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Free Float and Stock Liquidity: Evidence from Pakistan Stock Exchange

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Liquidity has become increasingly important in the stock market, highlighting its vital role in enabling high-volume trading with minimal price distortion, speed, and convenience. This study is carried out to examine the relationship between free float and stock market liquidity using different ratios and models namely, Amihud, Amivest and turnover. For this purpose, a sample of top 100 listed companies are selected from Pakistan Stock exchange (PSX) from 2013 to 2022. An inverse relationship between free float and liquidity was found using Amihud ratio whereas turnover ratio supports the notion of improved liquidity with increased free float. This study highlights the importance of free float in capital markets and offers practical advice for businesses and individuals navigating the complexities of stock liquidity. While our paper contributes to the current body of literature, it also invites additional investigation by bringing in a variety of variables and broadening the focus outside of Pakistan's KSE 100 index companies.

1. Introduction

Financial markets play a crucial role in the functioning of the global economy (Goldstein, I. 2023). Liquidity and trading activity are two fundamental and important traits within financial markets (Karkowska & Palczewski, 2023). Liquidity refers to the ease and efficiency with which an asset can be bought or sold in the market without significantly affecting its price (Geromichalos & Lee, 2023). Trading activity, on the other hand, represents the volume of transactions occurring in the market. Understanding the development and dynamics of liquidity and trading activity is vital for investors, companies, and policymakers in assessing market efficiency, risk management, and economic growth. Stock liquidity has been a topic of extensive debate in the literature on market microstructure. The global financial crisis of recent years has further amplified the attention given to liquidity concerns (Ali et al., 2017). Market participants, particularly companies, strive to enhance the liquidity of their stocks and avoid any situations that might lead to a reduction in liquidity (Khan & Rehman, 2020).

The ability to easily buy or sell stocks without significantly affecting their prices is a key aspect of liquidity. Liquidity holds significant importance for both companies and investors. Companies benefit from high stock liquidity as it attracts investment and allows them to raise capital by issuing shares (Levine & Zervos, 1996). In contrast, illiquid stocks require higher returns from investors, driving up costs for businesses and diminishing their overall value (Amihud & Mendelson, 1986; Butler et al., 2005; Fang et al., 2009). Moreover, liquid assets are preferred over illiquid ones due to the ability to trade them anonymously, reducing information asymmetry and enhancing market efficiency (Chung et al., 2010). High market liquidity is not only beneficial for individual companies but also for the overall economy. It is considered a sign of economic growth and effective resource allocation. In developed and developing countries alike, liquid stock markets facilitate the flow of capital, allowing businesses to access funding for expansion, investment, and innovation. Efficient resource allocation, driven by liquidity, supports economic growth and development.

Stocks with larger free float percentages are often more liquid. However the liquidity measurement tools and firm specific characteristics play important role in this regard, which is less explored area in Pakistan stock market. Furthermore, previous research has only focused on industrialized nations, and there is limited evidence on the relationship between stock liquidity and free float in companies that are listed on the Pakistan Stock Exchange considering different measures of liquidity. Moreover, lack of information in financial markets of Pakistan also prompts the query of whether these findings hold true for Pakistan's stock market (Asif et al., 2016). Hence the study aims to address this literature gap by finding out the impact of free float, financial leverage, firm size, dividend payout and share price on stock liquidity.

2. Literature Review and Hypotheses Development

There is broad consensus in the literature that greater liquidity is associated with lower anticipated returns. Amihud and Mendelson (1986), Brennan and Subrahmanyam (1996), and Amihud (2002) have provided evidence supporting this relationship. Investors are willing to pay

a premium for the benefits of liquidity, such as ease of transaction and reduced price impact. As a result, stocks with higher liquidity tend to have lower expected returns compared to illiquid stocks. This relationship between liquidity and expected returns is an important consideration for investors when making investment decisions.

High market liquidity is not only beneficial for individual companies but also for the overall economy (Alarussi, & Gao, 2023). It is considered a sign of economic growth and effective resource allocation. In developed and developing countries alike, liquid stock markets facilitate the flow of capital, allowing businesses to access funding for expansion, investment, and innovation. Efficient resource allocation, driven by liquidity, supports economic growth and development (Chikwira & Mohammed, 2023; Shafaq, 2023; Kithandi et al., 2023). Prior research on CEO power in Pakistan emphasizes the significant role that leadership dynamics play in firm performance, which may influence stock liquidity and overall market performance (Arif et al., 2023; Aziz & Arif, 2020; Arif & Aziz, 2018) .

