Capital structure
Equity liquidity
Leverage
Debt-equity choice

Liquidity and Capital Structure: The Case of Pakistani Non-Financial Firms
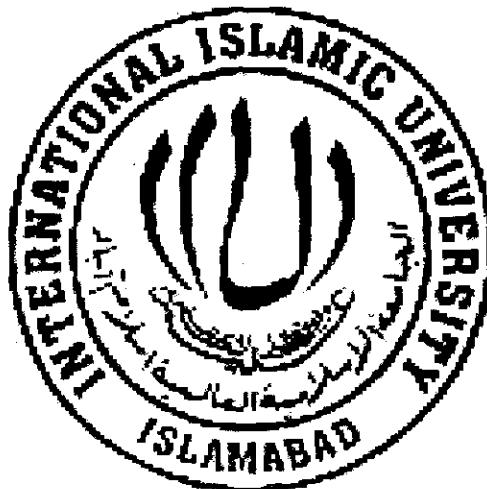
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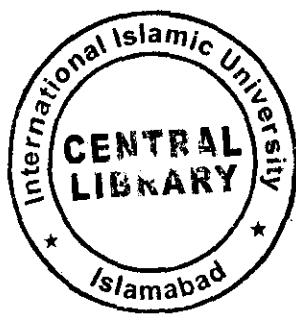
Dedication

To My Teachers and Family

Declaration

I hereby solemnly declare that all the literature presented in following dissertation is entirely based on research work carried out in defense of my thesis topic. This publication is pioneer in its context and has neither similarity to any previously submitted thesis nor any copied material in its contents from any source except where due reference is clearly mentioned. All of the published data is result of my own efforts, research and analysis with support of those mentioned in acknowledgement, in specific my supervisor. If at some later stage plagiarism is detected in the submitted research based literature, I will be fully responsible for all the consequences as per the prevailing rules and law of approval committee.

Hira Mehmood

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APPROVAL SHEET

Liquidity and Capital Structure: The Case of Pakistani Non-Financial Firms

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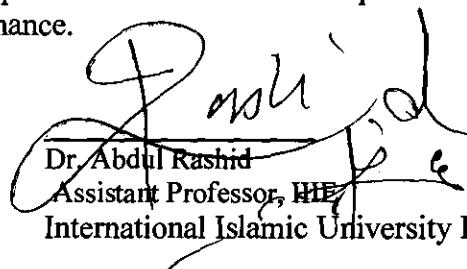
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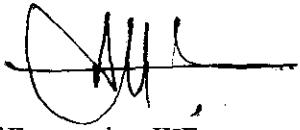
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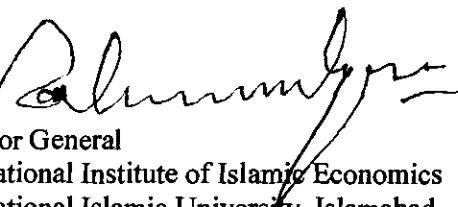
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Abstract

This study explores the impact of equity market liquidity on firms' leverage decisions in Pakistan using panel data covering the periods from 2000 to 2013. We use three alternative measures of liquidity to identify the impact of equity market liquidity on the capital structure decisions of firms. We also utilize firm-specific variables, namely, profitability, tangibility, firm size, cash holdings, and average trading price of stocks, as control variables in our empirical models. Ordinary least square pooled regression technique with robust standard errors is used for estimation of empirical models.

We find that equity market liquidity is significantly and negatively related to firm leverage decisions. We show that this finding is robust to different proxies of equity market liquidity used in the analysis. The negative relationship between equity market liquidity and firms' leverage decisions suggests that firms' whose stocks are liquid have lower equity issuing costs, and thus, they are more incline to use equity in their capital structure to reduce their leverage ratio.

The results from the debt-equity ratio reveal that equity market liquidity is negatively and statistically significantly related to firms' leverage choice between debt and equity. That is, firms with more liquid stocks prefer equity financing over debt financing. Finally, our results suggest that profitability, cash holdings, tangibility, and prices of stocks have significant and negative impacts on leverage, whereas firm size has a positive relation with leverage. Overall, the results presented in this study are consistent with the prior theories and the existing empirical literature of capital structure.

Keywords: Capital structure; equity liquidity; leverage; debt-equity choice

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List of Abbreviations

BLEV   Book Leverage

DER   Debt to Equity Ratio

EBIT   Earnings Before Interest and Taxes

GMM   Generalized Method of Moments

ILLIQ   Illiquidity

IPO   Initial Public Offering

KSE   Karachi Stock Exchange

MLEV   Market Leverage

OLS   Ordinary Least Square

SBP   State Bank of Pakistan

Chapter 1

Introduction

1.1 Background

Liquidity of a firm's equity is referred as one of the essential part of capital structure of the firm because it has a noteworthy impact on the overall value of the corporate firm. Corporate firms finance their investments and other capital needs through different sources in order to escalate their overall value. The financial decisions of firms commonly referred as capital structure decisions, to finance their investment and other operations. In principle, a firm can finance its capital needs through three sources, namely, equity, debt, and internally generated funds. The first two are referred as external source of financing, whereas the last one is referred as internal source of financing.

A fundamental issue in corporate finance is that how companies choose their own optimum level of capital structure. The trade-off theory of capital structure by Modigliani and Miller (1963), reveals that firms choose their capital structure by incorporating the marginal benefits and marginal costs of debt financing. The interest tax shield is the primary benefit of debt financing. However, incorporating debt in the capital structure is not free of cost. There are also costs attached to debt financing. Indeed, when firms choose debt for financing their investment needs they also bear certain costs. These costs include cost of financial distress, debt overhang, personal taxes, and agency problems between managers and investors. The trade-off theory of capital structure also suggests

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that firms have their own predetermined target capital structure and they adjust their capital structure towards their leverage targets.

Another prominent theory of corporate finance is the pecking order theory of capital structure by Myers and Majluf (1984). The pecking order theory suggests that firms while financing their capital and investment needs use internal funds that is cash and retained earnings, then prefer debt financing, and in the last prefer equity financing. The pecking order theory demonstrates that, firm managers while financing their capital needs don't have any deliberate target in their minds rather, they strictly follow the order suggested by the pecking order theory.

On the flip, the market timing theory of capital structure by Baker and Wurgler (2002), reveals that corporate firms time their equity issues and wait untill and unless the equity market conditions for stocks issuing become favourable. That is, firm managers prefer equity financing in periods of hot equity market and use debt financing when debt market conditions are favorable. Specifically, firm managers prefer external financing and more likely to use equity when the costs related to issuing equity are lower, and they use debt financing otherwise. Thus, according to the market timing theory, firm managers don't have any specific target capital structure rather; they mostly time their security issues.

Liquidity of firms' equity is acknowledged as one of the essential parts of firms' capital structure decisions. The objective of firm management is to maximize the overall value of the firm by choosing the best optimal level of debt and equity financing in such a manner that the costs and benefits of debt and equity financing are balanced[1]. More liquid stocks

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[1] Costs of issuing equity are transaction cost and information asymmetry.

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maximize the overall value of the firm. Firms always prefer internal financing firstly, and then use external financing as the last option. As large size firms are more diversified, have good reputation in debt market, and have huge collateral for issuing debt, and thus, there is less chance of being bankrupt for them as compared to small firms. Furthermore, there is low cost of issuing debt for large size firms than that of smaller firms. So, large size firms prefer debt financing as compared to small size firms.

Besides equity market liquidity, there are also other firm-specific variables that have significant and noteworthy impact on the firms' capital structure. On empirical grounds, several earlier studies, such as, Titman and Wessels (1988), Ozkan (2001), Amihud (2002), Butler et al. (2005), Akinlo (2011), and Khalaj et al. (2013) have mainly focused on firm-specific determinants of capital structure and have provided evidence that firms' profitability, tangibility of assets, firm size, and growth opportunities play a significant and noteworthy role in explaining the capital structure decisions of firms. However, the later studies, such as, Hovakimian et al. (2004) and Frieder and Martell (2006) have stressed the role of stocks liquidity in capital structure decisions of firms. What determines firms' capital structure? How firms finance their capital needs? How firms trade-off between debt and equity choice? Does higher level of equity liquidity, lead to relatively lower usage of debt? Does there any significant relationship exists between equity liquidity and firms leverage decisions? These fundamental questions have presently appealed the concern of both academics and researchers. The theoretical studies in general and empirical studies in particular both have suggested different impact of equity liquidity on the capital structure decisions of a firm. Specially, Frieder and Martell (2006), Byoun (2007), and Lipson and Mortal (2009) suggested that equity liquidity has

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significant and noteworthy impact on leverage decisions of firms. They showed that higher level of stocks liquidity is associated with the lower usage of debt. They further documented that firm managers with more liquid stocks prefer equity financing and retire the amount of debt from their capital structure. Therefore, illiquid stocks, which have higher costs of issuing, induce firm managers to use more debt, whereas liquid stocks, which have lower costs of issuing, encourage firm managers to do more equity financing.

Specifically, Udomsirikul et al. (2011) empirically concluded that the equity liquidity is directly linked with the capital structure of a firm. Companies holding larger amount of liquid stocks usually hold less debt in their capital structure. There is lower amount of transaction cost and other adverse selection costs for liquid stocks, thus providing incentives to firm managers' to issue more stock and less debt. Given this, firms holding larger amount of liquid stocks are more likely to be less levered, compared to firms with illiquid stocks. Furthermore, as explained by Butler et al. (2005), a firm's stock liquidity enforcing managers to raise external financing through issuance of stocks. They suggest that managers by increasing the liquidity of stocks decrease the cost of raising external capital financing as illiquid stocks have higher transaction costs as compare to liquid stocks. On the other hand, Hovakimian et al. (2001) have provided evidence that a firm holds higher amount of liquid stocks is significantly less levered. They further found that there is indirect relationship between liquidity of stocks and leverage decisions of firm, which is also in line with the notion that when issuing stocks are costly for firm managers then they prefer debt financing. This implies that firms that have more liquid equity are expected to be less levered.

According to the pecking order theory of capital structure, firm managers use their internal finance firstly, then use short term debt as a second option, and finally issued equity as a last possible option. When market conditions of issuing debt are not favorable, then firms ignore issuing of short-term debt and prefer issuing equity if internal funds are insufficient to meet their financing and other operational needs. However, according to Khapko (2009) and Stulz et al. (2013), if firms issue equity in less liquid market, then investors have to be given more discount to purchase these shares. Thus, the issuance of equity in this situation would be expensive for firms. So, firms will issue less equity and more debt when equity market is less liquid. In this context, security issuance is inversely related to stocks' illiquidity. Some empirical studies, such as Kyle (1985) and Baker and Wurgler (2002), have pointed out that there are higher transaction costs for less liquid stocks. Higher transaction cost means that it is expensive for a firm to issue equity, so, there is a larger price impact and stocks' liquidity decreases. Another study by Amihud and Mendelson (1986) also stressed on transaction costs by suggesting that transaction cost should be taken into account while issuing equity because liquidity decreases the expected rate of return on that equity. Further, Amihud (2002) by taking different measures of liquidity found that there is a inverse relationship between liquidity and stock returns. Similarly, Acharya and Pedersen (2005) also predicted a positive association between stock returns and stocks' illiquidity. Hovakimian et al. (2004) documented that higher stock returns are related to higher amount of issuing equity, and there is no effect on issuing debt of increased expected rate of returns.

According to the pecking order theory of capital structure, there is another cost of issuing equity that is asymmetric information. Asymmetric information means one party has

more and superior knowledge about the asset than other party. Information asymmetry causes the problem of adverse selection. Higher debt to assets ratio means that the firm has higher information asymmetry resulting from higher cost of equity, so the firm will prefer debt over equity financing (Lesmond et al., 2008; Wang, 2013). Quiet opposite, Shleifer and Vishny (1997) suggests that the use of debt in capital structure lowers the agency conflicts between managers and investors. A decrease in amount of agency conflicts among managers and outside investors result in lower amount of information asymmetry that further increase the liquidity of stocks and decrease the use of debt financing.

In Pakistan, there is not much studies on the issue of determinants of capital structure. The earlier work on the determinants of capital structure was done by Shah et al. (2004). Later on, Hijazi and Tariq (2006) by using cement industry data document that both firm size and profitability have significant and negative relationship with leverage ratio, while tangibility of assets and growth opportunities have positive impact on the leverage ratios. Consequently, previous empirical work on capital structure was extensively extended by Shah and Khan (2007) have conducted study by using panel data pooled regression analysis and including new variables[2] in their empirical models found that tangibility of assets, growth opportunities, and profitability have significant impact on leverage ratios, while firm size and earning volatility are statistically insignificantly related with leverage ratio. Ahmed et al. (2010) used new variables[3] in their model identified that industry type, liquidity, and payout ratio show an essential role, whereas tax does not show any significant impact in identifying the capital structure of Pakistani non-financial firms.

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[2] Earning volatility and non debt-tax shields.
[3] Tax, liquidity, and payouts.

Recently, Akhtar and Masood (2013) compared the cement industry and chemical industry, empirically concluded that both sectors are effected by similar factors. Furthermore, financial costs and tangibility are positively related with leverage ratio.

1.2 Problem Statement

In principle, liquidity of firms' equity has a important role in defining the overall value of firms. By examining the existing empirical literature regarding the determinants of capital structure, we observed that the firm-specific variables like firm size, profitability, tangibility of assets, and growth opportunities are significant in explaining capital structure dynamics[4]. Surveying most of the empirical literature from developed countries, several researchers have explored the role of equity market liquidity in defining the capital structure decisions of firms. On the other hand, when we review the literature for developing countries, most of the empirical studies have just focused on the factors related to the capital structure by using debt to assets ratio as a measure for firm leverage. However, for the better understanding of the role of stock market liquidity in firms capital structure decisions, there is a need to investigate the impact of equity liquidity on firm leverage in both developed and relatively developing countries. For this, we take stock market liquidity for identifying the role of equity market liquidity on firms' capital structure in case of Pakistan.

1.3 Objectives of the Study

This study emphasizes on two major objectives. First, the study aims to find the role of equity liquidity in firms' capital structure decisions. Specifically, we study whether firms

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[4] Such as Udomsirikul et al. (2011), Friedel and Martell (2006), and Lesmond et al. (2008)

with more liquid stocks exhibit lower debt to asset ratio. The study also aims to examine whether the firms whose stocks are more liquid opt equity financing over bank borrowing. By doing this, we understand how the equity liquidity impacts firms' choice of debt versus equity financing. Based on existing finance theories and empirical evidence we predict the firms holding larger amount of liquid stocks practice a lower cost of issuing new stocks and hence more inclined towards equity financing rather debt financing. Therefore, by following the empirical studies of Udomsirikul et al. (2011), Stulz et al. (2013), Lipson and Mortal (2009), and Khalaj et al. (2013), we hypothesize that firms that hold higher amount of liquid stocks are expected to be less levered. We predict this as liquidity of stocks decreases the cost of issuing new stocks and makes equity financing cheaper as compared to debt financing. Thus, firms reduce their leverage ratio by increasing equity finance. We test this hypothesis by taking a large sample of non-financial firms listed at the Karachi Stock Exchange over the period 2000-2013. Consistent with the previous empirical studies, we also use several firms-specific variables as control variables in our empirical analysis.

