Promoting Research

Orissa Journal of Commerce
Vol. 43, Issue 1, January-March 2022
ISSN: 0974-8482

URL: www.ojcoca.org
DOI: https://doi.org/10.54063/ojc.2022.v43i01.04

Stock Liquidity and Capital Structure: Evidence from NSE Listed Top 100 Non-Finance Indian Firms

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To cite this paper

Dutta, S.R., Sen, S.S. & Mukherjee, T. (2022). Stock Liquidity and Capital Structure: Evidence from NSE Listed Top 100 Non-Finance Indian Firms. *Orissa Journal of Commerce.* 43(1), 38-54.

Keywords

Liquidity, Illiquidity, Book leverage, Market leverage, Asset tangibility

JEL Classification

G10, G11, G12, G30, G32

Abstract: This study has investigated the influence of the stock liquidity (measured by Amihud's illiquidity) of a company on its capital structure using the top 100 non-finance firms listed in the NSE from 2010-11 to 2019-20. Using the fixed-effect panel regression model, the study has established that illiquidity has a significant affirmative influence on the book and market leverage. Furthermore, the findings reveal that turnover representing the business size and return on assets have adverse associations with both book and market leverage. Moreover, asset tangibility bears a positive influence on book leverage. The results endorse the usefulness of the notion of Pecking-order in the context of Indian companies.

1. Introduction

Capital structure (Nirajini and Priya, 2013) denotes the amount of equity and long-term debt in the financial structure of a company (Abor, 2005). Several studies (Ozkan, 2001; Titman and Wessels, 1988; Shleifer and Vishny, 1997) have identified firm size, asset tangibility, firm profitability, and growth potential as key firm-specific variables that define a firm's capital structure. However, the significance of market liquidity in driving capital structure choice is not addressed in these studies. Frieder and Martell (2006), Lipson and Mortal (2009), and Hovakimian *et al.* (2004) in their studies emphasized liquidity in the stock market as being a critical predictor of capital structure choices. Liquidity in the stock market is greatly affected by transaction costs and adverse selection costs (Damodaran, 2005). In this context, to describe a company's capital structure, the terms "trade-off" and "pecking order" have been employed by Frank and Goyal (2008). The "Trade-off" concept states that in the case of highly liquid stocks, companies choose equity financing over debt financing, because such stocks have lower transaction costs of issuing shares, making funding through equity more appealing than debt financing

(Frieder and Martell, 2006; Lipson and Mortal, 2009). In contrast, the notion of "Pecking order" diverges from the "Trade-off" notion of capital structure in its argument for a link between liquidity in the stock market and leverage. In agreement with the notion of the "Pecking Order", debt financing is preferable for illiquid stocks (Lesmond *et al.,* 2008), implying an inverse association between the two i.e. liquidity in the stock market and leverage. This is due to debt financing being less sensitive to adverse selection problems (Jensen, 1986). Information asymmetry plays a pivotal role to establish the association between the two.

When one delves into the past literature concerning the association between market liquidity and leverage, mixed pieces of evidence are found. According to certain studies, market liquidity has an affirmative linkage with a company's leverage strategy (Sibilkov, 2009; Akinola, 2011; Myers and Rajan, 1995; Morellec, 2001). Other studies, on the contrary, show that the opposite is true (Ahmed *et al.*, 2010; Stulz *et al.*, 2013; Hovakimian *et al.*, 2001; Rajendran and Achchuthan, 2013; Hovakimian *et al.*, 2006).However, Sharma and Paul (2015) observe no empirical association between the stock liquidity and capital structure.