One important component affecting stock liquidity is free float, which is the tradeable portion of shares that are accessible to the general public. It is an essential metric for determining how easily shares can be purchased or sold on the market. Ding et al. (2016) and Wang & Zhang (2015) claim that greater free float is linked to reduced liquidity risk, especially in nations with sound governance. The relationship between liquidity and free float is rooted in the way trading activity is changed. Market capitalization declines when a company creates a controlling block, which lowers the number of traders and consequently lowers liquidity. Furthermore, higher ownership concentrations have the potential to worsen information asymmetries by functioning as a decreasing function of the adverse selection costs brought on by insider and dealer informational asymmetries (Heflin & Shaw, 2000).

According to Miller and Work(s) (1961), the Dividend Irrelevance Theory suggests that investors should not care whether they receive dividends today or capital appreciation down the road. On the other hand, empirical data points to a relationship between stock liquidity and dividend policy. It makes sense that investors would choose liquidity, particularly in thinly traded stocks, and dividend-paying stocks meet this need. Graham et al. (2006) emphasize that liquidity considerations impact investors' expected returns and highlight the role that local market liquidity plays in driving returns.

There is a complex empirical relationship between share price and liquidity. Higher share prices may draw in a variety of investors, so it would seem sense to assume a positive relationship; however, Demsetz (1968) proposed a negative relationship. Because smaller dollar volume trades in low-priced stocks come with proportionately higher costs, the spread percentage may rise as the stock price declines. Given that lower-priced securities typically have higher percentage spreads, empirical evidence points to a possible negative relationship between share prices and liquidity (Branch, n.d.).

One important factor influencing stock liquidity is market capitalization, which indicates the size of the company (Febrianti & Saadah, 2023; Rafay et.al., 2023; Naik & Reddy, 2024).).

Because of their greater trading activity, larger companies are typically linked to higher liquidity. Larger companies have more willing buyers who support the firm's position. Market capitalization is a useful indicator for understanding how a firm's size affects its liquidity dynamics (Becht, 1999).

Firm leverage, which represents how a firm's capital structure affects stock liquidity, adds a control variable to the framework. High leverage could be linked to debt holders' monitoring, which could lessen information asymmetry. On the other hand, Cao and Petrasek (2014) contend that excessive leverage can result in illiquidity since lenders might abruptly stop providing funding. Interestingly, the majority of studies on the connection between stock liquidity and leverage have been conducted on non-financial firms, which has left a vacuum in our knowledge of the dynamics pertaining to financial institutions.

These factors are integrated into the theoretical framework, which acknowledges both their independent and combined effects on stock liquidity. A careful balance between ownership structure, dividend policies, stock pricing, market capitalization, and leverage is required to understand the complex dynamics. Comprehending the interplay between these constituents offers a nuanced outlook on the variables impacting liquidity within the Pakistan Stock Exchange.

On the basis of the theoretical framework and literature review, the below hypothesis would be tested in the research method to determine whether it answers the research objectives and aims. The following hypotheses have been proposed for investigating the said problem are;

H1: There is a significant impact of free float, financial leverage, Firm Size, Dividend Payout Ratio and Share Price on Stock Liquidity.

H2: There is strong interaction effect of free float shares with stock liquidity.

3. Methodology

3.1 Data Sources

Two main sources of information were used in the thorough data collection process for this study: Data Stream and the official website of the Pakistan Stock Exchange (PSX). This two-source approach guarantees a solid dataset that includes all of the PSX 100 index companies.

3.2 Sample Size Determination

The study's target population is the KSE-100 index companies that have been listed on the PSX in the last ten years, with a focus on the years 2013 through 2022. Within the given timeframe, a nuanced analysis of trends and patterns is made possible by this strategic temporal scope.

3.3 Statistical Technique

The panel data regression model is a sophisticated statistical technique used to examine the complex relationship between stock liquidity and free float. As this research tries to examine the

relationship among variables it follows the positivist paradigm (Ali, Arif, Galani, Ali, & Rehman, 2022). Using the Stata software improves the accuracy of the findings and makes it easier to do a thorough analysis of the relationships that have been found.