1.4 Importance of the Study

The main aim of this research is to contribute further on the relationship between liquidity and capital structure of firms by analyzing that how greater equity market liquidity tends to reduce the amount of debt financing. Most of the prior studies incorporate the firm-specific determinants in explaining the capital structure decisions. The impact of equity market liquidity on leverage decisions of firms in developing countries has rarely been studied. Yet, for designing effective policies for development

of equity market, it is necessary to know the relationship between equity liquidity and capital structure decisions of firms. Therefore, the empirical findings of this study may help policy makers to formulate the better policy framework accordingly. It also helps firm managers to make better financial decisions and policies while deciding about their firms' capital structure. Furthermore, this study is also helpful for the investors and stock traders to design effective strategies and policies to invest in most liquid stocks. Our study significantly departs from previous empirical studies on Pakistan. Specifically, the focus of our study is not to just identify the firm-specific determinants of capital structure. Rather, the main objective of the study is to examine the impact of equity market liquidity on firm leverage decisions.

1.5 Structure of the Study

The remaining structure of the study is as follows. Chapter 2 describes the prominent finance theories related to firm capital structure. Chapter 3 reviews the empirical literature. Chapter 4 describes the data, methodology, and empirical models of the study. Chapter 5 further discloses the empirical results of the study and our discussion on the results. Finally, Chapter 6 describes the conclusion and policy recommendations of the study.

Chapter 2

Literature Review

Although there is considerable debate on the capital structure in the literature however, the most relevant literature is presented as follows. We divide our literature in two sections. In the first section, we briefly explain the relevant finance theories of capital structure. In the second section, we present the previous empirical literature related to the capital structure decisions of firms.

2.1 Theoretical Literature

Finance theories provide different predictions on the capital structure decisions of a firm. Below, we discuss some important theories that describe the optimal capital structure for an organization. Specifically, Section 2.1.1 describes the trade off theory by Modigliani and Miller (1963), the second sub Section 2.1.2 reports the pecking order theory by Myers and Majluf (1984) and in the last, Section 2.1.3 explains the market timing theory by Baker and Wurgler (2002).

2.1.1 Trade-off Theory

The trade-off theory of capital structure, given by Modigliani and Miller (1963), describes a firm finance its financial needs through debt financing in such a way that the costs and benefits of debt financing are balanced without altering the market capitalization of the firm. Firm market value would be increased by using more debt due

to the tax benefit of taking more debt, whereas, the financial distress and bankruptcy costs induce firm managers to decrease the use of debt in their capital structure.

In the trade-off theory, Modigliani and Miller relaxed the corporate taxes and personal taxes assumption. In the presence of tax benefit of debt financing and the bankruptcy cost of debt financing, the rational manager finance its capital needs in such a manner that the optimal level of capital structure is achieved. So, the firms' main objective while financing their capital needs is to tradeoff between the net benefits and net costs of debt and equity financing. There is also costs attached to debt financing which is deadweight costs of bankruptcy, cost of financial distress, agency cost between managers and investors (Myers, 1977). And the corporate tax savings due to the interest deduction is the main benefit of debt financing (Kraus and Litzenberger, 1973). Similarly, Titman and Wessels (1988) suggest that firm holds mixture of debt and equity in their capital structure. Firms always use debt up till capacity, after which they decrease the level of debt because the cost of debt increases. In the presence of bankruptcy cost of debt firms stop financing its capital through debt and prefer equity financing. According to Myers (1984), firms that follow the trade-off theory first set their target debt to equity ratio then eventually move towards to that targeted ratio.

Stocks liquidity may have great importance in defining the capital structure of firms. According to the trade-off theory, firms having larger amount of liquid assets rely less on debt financing as the cost of issuing equity is lower for liquid firms as compared to illiquid firms. By adjusting the costs and benefits of both debt and equity financing the trade-off theory predicts inverse relationship between stocks' liquidity and leverage of the firm. On the flip, high profit oriented firms by taking tax advantage on debt financing

take more debt. In the presence of bankruptcy costs, taxes and agency conflicts among firm managers and investors, firm managers prefer to increase debt financing in their capital structure, as increase in profits. So, according to the trade-off theory of capital structure, there is a positive relationship between leverage and profitability of firm.

Cash holdings have a negative impact on firms' capital structure. As consistent with the trade-off theory, firm managers' preference is to maximize overall wealth of the stockholders. In order to meet this goal, firm managers maximize their wealth by balancing the marginal cost of cash holdings and the marginal benefits of the cash holdings. The cost of holding most liquid asset includes low rate of return on the stocks because of the liquidity premium and the tax disadvantage of holding excessive cash. The net benefit of cash holdings entails saving of transaction costs if firms raise capital through issuing new stocks as issuing new stocks are costly. The second benefit of cash holdings is that firms having cash reserves finance their capital needs through cash as issuing equity and debt both are expensive. On the flip, firm size is positively correlated with the leverage of the firm. Large size firms are well diversified and have a good reputation in debt market so these firms have easy access to debt market than smaller firms. Also the cost associated with debt financing is lower for larger firms relative to small firms so issuing debt is cheaper for larger firms. The trade-off theory of capital structure also confirms the positive relationship between firms leverage and size of the firm.

2.1.2   Pecking Order Theory

The pecking order theory of capital structure was originated by Myers and Majluf (1984). They highlighted the two important aspects of the pecking order theory. First one is that firm managers prefer internal funds over external funds to finance their investment and other operational needs. The second one is that if retained earnings are not sufficient to satisfy investment and other financial needs, then debt issuance is more preferable than equity issuance. In principle, there are three means of financing namely retained earnings, risky debt and shareholders' equity. Referring to the pecking order theory of capital structure, firm managers first prefer retained earnings and cash (most available liquid asset) as internal source of financing, then prefer less risky debt (straight debt and convertible bonds), and choose external equity financing as a last option for optimal capital structure decisions of a firm. The most accessible internal source of financing is cash and retained earnings and debt to equity are the feasible sources of external financing.

Professional managers always prefer internal funds over external due to the cost associated with external financing. In the light of the pecking order theory, the presence of asymmetric information among managers and shareholders, firm managers prefer internal financing over external financing. The firm managers have more information related to risk and market value of firm than the outside investors. Asymmetric information problem between internal management and outside investors is higher in equity financing than debt financing. In the presence of these costs firm managers are more inclined towards debt than equity issuance. There is also cost related to debt financing i.e. financial distress, debt overhang, bankruptcy cost, interest payments, and

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agency conflicts between managers and investors. This shows that retained earnings are preferred over debt financing and debt financing is preferred over equity financing (Myers; 1984). This theory implies that a firm has different financing sources and chooses internal financing as a first option. But when there is shortage of internal funds and there are not enough funds to meet the financial needs then firms take debt financing as external source of financing. Similarly, when issuing debt is no longer feasible for firm then equity will be issued as a second option of external source of financing. Equity is a least preferred source of external financing. Firms raise debt financing up till the capacity after that equity is issued because the cost related to issuing debt is higher. When firms are over levered then issuing more debt enforces additional debt issuance costs (costs of financial distress and bankruptcy). So, in this situation, the rational managers prefer to issue liquid stocks as issuing stocks are cheaper for firms relatively to debt issuance. In the presence of transaction cost and asymmetric information among investors and management, firm managers adjust the costs and benefits of debt and equity financing and choose the best optimal level of capital structure. So there is a negative relation between stocks' liquidity and leverage of firms.

Asymmetric problem between managers and outside investors is comparatively higher in equity financing than debt financing. Risk related to equity financing is higher than debt financing so investors always demand higher rate of return on equity due to the presence of asymmetric information risk. On empirical grounds, Fama and French (2002) by confirming the pecking order theory, concluded that firms holding higher amount of profits have enough cash to finance its project through internal generated funds so these firms are less levered. Similarly, Frank and Goyal (2003) following pecking order theory

suggested that internal funds are not enough for financing so firms will track equity financing faster than debt financing. They confirmed the negative association between equity liquidity and firms' leverage decisions.

According to the pecking order theory, if investments are larger than retained earnings then firms utilize external financing and if retained earnings are higher than investments then firms are likely to not go for external financing. More profitable firms have excessive amount of cash reserves in their balances, so, these firms prefer internal financing over external financing as cost related to external financing is higher as compared to internal financing.

The pecking order theory demonstrates that higher stock prices enforce firm managers to finance their financial needs through issuance of stocks rather debt because the cost of issuing new stocks is lower. Firm managers choose equity financing when the cost associated with the issuing new equity is comparatively lower than debt issuance and repurchase equity when the issuing cost is higher. Thus, there is a negative relationship between price of stocks and firms' leverage decisions. Similarly, the pecking order theory states that firms which are large in size don't bear any insolvency costs as compared to small size firms, therefore these firms take more debt and less equity in their capital structure. This implies that firm size has positive impact on the firms' leverage decisions.

The pecking order theory states that tangibility of assets is negatively correlated with leverage of firms. Tangible assets or in other words fixed assets, such as plant, property, and equipment, are easy to evaluate for outside investors in comparison with intangible assets e.g., goodwill, patents, and trademarks. This tends to decrease the asymmetric

information problem between management and investors and lower the cost of issuing new equity. Therefore, firms having larger amount of tangible assets issue more new equity and use lower amount of leverage in their capital structure.

In the light of the pecking order theory, firm managers finance their capital needs through internal source of financing and use the external source of financing as the last option. Due to higher asymmetric information raising funds through external source of financing makes for managers are too expensive. As the rational managers' motive is to escalate the overall value of the firm, so they fulfill their needs through internal financing. A firm holding larger amount of cash tends to decrease the leverage ratio. Thus, the pecking order theory expected a negative association between cash holdings and leverage of a firm.

2.1.3   Market Timing Theory

The market timing theory of capital structure by Baker and Wurgler (2002), indicates that firm managers prefer external source of financing and issue equity when the market performance and the cost associated with issuing equity is lower and issue debt otherwise. Firm managers time their security issue and wait until the equity market conditions become favorable for issuing stocks for higher return. However, when the equity market is in bad conditions and the cost of issuing equity is higher, firms manager's decrease the amount of issuing stocks and repurchase their equity and then debt will be used as external source of financing. Baker and Wurgler (2002), stated that firm managers prefer equity financing when market value of equity is higher and repurchase equity when market value of equity financing is lower. However, firms'

rational managers time their issues and prefer equity financing over debt financing when market conditions for equity issuing are good.

Equity market timing affects firms' capital structure in this way that in the short run, when the market valuation of stock issuance are higher firms are tend to be low levered by issuing equity. And when the equity market valuations are not favorable then firms do greater reliance on debt financing and hence, are over-levered. Market valuation enforces firm managers to issue equity and reduce the amount of debt financing until the optimum level of debt is achieved. So, there is an inverse relationship between leverage and market valuations.

Many researchers such as Bayless and Chaplinsky (1996), Huang and Ritter (2009), Alti (2006), and Elsas et al. (2014) empirically confirm the market timing effect of stock issuance. Welch (2004) points out that the change in market value of equity is not due to fluctuations in amount of shares outstanding but it is due to the change in stock prices. Therefore, stocks price impact is significant in explaining debt ratios. By following market timing theory, Huang and Ritter (2009) suggested that when the risk of issuing equity is lower and the returns on stocks are higher than the firm uses external source of financing. Similarly, Baker and Wurgler (2000) and Bayless and Chaplinsky (1996) suggested a positive relation between stock issues and the business cycle. Likewise, Alti (2006) confirming market timing theory concluded that when equity market conditions are favorable firms issue more equity and less debt as compared to in cold market conditions and hence prove the existence of negative relationship between debt ratios and market to book ratio. Hovakimian et al. (2004), Hovakimian (2006), and Elsas et al. (2014) also confirmed the market timing theory and concluded that firms having higher

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market to book ratio tend to hold lower amount of leverage and reported the negative relationship between market to book ratio and firms leverage decisions.

2.2 Empirical Literature

There is a considerable empirical research on the issue of capital structure in the corporate literature, most of it has emphasized on the firm-specific determinants of capital structure. However, our study not only focuses on the determinants of capital structure but also on examining the role of equity market liquidity in firm leverage decisions. To review empirical evidence on how firms decide their capital structure, firstly we divide the existing literature into two parts: traditional and non-traditional determinants of capital structure. The traditional factors are further divided into two parts. First, we present the empirical evidence on the factors that affect firms' leverage decisions negatively. Next, we present the review of the factors that are positively related to capital structure decisions of firms. Finally, we review the studies that examined the impact of stock market liquidity on firms' leverage decisions.

2.2.1 Factors that Affect Firm Leverage Negatively

The capital structure in general and liquidity of equity in particular, has recently become a growing area of research in finance. When we review the previous empirical studies on the determinants of capital structure, we find several empirical studies. Some of them arrive at opposing conclusions, however various researchers argue that equity liquidity directly affects firms' capital structure and firms with most liquid stock are less leveraged. Lipson and Mortal (2009) examined the relation between firms' equity market liquidity and capital structure decisions. By sorting US firms over the year 1986 to 2006

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into size quintile and then into liquidity quintile, they point out that higher equity market liquidity leads to decrease in the cost of issuing equity and hence motivating firm managers to use more equity financing rather debt financing. Similarly, Elsas et al. (2014) selected the simplest US firms that have made large investments during the 1989 to 2006 period. They empirically concluded that large investments are usually externally financed so firm managers prefer equity issuance when share prices increase confirming the market timing effect and leverage otherwise. And also found that investment opportunities and profitability have negative impact on the leverage ratios of the firms.