Consistent with the market microstructure approach, a stock's liquidity is determined by adverse selection costs and information asymmetry. In the opinion of Bagehot (1971), when market makers think they may face such investors who enjoy superior information about the security's true value it creates a probability of definite losses for them. They recover through the liquidity premium. If the asset price does not reflect its true value, agents may take unfair economic advantage of insider information. Conversely, the others trade for liquidity only using information that is publically available (Abad and Rubia, 2005). As mentioned, agency conflicts between insiders and outsiders may arise due to such information asymmetry, which lessens the volume as well as the number of transactions in the stock market ultimately leading to a fall in stock market liquidity (Akerlof, 1970). According to Jensen (1986) debt financing is substantially less information-sensitive than equity financing whereas equity financing is the most susceptible to the adverse selection problem. Accordingly, equity investors demand a higher risk premium from their investments. Indeed, lower stock liquidity may lead to more adverse selection problems or higher agency costs, resulting in less equity and more debt. In line with this, Lesmond *et al.* (2008) observe a favourable association between illiquidity and leverage through information asymmetry which is consistent with the pecking order hypothesis. However, this issue has not been given due consideration in the context of the Indian stock market. In this backdrop present study investigates the existence and extent of a liquidity-capital structure relationship in the Indian stock market.

2. Review of Literature

2.1. Theoretical Underpinning

After the seminal work on a firm's financial decisions by Modigliani and Miller (1958, 1963), (Serrasqueiro *et al.*, 2011), in dealing with challenges that create departures from the efficient market hypothesis, two pragmatic theories, in particular, are considered the most important (Newman *et al.*, 2011).The notion of Pecking-Order Theory comes after the Static Trade-off. The following is a summary of these two theories:

2.1.1. Static Trade-off Theory

In accordance with the notion of Static Trade-off, every enterprise strives to get the debt-to-equity ratio at an optimal level (Adair and Adaskou, 2015) that maximizes its market value by balancing the benefits and costs of its financing decisions (Thippayana, 2014; Jarallah *et al*., 2018). Companies frequently prefer debt to equity since interest payments are tax-deductible and preserve personal savings (Miller, 1977). Simultaneously, more employment of debt in the financial structure raises the risk that the firm has to face in meeting fixed-payment obligations (Banerjee, 2015), increasing the bankruptcy costs, indirect costs, and internal costs emanating from the conflicts of interests between agent and principal as a result of the greater likelihood of financial distress (Ross *et al*., 2012). In the process, as previously stated, distress-related costs begin to outweigh debt-related tax advantages (Brigham and Houston, 2015), gradually making the marginal benefit of a tax rebate of a company identical to the marginal costs of bankruptcy (Stiglitz, 1969).

Finally, the Static Trade-off Theory is primarily concerned with long-term financial objectives or strategies, focusing mostly on tax shields and financial distress (Ross *et al.,* 2012). By this theory, firms assess the tax advantages of debt financing in opposition to the danger of going bankrupt. (Brigham and Huston, 2015).

2.1.2. Pecking-Order Theory

Myers and Majluf (1984) are the pioneers of the Pecking-order Theory which is a substitute for the notion of Static Trade-off (Ross *et al.,* 2012).The concept of asymmetric information, which asserts that managers possess additional information about a company's prospects than investors, lies at the heart of this theory (Brigham and Huston, 2015; Brealey *et al*., 2014). Such a notion presumes the absence of a target or optimal debt-equity ratio (Agyei *et al*., 2020). As discussed, 'information asymmetry' affects decisions about internal and external finance, as well as new debt and common stock issuance (Brealey *et al*., 2014). As a result, there is a hierarchy in which retained earnings investments come first, then new debt issues, and finally new common stock issuing as the last choice (Brigham and Huston, 2015).

As opposed to the notion of Static Trade-off, the Pecking-order concentrates on the short-term, tactical issue of raising outside capital to finance investments. (Ross *et al*., 2012), and this illustrates the order in which companies want to raise capital: internal funds first, debts second, and new common stock third (Brigham and Huston, 2015).

2.2. Hypothesis Development

Though the concept of liquidity is applied numerous times in the market microstructure framework because of its significant role in the market microstructure approach, such a concept has limited use in corporate finance. More recently, we find some empirical studies to connect liquidity to capital structure as firms' capital structure decisions are guided by the liquidity of stock (Rashid *et al*., 2017).

