LIQUIDITY AND STOCK PRICE CRASH RISK

BY

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ABSTRACT

This study examines the relationship between stock liquidity and stock price crash risk in an emerging market, Thailand, to evaluate the performance of liquidity measurement. This study utilizes fixed-effect panel regression models to analyze traditional liquidity measures and free float on the Stock Exchange of Thailand (SET) from 2000 to 2019. This study found a significant negative relationship between stock price crash risk and stock liquidity when using traditional liquidity measurements, as measured by both NSKEW and DUVOL crash risk measurements, but not when utilizing liquidity measures based on free float. Thus, this result shows that increased stock liquidity reduces the crash risk.

Keywords: Stock Price Crash Risk, Liquidity Measure

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Chayanee Hutangkura

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CHAPTER 1
INTRODUCTION

Stock price crash risk refers to negative skewness in stock returns caused by asymmetric information (Jin et al., 2006; Hutton et al., 2009). Prior studies have found that one of the main factors contributing to the drop in stock prices is the fact that managers tend to hoard negative information. According to Chang et al. (2017), when negative information is finally made public, the stock price then experiences a significant decline, which ultimately leads to a crash.

Several studies have justified the significance of liquidity. Liquidity implies the capacity to trade a significant amount of a stocks in a short period at a low cost (Holden et al., 2014). According to governance theory, higher stock liquidity results in decreased crash risk. Liquidity can serve as an indicator for monitoring the firm management to exit when the managers have poor performance (Edmans, 2009). Higher liquidity increases monitoring by shareholders, which makes the stock price more informative and decreases the chance that managers will accumulate negative information (Maug, 1998). However, other studies suggest that higher stock liquidity raises the chance of stock crashes. The short-termism theory argues that increased liquidity and a resulting decrease in trading costs may attract a greater number of transient institutional investors. These investors tend to have short investment horizons and place a high value on the firm's short-term success (Porter, 1992; Fang et al., 2014).

In emerging markets, the number of studies that examine the relationship between stock liquidity and crash risk is limited. This is due to the fact that stocks are traded less frequently when compared to those in developed markets. However, it is essential to examine the impact of stock liquidity on crash risk in emerging markets because of an agency conflict between managers and shareholders that leads to the hoarding of negative information by managers in emerging markets (Cheuathonghua et al., 2022). Since family ownership consists of around 80% of the firms that are publicly traded on the Stock Exchange of Thailand (SET) (Wiwattanakantang, 2000), it might be inferred that there is a lack of monitoring of managers by other shareholders. Additionally, the relationship between liquidity and share ownership

receives a lot of attention due to the potential of larger ownership can influence information asymmetries and resulting in lower stock liquidity (Heflin et al, 2000). Free float is the proportion of shares in a firm that are available for trading on the public market and are not held by strategic shareholders who are involved in controlling the firm. In recent years, various investment institutions have recognized the significance of free floats when considering whether stock markets are liquid and investable. Major global indexes, comprising MSCI, FTSE, DJIA, and S&P 500, employ free-float adjustment to ensure that the weights of the component firms more accurately reflect the stocks that are available in the market. The Stock Exchange of Thailand (SET) will also launch new indexes that will be weighted by the free float of the constituent stocks and computed using adjusted market capitalization in early 2024. Firms that have a higher free float share number have been shown by previous studies to be able to reduce information asymmetry and increase liquidity (Cohen et al., 2012; Ciner et al., 2008; Ding et al., 2016; El-nader 2018).

Therefore, I hypothesize that there is less chance of a crash for firms that have higher liquidity and free float can be used as a measure of liquidity, as there is a positive relationship between free float and stock liquidity. The study of the relationship between stock liquidity and stock price crash risk has remained inconclusive due to variations in liquidity measures. Thus, the objective of this study aims to explore the relationship between stock liquidity and stock price crash risk to evaluate the performance of liquidity measurement by comparing free float with traditional liquidity measures, including the Amihud liquidity measure and the Zero return liquidity measure, on the Stock Exchange of Thailand (SET) over the period from 2000 to 2019. The subsequent sections of this paper are organized as follows: Chapter 2 provides the theoretical background and previous literature. Chapter 3 outlines the research methodology employed in this study, providing an explanation of the approach and techniques utilized to gather and analyze the data. Chapter 4 reported empirical results, and Chapter 5 presented the conclusions, respectively.

CHAPTER 2
REVIEW OF LITERATURE

2.1 Stock Price Crash Risk

Stock price crash risk is defined as a significant decline in stock prices that leads to a negative skewness in returns (Jin et al., 2006; Hutton et al., 2009). And the information asymmetry is a important factor for all participants in the market since the asymmetric information that exists between managers and outside shareholders is the cause of the decline in stock prices. There is an incentive for managers to hoard negative information about the firm to enhance their personal gain (Healy et al., 2001; Jin et al., 2006; Kothari et al., 2009). In despite the fact that managers may try to maintain negative information to themselves, there is a limit to the amount of negative information that they are able to collect. Whenever the limit is exceeded, negative information quickly spreads throughout the market, which eventually leads to a sudden decline in the price of the stock. (Chang et al., 2017).

