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# Stock liquidity and stock returns: the moderating role of financial constraints

Veronika Daniar Febrianti\* and Siti Saadah

## Abstract

**Research aims:** This study aims to analyze the effect of stock liquidity on stock returns in large and small capitalization companies and the moderating role of financial constraints in the relationship.

**Design/Methodology/Approach:** In this study, panel data analysis was conducted on 113 manufacturing sector companies on the Indonesia Stock Exchange from 2015 to 2019, grouped into small and large capitalization companies. To avoid measurement errors from applying the KZ index, which is very likely to occur, this study used the upper quartile (Q3) of the Debt-to-Equity Ratio (DER) and a dummy variable as an artificial variable to measure financial constraints instead of the KZ index.

**Research findings:** The results highlighted that liquidity is a predictor that could significantly explain the movement of stock returns in this sector. Investors, thus, will require additional compensation in the form of higher returns for holding less liquid stock. The study also found a significant moderating role of financial constraints. Consequently, as the illiquidity of stocks increases, additional greater compensation will be requested by investors on the stocks of companies experiencing financial constraints.

**Theoretical contribution/Originality:** This study provides additional empirical evidence for the studies documented that investors will ask for additional return compensation for stocks with low liquidity, and investors will demand higher additional returns in companies experiencing financial constraints. This finding indicates that liquidity is essential in risk premium forming stock returns.

**Practitioner/Policy implication:** This study can be used for investors or traders when choosing an investment strategy to be carried out.

**Keywords:** Stock Liquidity; Stock Returns; Bid-Ask Spread; Financial Constraints



## AFFILIATION:

Department of Accounting, Faculty of Economics and Business, Universitas Katolik Indonesia Atma Jaya, Jakarta Capital Special Region, Indonesia

## \*CORRESPONDENCE:

veronikadaniar282@gmail.com

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## Introduction

Investment is a current commitment made by investors in the form of money or other resources carried out in the long term to obtain future benefits as compensation for delaying consumption (Bodie et al., 2021). As the public awareness of investing increases and with technological developments in the capital market, which can now facilitate the ease of investment activities with online trading, many investors started to invest in the capital market in the expectation of getting additional income or passive income also increases. Return and risk are the two main factors in evaluating and selecting investments. Studying the factors that influence returns can help make investment decisions in the capital market, which

can also have implications for investors, including conventional investors (Sheykhbaglou et al., 2019). The form of returns that investors expect for their investments are dividends and capital gain. Investors undoubtedly expect high returns with a level of risk per the limits of their risk profile. In addition, some investors take advantage of the differences between the purchase price and the fluctuating market prices to get abnormal returns.

Theoretically, in an efficient capital market, stock prices reflect all the information available in the market. According to the efficient market hypothesis, the price of a security will adjust immediately when new information becomes available so that the price of a security will be equal to its fundamental value and result in no mispricing of securities prices (Bodie et al., 2021). According to the theory, investors will not be able to get high capital gain or abnormal returns, so investors will do more passive management to get the return from dividends than active management. However, for investors who do active management more often, stock liquidity can be essential for investors who rely on the difference between the bid and ask prices in the market to make a profit. It is because to buy or sell their stockholdings, information is needed that appears on the selling concession or buying premium, which will result in the difference between the bid and ask prices in the capital market, and the difference between the bid and ask prices is often considered as a form of stock liquidity (Chiang & Zheng, 2015).

Harris (2003) indicates that when investors/traders want to transact, liquidity relates to how quickly the transaction can be executed at a low cost. The faster execution occurs at a lower cost, the higher the liquidity. According to Chiang and Zheng (2015), liquidity refers to how quickly a security can be traded in the market to avoid losses or to make a profit. It is also one of the factors believed to affect stock prices and returns. Here, IDX authorities measure stock liquidity using trading volume, price, and frequency.