Main stream research in this field has been piloted in developed economies. The cost of issuing shares for US companies is reduced as the equity market becomes more liquid, making equity financing more enticing than financing through debt (Lipson and Mortal, 2009). In the same vein, in the opinion

of Frieder and Martell (2006), firms resort to debt financing in the case of illiquid stocks as they involve higher transaction costs of issuing equity, again signifying an adverse association between liquidity and leverage in the case of NYSE stock Exchange. Dang *et al.*(2019) witness that there exists an adverse association between liquidity in the stock market and leverage as the equity cost depresses when stock liquidity amplifies thereby investing in equity as a more viable option compared to debt. All such studies (Lipson and Mortal, 2009; Frieder and Martell, 2006; Dang *et al*; 2019) are guided by the trade-off theory which presumes that firms with more liquid stocks should have lower issuance costs of equity and be less leveraged. Liquidity-capital structure link can also be explained by the pecking-order theory as given by Myers and Majluf (1984).Debt financing, according to their views, is substantially less information-sensitive than equity financing (Jensen,1986), but equity financing is the most susceptible to the adverse selection problem.

Accordingly, equity investors demand a higher risk premium from their investments. Indeed, lower stock liquidity may lead to more adverse selection problems or higher agency costs, resulting in less equity and more debt. In line with this, Lesmond *et al.* (2008) also report a positive relationship between illiquidity and leverage through information asymmetry which is consistent with the pecking order hypothesis. On the flip side, Andres *et al.* (2014) in their study on US-listed firms suggest that a higher debt ratio is an indication of firms' profitability and highly liquid stocks lessen information asymmetry between managers and investors leading to more use of equity financing as compared to debt financing, thereby signifying again inverse association between liquidity in stock and leverage. When it comes to more liquid stocks, the cost of issuing equity is lower, making equity financing a more profitable option than debt financing, demonstrating an adverse association between equity liquidity and leverage (Butler *et al.,* 2005). Information asymmetry has a major influence on a stock's liquidity. The cost of issuing a particular stock grows as a result of greater informational asymmetry, leading to the adoption of debt financing as an appropriate mode of financing rather than equity financing thereby again supporting the notion of pecking order (Kyle, 1985).

In the context of an emerging economy, Thailand, Udomsirikul *et al.* (2011) attempt to establish a link between liquidity and leverage. They discover an adverse linkage between liquidity and leverage. Based on the study of Udomsirikul *et al.* (2011) for Thailand listed firms, Leelakasemsant (2015) aims to explore the joint effect of liquidity of equity and concentrated ownership on the capital structure of organizations. They establish that enterprises having more liquid stocks and lower ownership concentration opt for financing through equity as compared to debt financing to finance their requirements of capital, thereby again signifying an inverse association between equity liquidity and leverage. ElBannan (2017), on the other hand, finds no significant link between stock liquidity and leverage in his examination of the combined influence of liquidity in the stock market and family ownership on capital structure in a developing economy like Egypt. Using data from Australian companies, Nadarajah *et al.* (2018) aim to figure out how stock liquidity and governance quality interact to affect the capital structure. They claim a significant adverse association between stock liquidity and companies' leverage policies. Furthermore, they discover that the corporate governance quality has a greater impingement on highly liquid stocks. Likewise, Khediri and Daadaa (2011) explore a negative linkage between trading activity (a measure of stock liquidity) and leverage.

Andrade and Kaplan (1998) in their study indicate an inverse association between liquidity and leverage considering a greater degree of leverage as the genesis of financial distress. Sidhu (2018) in his study examines the linkage between stock liquidity and leverage in the Indian context. He concludes that there exists an inverse association between stock liquidity and leverage which is at par with the studies conducted in the context of advanced economies (Frieder and Martell, 2006; Lipson and Mortal, 2009). Contrary to popular belief, no indication of a link between stock liquidity and leverage is observed by Sharma and Paul (2015). Similarly, Haddad (2012) in the context of the Amman Stock Exchange exhibits that there exists an insignificant association between liquidity and leverage.

