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Empirical Analysis of Factors Affecting Stock Liquidity

--Taking Ping An Bank as an Example

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Abstract: With the continuous development of the Chinese economy, the stock market has become one of the important choices for investors, and the liquidity of the stock market has always been the focus of investors. Ping An Bank is one of China's well-known commercial banks and occupies an important position in the A-share market. The goal of this paper is to study the relationship between stock liquidity and return volatility, risk factors, circulation market value and cross-period of risk factors. Through ordinary least squares (OLS) regression analysis, it can be found that earnings volatility and circulating market value have an impact on stock liquidity significantly, that is, the higher the earnings volatility and circulating market value, the higher the stock liquidity. Risk factors and cross-terms of risk factors have no significant influence on stock liquidity. These findings have important implications for investors and market regulators to help them more fully assess stock value and risk and make more informed investment decisions.

Keywords: stock liquidity, return volatility, circulation market value, OLS regression analysis

1. Introduction

Stock liquidity is an important and widely concerned indicator in the financial market, which reflects the ease of stock trading in the market. The level of stock liquidity directly affects investors' trading decisions and market efficiency. Many studies have emphasized the important relationship between market liquidity and stock returns [1-6]. Therefore, understanding and explaining the fluctuation of stock liquidity is one of the important topics in financial research.

Some scholars have defined stock market liquidity as the ability of the market to absorb large amounts of securities at lower execution costs in a short period of time without significantly affecting securities prices [7-8]. It can be measured by indicators such as trading volume, trading costs and quotation spreads, and higher liquidity means that the stock is easier to buy and sell and the trading cost is lower. The effective bid–ask spread measure implicitly captured the transaction cost aspect of liquidity. Volatility is a measure of the degree of stock price volatility, which reflects the uncertainty and risk level of stock prices [9-10]. Risk affects stock price fluctuation. It includes market risk, interest rate risk, exchange rate risk, and so on. These risk factors will directly affect investors' expected returns and risks of stocks, and further affect the liquidity of stocks. The circulating market value refers to the total value of shares available for circulation in the market. It is one of the indicators for measuring the size of the company. It is one of the indicators for measuring the size of a company.

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Based on the above definition and explanation, it can be inferred that there is a certain theoretical connection between them. Volatility may affect investors' trading behavior and risk appetite, which in turn affects stock liquidity. The circulating market value may affect the trading volume and market depth of the stock, which in turn affects the stock liquidity. Risk factors may cause investors to worry about the stock market, thus affecting the stock liquidity.

This study aims to deeply explore the relationship between stock liquidity and volatility, risk factors, and circulating market value, and verify the correlation between them through theoretical analysis and empirical research. The study helps to better understand the dynamic changes of stock liquidity and the impact mechanism of related factors, and provides decision-making references and policy recommendations for investors and market regulators.

2. Influencing Factors

2.1. Earning Volatility

Earning volatility describes the degree of change or volatility in the level of profitability of a company over a period of time. On the one hand, the high volatility of earnings may lead to investors' heightened concern about risks, thus reducing the demand for stocks, decreasing the market trading activity and worsening stock liquidity. On the other hand, higher earnings volatility may also increase market uncertainty, making it more difficult for investors to predict future market price trends, thereby reducing their holding time for stocks, increasing the frequency of market transactions, and thus improving stock liquidity.

2.2. Liquidity Risk

Liquidity risk refers to the risk that when the liquidity of a stock deteriorates, it is difficult for investors to sell the stock quickly and thus suffer losses. There is a negative correlation between risk factors and liquidity, and in general, higher risk usually means more uncertainty and volatility, thus increasing the risk for investors during the trading process. When there is higher risk in the market, investors may trade more cautiously, reducing the volume of trading, which reduces the liquidity of the stock. Secondly, the feedback effect of risk and liquidity, the change of risk may have a feedback effect on the liquidity of stocks. For example, if a company's risk rating is lowered, it may attract more investors to participate in trading, increasing trading activity and liquidity.

2.3. Circulating Market Value of the Stock

Under normal circumstances, the larger the circulating market value of the stock, its trading volume and trading frequency are relatively high, so its stock liquidity is also better. The floating market value will also affect the market depth and liquidity risk of the stock. Stocks with a larger float value have a broader pool of buyers and sellers, so the market depth is relatively high.

3. Methodology

3.1. Hypothesis

First, assuming that the volatility of corporate earnings is negatively correlated with stock liquidity. The higher the volatility of returns, the greater the volatility of stock prices, the higher the risk investors will face, which may cause investors to worry about the stock market, thus affecting stock liquidity.

Second, There is a negative correlation between risk factors and stock liquidity. Risk factors can cause investors to worry about the stock market, thus affecting stock liquidity. There may be complex

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interactions between different risk factors, so introducing cross-terms of risk factors can better reflect the relationship between them.

Third, there is a positive correlation between circulating market value and stock liquidity. Assuming that the larger the circulating market value, the larger the size of the company, the larger the number of shares available for trading in the market, and the stock liquidity is relatively high.