Previous studies on the effect of liquidity on stock returns have revealed non-converging results. Some studies found that liquidity had a significant positive effect on return, but other studies uncovered the opposite results (see, for example, Bekaert, Harvey & Lundblad, 2007; Loukil, Zayani & Omri, 2010; Ibbotson et al., 2013; Chiang & Zheng, 2015; Chung & Chuwonganant, 2018; Sheykhbaglou et al., 2019). In their study, Ibbotson et al. (2013) unveiled that liquidity affected stock returns only in micro-capitalization companies.

Investors who expect returns from capital gains will rely on stock liquidity, and investors who expect returns from dividends will depend on company performance in the hope that companies that perform well will generate more profits so that the dividends to be distributed to stockholders will be greater. In several ways, companies can increase profits, expand to get new sales targets, reduce production costs, or add new projects with more significant profit potential. To do that, companies need short-term investments and capital expenditures, i.e., capital expenditures in the form of long-term investments with the benefit of more than one year.

To make capital expenditures, companies need funding that can be obtained from internal or external sources. However, not all companies can easily get external funding because

of financial constraints on the company. Companies that do not face financial constraints will find it easier to get external funding so that it is easier to make long-term investments to increase revenues and profits.

Of the many studies on the factors affecting stock returns, several studies have considered the role of liquidity and financial constraints as one of the main components that can affect stock returns (Nguyen, 2017; Sheykhbaglou et al., 2019). Financial constraint is the company's limitations in obtaining capital from available investment funding sources. Lamont, Polk, and Saaá-Requejo (2001) stated that financial constraints could affect the value of a company, and if that happens, changes in the intensity of financial constraints should be reflected in stock returns. Sheykhbaglou et al. (2019) specifically examined the relationship between liquidity and stock returns, focusing on the moderating role of financial constraints. The results demonstrated that stock liquidity had a positive and significant effect on stock returns and confirmed the moderating role of financial constraints in the relationship between stock liquidity and stock returns. Their study also found that the moderating role of financial constraints was more substantial in companies that did not have financial constraints. In other words, the effect of liquidity on stock returns is more significant in companies that do not experience financial constraints than in companies that experience them.

To study the role of financial constraints, researchers need to measure the severity of the constraints. Of the many studies that have been conducted regarding the role of financial constraints on the effect of stock liquidity on stock return, the KZ index is the most popular measure of financial constraint, as suggested by Kaplan and Zingales (1997) and used in studies conducted by Lamont, Polk, and Saaá-Requejo (2001) and Sheykhbaglou et al. (2019). However, in this study, the KZ index was not used to measure financial constraints. Instead, this study employed the upper quartile (Q3) of the Debt-to-Equity Ratio (DER) as recommended by Balfoussia and Gibson (2018) to measure financial constraint, and a dummy variable would be used as an artificial variable to measure this financial constraint. In this regard, direct application of parameters in standard models, such as the KZ standard model, can cause measurement errors from two things: 1) analysis period and 2) differences in the object studied used in the model. Moreover, former researchers have anticipated the potential for measurement errors by using a new standard model with the result from a re-estimation of the KZ model, which had been carried out with appropriate research objects but could not overcome the possibility of measurement errors from the selection of the analysis period in the standard model applied. This study also did not use pooled data to avoid the possibility of omitted variable bias caused by ignoring the differences in characteristics between individuals or unit cross-sections in the panel data used in this study.

The importance of liquidity for investors oriented towards capital gains, the non-convergence of the studies linking liquidity with stock returns, and the moderating role of financial constraints on the relationship between the two motivate the researchers to conduct this study. This study, therefore, intends to examine the relationship between liquidity and stock returns and the moderating role of financial constraints in two groups of companies: large capitalization and small capitalization companies. Previously, in their

study, Ibbotson et al. (2013) found that liquidity affected stock returns only in small capitalization companies. However, the study by Ibbotson et al. (2013) did not consider financial constraint as the factor affecting liquidity and stock returns.

Unlike the previous empirical study of Sheykhbaglou et al. (2019), this study developed a model that could handle omitted variable bias caused by potential heterogeneity between unit cross-sections in the data. The potential for measurement error in the financial constraints measurement tool was mitigated by using the upper quartile statistic of the Debt-to-Equity Ratio (DER) as an indicator of financial constraint. Further, this study also provides additional empirical evidence for the studies documented by Vayanos and Wang (2013) that investors will ask for additional return compensation for stocks with low liquidity. This finding indicates that liquidity is critical in risk premium-forming stock returns.