More recently, taking Chinese companies as a sample Chen *et al.* (2020) in their study determine the association between stock liquidity and excess leverage. In their study, they exhibit an inverse association between stock liquidity and excess leverage because more liquid stocks weaken information asymmetry thereby leading to a negative (positive) association between liquidity (illiquidity) and leverage which is in line with Lesmond *et al.*(2008). Rashid *et al.* (2017) look at the linkage between stock liquidity and leverage across all companies categorized as non-financial and which are registered on the Pakistan Stock Exchange. They discover an inverse association between the liquidity of stock and leverage, which is similar to those (Udomsirikul *et al.*, 2011; Frieder and Martell, 2006; Lipson and Mortal, 2009). Nai-Kang (2009) in his study observes an adverse and robust significant influence of liquidity on leverage.

A study by Umar and Sun (2016) looks at the association between leverage and stock liquidity. The study reveals two different sets of results. First, for large banks liquidity and leverage move in the same direction which is contradictory (Frieder and Martell, 2006; Lipson and Mortal, 2009). However, their research explores the inverse association between liquidity and leverage in respect of small firms.

Incorporating present circumstances, there remains a dearth of studies in the Indian context to determine the influence of liquidity (illiquidity) of stock on the capital structure. Second, it is mostly observed that studies related to liquidity and capital structure have been conducted so far in advanced countries, indicating a lack of studies addressing the issue in the context of an emerging economy. Third, there remains a dearth of studies in panel frameworks addressing the issue as most of the studies are concentrated on either cross-sectional relationships or time-series relationships. Hence, all these can be considered research gaps. Importantly, in practical terms, the findings of this study would be beneficial for the stock market regulators and corporate managers in devising plans and policies and other future courses of action.

3. Objective and Hypothesis of the Study

3.1. Objective of the Study

The main objective of the study is:

- To examine the association between stock liquidity (illiquidity) and leverage in the Indian stock market.

3.2. Hypothesis of the Study

The following hypothesis is formulated based on the above objective:

H_{01}: Stock liquidity (illiquidity) has a negative (positive) association with leverage.

4. Research Methodology

4.1. Data and Sample

The source of this study's database is the "Capitaline" database, which is a secondary source. To perform the study, the top 100 non-financial companies listed in the National Stock Exchanges of India (NSE) have been chosen as a sample. The research spans ten years, from April 1, 2010, to March 31, 2020, and the study period has been taken after the global financial crisis which ends in June 2009 but before the inception of COVID-19 and it is based on a uniformly arranged panel data organized by financial years. Top 100 companies have been taken as stocks belonging to such firms are regularly traded in the Indian stock market and such companies have been taken in terms of market capitalization and these companies have been grouped to minimize sectoral bias. Three companies are omitted as their financial years are different. Finally, our sample includes 97 companies. The cut-off date for selecting the sample is March 31, 2020.

4.2. Research Variables

4.2.1. Dependent Variable

The study's dependent variable is leverage. Leverage is measured by dividing the total book value of debt by the total book value of assets, a book value measure, according to previous research. (Pham *et al.*, 2020; ElBannan, 2017; Bonaime, 2014).

4.2.2. Independent Variable

Stock liquidity, measured by Amihud (2002) 'illiquidity' (ILL) is the independent variable in the present study. The reciprocal of stock liquidity, Amihud's illiquidity is interpreted as the average ratio of the weekly return in the absolute figure to the volume for that week:

$$|R_{iyw}| \ / \ VOLW_{iyw}$$

The return of stock i on week w of year t is denoted by R_{iyw} and $VOLW$ is the weekly volume. This measure provides the change in price in absolute figure (percentage) per rupee of weekly trading volume or the weekly impingement on the price of the order flow.