The liquidity of stocks is greatly affected by the cost related to equity issues. Under the pecking order theory of capital structure, transaction cost of illiquid stocks is higher than the liquid stocks. Transaction cost is the cost of issuing equity, so higher is the cost; lower will be the equity issues. Frieder and Martell (2006) concluded that when the transaction cost of issuing equity is higher, then stocks are illiquid and expensive to issue so the firm will prefer to increase the level of leverage and vice versa. By applying two-stage least square analysis on US panel data of NYSE firms, they further concluded that firms with higher spread will issue more leverage. Other variables such as profitability, research and development expenditures, and growth opportunities have negative relationship with market as well as book leverage of firms. In the same way Hadad (2012) examined the role of stocks liquidity on firms' capital structure. By using Amman stocks exchange data over the period 2000 to 2009, he concluded that higher stocks liquidity results in lower issuance costs and hence greater reliance on equity financing as compared to debt financing. Furthermore, he documented that modified liquidity ratio,

turnover ratio, profitability, and firm growth are negatively related to both market leverage and book leverage of the firm.

Information asymmetry between firm managers and outside investors restricts the firm managers to issue equity because it increases the cost of issuing equity. Therefore, issuing equity becomes expensive for firms[5]. The study of Lesmond et al. (2008) uses the fixed effect regression technique to investigate the relationship between stocks liquidity and capital structure decisions of firms, supporting the pecking order hypothesis that firms having more debt financing in their capital structure increase the information asymmetry in remaining equity. Consequently, the cost of equity liquidity is raised which induces the firm managers to use more debt. Kyle (1985) examined the model of speculative trading in which the insider managers by exploiting his monopoly power were setting prices efficiently and maximizing their profits.

According to the market timing theory of capital structure, firm managers time their security issues and only issue securities when the market circumstances are favorable. Therefore, debt financing is negatively affected by stock issuance. Graham and Harvey (2001) documented that market timing plays a vital role in explaining the financing decisions of firms. They further concluded that in hot equity market, with lower adverse selection cost of issuing equity, firm managers' issues more equity as compared to debt. Similarly, Baker and Wurgler (2002), Welch (2004), and Alti (2006) investigated the market timing effect of issuing equity and documented that during the IPO year firms enjoying favorable market conditions, and having low adverse selection cost of issuing equity, face greater decline in debt ratios as compare to firms having unfavorable market

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[5] Leelakasemsant (2011) has investigated the ownership concentration and information asymmetry for Thailand listed firms.

conditions. However it was observed that after IPO such behavior no longer exits. Their study also revealed that there is a negative relationship between profitability, market to book ratio, prices of stocks, non debt tax shields, and leverage of the firm.

Firms set their target leverage ratio and move towards that ratio with passage of time. Ozkan (2001) examined the determinants of target capital structure and adjustments towards the long run target leverage ratios by using the GMM technique and unbalanced data set of 390 UK listed firms. He concluded that firms having optimal target leverage ratio move towards that ratio particularly faster. This is because the cost of adjustment and the cost of being staying away from target leverage ratios are both important for firm capital structure. He further documented that profitability, liquidity, and growth opportunities have negative impact on firms borrowing decisions. Similarly, Hovakimian et al. (2004) analyzed the determinants of capital structure on dual debt and equity issues by using GMM technique. They have taken into account the US non-financial firms from 1982 to 2000 and empirically concluded that, as consistent with the dynamic trade-off theory, the dual issue of debt and equity offsets the deviation from target leverage ratios due to the accumulated earnings and losses. Consequently, the firms will move towards the target leverage ratios. They further stated that the market timing effect is insignificant in dual issues as higher stocks prices lead to increased equity issuance and not resulting in lower target leverage ratios. After such dual issue, leverage ratios decreases with the increase in market to book ratio, selling expenses, profitability, and research and development expenditures.

According to the pecking order theory, the liquidity of equity imposes significant impact on the profitability of firm. Fama and French (2002) jointly examined the trade-off and

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the pecking order theory of capital structure. By applying panel regression approach on US firms' data over the period 1965 to 1999, their study partially supports the pecking order hypothesis however it contradicts the trade-off hypothesis that high profit firms use less leverage. More profitable firms and the firms having good investments use less market and book leverage in their capital structure. They also predict negative relation between dividend payout ratio and debt. Similarly, Duca (2012) examined the capital structure of Romanian listed firms and concluded that firms having lower amount of tangible assets are more inclined to issue debt due to the presence of asymmetric information among managers and investors. He also find liquidity and tangibility of assets are negatively related with leverage of firms while profitability and firm size are insignificant and have no impact in defining firms' capital structure.

Elsas et al. (2014) take into consideration the US stock exchange data from 1971 to 2008, to examine the impact of stocks repurchases and mispricing on firms' capital structure. The results revealed that firms that are over-levered and whose equity are overpriced, progress more rapidly towards their target leverage ratio as compared to under levered firms. They also reported that both book debt and market debt are negatively related with growth opportunities of the firm. On the other hand, Thomas et al. (2014) used panel data set of Kenyan listed firms from 2006 to 2012 excluding commercial banks and aimed to examine the impact of profitability and firm size on firms' capital structure. They found that profitability and liquidity are significantly and negatively related to firms leverage ratios whereas firm size has positive impact in defining the leverage ratios. Hovakimian and Li (2011) analyzed the determinants of capital structure by using the Chinese small and large size firms' data set from years 1998 through 2006 using two stage least square

regression technique. They found that firms who take more debt pay less wages to employees further explaining that tangibility of assets, profitability, non debt tax shields, and employees wages have significantly negative impact on leverage ratio of the firm.

Opler et al. (1999), Guney et al. (2007), Ozkan and Ozkan (2004), Lins et al. (2010), and Harford et al. (2012) have empirically concluded that cash holdings have negative and significant impact on the leverage ratios of the firms. Their findings strongly support the pecking order theory, that firms having more cash in their capital structure finance their needs through internal funds rather external funds.

2.2.2 Factors that Affect Firm Leverage Positively

In this section we review that literature in which the variables have positive impact on the capital structure decisions of firm. Examples of these studies are Frank and Goyal (2003), Wang (2013), and Xiong and Su (2014). They have empirically found that there is positive and significant relationship between firm leverage ratios and size and also with the tangibility of assets.

Similarly, Hirota (1999) applies pooled regression technique along with the year fixed dummy to investigate the capital structure dynamics for Japanese listed firms and concluded that firms' capital structure in Japan is affected by real factors as well as the regulatory and institutional factors. Furthermore, he reported that all the real factors i.e. profitability, assets tangibility, taxes, firm size and investment opportunities have economic significance on firms' leverage decisions. And firm size and assets tangibility have positive relationship with leverage ratios of the firm.

Hovakimian et al. (2001) examined the debt and equity choice for US non-financial firms over the year 1979-1997. They have applied tobit regression and explained that firms progress towards target debt ratio which varies with the change of profitability and stock prices. When stock prices are low then firm issues debt and issue equity otherwise. They further reported that firm size and tangibility of assets have positive and significant impact on leverage decisions of firms whereas growth opportunities, profitability, and stock prices have negative impact on leverage decisions of firms. Similarly, Sibilkov (2009) empirical research was based on US listed firms. He documented that due to the presence of financial distress there is a positive association between stocks liquidity and secured debt whereas there is a curvilinear relationship between liquidity and unsecured debt. His findings revealed that there is a positive and significant impact of all the firm-specific variables such as firm size, plant property and equipment, research and development expenditures, market to book ratio and tax rate on leverage ratios of the firm.

According to the pecking order theory, Zare et al. (2013) investigate the factors affecting the capital structure decisions of firms in Tehran by using simple regression technique. They have reported that there is a positive relationship between firm size and leverage ratios. Moreover policies of the firms are also influenced by these factors and also effect the firm managers' decisions to secure leverage financing. On the other hand, Byoun (2007) reported that there is lower debt to equity ratio for the small firms in US not because they have excessive cash holdings but due to increase in amount of equity financing. As small size firms have shortage of capital, so these firms finance their capital needs through issuance of equity without approaching financial flexibility.

The studies related to Pakistan like Ahmed et al. (2010) presented a fixed effect model to investigate the relationship between debt ratios and firm-specific variables. They found that there is a negative association between firm size and debt ratios of a firm. While Shah et al. (2004) by using pooled regression analysis found that large size firms take more debt confirming the pecking order hypothesis. Shah and Khan (2007) apply fixed effect regression analysis to analyze the factors influencing the capital structure decisions of firm. They have found that increase in the firm size, tangibility of assets and earning volatility of firms result in increase in the leverage ratios of firms since there is a positive association between these variables.

2.2.3 Impact of Liquidity on Firms Leverage Decisions

Amihud and Mendelson (1986) established a model and figure out how stocks expected returns affect equity liquidity of a firm through the bid-ask spread. They have suggested that higher stocks expected returns is increasing function of spread therefore, firms must balance the expected trading costs of capital against stock and expected returns. Myers and Rajan (1995) emphasized on liquidity of assets and concluded that firms finance most of their capital needs through issuance of most liquid stocks. This results in greater reliance on the issuance of liquid equity and less on debt financing. Similarly, Butler et al. (2005) examined the optimal capital structure of US listed firms. Their findings support the market timing theory and concluded that that the cost of issuing equity is less for more liquid stocks. This leads to higher usage of equity and lower usage of leverage in firms' capital structure. However firms time their equity issues, so there is a negative relationship between equity liquidity and leverage of the firm.

Recent studies suggest that bid-ask spread is a measure of transaction cost. The higher is the spread greater is the transaction cost and more is the illiquidity of firms' equity. Kluger and Stephan (1997) used bid-ask spread as a measure of liquidity and suggested that liquidity is a multidimensional process. Similarly, Amihud (2002) found remarkable results regarding the liquidity of stocks while working on illiquidity of stocks for US listed firms at stock exchange. By taking Amihuds illiquidity measure of liquidity of stocks and bid ask spread as a measure of transaction cost concluded that if illiquidity of stocks is higher, then there is a lower stocks price and higher stocks expected returns. Hovakimian (2006) confirms the market timing hypothesis and concluded that firms in short run time their issues until the periods of high market to book ratios. He further reported that in the long run debt financing has significant impact on market to book ratios while equity issues don't show any significant relationship with growth opportunities of firms and leverage ratios.

Liquidity of stocks is also determined by information asymmetry. Kyle (1985) revealed that informed investors have more knowledge about the market so they take advantage of information asymmetry and maximize their profit. The increased information asymmetry therefore increases the stock issuing cost and the firm will be more inclined to debt financing as compared to equity financing. In contrast, Lesmond et al. (2008) showed that firms having larger amount of debt financing result in increase the information asymmetry in remaining equity, so the cost of equity liquidity increases. On the flip, Andres et al. (2014) provided evidence that an increase in expected debt gives signal of firms' profitability and it thus lowers the information asymmetries between managers and investors. By constructing year by year information asymmetry index for US listed firms,

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confirms the Ross signaling hypothesis and documented that higher equity liquidity lowers the information asymmetry between insiders and outsiders which results in greater reliance on equity financing.

Subsequently Udomsirikul et al. (2011) take into consideration Thailand firm level data starting from 2002 to 2008 to investigate the relationship between equity liquidity and capital structure decisions. By using fixed effects regression technique and three different measures of liquidity, documented that firms holding more liquid stocks decrease the amount of leverage in their capital structure. The empirical results suggested that there is a significant and negative relationship between equity liquidity and firms leverage ratios. Similarly, Leelakasemsant (2015) extended the work for Thailand listed firms and examined the impact of both equity liquidity and ownership concentration on capital structure of firms. He found that firms with higher equity liquidity and lower concentration in ownership structure used less debt financing. Welch (2004) explains the debt to equity dilemma for the US firms. By applying Fama and Macbeth approach, he explained that the change in expected stocks returns is due to the fluctuations in the debt to equity ratio.

However, on empirical grounds, there are still ambiguous results regarding the correlation between equity liquidity and leverage ratio of the firm. On the one side, there are numerous studies which provide evidence that there is a positive relationship between firms' equity liquidity and leverage ratios (see, for example, Myers and Rajan (1995), Morellec (2001), Sibilkov (2009), and Akinlo (2011)). On the other hand, several other studies, such as Hovakimian et al. (2001), Hovakimian (2006), Ahmed et al. (2010), Rajendran and Achchuthan (2013), Stulz et al. (2013), Bonaime et al. (2014), and Bolton

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et al. (2014), presented strong evidence that there is a negative relationship between leverage and liquidity of the firm. An increase in equity liquidity results in reduction of leverage ratios.

The study of Elsas et al. (2014) use the multiple regression approach to investigate the role of equity liquidity on firms capital structure decisions for Nigerian listed firms. They have taken different liquidity measures to clarify the relationship between stocks liquidity and leverage ratios. They further concluded that increased in equity liquidity results in lower leverage ratios. On the other way, Rajendran and Achchuthan (2013) use the regression analysis and examined the relationship between equity liquidity and capital structure for Sirilankan's telecom. They found that debt and equity financing dilemma depends upon the profitability of firms and suggested that firms management should focused on return on assets and return on equity ratios while incorporating liquidity decisions. Similarly, Sarlija and Harc (2012) in their analysis took 1058 small and large sized Croatian listed firms. By applying Pearson correlation technique, they empirically concluded that there is a significant and stronger relationship between liquidity and short term leverage than long term leverage. They further reported that firms having most liquid assets in general take less debt. Therefore, there is an inverse relationship between stocks liquidity and leverage ratios of the firm.

While reviewing the empirical studies we find that most of the empirical studies are based on developed countries. Several researchers have explored the role of equity liquidity on capital structure decisions of firms (see, for example, Frieder & Martell, 2006; Khalaj et al., 2013; Lipson & Mortal, 2009; Thomas et al., 2014; Udomsirikul et al., 2011). On the other hand, when we review the literature for developing countries,

most of the prior empirical studies have just focused on the firm-specific determinants of capital structure by using debt to assets ratio as a proxy of leverage (Akhtar & Masood, 2013; Akinlo, 2011; Shah & Khan, 2007). However, for the better understanding of the role of stock market liquidity in firms capital structure decisions, there is a need to investigate the impact of liquidity on firm leverage in both developed and relatively developing countries. For this, we take stock market liquidity to examine the role of equity liquidity on firms' capital structure decisions in case of Pakistan.

Chapter 3

Data and Methodology

3.1 Data and Sample Description

In order to examine the role of stock market liquidity on the capital structure decisions of firms, we have taken an unbalanced annual panel data set of all non-financial firms listed at the Karachi Stock Exchange (KSE) during the period starting from 2000 to 2013. We collected the annual data set from Balance Sheet Analysis of Non-Financial Firms published by State Bank of Pakistan (SBP). The financial firms were excluded from our data set because the capital structures of financial firms are different from non-financial firms. To examine the role of stocks liquidity we obtained the stock prices data of all the non-financial firms from the portal managed by the KSE. We took daily stock returns starting from year 2000 to 2013 of non-financial firms listed at the KSE.