3.4 Research Model

The following equations are used to find the relationship between dependent variable and independent variable.

$$\boldsymbol{LIQ}_{\boldsymbol{it}} = \boldsymbol{\alpha} + \boldsymbol{B_1 Freefloat_t} + \boldsymbol{\varepsilon_{it}} \quad \text{(eq 1)}$$

$$\boldsymbol{LIQ}_{\boldsymbol{it}} = \boldsymbol{\alpha} + \boldsymbol{B_1 Freefloat_{it}} + \boldsymbol{\beta_2 Control\ Variables} + \boldsymbol{\varepsilon_{it}} \quad \text{(eq 2)}$$

Where,

LIQ = Stock Liquidity (Where Liquidity includes three measures i.e. Amihud ratio, liquidity ratio and turnover)

α = constant

B = coefficient parameter

€t = error term

Equation 1 shows the relationship of dependent variable i.e. stock liquidity with only one variable i.e. free float.

Equation 2 shows the relationship of dependent variable i.e. stock liquidity with free float and other control variables.

Where the variables are as follows:

3.5 Dependent Variable

Stock liquidity was chosen as the dependent variable since it cannot be measured on itself. This study will include the stock liquidity frequency proxies by the abnormal change in volume and price of the stock as the dependent variable.

3.6 Stock Liquidity

Shares that can be traded with an “ease” is called stock liquidity. In our models Liquidity includes the Amihud ratio, liquidity ratio and turnover. The calculation of the liquidity measurements is shown below.

3.7 Amihud Ratio

The Amihud (2002) ratio, which evaluates the daily correlation between a stock's rupee volume and absolute value over time, is frequently used by industry experts. Regulators use this indicator to predict liquidity trends.

The Amihud formula is defined as follows;

$$\boldsymbol{Illiquidity = Average\ (\frac{|r_t|}{V_t})}$$

Where, t denotes the number of days, Rs.V denotes the volume of rupees on day t, and r denotes the daily stock return on day t.

3.8 Amivest Ratio

A liquidity ratio, often referred to as an Amivest ratio, determines how much trading takes place when the price of a stock moves. Liquidity ratio for each month is determined by summing up daily share transactions and daily return absolutes. The Amivest Ratio is defined as follows:

$$\boldsymbol{Amivest = Sum(\frac{V_t}{|r_t|})}$$

3.9 Turnover Ratio

"Turnover" describes the volume of shares exchanged as a percentage of all outstanding shares. Turnover is calculated as follow:

$$\boldsymbol{Turnover = \frac{V_t}{N_t}}$$

Where, t is the Number of days, V is the monthly trading volume of shares, and N is the total number of shares outstanding.

3.10 Independent Variable

3.11 Free Float

Free float, also known as public float, refers to a company's shares that are unrestricted (i.e., not held by insiders) and may be exchanged publicly. It can be formulated as follows:

Free float =number of shares available to be traded on a securities exchange/number of shares outstanding

3.12 Control Variables

Several control factors are included in the study to examine their impact on cross-sectional changes in stock market liquidity and determine their statistical significance. These include:

Stock Price

Reflecting the market value at which a company's stock is exchanged.

3.13 Market Capitalization

A gauge of firm size, representing the total market value of a company's outstanding shares.

3.14 Leverage

Defined as the ratio of long-term debt to the book value of assets.

3.15 Dividend Payout Ratio (DPR)

Obtained from company financial statements, indicating the proportion of earnings distributed as dividends.

This meticulous data collection methodology, with a dual-channel approach and a focus on precision, establishes a robust foundation for the subsequent empirical analysis. The chosen statistical technique and detailed measurement of variables promise a nuanced exploration of the factors influencing stock liquidity within the dynamic context of the Pakistan Stock Exchange.

3.16 Descriptive Statistics

Table 1 presents comprehensive descriptive statistics on various financial metrics including Amihud, Amivests, turnover, free float, dividend per share, leverage, market capitalization, and price. Amihud reflects stock illiquidity with a mean of 3.08e-06 indicating moderate illiquidity, while Amivests measures price volatility with a mean of 3.031651, indicating significant fluctuations. Turnover, averaging 2.222095, signifies substantial share exchange, while free float, with a mean of 62.02509, suggests reasonable accessibility with variability. Dividend per share, averaging 16.32998, exhibits considerable variability, and leverage, averaging 0.8969218, shows diverse financial leverage levels. Market capitalization, averaging 7.417795, appears stable, as does the price, with a mean of 172.272 but wide fluctuations. Understanding these factors aids investors and analysts in assessing stock financial health and associated risks effectively.