Hence, Illiquidity $(ILLIQ_{iy}) = 1/W_{iy}\ \Sigma_{t=1}^{Wiy} |R_{iyw}| / VOLW_{iyw}$

In the above equation, W (iy) denotes the week(s) for which data for stock I in year y are available. To get a meaningful result of Illiquidity the above figure is multiplied by 10^7.

4.2.3. Control Variables

Business size (SIZE) represented by the natural logarithm of the firm's total sales, asset tangibility (TAN), and profit earning capability of the firm as metered by return on assets (ROA) are among the control variables. Firm size has been considered as a control variable because of the persistence of an

adverse association between firm size and leverage (Titman and Wessels, 1988) as suggested by pecking-order theory as when compared to outside financing, large companies rely more on financing from their sources of capital. Controlling for asset tangibility is justified by the fact that tangible assets can be used as collateral or security for a loan and thus might have a positive impact on leverage (ElBannan, 2017; Rajan and Zingales, 1995); the same has been justified by some major studies (Sharma and Paul, 2015., Andres *et al*., 2014). Finally, this study controls for profitability following Sharma and Paul (2015), Haddad (2012), and Udomsirikul *et al.,* (2011). By the Pecking-order theory, an adverse association between return on assets or operating profitability and leverage is noticed, because more profitable

Table 1: Research Variables: Definition and Measurement

	Variables	*Definition and Measurement*
1.	Dependent Variable:	
	a) Capital Structure	Book Leverage (BLEV) = $\frac{Total\ Debts}{Total\ Assets}$ (Pham *et al.,* 2020; ElBannan, 2017; Bonaime, 2014)
2.	Independent Variable:	
	a) Stock Liquidity	Amihud (2002)'s'illiquidity'(ILL) = 1/ $W_{iy}\Sigma_{t=1}^{Wiy} \mid R_{iyw} \mid / VOLW_{iyw}$ where W (iy) denotes the weeks for which data for stock I in year y are available.
3.	Control Variable(s):	
	a) Firm Size	SIZE = Natural logarithm of the annual sales figure of each company during different financial years. (Sidhu, 2018; Rajanand and Zingales, 1995; Ozkan, 2001; Titman and Wessels, 1988).
	b) Asset Tangibility	Tangibility (TAN) = $\frac{Net\ Fixed\ Assets}{Total\ Assets}$ (Rajanand and Zingales, 1995; Abdullaand and Ebrahim, 2020; Pandey *et al*.; 2021).
	c) Profitability	Return on Asset (ROA) = $\frac{EBIT}{Total\ Assets}$ (Udomsirikul *et al*., 2011; Sharma and Paul, 2015; Haddad, 2012).

Source: Authors' Own Compilation

enterprises rely heavily on internal sources of finance, resulting in less debt use (ElBannan, 2017, Rajan and Zingales, 1995). Contrary to this, the notion of Static Trade-off speaks in favor of an affirmative association between profitability and leverage as such profitable firms enjoy a greater degree of leverage due to the advantage of the tax shield.

4.3. Model Specification

This research looks into the influence of stock market liquidity, as defined by Amihud's illiquidity, on a company's capital structure. To test and validate the research hypothesis, the following empirical model is developed:

$$BLEV_{it} = \beta_1 + \beta_2 ILL_{it} + \beta_3 SIZE_{it} + \beta_4 TAN_{it} + \beta_5 ROA_{it} + \mu_{it} \qquad \text{(Model 1)}$$

Where *i* (company) = 1, 2...97 and *t* (time) = 1, 2,3,4,..,10. The above equation is written as per the pooled OLS model. Accordingly, the regressors are assumed to be non-stochastic. Furthermore, if the regressors are found to be stochastic, they are uncorrelated with the error term (μ_{it}).