Forth, the cross-term of risk factors is negatively correlated with stock liquidity. The cross-term of risk factors can more comprehensively reflect the complex relationship between different risk factors and have an impact on stock liquidity.

3.2. Data

The trading data of Ping An Bank (stock code: 000001) from January 2021 to December 2022 were selected. The trading data of Ping An Bank was obtained from CSMAR, including its earnings liquidity, volatility and risk factors weighted by float market value.

Table 1: Descriptive statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Liquidity	485	0	0	0	0
Volatility	485	.36	.026	.3	.397
risk	485	1.077	.107	.901	1.367
CMktV	485	3278727.4	186714.3	2826356.2	3654584.3

Table 1 shows that the values of liquidity, volatility and risk fluctuate little, while the circulation market value fluctuates greatly.

3.3. Model

In this section, we modeled the known data, taking liquidity as the dependent variable and the cross term of Volatility, risk, risk and circulation market value as the independent variable, and conducted regression with OLS to explore the relationship between the dependent variable and the independent variable. The specific model is shown below.

$$liquidity = \beta_1 Volatility + \beta_2 risk + \beta_3 risk * CMktV + \epsilon. \quad (1)$$

In the model, the liquidity variable refers to the daily liquidity L index of stock i in month t is derived from the trading data of that month, and its calculation formula is $L_t^i = 1/Day_t^i \sum_{d=1}^{Day_t^i} |R_{td}^i|/V_t^i$, where R and V are respectively the return rate and trading volume (in millions) of stock i on the d trading day of t month, and day is the effective trading days of stock i from the first effective trading day to the trading day of t month.

Volatility in the model was estimated using the logarithmic returns of the last 250 trading days.

The risk, weighted by market capitalization, is calculated as a beta estimated from the capital asset pricing model using data from the last 250 trading days. Among them, the rate of return of stocks adopts "Daily stock return rate considering cash dividend reinvestment", the rate of return of market portfolios adopts "daily market return rate considering cash dividend reinvestment (weighted average method of circulating market value)", and the risk-free interest rate adopts "daily risk-free interest rate".

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The $risk * CMktV$ is the cross term of circulation market value and risk factor, circulation market value refers to the circulation market value of all stocks in the corresponding caliber statistics after the close of the statistical date.

4. Results

The results of the OLS regression analysis can be obtained by using Stata. Liquidity is the dependent variable. The coefficient of the independent variables volatility, risk, cross term of risk and circulation market value is -2.56e-05, 1.32e-05 and -4.27e-12, respectively. The constant term is 1.92e-05, all of which are significant under the 1% level. (See table 2.)

Table 2: Regression result

Variables	Liquidility
Volatility	-2.56e-05***
	(-5.69e-06)
Risk	1.32e-05***
	(-3.08e-06)
RiskCMktV	-4.27e-12***
	(0)
Constant	1.92e-05***
	(-2.25e-06)
Observations	485
R-squared	0.185
*** p<0.01, ** p<0.05, * p<0.1	

The regression results show that volatility and liquidity are negatively correlated, and when volatility increases, the value of liquidity will decrease, which is statistically significant ($T-value\ -4.15, p<0.01$). There is a negative correlation between risk and liquidity, that is, when the risk increases, the value of liquidity will decline, which is statistically significant ($T-value\ 4.30, p<0.01$), and the current market value is positively correlated with liquidity. Specifically, when market risk increases, the value of y rises, again statistically significant ($T-value\ -5.81, p<0.01$).

The joint significance test of the model shows that the value of F statistic is 36.35 and the p-value is 0.0000, which means that the joint influence of all independent variables in the model is significant.

In general, the fitting effect of the model is not perfect. The selected independent variables can only explain 18.5% of the variance of the liquidity value, and most of the variance is caused by other unknown factors, which verifies the complexity, unpredictability and random walk of the stock market.

In the current model, only volatility, risk and market risk are included as independent variables. Later studies can add other relevant factors, such as market liquidity, company size and industry characteristics, to more comprehensively explain and predict changes in stock liquidity. At the same time, multiple versions and time periods can be included to increase the stability and reliability of the model.

5. Conclusion

In this paper, the OLS regression method is used to analyze the factors affecting stock liquidity, and the relationship between stock liquidity and volatility, risk and circulating market value is obtained. It is found that the greater the Volatility, the weaker the stock liquidity, the greater the risk and the

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stronger the stock liquidity, while the greater the cross term of risk and circulation market value, the weaker the stock liquidity. From this, we draw some factors that affect the liquidity of stocks. In order to improve the liquidity of the stock market and promote orderly and legal trading, some measures can be taken. Governments and regulators can take measures to improve market liquidity, such as simplifying trading processes, reducing trading costs, and narrowing the quotation gap, so as to attract more investors to participate in trading and improve the trading activity of the market.

This paper studies Ping An Bank from January 2021 to December 2022, which is not universal in time selection. At the same time, the research method can continue to be improved by selecting control variables. The research of this paper needs to be further improved.

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