Variable	Mean	SD	Min	Max
Amihud	3.08e-06	.0000307	2.62e-14	.0005699
Amivest	3.031651	1.65856	-7.218297	1.912625
Turnover	2.222095	1.220549	-1.451506	6.976462
Free Float	62.02509	34.23994	1	100
Price	172.2072	264.5438	.3777011	2499.371
Firm Size	7.417795	.6652322	4.472775	8.805211

Leverage	.8969218	5.926182	0	77.85664
Dividend per share	16.32998	60.1214	0	776.89

Table No 1: Descriptive Statistics Of Dependent and Independent Variables

3.17 Correlation

The correlation matrix in Table-2 reveals insights into the relationships between financial metrics. Notably, a negative correlation exists between Amihud and Free Float, suggesting lower stock illiquidity with higher free float percentages. Positive correlations are found between free float and liquidity/turnover ratios. Little correlation is observed between Firm Size and other variables, while Price negatively correlates with free float. Dividend exhibits positive relationships with Price and Firm Size. Overall, no multicollinearity issues are evident, and these correlations aid in understanding how financial metrics interact and impact stock performance and market dynamics.

Table No 2: Correlation

Correlation	**Free float**	**Firm size**	**Price**	**Dividend per share**	**Leverage**	**Amihud**	**Turnover**	**amivest**
Free float	1.000							
Firm size	-0.054	1.000						
Price	-0.164	0.448	1.000					
Dividend per share	-0.019	0.240	0.666	1.000				
Leverage	-0.020	-0.064	-0.050	-0.033	1.000			
Amihud	-0.073	-0.042	0.131	0.037	-0.012	1.000		
Turnover	0.011	-0.005	-0.013	-0.022	-0.017	-0.012	1.000	
Amivest	0.0053	-0.061	-0.102	-0.051	-0.024	-0.020	-0.024	1.000

3.18 Regression Results using Amihud Ratio

In Model 1, regression analysis with free float as the sole independent variable reveals an inverse relationship with stock liquidity, though statistically insignificant, with a coefficient of -4.60e-08, a p-value of 0.035, and a t-statistic of -2.12. The adjusted R-squared of 0.0042 suggests that 42% of the variance in liquidity can be explained by free float. These findings support the

hypothesis of a positive correlation between higher liquidity and reduced illiquidity with increased free float, echoing previous studies like Ding et al. (2016). Model 2, incorporating additional control variables, similarly shows a negligible effect of free float on liquidity and negative relationships with dividend per share, firm size, stock price, and financial leverage. However, financial leverage marginally positively impacts liquidity.

The adjusted R-squared of Model 2 is 0.0600, indicating that included variables account for 6% of the variance in liquidity. Studies by Griffin (2010), Banerjee (n.d.), and Rasa et al. (2014) also find negative correlations between liquidity and dividend payout ratio, as well as the insignificant negative relationship between financial leverage and liquidity. Notably, investors in the Pakistan stock exchange (PSX) do not consider free float as a determinant of liquidity, aligning with findings by Eva & Claudia (2018) of an inverse relationship between free float and liquidity. (Vatankhah & Khosroshahi, n.d.).

Table No 3: Models

	Model No 1:			**Model No 2:**		
Variable	**Coefficient**	**t-statistic**	**P>|t|**	**Coefficient**	**t-statistic**	**P>|t|**
C	4.73e-07	3.07	0.002	1.96e-06	1.11	0.268
Free float	-4.60e-08	-2.12	0.035	-1.94e-08	-0.88	0.377
Price				2.63e-08	6.96	0.000
Firm Size				-3.97e-14	-3.55	0.000
Leverage				-3.16e-08	-0.27	0.784
Dividend per share				-2.21e-07	-3.46	0.007
R-squared	: 0.0054			0.00662		
Adj R-squared:	0.0042			0.006		

3.19 Regression Results using Amivest Ratio

In Model 1, the coefficient for free float is -0.0453007, significant at p = 0.035, indicating a noteworthy influence on stock liquidity. Model 3's adjusted R-squared of 0.0041 suggests that free float explains 41% of liquidity variation, supporting the idea that increased free float enhances liquidity akin to Amihud measure. Adding control variables in Model 2, the positive but insignificant free float coefficient contrasts with significant positive coefficients for market capitalization and share price, aligning with previous research indicating larger stocks and higher prices are associated with greater liquidity. The negligible positive effect of dividend per share on liquidity is consistent with prior findings, while no significant correlation between financial

leverage and liquidity is observed, in line with existing literature. (Brockman et al., 2009; Jacoby & Zheng, 2010; Ding et al., 2016; Jurgita StankeviĺIieno, 2014; Jiang et al., 2011; Wang & Zhang, 2015a, b; Stoll, 2000).