To examine the aforementioned econometric model, the research utilizes a static panel data technique (balanced), as the sample comprises data across firms and overtime. This technique, as argued, allows for individual heterogeneity control, alleviates the multicollinearity issue, amplifies the degree of freedom and data variability, and yields more efficient and unbiased estimates (Dimitropoulos, 2020; Khaki and Akin, 2020).

To proceed with, three classical panel data regression models, viz. pooled OLS model, random-effect model, and fixed-effect model are available within the framework and can be used. To examine the choices of panel data, viz. random-effect model and fixed-effect model against the pooled OLS model, the Breusch Pagan test and F test have been conducted, respectively. The estimates for both these tests, namely the BP test and F test are found significant (unreported), suggesting the use of panel data models, viz. random-effect model and fixed-effect model. At this stage, the Hausman test has been performed to determine the best model among the random-effect and fixed-effect models. The fixed-effect model wins the Hausman test, thus it's kept for investigation purposes.

5. Data Analysis

5.1. Summary Statistics

Table 2 reports the summary statistics of variables used in this study. The total number of firm-year observations is 970 for each variable. The statistics for BLEV (mean value = 0.2326; Std. Dev. = 0.2033) suggest that on average, 23 percent of the assets of the sample firms' have been financed by employing borrowed capital. The ILL varies from .0001 to 1573.2110with a mean value of 6.8671. The mean value of SIZE is 8.6231 with a minimum and a maximum value of 5.0661 and 13.1829, respectively. TAN has a mean of 0.4017, which suggests that fixed assets account for 40% of the resources held by the sample firms. The mean value of ROA is 0.2493, highlighting that the sample firms' managed to generate profit of around 25 percent by utilizing their resources.

Table 2: Descriptive Statistics

	BLEV	*ILL*	*SIZE*	*TAN*	*ROA*
Mean	.2326	6.8671	8.6231	.4017	.2493
Std. Dev.	.2033	60.9258	1.5510	.2094	.2107
Minimum	0	.0001	5.0661	.0010	.0002
Maximum	.7821	1573.2110	13.1829	1.0234	1.8245
Observation	970	970	970	970	970

Source: Authors' Own Compilation

5.2. Panel Unit-Root Test

The stationarity of panel data and the order of integration should be investigated to mitigate the spurious regression problem (Żltaṛ and Demirgüneṛ, 2020).To examine whether our data series are stationary at a level, more specifically, following Khan *et al.* (2021) & Paul and Mitra (2018), we apply Levin *et al.* (2002) testa conventional approach. The results of these tests are reported in Table 3. The LLC (2002) test results show that all the employed variables are stationary at their levels

Table 3 shows the results of the Levin *et al.* (2002) unit root test for the variables used in the regression. At the 1% level, the Adj.t-statistics for all variables are notable. This means that at level or I, all variables are stationary (0).

Table 3: Unit-Root Test Results

Variables	*Adj. t-statistics*
BLEV	-19.8942*
ILL	-83.3761*
SIZE	-14.0339*
TAN	-7.4513*
ROA	-13.5792*

Source: Authors' Own Compilation

*indicates a 1% level of significance

5.3. Correlation Analysis

Table 4 presents the Pearson's correlation matrix showing the degree of associations between the target variable, viz. leverage (BLEV), explanatory variable, viz. illiquidity (ILL), and the control variables, namely business size (SIZE), asset tangibility (TAN), and return on assets (ROA). The results show that there is an affirmative correlation between illiquidity and leverage. Concerning control variables, firm size, as measured by sales turnover and asset tangibility seem to have a positive correlation with leverage, while profitability measured by ROA and leverage are negatively correlated. Asset tangibility appears to have a positive association with leverage. Table 4 also shows that each pair of predictors has

a correlation coefficient of less than 0.80 (Gujarati, 1995), suggesting that there is no multicollinearity issue in our dataset. This means that in our data collection, multi-collinearity isn't an issue. Moreover, the VIF values of the independent and control variables range from 1.0100 to 1.0300, that is, within the threshold of 10 (Hair *et al.*, 1995), and also the tolerance level of the variables ranges from .9703 to .9889, which is, within the threshold limit of 2 (Hair *et al.*, 1995). This allows us to rule out the possibility of multi-collinearity between variables in the examined model.