## **Literature Review and Hypotheses Development**

### **Efficient Market Hypothesis**

The Efficient Market Hypothesis was first introduced by Fama (1970). Fama (1970) divides the market into three forms: the weak form, in which the information set of this form is only historical prices; a semi-strong form, in which the prices of this form efficiently adjust to other publicly available information; the strong form, in which the concern is whether given investors or groups have monopolistic access to any information relevant for price formation. As in Fama (1970), Bodie et al. (2021) explain that in an efficient market, the price of securities fully reflects the availability of information entering the market, so that price increases and decreases will only occur due to the response to new information. The new information itself is unpredictable; if the information is predictable, it means that the prediction is part of the new information. In this way, the changes in stock price due to unpredictable responses to new information should also move unpredictably, so stock prices should have an irregular or random walk pattern (Bodie et al., 2021). In an efficient market, asset prices also reflect their fundamental values, and there is no mispricing of assets.

The forms of market efficiency introduced by Fama (1970) affect the investment strategy carried out by investors. In an efficient market, a more suitable strategy is a passive management strategy, often defined as a buy-and-hold strategy, while an active management strategy is considered useless (Bodie et al., 2021). In an efficient market, all information relevant to the market prices can be accessed and reflected in the stock price itself so that there is almost no change in stock prices that can cause abnormal returns; therefore, active management is deemed useless in an efficient market condition. The strategy commonly used in passive management is to form an index fund, a collection of stocks or portfolios whose proportions can replicate the reference index to generate returns close to the reference index's value (Bodie et al., 2021). Conversely, in inefficient market conditions, active management is more suitable to be applied since the limited

information that can be accessed causes volatility in stock price, allowing investors to actively buy and sell stocks to get returns from the price difference.

### **Stock Liquidity**

According to Chiang and Zheng (2015), stock liquidity refers to how quickly a security or stock can be traded to avoid losses or gain profits. Avramov, Chordia, and Goyal (2006) stated that liquidity generally reflects the ability to buy or sell several stocks reasonably quickly and with low trading costs. In addition, liquidity is essential for traders as it allows them to implement their trading strategies inexpensively. Stock exchange authorities like liquidity because it attracts traders to the market, while regulators favor liquidity since liquid markets are less volatile than illiquid markets (Harris, 2003).

Liquidity can be measured by various measurements. According to Amihud, Mendelson, and Pedersen (2005), referred to in Chiang and Zheng (2015), the liquidity of a stock can be reflected in the bid-ask spread. It is because to sell and buy stocks, individuals will need information on the bid and offer prices formed due to the sale and buying concessions. Related to that, Harris (2003) stated that the bid-ask spread consists of two components: i) transaction costs and ii) adverse selection. Transaction costs are part of the bid-ask spread, compensation for dealers for normal costs arising from their operational activities, including the risk premium demanded by the dealer for the inventory risk they hold. Meanwhile, adverse selection is part of the bid-ask spread, compensating dealers for possible losses from trading activities with well-informed traders. Therefore,

$$\text{spread} = \text{transaction cost} + \text{adverse selection cost}$$

Dealers never set the two components separately but simply reflect on their bid-ask pricing. The presence of an adverse selection cost component causes spreads to increase when information asymmetry increases, which means that liquidity decreases. In prior studies, Brennan and Subrahmanyam (1996) used transaction cost to measure liquidity, and Datar, Naik, and Radcliffe (1998) employed trading volume to measure liquidity in their research. Various liquidity measurements have been utilized because the researchers considered no perfect proxy for describing stock liquidity. In the search for a precise explanation of liquidity, many researchers have then developed various forms of liquidity measurement. According to Chiang and Zheng (2015), one of the liquidity measurements deemed the best is the Amihud measurement developed in their research in 2002. This measurement uses the concept of illiquidity, which can simultaneously capture the impact of price, volume, and volatility.