3.2 Definitions of Variables

Although the aim of this study is to explore the effect of equity market liquidity on firms' capital structure, we include several other firm-specific variables in our analysis which also effect capital structure of firms. These variables include firm size, profitability, assets tangibility, and average trading price of stocks. To measure the stock market liquidity, we use three different proxies, namely Amihuds' illiquidity, modified liquidity ratio, and modified turnover ratio. Further, to measure the capital structures of firms we use two proxies, namely book leverage and market leverage.

The majority of prior studies (as, for instance, Hovakimian et al. (2001), Baker and Wurgler (2002), Lipson and Mortal (2009), Udomsirikul et al. (2011), Rezaei and Latifi (2013), and Ahmed et al. (2010)) have been using the following firm specific control variables, which we also use in our study.

Table 3.1: Variables definitions

Variable Name	Abbreviations	Expected sign	Definition
Dependent Variables:			
Book Leverage	BLEV	-ve	Book leverage is defined as the ratio of the book value of debt to total assets while book debt is combination of current liabilities and non-current liabilities
Market Leverage	MLEV	-ve	Market leverage is defined as the book value of debt divided by the market value of assets
Debt to Equity ratio	DER	-ve	The ratio of book value of debt to shareholders equity
Independent Variables: **A. Focused Variables**			
Amihuds' illiquidity	ILLIQ	+ve	ILLIQ is defined as the average ratio of the daily absolute return to the (rupee) trading volume on that day
Modified turnover ratio	MT	-ve	The ratio of the monthly number of shares traded to the total number of shares outstanding divided by the volatility of earnings
Modified liquidity ratio	MLR	-ve	The ratio of the sum of daily trading volume to the sum of absolute returns in a year is divided by the volatility of earnings

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B. Control Variables

Profitability	PROF	-ve	The ratio of net profit before tax to total assets
Tangibility	TANG	+ve/-ve	The ratio of fixed assets after deducting accumulated depreciation to total assets
Firm Size	SZ	-ve/+ve	Natural logarithm of book value of sale
Price level	PRC	-ve	The natural log of the average trading price of stocks during the year
Cash holdings	CH	-ve	The ratio of cash to total assets

3.3 Empirical Models

In order to measure the impact of equity market liquidity on capital structure of firms, we construct our models by following the studies of Udomsirikul et al. (2011), Ahmed et al. (2010), Lesmond et al. (2008), and Hovakimian et al. (2004). We also examine whether the firms whose stocks are more liquid opt equity financing over bank borrowing. We construct various regression models to examine the impact of equity market liquidity on firms leverage decisions by altering the dependent variable i.e., book leverage, market leverage, and debt to equity ratio. For measuring equity market liquidity we take three different measures as independent variables, namely, Amihuds' illiquidity, modified liquidity ratio, and modified turnover ratio.

Following the study of Udomsirikul et al. (2011) and Hovakimian et al. (2004) we construct our regression model as follows.

$$BLEV_{i,t} = \beta_0 + \beta_1 LIQ_{i,t} + \beta_2 SZ_{i,t} + \beta_3 TANG_{i,t} + \beta_4 PROF_{i,t} + \beta_5 PRC_{i,t} + \beta_6 CH_{i,t} + \varepsilon_{i,t} \qquad (3.1)$$

where,

$BLEV_{i,t}$ represents book leverage

$LIQ_{i,t}$ is the liquidity

$SZ_{i,t}$ represents firms' size

$TANG_{i,t}$ is the tangibility

$PROF_{i,t}$ represents the profitability

$PRC_{i,t}$ represents the average trading price of the stocks

$CH_{i,t}$ represents the cash holdings of the firm

In this study t represents the time period and $\square$ is for cross sectional units. β_0 and β are the intercept and the slope coefficients of the regression models. $\varepsilon_{i,t}$ is the error term and it captures the unobserved shocks of the model. Equation (3.1) indicates that how equity liquidity affects firms' leverage decisions. The above equation shows that book leverage is the main dependent variable.

To measure the impact of equity market liquidity on firms' leverage, we use two different proxies of leverage, namely book leverage and market leverage. By following the existing empirical literature such as Lipson and Mortal (2009), Udomsirikul et al. (2011), and Iskandrani and Haddad (2012), we also estimate the above model for market leverage, which is presented below.

$$MLEV_{i,t} = \beta_0 + \beta_1 LIQ_{i,t} + \beta_2 SZ_{i,t} + \beta_3 TANG_{i,t} + \beta_4 PROF_{i,t} + \beta_5 PRC_{i,t} + \beta_6 CH_{i,t} + \varepsilon_{i,t} \qquad (3.2)$$

where, $MLEV_{i,t}$ = market leverage, $LIQ_{i,t}$ = liquidity, $SZ_{i,t}$ = Size, $TANG_{i,t}$ = tangibility, $PRC_{i,t}$ = average trading price and $CH_{i,t}$ = cash holdings of the firm. In the above equation now we replace the dependent variable with market leverage in order to examine the impact of equity liquidity on firms' market leverage.

We also estimate another model in order to examine whether firms' those equity are more liquid prefer equity financing over debt financing. For this purpose, consider use debt to equity ratio as the dependent variable. Specifically the model takes the following form.

$$DER_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 SZ_{it} + \beta_3 TANG_{it} + \beta_4 PROF_{it} + \beta_5 PRC_{it} + \beta_6 CH_{i,t} + \varepsilon_{it} \qquad (3.3)$$

In equation (3.3) we take DER = debt to equity ratio as dependent variable and the rest of the variables are same as used in equations (3.1) and (3.2). Literature shows that liquidity has negative impact on debt to equity ratio of the firm. Shah and Khan (2007), and Ahmed et al. (2010) also used DER ratio as measure of leverage and find negative relationship between liquidity and DER ratio of the firms. So, by following the existing empirical literature, we also use DER as measure of leverage.

3.4   Liquidity Measures

Liquidity of firms' equity means the selling of shares without any price change. The larger value of this liquidity measure indicates that the firm is more liquid and has greater safety edge to meet its short term liabilities and escapes from problem of financial distress. Most of the existing empirical studies such as Hovakimian et al. (2004), Shah and Khan (2007), Ahmed et al. (2010), and Elsas et al. (2014) use debt to equity ratios as

measures of liquidity. But in this study to measure the role of equity market liquidity on firms' capital structure decisions we use three different proxies of liquidity which are discussed in detail as below.

3.4.1 Amihud's (2002) Illiquidity

To examine the role of equity market liquidity on firms' leverage decisions, we use Amihuds' illiquidity as first measure of liquidity. It measures the market value of the companys' stocks and now a days extensively used by researchers to measure the liquidity of stocks. Amihud's (2002) illiquidity measure $(ILLIQ_{i,y})$ is defined as the average ratio of the daily absolute stock return to the (rupee) trading volume on that day.

$$ILLIQ_{i,y} = \frac{1}{D_{i,y}} \sum_{t=1}^{D_{i,y}} \left[\frac{|R_{i,d,y}|}{VOLD_{i,d,y}} \right]$$

where, $R_{i,d,y}$ is the absolute value of the stock return of stock 'i' on day 'd' of year 'y'. $VOLD_{i,d,y}$ is the daily volume in Pak rupee and $D_{i,y}$ is the respective number of days when data are available for stock 'i' in year 'y'. This ratio gives the absolute (percentage) price change per rupee of daily trading volume. Amihud's (2002) illiquidity shows the price impact of stocks and also be expressed as one rupee of trading volume related to daily price change. Greater the price impact greater will be trading cost and hence higher illiquidity of stocks. This liquidity measure basically measures illiquidity of stocks and this concept was first introduce by Amihud and Mendelson (1986). They found that stock returns are increasing function of stock illiquidity. Amihud (2002), Hovakimian et al.

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(2001), and Hovakimian et al. (2004) empirically documented that there is a positive relationship between ILLIQ ratio and leverage of the firm. So following the existing empirical studies, we also expect that ILLIQ ratio is positively related with leverage of the firm.

3.4.2 Modified Turnover (MT)

The modified turnover (MT) is used as second measure of liquidity. In literature, Lipson and Mortal (2009), Udomsirikul et al. (2011), and Iskandrani and Haddad (2012) used this ratio in their empirical studies. On the basis of these studies, we also use this proxy for measuring stock market liquidity. This ratio can be defined as the ratio of the monthly number of shares traded to the total number of shares outstanding divided by the volatility of earnings.

$$MT_{i,y} = \frac{1}{M_{i,y}} \sum_{i=1}^{M_{i,y}} \frac{VOL_{i,m,y}}{N_{i,y} \times VOLTALITY_{i,y}}$$

where, $M_{i,y}$ is the number of months for which data are available. In the numerator $VOL_{i,m,y}$ is the monthly number of shares traded for firm 'i' in 'm' month of 'y' year, $N_{i,y}$ is the total number of shares outstanding for firm 'i' in year 'y' and it is defined as the amount of stocks which a company issue and it increases the liquidity of firm. $VOLTALITY_{i,y}$ is the volatility of earnings of ith firm in year 'y', and is defined as the absolute difference between the annual percentage change in earnings before interest and taxes (EBIT) and the average of this change over the sample period. Lipson and Mortal

(2009), Udomsirikul et al. (2011), and Iskandrani and Haddad (2012) found a negative relationship between modified turnover ratio and leverage. We also expect negative relationship between leverage and modified turnover ratio.

3.4.3   Modified Liquidity Ratio (MLR)

We also use another measure to evaluate stock market liquidity. In particular, we use modified liquidity ratio (MLR) as our third measure of liquidity. The modified liquidity ratio is defined as the ratio of the sum of the daily trading volume to the sum of absolute stock return in a year divided by the volatility of earnings.

$$MLR_{i,y} = \frac{1}{D_{i,y}} \sum_{i=1}^{D_{i,y}} \left[\frac{VOL_{i,d,y}}{|R_{i,d,y}|} \right] \frac{1}{VOLTALITY_{i,y}}$$

In the above ratio $VOL_{i,d,y}$ and $R_{i,d,y}$ are the daily volume of ith stock of day 'd' in year 'y' and daily stock returns for year respectively. $D_{i,y}$ is the number of days when data are available for ith stock in year 'y'. $VOLTALITY_{i,y}$ is the volatility of earnings, and is defined as the absolute difference between the annual percentage change in earnings before interest and taxes (EBIT) and the average of this change over the sample period. As in Udomsirikul et al. (2011), Iskandrani and Haddad (2012), and Elsas et al. (2014), we also expect negative relationship between leverage and modified liquidity ratio.

3.5 Leverage

Leverage ratios help to analyze the financial position of firms. It also tells us that how much debt a firm holds to meet its financial obligations. Higher value of leverage ratio indicates that the firm is over levered and lower value of leverage ratio indicates that the firm is under levered. Likewise , Hovakimian et al. (2001), Baker and Wurgler (2002, Fama and French (2002), Lipson and Mortal (2009), Ahmed et al. (2010), Udomsirikul et al. (2011), Iskandrani and Haddad (2012), Rezaei and Latifi (2013), and Elsas et al. (2014) we also use two different measures of leverage that is market leverage and book leverage. The book leverage is defined as the ratio of the book value of debt to total assets. And book debt is calculated by adding current liabilities and non-current liabilities. Higher value of book leverage indicates that firm is having more debt and less equity in their capital structure.

We also use market leverage as a second measure of firm leverage. Market leverage is defined as book value of debt is divided by the market value of assets. And market value of assets is calculated as total assets minus book value of equity plus market value of equity. The book value of equity is total assets less total liabilities. The book value of debt is simply current liabilities and non-current liabilities. The market value of equity is calculated by multiplying the number of shares outstanding with the current stock price. We eliminate those observations where market leverage and book leverage are above one. The main difference between the two leverage ratios i.e. market and book leverage is that, the book leverage is not sensitive to change in stock prices while market leverage is sensitive to change in stock prices. The third measure of leverage that we use in our study is debt to equity ratio (DER) and is define as the ratio of book value of debt to

shareholders equity. Consistent with existing empirical studies of Ahmed et al. (2010), Booth et al. (2001), and Shah et al. (2004) we also use book value of debt to shareholders equity as measure of leverage ratio.

3.6   Control Variables

In order to measure the impact of equity market liquidity on firm leverage decisions, it is essential to control for other firm-specific variables that have also significant impact on firms' capital structure. Therefore, consistent with the studies of Baker and Wurgler (2002, Fama and French (2002), Hovakimian et al. (2004), Frieder and Martell (2006), Lipson and Mortal (2009), Ahmed et al. (2010), and Udomsirikul et al. (2011) we use following conventional control variables which have an important control on the leverage of corporations. We present the definitions of these firm specific variables in detail and also present empirical evidence on these variables. We find that different theories predict different relationship between leverage and firm-specific variables. Our control variables are defined as follows.

3.6.1   Profitability

To examine the effect of other control variables like profitability (PROF) on optimal level of leverage ratios we take earnings before interest and taxes (EBIT) divided by total assets as a measure of profitability of firms. This ratio indicates that how efficient management uses its internal assets to convert into earnings (net income). Firms' profitability is predicted to influence leverage ratios negatively. Most of the prior empirical studies such as Ozkan (2001) and Huang and Ritter (2009) documented that firm profitability decreases with the increase in market and book leverage ratios.

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According to the pecking order theory by Myers and Majluf (1984), a more profitable firm uses its internal source of financing over external source of financing to satisfy their capital and investment needs. The accessible internal source of financing is cash and retained earnings and debt to equity as the feasible source of external source of financing. A firm having a high level of profitability uses retained earnings and takes less debt. Therefore there is a negative relationship between leverage and profitability of a firm (Bennett & Donnelly, 1993; Frank & Goyal, 2003; Hirota, 1999; Hovakimian et al., 2004; Lipson & Mortal, 2009; Rajan & Zingales, 1995).

On the flip, the trade-off theory of capital structure, predicted that firms prefer to take debt financing rather equity financing due to tax benefit of debt and lower bankruptcy cost. Therefore, due to presence of non-debt tax shields effects of debt financing and lower level of bankruptcy risk, more profitable firms take interest in debt financing rather equity financing. Thus, profitability induces firm managers to take more debt financing which supports the trade-off hypothesis that there is a positive relationship between firm profitability and leverage ratios. This prediction is also in line with many researchers such as Fama and French (2002), Akinlo (2011), Wang (2013), and Andres et al. (2014).

3.6.2 Cash Holdings

$CH_{i,t}$ shows the cash holdings of ith firm in year t. The cash to total assets is used to calculate the cash holdings (CH) of a firm. This measure tells us that how much firms holds cash in their capital structure. Higher the ratio higher will be the amount of cash which firm holds. On the other hand, lower ratio of CH the lower will be the cash holdings.

