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Testing and analyzing the effect of business risk and liquidity variables on the return rate of shares of manufacturing companies listed in Tehran Stock Exchange

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Abstract

Several factors affect the liquidity of companies' shares. According to the research, the most important factors are the number of traded shares, the number of traded companies, the value of traded shares, the percentage of the total volume of the transaction to the total market value, the number of buyers and the frequency of purchases. The present research examines and analyzes the effect of business risk and liquidity variables on the return rate of manufacturing companies admitted to the Tehran Stock Exchange in the period from 1397 to the end of 1401 and among the 494 companies admitted to the Tehran Stock Exchange, with the method of systematic elimination. 165 manufacturing companies have been selected. In this research, research hypotheses have been tested by using Limer's F test, Hausman test, fixed effects model and random effects model. The results obtained from the research show that the commission rate and business risk have a positive and significant effect on the stock returns of selected companies. On the other hand, the difference in the proposed price of buying and selling shares has a negative and significant effect on the stock returns of the investigated companies.

Key words: business risk, bid price difference, commission rate, manufacturing companies, stock liquidity stock return.

Introduction

Liquidity is considered one of the key dimensions in the process of optimal resource allocation. It refers to the ease with which a financial asset can be converted into cash. The liquidity of a financial asset is assessed based on its ability to be converted into cash at any given time without incurring a loss. Tradable securities can be converted into cash at any time through sufficient market sales, although there is no guarantee against potential losses. One of the most important functions of financial markets, particularly the capital market, is to convert various assets into securities, thereby enhancing their liquidity and reducing the liquidity risk premium. Financial markets, on the one hand,

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facilitate access to cash through the combination of money market and capital market instruments, ensuring optimal allocation. On the other hand, they improve market mechanisms and regulations, making the securities market a safe and attractive environment for society as a whole. This, in turn, channels public funds into productive activities, promoting economic growth while allowing individuals to benefit from the profits generated by these activities. (Rezaei and etal, 2024).

Liquidity plays a crucial role in asset price discovery, risk distribution, and transaction cost reduction. Therefore, understanding the factors affecting liquidity is essential. Given the increasing importance of liquidity, identifying its influencing factors can contribute to its improvement. One of the key factors affecting liquidity is the presence of an efficient capital market. A notable characteristic of efficient markets is the absence of transaction costs, which leads to high liquidity in stocks. Transaction costs encompass a wide range of explicit costs, such as taxes and brokerage fees, as well as implicit costs resulting from informational inefficiencies. Therefore, stock liquidity can be considered a criterion for market efficiency. In addition to the theoretical aspects of the issue, from a practical standpoint, considering the realities of phenomena like buy and sell queues and other related problems, focusing on liquidity and efforts to address this challenge appear necessary. Enhancing liquidity can lead to a more extensive distribution of financial risk by reducing portfolio management costs and motivating investors to make better-informed trading decisions (Rahmani et al., 2009, p. 40).

Theoretical foundations

Concept and Importance of Liquidity

Liquidity is a complex concept and cannot be directly observed. Various definitions and interpretations have been proposed in relation to liquidity. On the one hand, liquidity and illiquidity are two sides of the same coin, often used to refer to the same concept. In its simplest definition, the liquidity of an asset is the ability of a market to absorb large volumes of transactions without causing significant price fluctuations. For an asset to be considered liquid, a liquid market for that asset is essential. Liquid markets are considered desirable due to benefits such as better resource allocation and informational efficiency. Investors with short-term investment horizons prefer stocks with high liquidity over less liquid ones. Liquidity here refers to the ease of buying and selling a particular stock. (Amihud and Mendelson, 2021).

Liquidity is the ability to buy or sell an existing stock at a low cost without significantly impacting the asset's price. The primary way secondary markets contribute to lowering the cost of capital is by providing liquidity. Given the complexity of liquidity, estimating the liquidity of a stock in any research requires considering various aspects and multiple criteria. Moreover, since liquidity has multiple dimensions, it cannot be represented by a single measure (Amihud, 2020).

