationship between stock liquidity in interaction with institutional ownership and excess leverage. Therefore, firm governance (institutional ownership in this case) reduces agency issues between managers and shareholders by improving the procedure that increases the supervision and control over management. This results in a reduced amount of liabilities which is a regulating tool, and the liabilities of the firm thus drop. According to the agency theory, the manager might make decisions in terms of financial policies that serve their and the shareholders' interests. Considering that the presence of institutional investors might change firm behavior (including the determination of the optimal financial leverage level) because of their ownership and supervision over the manager, results indicated a significant relationship between institutional ownership in interaction with stock liquidity level and the decisions regarding firm financial structure which can be justified by the "active supervision hypothesis". According to this hypothesis, active supervision of institutional investors prevents firm managers from making decisions that would threaten firm flexibility. In this regard, Hosseini Ebrahiabadi et al. (2017) demonstrated that institutional ownership has a significant impact on the financial leverage of the firms listed in the Tehran Stocks Exchange which is consistent with the results of the present study.

Considering the results of testing the first hypothesis, managers of commercial units are recommended to nudge their excess leverage towards the optimal capital structure to use the advantages of an optimal capital structure and determine a suitable level of financial leverage since this can lead to the efficiency of input resource allocation to the capital market on the long run. Moreover, according to the results of the second hypothesis, investors are recommended to always pay attention to the governance features of the firm such as institutional ownership alongside stock liquidity in their stock purchase and investments, and investigate the number of stocks held by institutional shareholders to reduce agency issues and violation of rights and monitor the firm before and after signing liabilities contracts so that the risk of return on assets is reduced. Besides, considering the influence of institutional ownership on the relationships between excess financial leverage and stock liquidity and, subsequently, the amount and manner of decisions regarding capital structures, the relevant references and organizations are recommended to issue regulations on the quality of firm governance disclosure and its factors so that a transparent information environment is created and the costs of financing capital from other resources such as stock are reduced which results in the optimal composition of capital

structure as well as creating. Creating such a transparent information environment can be quite beneficial for firms.

Future Research

Researchers are recommended to address the following issues in their future studies:

- Investigation of the role of stock liquidity in financial leverage through the stages of a firm's life cycle.
- Investigation of the effect of stock liquidity and excess leverage: Emphasis on Information Asymmetry. Based on the results of the research, investors and users of financial statements are suggested to When deciding, consider the liquidity of stocks as an effective factor in reducing excess financial leverage Also, it is suggested to those who intend to invest in the stock exchange to study the role of information asymmetry in companies.
- Investigating Excess Financial Leverage, Firm Value and Stock Liquidity Risk in Firms with Growth Opportunities or Financial Constraints.

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