According to the trade-off theory firm manager preference is to raise the overall wealth of the stockholders. In order to meet this goal, firm managers maximize their wealth by balancing the respective costs of cash holdings and the benefits of the cash holdings. The cost of holding most liquid asset i.e. cash includes low rate of return on the stocks because of the liquidity premium and the tax disadvantage of holding excessive cash. The net benefit of cash holdings entails saving of transaction costs if firms raise capital trough issuing new stocks as issuing new stocks are costly and the second benefit is firms finance their capital needs through cash as issuing equity and debt both are expensive. The first one is referred as transitive motive of cash holdings and the second is referred as precautionary motive of cash holdings. So according to this theory, a firm holding larger amount of cash in their capital structure takes less leverage.

According to Myers and Majluf (1984), asymmetric information among firms' management and outside investors makes issuing new equity costly. Thus, rational managers finance their investment needs through internal source of financing (cash) and then debt and in the last with issuing equities. A firm holding larger amount of cash tends to decrease the leverage ratio. There is a negative relationship between leverage and cash holdings of firm. Opler et al. (1999), Ozkan and Ozkan (2004), Guney et al. (2007), Lins et al. (2010), and Harford et al. (2012) also empirically concludes that there is a negative correlation between cash holdings and leverage decisions of firm.

3.6.3 Tangibility

$TANG_{i,t}$ shows assets tangibility of firm i in year t. The net property, plant, and equipment is divided by the total assets is used to measure tangibility of assets (TANG). In the finance literature, the pecking order theory suggests that tangibility of assets has

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negative impact on capital structure of firms. Tangible assets (plant, property and equipment) are easy to value for outside investors as compared to intangible assets (goodwill, patents and trademarks). This tends to decrease the asymmetric cost of issuing new equity. Therefore, firms holding larger amount of tangible assets issue more new equity and use lower amount of leverage in their capital structure. The existing empirical studies of Duca (2012), Hovakimian et al. (2004), Feidakis and Rovolis (2007), R. Huang and Ritter (2009), Hovakimian and Li (2011), and Rashid (2012) by supporting the pecking order hypothesis also reported that assets tangibility has negative impact on leverage decisions of firms.

Alternatively, under the trade-off theory, firms holding larger amount of fixed assets prefer high levels of debt ratio in their capital structure with the reasoning behind that the larger firms are well diversified and have large amount of fixed assets. Firms having larger amount of tangible assets can use these assets as collateral and these firms have less cost of issuing debt, so there is less chance of being bankrupt. Firms having lesser amount of fixed assets have more chances of being bankrupt, so these firms issue equity rather debt. Some empirical studies along with Fama and French (2002), G. Huang (2006), Sibilkov (2009), Udomsirikul et al. (2011), and Akhtar and Masood (2013) yield strong evidence that firms' leverage increases with the increase in assets tangibility.

3.6.4 Firm Size

The natural log of sales in a year is used as a measure for firm size (SZ). Several empirical literatures show the positive impact of firm size on leverage ratios (Fama and French (2002) and Sibilkov (2009)). The trade-off theory, demonstrates that there is positive correlation between leverage and the firm size. Under this theory there is cost

associated with leverage and that cost includes bankruptcy cost and the agency conflicts between managers and investors. Firms which are large in size are well diversified, have more market knowledge and also enjoy economies of scales. These firms have less chance of bankruptcy as compare to small firms and have easy access to debt than small size firms so these firms take more debt financing. Therefore, we also expect positive relationship between leverage and firm size. On the other hand, small size firms are more likely to liquidate due to financial distress. So these firms have lower leverage ratios. Similarly, Rajan and Zingales (1995) empirically concluded that firm size is positively correlated with firms leverage decisions. Later on, Ozkan (2001), Morellec (2001), Hovakimian et al. (2004), and Iskandrani and Haddad (2012) by supporting trade-off theory, empirically concluded that there is a positive association between leverage decisions of firm and firm size.

There is also contradicting views regarding the firm size and market and book leverage. There is also negative association among firm size and leverage ratios. The pecking order theory postulates that larger firms usually confront lesser asymmetric problems and more chance to retain their earnings. Therefore, these firms prefer internal funds and uses less external financing. Similarly, cost related to issue new equity is lower for large firms as compared to small firms, so, these firms issue new equity and are less levered. Negative relationship between firm's size and leverage is also confirmed by Titman and Wessels (1988) and Khapko (2009).

3.6.5   Price Level

The price level of stocks (PRC) is calculated by taking the natural logarithm of average trading price of stocks during the year t. The market timing theory of capital structure

indicates that when price of stocks are higher than firms tend to prefer equity financing over debt financing. Firms increase the level of equity financing when the cost associated with the equity is comparatively lower than the debt financing and repurchase equity when the cost is higher. The managers of firm time their equity issues and wait until the market conditions become favorable for issuing stocks for higher return and when the economy is in bad conditions and the cost of issuing equity is high, firm managers do not issue stock and then the debt will be used as external source of financing. So managers time their issue and wait for the favorable market conditions. There is an inverse relationship between stocks prices and leverage decisions of firm.

Stoll and Whaley (1983) reported that stocks transaction costs must keep into account while financing through equity and further documented that the situation is subject to the larger change in stock prices results from illiquidity of stocks. In the light of this the negative relationship between leverage and average trading price is also predicted by Udomsirikul et al. (2011), Hovakimian (2006), Baker and Wurgler (2002), Amihud (2002), Graham and Harvey (2001) and Stoll and Whaley (1983).

3.7 Estimation Technique

By following the literature we come to know that to measure the impact of liquidity on capital structure different researchers have used pooled regression approach, fixed effects, random effect, TSLS, GMM and instrumental variables approach. Udomsirikul et al. (2011), Lipson and Mortal (2009), Hovakimian et al. (2004), and Hovakimian et al. (2001) have used fixed effect technique to examine the impact of equity liquidity on leverage.

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Several earlier researchers such as Lesmond et al. (2008), Huang and Ritter (2009), and Chen (2004) have used cross sectional OLS regression approach to measure the determinants of capital structure. Xiong and Su (2014) also used pooled OLS regression analysis and examined the impact of leverage on profitability, growth opportunities, and firm size. Similarly, Bevan and Danbolt (2004) have also estimated the determinants of capital structure for UK listed firms by using a pooled panel regression approach and the fixed effects regression approach.

In our case, we follow the Fama and MacBeth (1973), Fama and French (2002), Baker and Wurgler (2002), Frank and Goyal (2003), Wang (2013), and Elsas et al. (2014) and use cross-sectional pooled ordinary least square regression approach. Specifically, we apply the pooled ordinary least square (OLS) regression for both market leverage and book leverage equations. We also adjust the standard errors for heteroskedasticity and clustering in order to get robust standard error. To mitigate the problem of heteroskedasticity of errors, we apply robust test. The robust standard errors are also useful when there is minor problem about normality of error terms.

Chapter 4

Empirical Results

This chapter presents the empirical findings of the analysis and their interpretations. In particular, first, it presents the summary statistics of firm-specific variables. Next, this chapter presents the results of pooled OLS regression to examine the impact of stock market liquidity on firms book leverage. After this, the chapter presents the results of market leverage regression. Finally, the pooled OLS regression results for the choice between debt and equity are presented in this chapter.

4.1 Summary Statistics

The summary statistics of firm-specific variables are presented in Table 4.1 to describe some relevant information about data set. It helps us in understanding the economic meaning of estimated parameters of regression analysis and it also helps in explaining the internal consistency of data set. Specifically, Table 4.1 gives the mean, standard deviation, first quartile (Q_1), median, and third quartile (Q_3) values of the variables included in the model. These variables are book leverage, market leverage, firm size, price of stocks, cash holdings, profitability tangibility, and three different firm-specific measures of stock liquidity i.e. Amihuds' illiquidity, modified liquidity ratio, and modified turnover ratio. Mean or simple average is a measure of central tendency and it refers to the central value of the underlying variables. Standard deviation quantifies the spread or variation in the variable and explains how far the variable from its actual or mean value. First quartile (Q_1) is the upper quartile and its value lies in the middle of

smallest value and the median, and median is the middle value of arranged data set.

Third quartile (Q_3) is middle value between the median and largest value in the data set.

Table 4.1: Descriptive Statistics of firms-specific variables

Variables	Mean	Std. Dev.	Q_1	Median (Q_2)	Q_3
Leverage Measures					
Book Leverage	0.510	0.215	0.345	0.513	0.678
Market Leverage	0.457	0.252	0.268	0.477	0.654
Operating Characteristics					
Firm Size (SZ)	7.221	1.734	6.240	7.181	8.222
Price of stock (PRC)	3.002	1.440	1.961	2.928	3.954
Cash holdings (CH)	0.048	0.091	0.004	0.013	0.047
Profitability (PROF)	0.054	0.142	-0.002	0.036	0.109
Tangibility (TANG)	0.522	0.227	0.359	0.528	0.688
Liquidity Measures					
Amihud's (2002) illiquidity (ILLIQ)	5.069	53.661	0.003	0.016	0.149
Modified turnover ratio (MT)	1.399	37.300	0.003	0.022	0.102
Modified liquidity ratio (MLR)	21.7	7310	0.049	0.462	6.59

Note: Table 4.1 presents the summary statistics. The pooled data for non financial firms listed at Karachi Stock Exchange from year 2000-2013 have been used and the table reports the mean, standard deviation, Q_1, Q_2, and Q_3 values of the variables used in our regression models. Book leverage and market leverage are the dependent variables of our regression models. Amihuds' (2002) illiquidity ratio is the ratio of daily absolute return to the (rupee) trading volume. Modified turnover ratio is defined as the ratio of the monthly number of shares traded to the total number of shares outstanding divided by the volatility of earnings. Modified liquidity ratio is the ratio of the sum of daily trading volume to the sum of absolute stock return in a year is divided by the volatility of earnings. SZ represents firm size and is the natural log of total sales. PRC is the prices of stocks. CH is the cash holdings of the firms (cash/total assets). PROF is the profitability of firm. TANG is the ratio of fixed assets after deducting accumulated depreciation to total assets.

The mean value of book leverage is 0.510 and the median is 0.513. The mean value of book leverage is greater than the median, which indicates that the observations of the book leverage are negatively skewed. Similarly, the market leverage is also negatively skewed as mean value of market leverage is 0.457 and median is 0.477. The standard deviation of book leverage is 0.215 while, for the market leverage is 0.252 indicating that the market leverage is more volatile than book leverage. Furthermore, the natural logarithm of sales is used as measure of firm size and its mean value is 7.221 and median is 7.181 which indicate that firm size is positively skewed.

Similarly, the mean value of price of stock is 3.002 and median is 2.928 showing that price of stocks are also positively skewed. Cash holdings (CH) are 0.048 and standard deviation is 0.091 which shows that firms hold less cash. The mean value of profitability is 0.054 and median is 0.036 showing that profitability is positively skewed. On the other hand, tangibility mean value is 0.5226 and median is 0.528 indicating that out of total assets 52.26% of the firm's assets are tangible. The Amihud's illiquidity mean is 5.069 which show that on average, in Pakistan firms' equity is much less liquid. Modified liquidity ratio has mean of 21.7 and median is 0.462 and modified turnover mean is 1.399 and median is 0.022. All the liquidity measures are also positively skewed.

4.2 Measuring the Impact of Equity Market Liquidity on Firms' Leverage Decisions

In this subsection, we present the pooled OLS regression results. In order to examine how stock market liquidity affects the capital structure decisions of firms, we use two different measures of capital structure, namely, book leverage and market leverage. To grasp the stock market liquidity, we use three different measures. These measures are Amihuds' illiquidity, modified liquidity ratio, and modified turnover ratio. We use different measures of liquidity to ensure the robustness of our results. While estimating the impact of stock market liquidity on firms leverage decisions, we use several firm-specific variables as control variables which also have significant impacts in explaining firms' capital structure. These variables are profitability, cash holdings, firm size, price of stocks, and tangibility of assets. One should note that in order to mitigate the problem of heteroskedasticity in the data set, we utilize robust standard errors in statistical interference. Below, first, we present the empirical results for book leverage, and next, we discuss the results of market leverage regression. Finally, to examine how stock market liquidity affects the choice between debt and equity, we present another set of results where we consider debt to equity ratio as dependent variable. In estimating regression models for debt to equity ratio, our set of control variables are same as in book leverage and market leverage regressions.

4.2.1   Results for Book Leverage

To measure the impact of equity market liquidity on firms' leverage decisions, equation (3.1), presented in the methodology chapter, is estimated. The Table 4.2 show the results

of the pooled OLS regression considering book leverage as dependent variable and liquidity (LIQ), profitability (PROF), cash holdings (CH), firm size (SZ), average price level (PRC), and tangibility of assets (TANG) as independent variables. In particular, independent variables are given in first column of the table, estimated coefficients are given in the second column, robust standard errors are presented in the third column and the last column shows the respective p-values of the variables, which tell us the rejection of the null hypothesis at the exact level of significance. Table 4.2 also reports the F-statistic and its p-value (prob) to examine the estimated model. The p-value of F-statistic indicates that the estimated model is significant and it is a good fit to the data set.

Based on the prior empirical literature and the related finance theories, we hypothesized that the stocks liquidity has significant and negative impact on book leverage of the firm.

Table 4.2: Results for the impact of Amihuds' illiquidity on book leverage

Variables	Coefficients	Std. error	P-value
$ILLIQ_{i,t}$	0.103***	0.029	0.000
$PROF_{i,t}$	-0.338***	0.076	0.000
$CH_{i,t}$	-0.385***	0.049	0.000
$SZ_{i,t}$	0.031***	0.003	0.000
$PRC_{i,t}$	-0.027***	0.005	0.000
$TANG_{i,t}$	-0.309***	0.023	0.000
Constant	0.523***	0.026	0.000
F-statistic	58.15		
Prob (F-statistic)	0.000		

The estimated results stated in Table 4.2 indicate that there is a positive relationship between Amihud's illiquidity measure and the book leverage of firms. The estimates of other variables included in the regression model reveal that the profitability of firms, cash holdings, stock prices, and the tangibility of assets are negatively related to book leverage. What follows below, we first discuss the results of illiquidity measure. However, we also discuss the results of control variables in detail, to compare our findings with the existing empirical studies on capital structure.

The sign of the coefficient of Amihuds' illiquidity is positive and statistically significant. This finding suggests that the firms whose stocks are illiquid take higher amount of leverage in their capital structure. A higher value of Amihud's illiquidity measure shows less liquidity of stocks. Thus, firms holding less liquid stocks use more leverage in their capital structure because the transaction cost of issuing illiquid stocks are higher. The pecking order theory of capital structure, states that firms whose stocks are illiquid use more debt and less equity for investment purposes as the cost of issuing new stocks is higher. Similar results are also reported by Iskandrani and Haddad (2012), Udomsirikul et al. (2011), Lipson and Mortal (2009), and Amihud (2002).