Securities liquidity in the capital market is one of the most important factors

influencing the proper functioning of the market. Liquidity improves the success of initial public offerings (IPOs), reduces the bid-ask spread, and enhances price discovery. A liquid capital market promotes both informational and allocative efficiency. It has not been long since companies listed on the stock exchange in our country have been ranked based on six criteria, and the results have been announced as the top 50 companies. One of the issues that capital market officials pay great attention to is the factors affecting liquidity. The higher the stock's liquidity, the greater the success of IPOs, the lower the bid-ask spread, and the more efficient the price discovery process. More liquid financial assets have lower transaction costs, are traded more easily, and a large volume of these securities has minimal impact on their market price. As liquidity increases, the price of securities is determined more accurately, as more participants are involved in the price-setting process (Tejarat Bank Brokerage Company). As a result, investors prefer companies with higher liquidity levels, which attracts more capital towards these companies. Liquidity is one of the key criteria for determining the value of a company. If risk is assumed to be constant, stocks with lower liquidity will have a higher expected rate of return, which reduces profitable investment opportunities. The more liquid a stock is in the market, the lower the cost of capital for companies, which in turn affects the company's ability to seize investment opportunities. In other words, one of the criteria for determining the value of a company is the liquidity of its stocks (Zarei Estahriji, 2019).

Liquidity is a concern for those who trade stocks or manage trading infrastructures. One of the most important indicators in evaluating the market's condition is the liquidity of the securities within it. A high level of liquidity in the stock market indicates the market's success in ensuring transparency of information and aligning the prices of securities with their intrinsic value. Mutual investment funds, which have only been active in the capital market for a few years, have unique features and have captured a significant portion of the market after the relevant tax law was passed. These funds provide a simple and safe investment tool for individuals. One of their key features is that holders of fund units can redeem their units at the end of each day and receive cash. This feature ensures that these funds pay special attention to the liquidity of stocks, along with their risk and return, when forming their investment portfolios. As a result, mutual funds seek indicators that can predict stock liquidity. Stocks with high liquidity naturally carry lower holding risk, as they can be quickly converted into cash. Therefore, due to the risk-averse nature of investors, they tend to choose stocks with high liquidity so they can sell them quickly when necessary, with minimal price impact. Predicting the liquidity of a stock using past liquidity data can be very useful. The issue of stock liquidity in the Tehran Stock Exchange, which is classified among the world's illiquid exchanges due to the lack of mechanisms that ensure liquidity, remains a primary concern for investors. (Amihud and Mendelson, 2021).

Commercial Risk (Turnover)

Commercial risk in stocks influences the expected return from two perspectives. First, stock liquidity is a desirable feature for investors, meaning that the higher the commercial risk of a stock, the greater its liquidity and the lower the liquidity risk, resulting in lower expected returns. From another perspective, stock trading volume leads to a narrower distribution of stock returns, meaning that returns will cluster around the mean. However, if the trading volume is low, return volatility increases, and the variance of the return distribution will be higher compared to when trading volume is high (Qaemi & Toosi, 1989). The relationship between commercial risk and stock returns has been examined in numerous studies. (Zarei Estahriji, 2019) From the perspective of Karpov (1987), studying the relationship between commercial risk and stock returns is highly significant, as it plays a crucial role in event studies, futures market studies, understanding the structure of financial markets, and discussions related to the empirical distribution of speculative prices. Given the importance of this relationship, the current research examines the relationship between commercial risk and the direction of stock return changes in the Tehran Stock Exchange. Turnover Ratio also referred to as Trading Velocity. Commercial risk refers to the volume of transactions conducted within a specific period, usually on a daily basis. Higher transaction volumes indicate more active stocks. In this study, the average monthly commercial risk in the Tehran Stock Exchange is used, measured in millions of rials.

The level of commercial risk reflects the hidden urgency or intensity in price movements. Higher commercial risk indicates stronger market pressure or inclination. By reviewing commercial risk alongside price movements, analysts can better assess the market's inclination or pressure to buy or sell. This information can then be used to confirm price movements or serve as a warning that the price movement may be uncertain. In conclusion, understanding commercial risk helps better assess trading activity, stock liquidity, and their effects on stock returns, providing investors with valuable insights into market dynamics. (Zarei Estahriji, 2019).