### **Financial Constraint**

Financial constraint is the company's limitations in obtaining capital from available investment funding sources. Kaplan and Zingales (1997) conveyed that a company can be said to be experiencing financial constraints when there is a gap between the use of internal and external allocation funds. Bao, Chan, and Zhang (2012) stated that companies with financial constraints are less likely to invest in new projects because of their

limitations in obtaining external funding. According to Moyen (2004), companies with financial constraints are identical to companies that do not pay dividends, have low cash flow values, and own high debt, so they are considered companies with financial constraints and less profitable for investors because they cannot provide high returns.

### **The Relationship between Stock Liquidity and Stock Returns**

A survey of the theoretical and empirical literature on market liquidity conducted by Vayanos and Wang (2013) showed that many in-depth studies have been carried out on this liquidity and how it relates to stock returns. In this literature, it is stated that there are two types of costs associated with stock illiquidity: 1) adverse selection costs that arise from the existence of information asymmetry and 2) transaction costs that originate from the risk premium demanded by dealers due to the risk of the inventory they hold. The higher the information asymmetry in the market and the higher inventory risk faced by dealers will be reflected in the higher bid-ask spread. The higher the bid-ask spread causes the stock to become more illiquid. The literature in a survey conducted by Vayanos and Wang (2013) also asserted that investors would ask for additional compensation for being willing to hold fewer liquid stocks. The compensation requested is in the form of greater stock returns. Further, Brennan and Subramanyam (1996) and Brennan, Chordia, Subramanyam, and Tong (2012) found a positive relationship between average stock returns and liquidity costs.

Many studies have been conducted to test the effect of liquidity on stock returns. Chiang and Zheng (2015) used the Amihud measurement as a liquidity measure, which Amihud developed in 2002, examined the effect of liquidity on stock returns on the international market with a sample of G7 countries, and found that the liquidity variable was positively correlated with stock returns. Besides, Chung and Chuwonganant (2018) investigated the role of liquidity on stock returns and uncovered that stock returns have become more sensitive to market volatility with the proliferation of high-frequency trading. Loukil, Zayani, and Omri (2010) found that liquidity with a bid-ask spread proxy was negatively correlated with stock returns, while Bekaert, Harvey, and Lundblad (2007) revealed that liquidity had no significant effect on stock returns. In addition, there is an assumption that investing in less liquid stocks is the same as investing in small-capitalization stocks (Ibbotson et al., 2013). In their study, Ibbotson et al. (2013) unveiled that liquidity affected stock returns only in micro-capitalized.

Based on the theoretical arguments in the literature on the market and stock liquidity, the first hypothesis to be empirically proven in this study is as follows:

***H<sub>1</sub>: The higher the bid-ask spread (the higher the stock illiquidity), the higher the compensation returns demanded by investors.***

### **The Relationship between Financial Constraint, Liquidity, and Stock Returns**

All companies are believed to have financial constraints. Thus, companies can be categorized with high or low financial constraints. Nguyen (2017), in a study, reported that the stocks of companies that experienced financial constraints were significantly lower in liquidity than those of companies that did not experience financial constraints. According to Tirole (2006), financial constraints arise due to friction in the supply of capital, and the primary source is the existence of information asymmetry between investors and companies. For companies, this supply friction will increase the cost of funding from external sources (increase the cost of capital) so that it is not impossible to cause companies to leave the capital market to a certain extent. Also, Ascioğlu, Hedge, and McDermott (2008) stated that because market liquidity captures the information asymmetry between market players, such companies (with supply friction or companies with financial constraints) are very likely to have more illiquid stocks. Nguyen (2017) also asserted that companies with financial constraints would face higher capital costs and low stock liquidity. In addition, Fang, Noe, and Tice (2009) found that companies with high liquidity perform well. Lamont, Polk, and Saaá-Requejo (2001) also stated that financial constraints could affect the value of a company, and if financial constraints affect the value of a company, changes in financial constraint intensity should be reflected in liquidity and stock returns.