In the other firm-specific variables, there is an inverse relationship among profitability and book leverage in this model. The coefficient of profitability is significant at 1% level of significance. This coefficient has similar sign as estimated by Lipson and Mortal (2009). The finding suggests that highly profit firms prefer less debt financing for investment purposes. As consistent with the pecking order theory, more profitable firms hold higher amount of cash reserves and retained earnings as compared to unprofitable firms so these firms choose internal financing over external financing. These results are

also in accord with the findings of Wang (2013), Khalaj et al. (2013), Frieder and Martell (2006), and Udomsirikul et al. (2011). They also found that there is a negative relationship between firms' profitability and leverage ratios.

The cash holding coefficient presented in the table above indicates that it has a negative impact on book leverage of the firm. The estimated coefficient of cash holding is significant at 1% level of significance. This result implies that firms having more cash in their hands usually take less debt in their capital structure. Firm managers prefer internal financing i.e. cash and retained earnings over external financing comprised of debt and equity. The asymmetric information problem among managers and outside investors makes issuing equity as well as debt costly so, firm managers use internal financing for investment purposes. Referring the pecking order theory of capital structure, there is an inverse relationship between leverage and cash holdings of a firm. These significant negative results of cash holding and leverage are common with the previous empirical studies of Harford et al. (2012) and Opler et al. (1999) reported that cash holdings have negative impact on leverage decisions of firms.

The impact of the firm size on book leverage is positive and statistically significant. The finding indicates that the large size firms are well reputed in the debt market and have easy access to debt. So, these firms prefer more debt financing in their capital structure. According to the trade-off theory, the large size firms are more diversified and enjoy economies of scale and have good reputation in debt market so these firms have easy access to debt. Therefore, firm size is positively related with the leverage decisions of firm. This relationship is also confirmed by the existing empirical studies of Fama and French (2002), Frieder and Martell (2006), and Hovakimian and Li (2011).

Price level of stocks is negatively related with the leverage decisions of firms. The coefficient of price level is statistically significant, indicating that firms prefer equity financing over debt financing when their share prices are higher as there is less cost associated with issuing equity. According to the market timing theory, firm managers time their issue and issue equity when equity market conditions are favorable and issue debt otherwise. There is a negative relationship between stock prices and leverage of the firm. These findings are also in line with Udomsirikul et al. (2011), Lipson and Mortal (2009), Frieder and Martell (2006), and Hovakimian et al. (2001).

There is a negative relationship between book leverage and tangibility of assets. Tangibility of assets is statistically significant, suggesting that tangible assets are easy to value than intangible assets resulting low asymmetric information problem between firms' management and outside investors. Thus, low information asymmetry makes equity less costly resulting firm managers to incline more towards equity issues and decrease the amount of debt in their capital structure. According to the pecking order theory of capital structure, there is a negative association between tangibility of assets and firms' debt financing. Similar results are also predicted by Frank and Goyal (2003), Feidakis and Rovolis (2007), R. Huang and Ritter (2009), Udomsirikul et al. (2011), and Rashid (2012).

Table 4.3: Estimates for the impact of modified liquidity ratio on book leverage

Variables	Coefficients	Std. error	P-value
$MLR_{i,t}$	-0.222***	0.040	0.000
$PROF_{i,t}$	-0.309***	0.092	0.001
$CH_{i,t}$	-0.375***	0.054	0.000
$SZ_{i,t}$	0.032***	0.003	0.000
$PRC_{i,t}$	-0.031***	0.006	0.000
$TANG_{i,t}$	-0.286***	0.026	0.000
Constant	0.524***	0.029	0.000
F-statistic	51.50		
Prob (F-statistic)	0.000		

Table 4.3 shows the results of estimated regression with book leverage as dependent variable and liquidity, profitability, cash holdings, firm size, average trading price of shares, and tangibility of assets as independent variables. In order to measure the impact of equity market liquidity on firms leverage decisions, we take another measure of liquidity that is modified liquidity ratio. In Table 4.3 second column shows the estimated parameters coefficients third column shows the standard errors and the last column shows the P-values of the estimated coefficients. The probability of F-statistic and the estimated coefficients in the above table are significant. The coefficient of modified liquidity ratio is -0.222 in this case which provides evidence that there is negative relationship between modified liquidity ratio and book leverage of firm. The result indicates that firm managers lower the amount of leverage when their equity is more liquid because liquidity of equity reduces the cost associated with the equity issuance. Under the pecking order

theory of capital structure, there is a negative relationship between liquidity and leverage decisions of firms. These results also supports the existing studies of Udomsirikul et al. (2011), Lipson and Mortal (2009), and Frieder and Martell (2006). They also showed that firms take less leverage when their stocks are liquid and take more debt when their stocks are illiquid.

In addition, the results in the Table 4.3 provide evidence that there is a positive relationship between book leverage and firm size whereas profitability, cash holdings, average trading price of stocks and the tangibility of assets have negative impact on book leverage of firm. In particular, the positive relationship between book leverage and firm size indicates that large firms are well diversified, enjoys the economies of scale, and also these firms have easy access to debt. Therefore, these firms take more debt financing. Under the trade-off theory, large size firms take more debt due to lower level of agency and bankruptcy costs. Similarly, Udomsirikul et al. (2011), Mohamed and Seelanatha (2014), and Khalaj et al. (2013) also points that large size firms have more knowledge about market conditions so these firms have easy access to debt as compare to small size firms.

Similarly, there is a negative and significant relationship between book leverage and profitability of the firm. This result implies that profitable firms utilize internal funds rather external funds due to the presence of asymmetric information problem and the cost of adverse selection in external financing. Therefore, firms having large amount of profits take less debt. According to the pecking order theory, more profitable firms have large amount of cash reserves, so these firms prefer internal financing. The negative relationship between profitability and leverage is also confirmed in literature. These

results are also consistent with Wang (2013), Udomsirikul et al. (2011), Lipson and Mortal (2009), Amihud (2002), and Bennett and Donnelly (1993).

The impact of cash holding on firms leverage is significantly negative. The finding suggests that firms holding larger amount of cash finance their capital needs through internal source of financing. In the asymmetric information between firm mangers and investors firm managers not issue equity rather debt as issuing equity and debt both are costly. However, the findings also supports the pecking order theory, that firms having excessive cash holdings prefer internal financing and hence take less debt. These results are also consistent with the studies of Lins et al. (2010) and Ozkan and Ozkan (2004). They also documented that increase in cash reserves induce firm managers to use internal funds and decrease the amount of external financing.

This study reports that price level has a negative coefficient and it is statistically significant. This shows that price level of stocks decreases with the increase in the amount of book leverage. According to the market timing theory, the managers of firm time their issues and wait until the equity market conditions become favorable for issuing stocks for higher return. However, when the equity market is in bad conditions and the cost of issuing equity is higher, firm managers avoid to issue stocks and prefer using debt as external source of financing. The market timing theory, also predicted that there is a negative association between leverage ratios and price of stocks. Same results are also confirmed by Udomsirikul et al. (2011), Baker and Wurgler (2002), and Amihud (2002).

The result of tangibility of assets is also very important. The negative value of the coefficient of tangibility of assets shows that if there is 1 unit increase in tangibility of

assets then book leverage is decreased by 0.286 units. It means that there is negative relationship between these two variables. The reason behind this finding is that the firms having larger amount of fixed assets rely more on debt financing due to low level of asymmetric information problem. The pecking order theory, also predicts the negative association between firms' leverage and tangibility of assets. These results are also in line with Akhtar and Masood (2013), Udomsirikul et al. (2011), Sibilkov (2009), and Fama and French (2002).

Table 4.4: Estimation results for the impact of modified turnover ratio on book leverage

Variables	Coefficients	Std. error	P-value
$MT_{i,t}$	-0.745***	0.195	0.000
$PROF_{i,t}$	-0.315***	0.093	0.001
$CH_{i,t}$	-0.378***	0.054	0.000
$SZ_{i,t}$	0.031***	0.003	0.000
$PRC_{i,t}$	-0.031***	0.006	0.000
$TANG_{i,t}$	-0.286***	0.026	0.000
Constant	0.529***	0.029	0.000
F-statistic	51.83		
Prob (F-statistic)	0.000		

Table 4.4 reports the results of pooled regression for measuring impact of equity market liquidity on firms leverage decisions. All the variables in this model are significant at 1% level of significance. It can be easily observed from the table presented above that all the variables are same to those given in the Table 4.3 except liquidity variable. The new

measure of liquidity that is modified turnover ratio is used in this model. The probability of F-statistic is also statistically significant showing that all the independent variables are best explained the dependent variable. When we look at the sign of modified turnover ratio (MT) we have observed that MT carries a negative sign. This implies that it has negative and significant impact on book leverage of the firm. The negative sign of modified turnover ratio suggests that the firms decrease the amount of debt when stocks are more liquid. As cost related with issuing new stocks is lower than debt financing so, firm managers prefer equity financing rather debt financing. The pecking order theory of capital structure, documents that there is an inverse relationship between equity liquidity and debt financing of firms. The specification of our baseline regression is same to those in Khalaj et al. (2013), Iskandrani and Haddad (2012), Udomsirikul et al. (2011), and Lipson and Mortal (2009). They also confirmed inverse relationship between modified liquidity ratio and book leverage of the firm.

When we look at the coefficient of profitability it is negative and also significant. The negative sign of the coefficient of profitability implies that, if all variables hold constant, if there is 1 unit increase in profitability then book leverage is decreased by 0.135 units. The reason behind this relationship is that more profitable firms have large amount of cash available with them, so these firms utilize their internal funds rather external funds as there is cost attached with the external financing. This result also supports the pecking order hypothesis, which postulates that there is a negative association between leverage and profitability of the firm. Similar results are also reported by Elsas et al. (2014), Hovakimian et al. (2004), and Hovakimian et al. (2001).

The impact of cash holdings on firm leverage decisions is also very important. Our results indicate that the cash holding has negative and significant impact on book leverage of the firm. The negative coefficient of cash holdings suggests that firms holding larger amounts of cash take less debt in their capital structure as issuing debt is costly for firms. Under the pecking order theory of capital structure, firm holding excessive amount of cash use internal financing rather debt and equity financing as both are expensive due to the higher degree of asymmetric problems between managers and investors. Opler et al. (1999) and Guney et al. (2007) also confirm the negative relationship between cash holdings and leverage of the firm. In the remaining firm-specific variables the coefficient of firm size has positive and significant impact on firms book leverage. This indicates that large size firms take more debt due to the easy access and good reputation in debt market. Due to the presence of lower agency and bankruptcy costs larger firms are more incline towards debt issuance. The trade-off theory also indicates a positive association between firm size and firms' debt financing. This positive relationship is also in line with the studies of Hovakimian and Li (2011), Lipson and Mortal (2009), and Hovakimian et al. (2004).

In addition, the results indicate that the impact of stocks prices on book leverage is statistically significant. The result reports that there is a negative relationship between firm leverage and price level of stocks. The market timing theory of capital structure, postulates that firm managers time their equity issues and issues equity when equity market is favorable for stock issuance. The market timing theory, also documented that there is a negative relationship between price level of stocks and firms' leverage. Udomsirikul et al. (2011), Lipson and Mortal (2009), Welch (2004), and Baker and

Wurgler (2002) also reported the negative association between price of stocks and book leverage of the firm. Further, tangibility of assets in our study has negative and significant impact on the book leverage of the firm. This result suggests that tangible assets are easy to value than intangible assets resulting low asymmetric information between firms' management and investors. This lower level of asymmetric information problems between management and outside investors enforce firm managers to issue more equity and less debt as issuing debt is costly for firms. The pecking order theory, also predicts the negative association between tangibility of assets and leverage of the firm. The same relationship is also in line with the existing empirical studies of Udomsirikul et al. (2011), Feidakis and Rovolis (2007), and Fama and French (2002).

4.2.2 Results for Market Leverage

In this subsection, we document another type of relationship of equity market liquidity on firms leverage by using market leverage as dependent variable. We do this analysis, to check what is the impact of equity market liquidity on firms market leverage? In addition, these results are also helpful in comparing the impact of equity market liquidity on firms market leverage and on book leverage. The regression results of market leverage are presented below.

Table 4.5: Estimation results for the impact of Amihuds' illiquidity on market leverage

Variables	Coefficients	Std. error	P-value
$ILLIQ_{i,t}$	0.440***	0.194	0.024
$PROF_{i,t}$	-0.191***	0.044	0.000
$CH_{i,t}$	-0.385***	0.054	0.000
$SZ_{i,t}$	0.019***	0.003	0.000
$PRC_{i,t}$	-0.093***	0.004	0.000
$TANG_{i,t}$	-0.428***	0.026	0.000
Constant	0.802***	0.029	0.000
F-statistic	127.15		
Prob (F-statistic)	0.000		

In Table 4.5, we document the results of our regression equation (3.2) as reported in methodology chapter. We take market leverage as dependent variable and liquidity (LIQ), profitability (PROF), cash holdings (CH), firm size (SZ), average trading price of stocks (PRC), and tangibility of assets (TANG) as independent variable. Likewise in Table 4.2 all the variables are same except market leverage. All the variables are statistically significant and have same sign with the findings of existing empirical studies. The variable Amihud ILLIQ indicates that it has a positive impact on market leverage of firm. The positive coefficient of ILLIQ that illiquid stocks have higher transaction cost and issuing these illiquid stocks is expensive for firms. Therefore, firm managers prefer to issue debt rather equity. Iskandrani and Haddad (2012) have pointed that there is a positive relationship between Amihuds' illiquidity measure and market leverage.

Similarly Khalaj et al. (2013), Udomsirikul et al. (2011), and Amihud (2002) also reported the similar estimated results.

Likewise previous models all the other firm-specific variables are also statistically significant. Our result shows an inverse relationship between market leverage and profitability of the firm which also supports the pecking order hypothesis. The result can be analyzed as more profitable firms have excessive amount of cash reserves so these firms finance their investment needs through internal funds and hence take less debt. The finding of our results are also consistent with the existing empirical studies of Elsas et al. (2014), Udomsirikul et al. (2011), and Lipson and Mortal (2009). They reported that there is an inverse relationship between profitability and leverage decisions of firms. The sign of cash holdings is negative in this model which reveals that firm having more cash holdings in their capital structure usually takes less leverage. This result also supports the pecking order hypothesis, that firms holding excessive amount of cash reserves finance their financial needs through internal financing and hence use cash. Similar results are also reported by Harford et al. (2012), Opler et al. (1999), and Guney et al. (2007).