Research background

Ahmadpour and Rasaian (2023), in their study titled "The Relationship between Risk Measures and the Bid-Ask Spread in the Tehran Stock Exchange"concluded that a model incorporating all independent variables explains over 68% of the variations in the bid-ask spread of stocks. Espinosa et al. (2022), in their study titled "Examining the Relationship between Disclosure and Liquidity of Companies Listed on the Madrid Stock Exchange"concluded that there is a direct relationship between disclosure and liquidity. Amihud and Mendelson (2021), in their research titled "Proposing Policies to Enhance Stock Liquidity in Companies "concluded that companies tend to adopt policies that increase stock liquidity, as liquidity leads to higher returns and increased company value. Karimi and

Samadi (2021), in their research titled "Examining the Relationship between Stock Liquidity and Capital Structure Decisions of Companies Listed on the Tehran Stock Exchange Between 2000 and 2006 "concluded that there is a relationship between stock liquidity and capital structure. The risk of illiquidity has a significant positive relationship with the company ratio, and increasing stock illiquidity in recent years has led financial managers to rely more on debt for funding their activities. Amihud (2020), in his study titled "The Positive Relationship between Expected Market Illiquidity and Forecasted Excess Stock Returns" concluded that expected market illiquidity has a positive relationship with forecasted excess stock returns. He argued that a portion of the expected excess return can be explained by the illiquidity premium, with illiquidity having a greater impact on the premium for smaller companies' stocks. Bloomfield and Wilks. (2020), in their study titled "Portfolio Selection Using Three Criteria: Average Return, Standard Deviation of Return, and Liquidity in the Tehran Stock Exchange"concluded that high levels of liquidity influence investors' decisions and impact the efficient frontier. They also highlighted that liquidity is one of the most important criteria for investors when forming a portfolio. The study attempted to integrate liquidity into Markowitz's portfolio selection model using both filtering and liquidity constraint approaches in the Iranian capital market. Their final model allows investors to form portfolios that are optimal in terms of return, risk, and liquidity.

Methodology

Research Method, Statistical Population, and Sample Size

The research methodology is applied research in terms of its objective. Based on the type of data, it is a descriptive-survey study of correlational and ex-post facto nature. (Azar and Momeni, 2008).This research examines the relationship between various liquidity measurement indicators, such as commission rate, bid-ask spread, business risk, and stock returns. Also, for this study, 165 manufacturing companies were selected from a total of 494 companies listed on the Tehran Stock Exchange over a five-year period, from the fiscal years 2018 to 2022. The selection was made using the systematic elimination method with specified filters, and the research model was analyzed and tested accordingly.

Research Hypotheses

Main Hypothesis:
Liquidity indicators of stocks have a significant effect on the rate of return of manufacturing companies listed on the Tehran Stock Exchange.
Sub-Hypotheses:

1. The commission rate has a significant effect on the rate of return of manufacturing companies listed on the Tehran Stock Exchange.
2. The bid-ask spread has a significant effect on the rate of return of manufacturing companies listed on the Tehran Stock Exchange.
3. Business risk has a significant effect on the rate of return of

manufacturing companies listed on the Tehran Stock Exchange.

Results

Testing of Research Hypotheses

Test of the First Sub-Hypothesis:

This hypothesis involves determining and analyzing the relationship between liquidity measurement indicators and stock returns using the obtained panel data.

H0: The commission rate has a significant effect on the rate of return of manufacturing companies

listed on the Tehran Stock Exchange.

H1: The commission rate does not have a significant effect on the rate of return of manufacturing

companies listed on the Tehran Stock Exchange.

$$\begin{cases} H_0 : \beta = 0 \\ H_1 : \beta \neq 0 \end{cases}$$

The model related to this hypothesis is as follows:

$$SR = \delta_0 + \delta_1 CR_{it} + \delta_2 GBBS_{it} + \delta_3 TU_{it} + \varepsilon_{it}$$

, Sothat;

- SR: Stock return of company \(i\) in year \(t\)
- CR: Commission rate of company \(i\) in year \(t\)
- GBBS: Bid-ask spread of company \(i\) in year \(t\)
- TU: Business risk of company \(i\) in year \(t\)
- εit: Error term

Based on the results presented in Table (1) for the studied companies, in the research model where the dependent variable is SR (stock return), the commission rate variable shows a positive and significant effect of 0.374 units on the stock return (SR), as indicated by the t-statistic value (5.418) and the associated p-value (0.0000). Therefore, the positive and significant effect is confirmed. The R-squared value of 0.972 in the first model indicates that the explanatory variable of the model can explain 97.2% of the variation in the dependent variable.