Concerning the moderating role of financial constraints, the second hypothesis to be tested in this study is as follows:

*H<sub>2</sub>: The link between the bid-ask spread (stock illiquidity) and the return compensation demanded by investors will be stronger in the stocks of companies experiencing financial constraints.*

## **Research Method**

This study aims to analyze the moderating role of financial constraints in the relationship between liquidity and stock returns. The data used were historical stock daily trading data from 2015 to 2019 from companies in the manufacturing sector in the Indonesia Stock Exchange (IDX) that met the criteria of not experiencing a stock split during the study period.

### **Operational Variable Definition**

#### **Stock Return**

Stock return is the profit enjoyed by investors on the investment made. Stock return was calculated as the percentage change in price in two consecutive periods.

$$R = \frac{(P_t - P_{t-1})}{P_{t-1}} \dots \dots \dots (1)$$

**Stock Liquidity**

Liquidity is related to how quickly the transaction can be executed at a low cost. According to Amihud, Mendelson, and Pedersen (2005), the liquidity of a stock can be reflected in the bid-ask spread because selling and buying stocks will require information on the bid and offer prices formed due to selling concessions and buying premiums, which will lead to differences in bid-ask spreads.

$$Bid - ask\ spread = \frac{(Ask\ Price - Bid\ Price)}{Ask\ Price} \times 100\% \dots\dots\dots (2)$$

**Financial Constraint**

Following Balfoussia and Gibson (2018), the proxy to be used to measure financial constraints was the Debt-to-Equity Ratio (DER). Here, companies included in the financial constraint group have a DER in the upper quartile (Q3). Also, the dummy variable would be used as an artificial variable to measure this financial constraint variable with the following:

$$D_i \begin{cases} = 1 & \text{for companies with FC} \\ = 0 & \text{for NFC companies} \end{cases} \dots\dots\dots (3)$$

Under the study objectives, the model specifications to be built and the parameters to be estimated in this study are:

$$Y_{it} = \beta_{0i} + \beta_1 Liquid_{it} + \beta_2 D_{it} + \gamma_1 Liquid_{it} D_{it} + e_{it} \dots\dots\dots (4)$$

where

- $Y_{it}$  : Stock return i on period t
- $Liquid_{it}$  : Stock liquidity l on period t
- $D_{it}$  : Qualitative variable financial constraint

Based on equation (4), the correlation between research variables for companies without financial constraints (D=0) is:

$$Y_{it} = \beta_{0i} + \beta_1 Liquid_{it} + e_{it} \dots\dots\dots (5)$$

Meanwhile, for companies that did not experience financial constraints (D=1):

$$Y_{it} = (\beta_{0i} + \beta_2) + (\beta_1 + \gamma_1) Liquid_{it} + e_{it} \dots\dots\dots (6)$$

Comparing equation (5) and equation (6),  $\gamma_1$  is a parameter that measures the difference in the effect of liquidity on stock returns in companies with financial constraints and companies without financial constraints. Therefore,  $\gamma_1$  is a parameter that measures the moderating role of financial constraints.



## Results and Discussion

### Descriptive Statistics

This study on the relationship between liquidity and stock returns was conducted on 113 companies that met the criteria for the predetermined sample. The relationship model was estimated on groups of companies with large capitalization and those with small capitalization. It was done because several studies showed that the effect of liquidity on stock returns was only significantly observed in companies with small capitalization.

Based on the criteria used by Teoh and Wong (1993), comparing the stock market capitalization with the median value of the sample market capitalization, 47 companies with large capitalization and 66 companies with small capitalization were observed. Using the criteria applied by Balfoussia and Gibson (2018), from each group of companies with large and small capitalizations, some companies experiencing financial constraints were also observed. The data are presented in Table 1.

**Table 1** Companies with Financial Constraints

Large Capitalization Companies		Small Capitalization Companies	
Period	Number of Companies	Period	Number of Companies
2015	12 (25.5%)	2015	21 (31.8%)
2016	9 (19.1%)	2016	18 (27.3%)
2017	10 (21.3%)	2017	21 (31.8%)
2018	15 (31.9%)	2018	20 (30.3%)
2019	13 (27.7%)	2019	18 (27.3%)

On average, throughout the analysis period, the number of large capitalization companies that experienced financial constraints was 25.1%, while the number of companies with small capitalization was 29.7%.