Similar to existing studies, firm size is also positive and significant in this regression model. The finding indicates that large size firms take more debt due to the easy access and good reputation in debt market. The result is also parallel with the trade-off theory of capital structure. In the presence of lower agency and bankruptcy costs larger firms are more inclined towards debt issuance. This positive relationship is also in line with the studies of Akhtar and Masood (2013), Hovakimian and Li (2011), and Hovakimian et al. (2004). As far as the sign of price of stock is concerned, it is also negative and statistically significant. The coefficient of price level of stocks implies that higher the

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stock prices lower will be the leverage ratios. According to the market timing theory of capital structure, firm managers time their issue and issue equity when equity market is favorable for stock issuance. This result is also consistent with the studies of Stoll and Whaley (1983), Amihud (2002), and Welch (2004). They also document that stock prices have a negative impact on leverage of firms. The coefficient of tangibility of assets is significant and has negative sign indicating that tangibility of assets has an inverse relationship with leverage ratio. According to the pecking order theory, intangible assets are easy to value than tangible assets resulting low asymmetric information between management and investors. Asymmetric information problems between firms' management and outside investors enforce firm managers to issue more equity and less debt as issuing debt is costly for firms. The same relationship is also consistent with the existing empirical studies of Iskandrani and Haddad (2012), Duca (2012), Udomsirikul et al. (2011), and Fama and French (2002).

Table 4.6: Results for modified liquidity ratio with market leverage

Variables	Coefficients	Std. error	P-value
$MLR_{i,t}$	-0.185***	0.057	0.001
$PROF_{i,t}$	-0.203***	0.053	0.000
$CH_{i,t}$	-0.355***	0.061	0.000
$SZ_{i,t}$	0.016***	0.004	0.000
$PRC_{i,t}$	-0.091***	0.005	0.000
$TANG_{i,t}$	-0.394***	0.030	0.000
Constant	0.800***	0.033	0.000
F-statistic	117.30		
Prob (F-statistic)	0.000		

In order to measure the impact of equity market liquidity on firms leverage decisions, we take modified liquidity ratio as a second proxy of liquidity. In this analysis market leverage is the dependent variable while the rest of the variables are same as mentioned in the Table 4.5 except liquidity measure. The probability of the F-statistic is also significant at 1% level of significance which means that we strongly reject our null hypothesis that all the independent variables are equal to zero. And the regression model has some validity in fitting the data. In the above table we take modified liquidity ratio as measure of liquidity. The result of this estimated coefficient is significantly negative related with the market leverage of firm. However, one should note that this negative relation is because firm managers decrease the amount of leverage in their capital structure when their equity is more liquid. Lower costs of liquid stocks make equity more attractive than debt. This result is also parallel with the pecking order theory. Iskandrani

and Haddad (2012), Udomsirikul et al. (2011), and Lipson and Mortal (2009) also empirically conclude that there is a negative association among modified liquidity ratio and market leverage of the firm.

The sign of all other control variables are negative except firm size variable. The negative sign of profitability indicates that more profitable firms prefer internal financing for investments and hence take less leverage in their capital structure which is consistent with the pecking order theory. The same findings are also reported by Wang (2013), Hovakimian and Li (2011), Udomsirikul et al. (2011), and Rajan and Zingales (1995). The impact of cash holdings on market leverage is statistically negatively significant. This relation is because of the pecking order theory that firms having larger amount of cash take less debt as issuing debt is costly for firm. Such type of relationship is also reported by Lins et al. (2010), Harford et al. (2012), and Ozkan and Ozkan (2004). Price of stocks (PRC) has negative and significant impact on firms leverage. Firms finance their investment needs through issuing equity if shares prices are higher and are overvalued and hence, decrease the amount of debt financing. Under the market timing theory, price level of stocks and market leverage exhibit the negative relationship. Specifically, Hovakimian and Li (2011), Udomsirikul et al. (2011), and Amihud (2002) also confirmed this negative relationship between price of stocks and market leverage.

The estimated coefficient of tangibility of assets is negative and significant, implying that firms having more tangible assets take less leverage. Following the pecking order theory of capital structures, firms having fewer amounts of fixed assets have more asymmetric information problems. Therefore, these firms increase the amount of debt financing and become over levered. This finding is also in line with Duca (2012), Rashid (2012),

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Udomsirikul et al. (2011), and Feidakis and Rovolis (2007). Similarly, consistent with most of the existing empirical literature, firm size has positive and significant impact on market leverage of the firm. According to the trade-off theory of capital structure, there is lower level of bankruptcy and agency costs for large size firms enforcing these firms to take more debt financing. Mohamed and Seelanatha (2014), Thomas et al. (2014), Xiong and Su (2014), Lipson and Mortal (2009), Sibilkov (2009), and Frank and Goyal (2003) also showed that there is a positive relationship between firm size and leverage of the firm.

Table 4.7: Results of modified turnover ratio with market leverage

Variables	Coefficients	Std. error	P-value
$MT_{i,t}$	-0.283***	0.083	0.001
$PROF_{i,t}$	-0.207***	0.054	0.000
$CH_{i,t}$	-0.357***	0.061	0.000
$SZ_{i,t}$	0.015***	0.004	0.000
$PRC_{i,t}$	-0.092***	0.005	0.000
$TANG_{i,t}$	-0.396***	0.030	0.000
Constant	0.806***	0.033	0.000
F-statistic	120.01		
Prob (F-statistic)	0.000		

Higher liquidity as measured by modified turnover ratio is followed by lower leverage. The negative relationship between modified turnover ratio and leverage is due to the liquidity impact of stocks. The coefficient of MT is -0.283 which shows that if there is

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one unit increase in MT then market leverage is decreased by 0.283 units. Following the pecking order theory, there is an inverse relationship between equity liquidity and firms leverage because there is less transaction cost for liquid firms. The studies of Udomsirikul et al. (2011) and Frieder and Martell (2006) also show the negative relationship between modified turnover ratio and market leverage of the firm.

In addition, referring the empirical findings of Wang (2013), Hovakimian et al. (2004), and Hovakimian et al. (2001) profitability is also negatively and significantly related with the firms market leverage. Firms having more profits use internally generated funds and tend to decrease the amount of leverage in their capital structure. The same relationship is also predicted by the pecking order theory of capital structure. As expected, the result regarding the cash holding (CH) of firm is negative and significant. This result shows that amount of debt decreases with the increase in cash holdings of the firm. The result also supports the pecking order hypothesis, that firm holding larger amount of cash prefers internal financing over external financing for investment purposes. Such results also comply with the study of Harford et al. (2012). On the flip, the result regarding the firm size and the market leverage is positive and remain statistically significant in this study. This positive relationship between these two variables indicates that the larger firms take more leverage confirming the trade-off hypothesis. Thomas et al. (2014), Xiong and Su (2014), Iskandrani and Haddad (2012), and Udomsirikul et al. (2011) also reported the same results that there is a positive relationship between leverage and firm size.

The impact of shares price on leverage is negative and statistically significant. The result indicates that the firms having higher shares price take less leverage as issuing equity is cheaper than debt. Referring the market timing theory of capital structure, one can notice

the negative association between price level of stocks and leverage decisions of firm. Similar results are also confirmed by the studies of Udomsirikul et al. (2011), Hovakimian and Li (2011), and Welch (2004). Likewise in earlier models, we observed the coefficient of tangibility of assets carrying a negative sign suggesting that there is a negative relationship between market leverage and tangibility of assets. Referring the pecking order theory, intangible assets are easy to value than tangible assets resulting low asymmetric information between management and investors. Asymmetric information problems between firms' management and outside investors enforce firm managers to issue more equity and less debt as issuing debt is costly for firms. These findings are also confirmed by Rashid (2012), Udomsirikul et al. (2011), Feidakis and Rovolis (2007), and Frank and Goyal (2003).

4.2.3 Choice between Debt and Equity Financing

Finally, to meet our second objective we also estimate another model in order to examine, whether firm whose equity is more liquid prefers equity financing over debt financing. For this purpose, we use debt to equity ratio (DER) as the dependent variable and DER is defined as the ratio of book value of debt to shareholders equity. Table 4.8 presents the results of the regression model.

Table 4.8: Estimates for the impact of Amihuds' illiquidity on debt to equity ratio

Variables	Coefficients	Std. error	P-value
$ILLIQ_{i,t}$	0.321	0.304	0.292
$PROF_{i,t}$	-0.318	0.205	0.121
$CH_{i,t}$	-1.000***	0.125	0.000
$SZ_{i,t}$	0.107***	0.008	0.000
$PRC_{i,t}$	-0.088***	0.014	0.000
$TANG_{i,t}$	-0.501***	0.066	0.000
Constant	0.738***	0.068	0.000
F-statistic	52.48		
Prob (F-statistic)	0.000		

The above table shows the estimation results of equation (3.3) presented in methodology chapter where, debt to equity ratio (DER) is dependent variable while Amihuds' illiquidity (ILLIQ), profitability (PROF), cash holdings (CH), firm size (SZ), price level of stocks (PRC), and tangibility of assets (TANG) as independent variable. The coefficient of ILLIQ variable is positively insignificant indicating that firms use more debt financing and decrease the level of equity financing with the increase in illiquidity of stocks. As issuing stocks are expensive for the firms. Similar results are also reported by Udomsirikul et al. (2011) and Amihud (2002), that there is a positive relationship between debt ratios and illiquid stocks of the firm.

The above table reports the result of debt to equity choice of firms. The estimated result of other firm-specific variables implies that profitability, cash holdings, tangibility of

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assets, and price level of stocks have negative relationship with firms' debt ratio. The effect of these firm-specific variables is statistically significant except profitability and consistent with the existing empirical studies of Rashid (2012), Udomsirikul et al. (2011), Ahmed et al. (2010), and Frank and Goyal (2003). In particular, the negative sign of profitability indicates that more profitable firms have excessive amount of cash so these firms prefer internal financing over debt borrowing. The finding also supports the pecking order theory, that high profit firms have enough amounts of cash reserves so these firms prefer internal funds for investment purposes. The negative effect of profitability on debt to equity ratio is also comparable with the previous findings of Akinlo (2011), Shah and Khan (2007), Hovakimian et al. (2004), and Koutmos and Saidi (1995), that profitable firms reduce the amount of debt to equity ratio. Cash holdings are also negatively significant indicating that the firms' holding excessive amount of cash reserves finance their capital needs through cash and hence decrease the level of debt financing. This result is also parallel with the pecking order theory of capital structure, that firms holding larger amount of cash take less debt and hence prefer internal financing to fulfill their financial needs. Harford et al. (2012) also report the inverse relationship among cash holdings and debt to equity ratio of firms.

Similarly, price level of stocks has negative and significant impact on debt to equity ratio providing evidence that an increase in prices of stocks tend to decrease the debt ratio. The result also confirms the market timing hypothesis that firm managers time their issues and issue stocks when the cost related to these issues is lower since there is an inverse relationship between price level of stocks and debt to equity ratio. The result is also consistent the studies of Ahmed et al. (2010), R. Huang and Ritter (2009), and Frank and

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Goyal (2003). In addition, tangibility of assets shows negative impact on debt ratio. The negative relationship between these two variables indicates that as tangible assets are easy to value than intangible assets resulting low asymmetric information problems between mangers and investors. Therefore, firms having larger amount of tangible assets tend to increase the level of equity financing and decrease the amount of debt financing. The results support the pecking order theory, and also consistent with the previous findings of Frank and Goyal (2003), Feidakis and Rovolis (2007), Rashid (2012), and Udomsirikul et al. (2011), that firms having larger amount of tangible assets take less debt and more equity financing.

The other control variable that is firm size has negative association with debt-equity ratio. Large size firms are well diversified and have more market knowledge than smaller firms. So these firms take more debt financing and less equity financing. The result is also parallel with the trade-off theory, indicating positive association among firm size and debt to equity choice of firm. The study of Xiong and Su (2014), Iskandrani and Haddad (2012), Shah and Khan (2007), and Hovakimian et al. (2004), also reported the similar results that large size firms take more debt and less equity in their capital structure.

Table 4.9: Results for the impact of modified turnover ratio on debt to equity ratio

Variables	Coefficients	Std. error	P-value
$MLR_{i,t}$	-0.637***	0.197	0.001
$PROF_{i,t}$	-0.304***	0.088	0.001
$CH_{i,t}$	-0.943***	0.129	0.000
$SZ_{i,t}$	0.115***	0.009	0.000
$PRC_{i,t}$	-0.103***	0.013	0.000
$TANG_{i,t}$	-0.450***	0.070	0.000
Constant	0.714***	0.072	0.000
F-statistic	43.08		
Prob (F-statistic)	0.000		

To measure the choice between debt and equity financing we take debt to equity ratio (DER) as dependent variable. And we take modified liquidity ratio (MLR) as measure of liquidity. The overall model is significant with 1% probability of F-test. When we look at the coefficient of modified liquidity ratio we observed that the sign of MLR variable is negative and significant. This result shows that firm finance its capital needs through issuance of equity. As firms stocks are more liquid so issuing equity is beneficial for firms. The finding also supports the pecking order hypothesis, that when there is shortage of internal funds and external finance is the option then firms finance their capital needs with issuing liquid stocks and decrease the level of debt financing as costs of issuing debt is higher. The finding is also supports the existing empirical studies of Akhtar and Masood (2013), Duca (2012), Ahmed et al. (2010), and Hovakimian et al. (2001) that an

increase in equity liquidity results to decrease in debt ratio confirming negative correlation among these two variables.

The regression estimate of profitability is -0.304 indicating that if there is 1 unit increase in profitability then debt to equity ratio is decreased by 0.304 units. The result suggests that profitability is negatively significant at 1% level of significance. Under the pecking order theory of capital structure, more profitable firms have excessive cash reserves so they decrease the amount of debt financing and use retained earnings. This result is also consistent with the existing empirical studies of Akinlo (2011), Hovakimian et al. (2004), Sibilkov (2009), and Shah et al. (2004). They also reported that profitability of firm has negative impact on debt to equity ratio.

Similarly, a cash holding of firm is also negatively significant indicating that cash holding has negative impact on debt-equity ratio. The result suggests that firms having more cash reserves finance their capital needs through internally generated funds and reduce the level of debt financing which also supports the pecking order theory. Ozkan and Ozkan (2004) and Opler et al. (1999) also reported that cash holdings of firm decrease with the increase in debt to equity ratio. In addition, firm size has positive and significant impact on debt to equity ratio. The positive sign of size shows that larger firms have more market knowledge and well reputed at debt market and also these firms have less chance of being bankrupt. Thus large firms take more debt relative to equity financing. According to trade-off theory, there is less bankruptcy cost for large size firms and hence prefer debt financing. The finding is also consistent with the existing studies of Xiong and Su (2014), Duca (2012), Ahmed et al. (2010), Driffield, Mahambare, and Pal (2007), and Alti (2006).