Table 4: Correlation Matrix

Variables	*BLEV*	*ILL*	*SIZE*	*TAN*	*ROA*	*VIF*	*I/VIF*
BLEV	1						
ILL	0.0972*	1				1.0300	.9703
SIZE	0.0456	-0.1435*	1			1.0200	.9765
TAN	0.3239*	0.0822*	0.0409	1		1.0200	.9805
ROA	-0.3239*	-0.0303	0.0170	0.0976*	1	1.0100	.9889

Source: Authors' Tabulation

Notes: * indicates a 1% level of significance.

5.4. Regression Results

Table 5 presents the estimates for our baseline model, model (1). Applying the fixed-effects regression model (as suggested by the Hausman test), the results show that the illiquidity of stock maintains a significant and positive relationship with leverage (coefficient = 0.0001; t-value = 1.9200), indicating that along with an increase in the illiquidity of stock, leverage increases. This result validates the Pecking-order Theory as suggested by Lesmond *et al.* (2008) and Jensen (1986) and also the studies by Lipson and Mortal (2006), Udomsirikul et al. (2011), and Sidhu (2018), who have shown that due to the illiquidity of stock, the cost of issuing equity enhances, suggesting that debt financing is better as compared to equity financing plan. Concerning the control variable, asset tangibility has an affirmative and significant influence on book leverage. On the contrary, firm size and profitability, as measured by turnover and return on assets, respectively are associated with leverage negatively. The adverse influence of these two on leverage again supports the application of the notion of Peking-order in this context (Titman and Wessels, 1988; ElBannan, 2017; Rajan and Zingales, 1995).

5.5. Model Robustness

To validate the estimates of our baseline model as reported in Table 5, we re-run the model using market leverage (MLEV) as a proxy for the dependent variable. Following prior studies market leverage is calculated by total debts to the market value of asset ratio (Udomsirikul *et al.*, 2011; ElBannan, 2017), where the market value of assets equalling total assets minus the book value of equity plus market capitalization. Based on the above discussion, the following empirical model is developed:

Table 5: Estimates of Fixed-Effects Regression Model (Model 1)

Variables	*Coefficient*	*t-value*
ILL	.0001**	1.9200
SIZE	-.0843*	-11.0700
TAN	.0793*	2.7800
ROA	-.2768*	-10.1300
Constant	.9963*	14.8000
R^2 : Within	.2025	
Between	.0065	
Overall	.0170	
F-Statistic	33.7500*	
Hausman Test (Chi-Square)	101.4500*	
N	970	

Source: Authors' Own Compilation

Notes: The baseline model's estimates are shown in this table.* indicates a 1% level of significance, whereas ** indicates a 5 % level of significance.

$$MLEV_{it} = \beta_1 + \beta_2 ILL_{it} + \beta_3 SIZE_{it} + \beta_4 TAN_{it} + \beta_5 ROA_{it} + \mu_{it} \quad \text{(Model 2)}$$

Where *i* (company) = 1, 2...97 and *t* (time) = 1, 2, 3, 4,.., 10. The above equation is written as per the pooled OLS model. Accordingly, the regressors are assumed to be non-stochastic. Furthermore, if the regressors are found to be stochastic, they are not associated with the error term (μ_{it}).

Table 6: Estimates of Fixed-Effects Regression Model (Model 2)

Variables	*Coefficient*	*t-value*
ILL	.0002*	5.8100
SIZE	-.0621*	-10.4600
TAN	.0210	.9400
ROA	-.2061*	-9.6800
Constant	.6950*	13.2500
R^2 : Within	0.2141	
Between	0.0040	
Overall	0.0166	
F-Statistic	24.8100*	
Hausman Test (Chi-Square)	99.5700*	
N	970	

Source: Authors' Own Compilation

Notes: This table presents the estimates for the robustness check.* indicates a 1% level of significance.