Table 1. Results of the First Sub-Hypothesis Test

Result	Type of Relationship	DW	F	AdjR^2	p-valu	t-statistic	Coefficient	Variable	Hypothesis
Accept	Positive	2.529	138.561	0.965	0.000	5.418	0.374	CR	1

Reference: Research Findings

With an adjusted R-squared value of 0.965, it is evident that this coefficient is high, indicating a good explanatory power of the model. The calculated Durbin-Watson statistic (2.529) suggests the absence of autocorrelation in the model. According to the Fisher F-test statistic (138.561) and its p-value (0.0000), the overall regression fit is valid. Other computed statistics, including the correlation coefficient (0.971), adjusted R-squared (0.964), Durbin-Watson statistic (2.2), and Fisher F-test statistic {132.530 with p-value (0.0000)}, indicate the adequacy of the overall regression fit.

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Test of the Second Sub-Hypothesis:

In this hypothesis, the relationship between the bids-ask spread and stock returns is analyzed using the obtained panel data.
H0: The bid-ask spread has a significant effect on the rate of return of manufacturing companies listed on the Tehran Stock Exchange.
H1: The bid-ask spread does not have a significant effect on the rate of return of manufacturing companies listed on the Tehran Stock Exchange.
The model related to this hypothesis is as follows:

$$SR = \delta_0 + \delta_1 CR_{it} + \delta_2 GBBS_{it} + \delta_3 TU_{it} + \varepsilon_{it}$$

Based on the results presented in Table (2) for the studied companies, in the research model where the dependent variable is SR (stock return), the t-statistic value is -6.157 with a corresponding p-value of 0.0000. Therefore, this negative and significant effect is confirmed. The coefficient of determination (R^2) obtained in the first model shows that the explanatory variable can explain 97.2% of the variation in the dependent variable. The adjusted R^2 of 96.4% indicates that this coefficient is high, reflecting the model's good explanatory power.

Table 2. Results of the Second Sub-Hypothesis Test

Result	Type of Relationship	DW	F	AdjR^2	p-valu	t-statistic	Coefficient	Variable	Hypothesis
Accept	Negetive	2.2	175.032	0.972	0.000	-6.157	-0.425	GBBS	2

Reference: Research Findings

The calculated Durbin-Watson statistic (2.2) suggests that there is no autocorrelation in the model, and according to the F-test statistic (175.032) with a p-value of 0.0000, the overall regression fit is valid. Other computed statistics, including the correlation coefficient (0.971), adjusted R^2 (0.972), Durbin-Watson statistic (2.2), and the F-test statistic (175.032 with p-value of 0.0000), indicate the adequacy of the overall regression fit.

Test of the Third Sub-Hypothesis:

In this hypothesis, the determination and extent of the relationship between trading volume (business risk) and stock returns are analyzed using the obtained panel data.
H0: Trading volume (business risk) has a significant effect on the stock returns of manufacturing companies listed on the Tehran Stock Exchange.
H1: Trading volume (business risk) does not have a significant effect on the stock returns of manufacturing companies listed on the Tehran Stock Exchange.
The model related to this hypothesis is as follows:

$$SR = \delta_0 + \delta_1 CR_{it} + \delta_2 GBBS_{it} + \delta_3 TU_{it} + \varepsilon_{it}$$

Based on the results presented in Table (3) for the studied companies, in the research

model where the dependent variable is SR (stock return), the t-statistic value is (33.724) and the associated p-value is (0.0000). The business risk variable has a significant positive effect of 0.030 units on stock returns (SR), thus confirming the positive and significant relationship. The R^2 value obtained in the first model indicates that the explanatory variable can account for 97.2% of the variability in the dependent variable.

Table 3. Results of the Third Sub-Hypothesis Test

Result	Type of Relationship	DW	F	AdjR^2	p-valu	t-statistic	Coefficient	Variable	Hypothesis
Accept	Negetive	2.259	138.561	0.965	0.000	33.724	1.020	TU	3

Reference: Research Findings

The adjusted R^2 value of 96.5% shows a high coefficient, indicating the model's strong explanatory power. The computed Durbin-Watson statistic (2.529) indicates no autocorrelation in the model. Based on the F-test statistic (138.561) and the p-value (0.0000), the overall regression fit is valid. Other calculated statistics, including the correlation coefficient (0.971), adjusted R^2 (0.964), Durbin-Watson statistic (2.2), and F-test statistic {(p-value = 0.0000) 132.530}, all suggest the overall fit of the regression is appropriate.