Table No 4: Models

	Model No 1:			**Model No 2:**		
Variable	**Coefficient**	**t-statistic**	**P>|t|**	**Coefficient**	**t-statistic**	**P>|t|**
C	4.655843	3.07	0.002	-15.63422	-8.28	0.000
Free float	-.0453007	-2.11	0.035	.0114701	2.83	0.005
Price				.0009169	0.003	0.170
Firm Size				.4750601	4.30	0.000
Leverage				-.0276511	-1.29	0.196
Dividend per share				.182751	1.54	0.124
R-squared :	0.0053			0.0052		
Adj R-squared:	0.0041			0.0051		

3.20 Regression Results using Turnover Ratio

In Table 5, the regression analysis reveals insights into the relationship between the turnover ratio and free float, where the coefficient for free float is 0.0125828 with a significant t-statistic of 3.69 and a p-value of 0.000, suggesting a positive association. However, the R-squared value of 0.0173 indicates that free float explains only 1.73% of the turnover ratio's variability. In Model 2, incorporating additional independent variables, free float maintains a positive and significant relationship with turnover ratio, while other variables like price, firm size, and dividend per share also show significant associations. The adjusted R-squared of 0.1699 suggests that the model explains 17.56% of turnover ratio variability. While these findings support the notion of improved liquidity with increased free float, the turnover ratio's explanatory power is less robust compared to previous results, indicating potential influence from other unidentified factors.

Table No 5: Models

Model 1	**Model 2**

Variable	Coefficient	t-statistic	P>|t|	Coefficient	t-statistic	P>|t|
C	4.434903	18.45	0.000	-1.61928	-1.07	0.286
Free float	.0125828	3.69	0.000	.0081426	2.63	0.009
Price				-.0050784	-10.08	0.000
Firm Size				.4284358	4.86	0.000
Leverage				-.0293634	-1.84	0.067
Dividend per share				.0210628	2.36	0.019
R-squared:	0.173				0.1796	
Adjusted R-squared:	0.160				0.1699	

5. Conclusion

To sum up, our study, which spanned a period of years from 2013 to 2022, examined the dynamics of stock liquidity in relation to the top 100 companies that are listed on the Pakistan Stock Exchange (PSX). Our study aimed to interpret the complex relationships influencing stock liquidity in the Pakistani stock market by focusing on important variables like price, dividend payout ratio, firm size, free float, and leverage.

A detailed summary of financial variables, such as market capitalization, dividend per share, free float, stock prices, and stock liquidity, is given by the extensive descriptive statistics shown in Table 1. When evaluating the risk and financial stability of individual stocks, analysts and investors rely heavily on these metrics, which capture central tendencies, variability, and range.

The results of our correlation analysis were informative in that they showed positive correlations with turnover and Amivest ratios and negative correlations between free float and the Amihud ratio. Consistent with previous studies, a significant and impactful correlation is found between free float shares and capital market liquidity.

Moreover, our research adds significant value by validating the significant influence of firm size and free float on stock liquidity. Although variables such as price, leverage, and dividends had a less noticeable impact, the complexity of stock liquidity implies that there may be more influencing factors than those we looked at in the first place.

This study highlights the importance of free float in capital markets and offers practical advice for businesses and individuals navigating the complexities of stock liquidity. While our paper contributes to the current body of literature, it also invites additional investigation by

bringing in a variety of variables and broadening the focus outside of Pakistan's KSE 100 index companies.

Looking ahead, future studies could investigate international stock exchanges, like the S&P 500, and compare results between various nations. Furthermore, increasing the sample size and keeping the data longer than ten years could provide a more thorough understanding of the dynamics as they change. A more sophisticated understanding of the nuances of the stock market would be made possible by taking into account the moderating and mediating effects with these variables, which would further enhance the depth of analysis.

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