Table 6 shows the estimates for model 2 (i.e., robustness check). Applying the fixed-effect regression approach (as suggested by the Hausman test), the results reveal that everything is in line with the findings of our baseline model as reported in Table 5. The only exception is that asset tangibility has an insignificant association with market leverage. Nevertheless, most of the findings of this study are robust.

6. Results and Discussion

Table 5 shows that there is a considerable affirmative association between illiquidity (ILL) and book leverage (BLEV). The finding strongly accepts H_{01}. Since the present study finds a positive association between illiquidity (ILL) and book leverage (BLEV), it can be concluded that book leverage tends to increase along with the upward movement of illiquidity of stock. The result is in line with the findings of (Lemond *et al.*, 2008; Jensen, 1986). Contrasting this, the above table highlights a notable adverse association between business size (SIZE) and book leverage (BLEV) which is contrary (ElBannan, 2017; Rajan and Zingales, 1995). Similarly, an adverse association between ROA and book leverage (BLEV) is observed which states that profitability denoted by ROA is a crucial factor in influencing capital structure proxied by book leverage (BLEV) and it is compatible with (Titman and Wessels, 1988). However, a positive and significant association exists between asset tangibility (TAN) and book leverage (BLEV) representing capital structure thereby supporting (Sharma and Paul, 2015; Andres *et al.*, 2014; ElBannan, 2017; Rajan and Zingales, 1995).

7. Conclusion

This study starts with the quest of determining the nature of the association between the Liquidity of a stock measured by Illiquidity and the capital structure where the latter is proxied by the Book Leverage. It is hypothesized that the illiquidity of stock results in higher adverse selection costs of equity, thereby making debt financing a better plan than equity financing, indicating a positive association between the illiquidity of stock and leverage (Lesmond *et al.*, 2008; Jensen, 1986).

The findings depict an affirmative and significant association between Illiquidity and Capital Structure (Book Leverage or Market Leverage) thereby rejecting the null hypothesis and accepting the H_{01}. Hence, in the Indian context, the Pecking-order theory dominates over the Trade-off Theory. Moreover, Business size has an adverse and significant bearing on both Book Leverage and Market Leverage signalling that with the increase in firm size, leverage tends to diminish and such findings are contradictory (ElBannan, 2017; Rajan and Zingales, 1995). However, Asset Tangibility has an affirmative and significant association with Book Leverage thereby supporting (Sharma and Paul, 2015; Andres *et al.*, 2014; ElBannan, 2017; Rajan and Zingales, 1995). Contrasting, Asset Tangibility has no relationship with Market Leverage. Finally, Return on Assets (ROA) has an adverse and significant impact on the Capital Structure, whether measured by any of the two leverage ratios, thereby confirming the Pecking-order theory's application and that such findings are compatible with (Titman and Wessels, 1988).

This study has strong theoretical as well as practical implications. In the case of illiquid stocks, businesses should rely more on debt financing. Further, this study is beneficial to investment analysts

and firm managers for proper financing policy formulation and its' implication. The empirical findings of this study would immensely assist different kinds of investors and firm managers in undertaking long-term investment decisions and designing the most appropriate strategic policy for a firm.

Though transaction cost is considered an important factor influencing capital structure decisions (Li *et al.*, 2011) the transaction cost channel has not been considered owing to the scarcity of data on transaction cost in the Indian context. Moreover, in an 'operationally efficient' market due to competition among the brokers, transaction cost also becomes competitive and may not be a decisive factor. This study opens up new areas for further research. A study may be undertaken considering the joint impact of ownership concentration and illiquidity of stock on the leverage policy of a firm in the context of a developing economy.

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