Descriptive statistics for the liquidity and return variables are shown in Table 2.

**Table 2** Descriptive Statistics of Research Variables

Statistics	Large Capitalization Companies		Small Capitalization Companies	
	Liquidity	Return	Liquidity	Return
Mean	9.447797	0.058919	20.48159	0.080223
Median	0.625000	0.000000	2.976190	0.000000
Maximum	100.0000	34.67742	100.0000	35.00000
Minimum	0.023652	-25.00000	0.200000	-34.63687
Std. Dev.	26.80426	2.944242	36.41926	3.910795

The relative value of the standard deviation of liquidity to its mean indicates that the stock of companies with large capitalization had higher liquidity variability than the stocks of companies with small capitalization. However, the variability of stock returns of companies with large market capitalization showed a coefficient of variation almost the same as that of companies with small capitalization.

Then, testing the significance of the effect of liquidity and the moderating role of financial constraints on stock returns was carried out on the estimation results of the regression equation. With specifications written in equation 4, it used daily trading historical data of 47 stocks of large capitalization companies and 67 stocks of small capitalization companies from 2015 to 2019. Considering that the data used in this study were panel data, the estimation of the regression equation 4 was performed utilizing the panel data analysis method.

The selection of the best regression model for large capitalization companies was carried out using the Chow test procedure by testing the constant parameter hypothesis in equation 4.

**Table 3** Chow Test Results of Large Capitalization Companies

Effects Test	Statistic	d.f	Prob.
Cross-section F	3.447053	(46.56961)	0.0000
Cross-section Chi-square	158.483138	46	0.0000

The test results disclosed in Table 3 recommend that the common effect model (CEM) was unsuitable for this study's data. Therefore, the Hausman Test procedure was carried out to choose one of the best models from the two models, each of which could capture the heterogeneity between cross-sectional units. The hypotheses are as follows:

**Table 4** Hausman Test Results of Large Capitalization Companies

Effects Test	Chi-Sq Statistic	Chi-Sq d.f	Prob.
Cross-section random	73.758466	3	0.0000

Table 4 shows the prob-value of 0.0000, indicating that the Hausman test result recommended that the fixed effect model (FEM) was the most appropriate method for modeling large capitalization companies' stocks.

Then, the Chow test results presented in Table 5 for stock data of small capitalization companies require not rejecting  $H_0 : \beta_{01} = \beta_{02} = \dots = \beta_{066}$ , so the best regression model for small capitalization companies was the common effects model (CEM) specifications.

**Table 5** Chow Test Results of Small Capitalization Companies

Effects Test	Statistic	d.f	Prob.
Cross-section F	0.975124	(65,79989)	0.5336
Cross-section Chi-square	63.412585	65	0.5336

### Inference Analysis

The best regression model estimation results for the two groups of companies based on their market capitalization are displayed in Tables 6 and 7.

**Table 6** Regression Results of Large Capitalization Companies

Variable	Coef	Std. Error	t-Statistic	Prob.
LIQUID	0.001834	0.000558	3.284367	0.0010
DUMMY	-0.059457	0.030290	-1.962940	0.0497
LIQUID_DUMMY	0.002551	0.000986	2.585831	0.0097
C	0.049262	0.015070	3.269002	0.0011

Table 6 discloses the estimation results of the regression model for the group of stocks of large capitalization companies. In this group, liquidity was a significant predictor that would significantly affect stock returns. The positive coefficient on the LIQUID variable (in this study, it was measured by the bid-ask spread) suggests that the higher the bid-ask spread (the lower the liquidity of the stock), the higher the compensation return offered by the stock.