Test of the Main Hypothesis:

Given the confirmation of the first to third sub-hypotheses, it can be concluded that the main hypothesis of the research is also confirmed. That is, the liquidity indicators of stocks have a significant effect on the stock returns of manufacturing companies listed on the Tehran Stock Exchange.

Discussion and Conclusion

Based on the results of testing the first sub-hypothesis, as the commission rate (transaction speed ratio) increases, the stock returns will also increase accordingly. Conversely, as the bid-ask spread increases, the stock returns will decrease proportionally. Furthermore, as the commercial risk ratio of company's increases over trading days, this increase will lead to a rise in stock returns for the companies listed on the Tehran Stock Exchange. Therefore, it is confirmed that liquidity measurement indicators have a positive and significant effect on stock returns.

According to the results of testing the second hypothesis, the effect of the bid-ask spread on stock returns was examined. The results from the analysis of this hypothesis are accepted, meaning that the bid-ask spread has a negative and significant effect on stock returns. As the bid-ask spread increases, stock returns decrease.

Also, according to the results of testing the third hypothesis, the effect of commercial risk on stock returns was examined. The results from the analysis of this hypothesis are accepted, indicating that commercial risk has a positive and significant effect on stock returns. As commercial risk increases, stock returns also increase.

On the other hand, the results obtained from the study indicate that liquidity measurement indicators have a positive and significant effect on stock returns. In other words, companies with higher liquidity ratios tend to have higher stock returns. Studies by Amihud and Mendelson also show that companies tend to adopt policies to increase the liquidity of their stocks because liquidity enhances returns and company value. The findings of Omri, Ziani, Loquercio, Demey, Matus, and Walter also confirm the positive effect of liquidity measurement indicators on stock returns. In the second hypothesis, the effect of the commission rate on stock returns was confirmed. This result aligns with the findings of Marshall and Young, and Picot. These studies indicate a positive effect of transaction speed on stock returns, with companies having higher commission rates achieving higher returns.

The third hypothesis confirmed the effect of the bid-ask spread on stock returns, showing a significant negative effect over five years. Studies by Matusi and colleagues, Baker, Stein, Chordia, Ahmadpour, and Rasaian demonstrate a negative and significant effect of the bid-ask spread on stock returns. The fourth hypothesis confirmed the effect of commercial risk on stock returns. This result is consistent with the findings of Najarzadeh, Ziyoudar, and Chordia. These studies show that commercial risk has a positive effect on stock returns, with companies having higher commercial risk achieving higher returns.

Recommendations based on results

Based on the results of the study, the following recommendations are presented:

- The results indicate the impact of liquidity measurement indicators on stock returns for companies listed on the stock exchange. It is recommended that investment managers pay serious attention to this and consider this variable as an important parameter in their decision-making processes. They should also focus on factors such as commercial risk, the number of shares traded, the frequency of trades, the number of buyers, the number of trading days, and the monetary volume of transactions, which are influential factors affecting liquidity. These variables should be periodically reviewed and analyzed.
- Stakeholders and analysts are advised to use the results of this research to assess the status of companies on the stock exchange, improve investment strategies, and enhance decision-making.
- Given the high importance of liquidity in the stock exchange, suggestions are provided to increase market liquidity and make appropriate decisions in this regard.
- When there are supply and demand queues, market makers or other

financial institutions act with their capital, either directly or on behalf of others, to buy and sell the stocks of the concerned company until the market price approaches the intrinsic value of the stock. Consequently, new investors in that industry or specific company can confidently purchase shares, knowing the degree of liquidity and the stock's intrinsic value.

- The presence of various investors and participants with different needs, risk tolerances, and investment goals positively impacts market liquidity.
- Investing in mutual funds allows shareholders to quickly convert their investment into cash.

Recommendations for future studies

- One of the suggestions for future research is to examine other factors affecting stock returns of companies listed on the Tehran Stock Exchange. For this purpose, the relationship and impact of factors such as market return, earnings, and company size on stock returns could be tested.
- Since this research includes all companies listed on the Tehran Stock Exchange, it is possible to focus on specific industries or categories for further investigation.
- It is recommended to extend the study to a broader time frame, such as a ten- or fifteen-year period.
- Future research is advised to utilize nonlinear methods, such as quadratic, logarithmic, and other advanced techniques, as the absence of a relationship or weak connection in linear methods does not necessarily imply a lack of correlation or a strong relationship between variables.

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