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The price level of stocks has negative and significant impact on debt to equity ratio confirming the market timing hypothesis. The result implies that the stocks having higher prices are expensive for investors resulting firm managers to decrease the demand of these stocks as issuing stocks are expensive for firms due to higher transaction cost. However, these firms tend to issue debt rather equity. Same results are reported by R. Huang and Ritter (2009), Alti (2006), and Welch (2004). Similarly, the coefficient of tangibility of assets is statistically significant and carrying the negative sign. The result shows that there is a negative relationship between tangibility of assets and firm's debt to equity choice. The result also supports the pecking order theory, indicating that firm having more tangible assets decreases the level of debt financing in their capital structure and hence prefer equity financing. Ahmed et al. (2010), Feidakis and Rovolis (2007), and Hovakimian et al. (2004) also indicate that there is a negative correlation between tangibility of assets and debt choice of firm.

Table 4.10: Estimation Results for the impact of modified turnover ratio on debt to equity ratio

Variables	Coefficients	Std. error	P-value
$MT_{i,t}$	-0.014**	0.724	0.046
$PROF_{i,t}$	-0.313***	0.089	0.000
$CH_{i,t}$	-1.005***	0.133	0.000
$SZ_{i,t}$	0.114***	0.009	0.000
$PRC_{i,t}$	-0.105***	0.013	0.000
$TANG_{i,t}$	-0.468***	0.070	0.000
Constant	0.737***	0.072	0.000
F-statistic	41.03		
Prob (F-statistic)	0.000		

Table 4.10 shows the estimated coefficients of regression with debt to equity ratio as dependent variable and Modified liquidity ratio and other control variables such as profitability, cash holdings, size, price of stocks and tangibility as independent variable. The coefficient of $MT_{i,t}$ remains negative and statistically significant indicating that firm managers lower down the level of debt financing when stocks are more liquid and issue more equity as issuing equity is cheaper for the firm. The result also supports the pecking order theory, that there is a negative relationship among equity liquidity and firm debt to equity choice. Same results are also reported by Udomsirikul et al. (2011) and Hovakimian et al. (2004).

The estimated results of impact of other control variables on debt to equity ratio are similar as mentioned in the Table 4.8 and 4.9. Specifically, the results presented in the Table 4.10 provide evidence that profitability, cash holdings, tangibility of assets, and

price level of stocks coefficients to be negative while coefficient of the firm size variable is positive. The negative coefficient of profitability indicates that firms holding larger amount of profit have excessive cash in their hands so firm managers are reluctant to issue debt and utilize internal financing rather external financing which also supports the pecking order theory. These results are also consistent with the studies of Duca (2012) and Opler et al. (1999). Similarly, our negative result regarding price level of stocks shows that managers of firm time their issues and prefers issuing equity when stock prices are lower and reduce the amount of debt ratio. The result is also consistent with the empirical studies of R. Huang and Ritter (2009), Sibilkov (2009), and Alti (2006). They showed that price level of stocks has negative impact on debt ratios.

The impact of tangibility of assets on debt to equity ratio is negatively significant throughout our study and reveals that firms having large amount of fixed assets take less debt. The rationale behind this is as tangible assets like plant, property, buildings and equipment are easy to value than intangible assets such as goodwill, patents and copy rights for outside investors. This results in lower level of asymmetric problems among managers and outside investors which leads to increase the amount of equity financing and decrease the level of debt financing. This relationship also supports the pecking order theory of capital structure. The prior studies such as Duca (2012), Ahmed et al. (2010), and Feidakis and Rovolis (2007) also showed that tangibility of assets have negative association with debt to equity ratio.

The positive sign of firm size shows that larger firms have more volatile cash flows and have good reputation in debt market so these firms have less chances of being bankrupt than small size firms. Hence these firms take more debt. According to the trade-off theory

of capital structure, there is a positive association between firm size and debt ratios. This coefficient has similar sign as reported by Xiong and Su (2014), Ahmed et al. (2010), R. Huang and Ritter (2009), and Welch (2004).

Chapter 5

Conclusion and Policy Recommendations

5.1 Background of Thesis

Reviewing the most of the empirical literature, we observe that most of the prior studies regarding the determinants of capital structure have provided evidence that firm size, profitability, assets tangibility, cash holdings, and growth opportunities are significant in explaining the capital structure dynamics. But most of the studies are related to developed countries. On the other hand, when we review the literature for developing countries, researchers just focused on firm-specific variables that have influence in defining the capital structure by using debt to assets ratio. However, they have ignored the role of equity market liquidity on firms' leverage decisions.

The aim of the study is to investigate the impact of equity market liquidity on firms leverage decisions. Specifically, we predict that firms' holding excessive amount of liquid stocks have a lower debt to asset ratio. In principle, we also aim to examine whether firms whose stocks are more liquid prefer equity financing over bank borrowing. By doing this we understand how equity market liquidity impacts the firms' choice of debt versus equity financing. In order to measure this impact we also use other firm specific variables which have significant role in defining capital structure of firm. We use unbalanced annual panel data set of all listed manufacturing companies at the Karachi Stock Exchange (KSE) during the period from 2000 to 2013. To measure the impact of

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equity market liquidity on firm leverage decisions, we use pooled OLS regression technique with robust standard errors.

5.2 Summary of Findings

In this study, we examine how equity market liquidity effects the financing decisions of firms in Pakistan. Specifically, we study whether firms holding higher amount of liquid stocks take less leverage. We take market leverage and book leverage as proxies for leverage. In this study we take three different measures of liquidity namely, Amihuds' (2002) illiquidity measure, modified liquidity ratio, and modified turnover ratio to examine the role of equity liquidity on firms capital structure . The outcome of this study shows that higher equity liquidity leads to decrease the leverage ratios suggesting negative relationship among liquidity and leverage of the firm. The empirical results of the pooled OLS regression show that the liquidity of the firm equity is related to the cost of issuing equity. Firms tend to issue more stocks when their stocks are more liquid and decrease the level of leverage. And the firms having higher amount of illiquid stocks tend to decrease the amount of equity financing and hence increase the level of debt financing. We also explore that the liquid stocks have lower costs of issuing equity. This shows that in Pakistan, there is a negative relationship between equity liquidity and leverage of a firm. These results are also in accord with our hypothesis that greater liquidity of stocks decreases the amount leverage of the firm.

We also find that firms with more liquid equity prefer equity financing over bank borrowing, indicating that firms lower debt to equity ratios when the stocks are liquid. However, the results suggest that firms tend to issue equity more than debt financing

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when equity market conditions are favorable. Furthermore, these results also suggest that the trade-off theory, the pecking order theory and the market timing theory have a significant impact in explaining the capital structure dynamics. The results are also consistent with the findings of existing empirical studies, such as Udomsirikul et al. (2011) and Lipson and Mortal (2009), Frieder and Martell (2006), Hovakimian et al. (2004), and Hovakimian (2001), that shows that more liquid firms prefer equity financing and decrease the amount to debt in their capital structure.

This study also examines the role of equity market liquidity on firm specific variables. These are profitability, cash holdings, firm size, and prices of stocks and tangibility of the firm. We have noted that profitability, cash holdings, price level of stocks and tangibility has negative and significant impact on market and book leverage of the firm while, the firm size has positive and significant impact on leverage decisions of the firm in Pakistan.

5.3 Policy Recommendations

From the policy point of view, this study would be beneficial to financial investors as well as share holders such as investment banks and other debt providing organizations. The findings of this study also suggest that financial investors particularly banks and stakeholders should give priorities by taking consideration the economic stability and financial position of firms while doing investment. The negative and significant association between equity liquidity and leverage ratios leads to create equity more attractive in the minds of public and investors. Furthermore, this study would provide insight to financial investors to invest in firms having highly liquid stocks.

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The results also suggest that firm managers should design their external financing policy by utilizing more liquid equity and then prefer bank borrowing when there is shortage of internally generated funds to meet their financial obligations. Specifically, our findings that firms having more liquid stocks are likely to reduce their leverage ratios have important implication for firm managers. This study would also help firm managers for designing long term investment plans and strategic decisions.

Equity market liquidity has a negative impact on leverage decisions of firms. This implies that well functioning and liquid equity markets would help in reducing the firms' choice on bank borrowing. Since liquidity has a huge and noteworthy role to make the financial decisions of firms. Therefore, the results of this study would help the policy makers by suggesting that there is great need to manage the liquidity in order to finance through equity in capital decisions of firms.

5.4 Future Research Area

Although the focus of this study is to examine the role of equity market liquidity on firms leverage decisions. However, we explicitly investigate the firms' whose stocks are more liquid prefer equity financing over bank borrowing. In our study by using annually firm level data we examined the impact of equity market liquidity on leverage decisions. It is also possible that the impact of equity liquidity varies across industries. However, this could be useful to extend the study by comparing the liquidity impact for different sectors of economy. Further, we use annually data in this study one can enhance this research by using quarterly data to examine the role of equity liquidity on firms' capital structure.

Our study is based on Pakistan data however, it would be useful to examine whether the conclusion of our study, that equity market liquidity and firm-specific variables have significant impact on leverage decisions of firms also holds for other countries which have similar capital structure of financial markets such as India, Sirilanka, Bangladesh, Afghanistan, Iraq, Iran etc. A more useful research can be done by examining the capital structure and the role of equity liquidity on leverage decisions of firms' of East Asian countries. Due to the availability of data we have taken three measures of the liquidity and for the sake of simplicity we haven't incorporated other measures of liquidity such as bid ask spread, and Gibbs measure. Therefore, one should incorporate these aspects of liquidity for measuring stocks liquidity.

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Appendix

We regress all the models estimated in the thesis by incorporating growth opportunities as another control variable. For this we take market to book ratio of assets as proxy for growth opportunities. By inclusion of growth opportunities variable it is quite clear that the modified liquidity ratio as measure of liquidity is not showing any relation with the market leverage of the firm.

Table A.1: Alternative Regression estimates for the impact of liquidity on market leverage with growth opportunities

Variables	Amihud estimates		Modified turnover ratio		Modified liquidity ratio	
	Coefficients	P-value	Coefficients	P-value	Coefficients	P-value
$LIQ_{i,t}$	0.520**	0.004	-0.341***	0.000	-0.718	0.312
$PROF_{i,t}$	-0.173***	0.000	-0.179***	0.001	-0.178***	0.001
$CH_{i,t}$	-0.373***	0.000	-0.343***	0.000	-0.343***	0.000
$SZ_{i,t}$	0.019***	0.000	0.015***	0.000	0.015***	0.000
$PRC_{i,t}$	-0.085***	0.000	-0.083***	0.000	-0.083***	0.000
$TANG_{i,t}$	-0.415***	0.000	-0.383***	0.000	-0.383***	0.000
$GROW_{i,t}$	-0.001**	0.002	-0.000**	0.002	-0.001**	0.002
Constant	0.779***	0.000	0.783***	0.000	0.786***	0.000
F Statistic	108.10		F Statistic 100.23		F Statistic 98.03	
F(Prob)	0.000		F(Prob) 0.0000		F(Prob) 0.0000	

Note: The table reports the pooled regressions for market leverage and showed the results of various measures of liquidity used in our regression models. Each liquidity measure and its corresponding coefficients and p-values are mentioned at the top of the table. Amihuds' (2002) illiquidity ratio is the ratio of daily absolute return to the (rupee) trading volume. Modified turnover ratio is defined as the ratio of the monthly number of shares traded to the total number of shares outstanding divided by the volatility of earnings. Modified liquidity ratio is the ratio of the sum of daily trading volume to the sum of absolute stock return in a year is divided by the volatility of earnings. Market leverage is the ratio of total debt to market value of assets. SZ represents firm size and is the natural log of total sales. PRC is defined as the average trading price of shares during the accounting years. CH is the cash holdings of the firms and is the ratio of cash to total assets. PROF is the profitability and is defined as the ratio of the net profit before tax to total assets. TANG is the ratio of fixed assets after deducting accumulated depreciation to total assets. GROW is the measure of growth opportunities and is the ratio of market to book value of assets.

We regress all the models estimated in the thesis for book leverage inclusion of another control variable growth opportunity. For this we take market to book ratio of assets as proxy for growth opportunities. By inclusion of growth opportunities variable it is quite clear that GROW is not significant and not showing any impact in defining book leverage of firm for all of the liquidity variables.

Table A.2: Estimates for the impact of liquidity on book leverage with growth opportunities

Variables	Amihud estimates		Modified turnover ratio		Modified liquidity ratio	
	Coefficients	P-value	Coefficients	P-value	Coefficients	P-value
$LIQ_{i,t}$	0.103***	0.000	-0.742***	0.000	-0.232***	0.000
$PROF_{i,t}$	-0.339***	0.000	-0.317***	0.001	-0.312***	0.001
$CH_{i,t}$	-0.386***	0.000	-0.379***	0.000	-0.377***	0.000
$SZ_{i,t}$	0.031***	0.000	0.032***	0.000	0.033***	0.000
$PRC_{i,t}$	-0.028***	0.000	-0.033***	0.000	-0.032***	0.000
$TANG_{i,t}$	-0.311***	0.000	-0.288***	0.000	-0.287***	0.000
$GROW_{i,t}$	-0.000	0.610	0.005	0.603	0.009	0.450
Constant	0.525***	0.000	0.530***	0.000	0.526***	0.000
F Statistic	49.79		F Statistic 43.12		F Statistic 42.83	
F(Prob)	0.000		F(Prob) 0.0000		F(Prob) 0.0000	

Note: The table reports the pooled regressions for book leverage and showed the results of various measures of liquidity used in our regression models. Each liquidity measure and its corresponding coefficients and p-values are mentioned at the top of the table. Amihuds' (2002) illiquidity ratio is the ratio of daily absolute return to the (rupee) trading volume. Modified turnover ratio is defined as the ratio of the monthly number of shares traded to the total number of shares outstanding divided by the volatility of earnings. Modified liquidity ratio is the ratio of the sum of daily trading volume to the sum of absolute stock return in a year is divided by the volatility of earnings. Book leverage is the ratio of total debt to total assets. SZ represents firm size and is the natural log of total sales. PRC is defined as the average trading price of shares during the accounting years. CH is the cash holdings of the firms and is the ratio of cash to total assets. PROF is the profitability and is defined as the ratio of the net profit before tax to total assets. TANG is the ratio of fixed assets after deducting accumulated depreciation to total assets. GROW is the measure of growth opportunities and is the ratio of market to book value of assets.

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