Table 6 also shows significant differences in the effect of liquidity on stock returns for companies that experienced financial constraints and companies that did not experience financial constraints. The significance of the difference was indicated by the significant coefficient of the interaction LIQUID\_DUMMY variable. The positive coefficient on the interaction variable demonstrates that the effect of liquidity on stock returns was more substantial in companies experiencing financial constraints. The positive sign on the coefficient of the interaction variable also means that in companies experiencing financial constraints, when the bid-ask spread increased (stock liquidity decreased), it caused investors to ask for higher compensation returns than in companies that did not experience financial constraints. By itself, the coefficient of the interaction variable indicates the moderating role of the financial constraint.

**Table 7** Regression Results of Small Capitalization Companies

Variable	Coef	Std. Error	t-Statistic	Prob.
LIQUID	0.001122	0.000494	2.270548	0.0232
DUMMY	-0.081831	0.035911	-2.278731	0.0227
LIQUID_DUMMY	0.001615	0.000784	2.061112	0.0393
C	0.067793	0.018506	3.663323	0.0002

The same results are displayed in Table 7 for the group of stocks of small capitalization companies. In this group, it was also observed that liquidity was a significant predictor of stock returns. The higher the bid-ask spread (the more illiquid the stock), the higher the compensation the stock provides. The positive and significant coefficient of the interaction LIQUID\_DUMMY variable indicates that in this group when the bid-ask spread increased (stock liquidity decreased), the stocks of companies experiencing financial constraints would offer higher return compensation than stocks of companies that did not experience financial constraints. This finding is similar to the stock of large capitalization companies, showing the significant moderating role of the financial constraint variable.

The study results for these two groups of large and small capitalization stocks provide empirical evidence for theoretical studies documented in a survey conducted by Vayanos and Wang (2013) that investors will ask for additional return compensation for stocks with

low liquidity. The compensation demanded is in the form of higher stock returns. Investors need liquidity as it allows them to implement their trading strategies at a low cost so that an increase in return compensation will occur along with an increase in stock illiquidity (an increase in the bid-ask spread). The low trading cost for liquid stocks can be explained by the theoretical argument that illiquidity in stock is related to two cost components, i.e., adverse selection costs and transaction costs. Adverse selection costs arise from information asymmetry, while transaction costs originate from premium risk requested by the dealer because of the inventory risk it holds. The higher the information asymmetry in the market and the higher the inventory risk from holding stock faced by dealers will be reflected in the higher bid-ask spread. More illiquid stocks will be reflected in higher bid-ask spreads. Harris (2003) stated that liquidity is the ability to transact stocks in large quantities at low trading costs quickly.

This study also reported a significant moderating role of the financial constraint variable. Tirole (2006) stated that financial constraints in companies arise due to friction in the supply of capital, which is the leading cause of information asymmetry between investors and companies. As Ascioğlu, Hedge, and McDermott (2008) asserted, market liquidity captures the information asymmetry between market players; hence, companies with supply friction or financial constraints are very likely to have their shares more illiquid. In a study, Nguyen (2017) also found that the stocks of companies experiencing financial constraints had significantly lower liquidity than those of companies that did not experience financial constraints. Therefore, the stocks of companies experiencing financial constraints will offer additional higher return compensation when illiquidity increases compared to stocks of companies that do not experience financial constraints.

## **Conclusion**

The results of this study provide an important illustration that investors will ask for a higher return compensation along with an increase in stock illiquidity (bid-ask spread). More significant additional compensation will occur in the stocks of companies experiencing financial constraints. Additional return compensation demanded by investors also means an increase in the company's equity cost. Because the cost of equity is a vital component in the cost of capital, the additional compensation requested by investors due to illiquidity impacts the company's cost of capital. It is an essential implication of the findings of this study. In financially constrained companies, an increase in stock illiquidity will have a worse impact on the cost of capital, i.e., through an additional increase in higher returns demanded by investors. This situation will finally limit the company's ability to execute investment projects with positive NPV, which will benefit the company. Therefore, efforts to increase stock liquidity are significant for companies. The limitation of this study is the measurement of liquidity, which only used the immediacy dimension, while the width, depth, and resiliency still require further development. Another limitation is that some companies' data could not be downloaded during the study period, so the companies could not be used as samples. Hence, it is recommended that future research can develop other measurement tools that can capture all liquidity dimensions.

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