The framework of agency theory has been utilized in several studies that examine the relationship between the occurrence of hoarding negative information and the chance of a stock price crash. Jin et al. (2006) suggest that a lack of transparency in a firm could lead to management secretly stealing profits in a way that is unnoticed by outside investors. Managers may hoard negative information regarding the firm's performance to maintain their positions until a significant decline happens. According to Bleck et al. (2007), managers might want to hold onto failed projects for their own benefit. To prevent investors from halting these projects in advance, historical cost accounting may be utilized to hide negative information. However, the issues from these failed projects accumulate over time and finally show up, resulting in crashes. Benmelech et al. (2010) showed that managers who receive stock-based pay are more likely to hide negative information about the firm's future growth potential. It also results in the price of stocks being artificially raised, which leads to a crash.

Prior studies on stock price crash risk have been extensively examined in developed markets. Chen et al. (2001) predicted the asymmetry of daily returns for

individual stocks. A study of the U.S. market from 1962 to 1998 found that stocks showing 36 months of positive returns and an increase in trading volume over the previous 6 months tend to have the highest level of negative skewness.

According to a study by Jin et al. (2006), which examined 40 stock markets from 1990 to 2001, information that is asymmetric between insiders and outside investors can raise the chance of a stock crash. Firms can withdraw the remaining claim by offering negative information to outside investors, but this is typically expensive and rarely done, and it often leads to a crash.

The relationship between opacity in financial reporting and the chance of U.S. stock price crashes was studied by Hutton et al. (2009) between 1991 and 2005. Firms with unclear financial statements are more likely to experience declines in stock prices.

Kim et al. (2011) studied the correlation between tax avoidance and stock crashes in the U.S. from 1995 to 2008. The results show that there is a higher chance of stock crashes when various tax avoidance tactics are used.

An et al. (2013) examined the relationship between institutional investors and the risk of stock price crashes in the U.S. equities market from 1987 to 2010. The results suggest that focused institutional investors' monitoring reduces managers' incentive to conceal negative information. Thus, this reduces the chance of stock price crashes and reduces the synchronization of stock prices.

Corporate social responsibility (CSR) and the likelihood of a firm experiencing a stock price crash in the United States between 1995 and 2009 were examined by Kim et al. (2014). Companies with higher Corporate Social Responsibility (CSR) ratings are less likely to experience a significant decline in their stock prices. This impact is most significant in the presence of efficient monitoring from internal or external boards.

Financial institutions and stock crashes in the U.S. from 1997 to 2009 were studied by Cohen et al. (2014). The results show that institutions using more aggressive earnings management strategies showed a significantly higher crash risk prior to the beginning of the crisis in 2007.

The association between conditional conservatism and the likelihood of stock market crashes in the United States from 1964 to 2007 was investigated by Kim

et al. (2015). The findings indicate that a firm's probability of facing stock price declines in the future lowers when its financial reporting contains conditional conservatism. Furthermore, changes in the level of conditional conservatism resulted in a reduced likelihood of future crash risk.

Callen et al. (2015) examined the correlation between short interest and the probability of stock price crashes in the U.S. stocks market from 1981 to 2011. A significant positive relationship exists between short interest and the chance of a stock price crash, especially in companies with poor governance mechanisms.

DeFond et al. (2015) examined the impact of adopting International Financial Reporting Standards (IFRS) in European Union (EU) countries from 2003 to 2006 on the crash risk of stock prices. The results show that the adoption of IFRS by nonfinancial firms reduces their crash risk, especially in countries where the adoption of IFRS led to more credible adjustments to local Generally Accepted Accounting Principles (GAAP) and in situations where information environments are bad.

The relationship between real earnings management, known as REM, and U.S. market crashes from 1989 to 2009 has been examined by Francis et al. (2016). The results show that firms that vary from industry standards in their operational practices are more likely to experience future crashes.

Furthermore, Chang et al. (2017) studied the relationship between stock liquidity and stock crashes in the U.S. from 1993 to 2010. Results show that managers tend to keep negative information private due to concerns that releasing it can cause short-term investors to sell their shares. In the end, an accumulation of negative information is suddenly disclosed, leading to a stock crash.

However, past studies have not extensively examined the risk of stock price crashes in emerging markets. The relationship between the likelihood of stock market crashes in China and executives receiving excessive perks was examined by Xu et al. (2014) between 2003 and 2010. The results indicate that executives at state-owned businesses generally withhold negative information from the public for extended periods of time due to their desire to get excessive perks. This action increases the chance of future stock market crashes.

Chauan et al. (2017) examined the relationship between stock liquidity and the risk of a stock price crash in India from 2001 to 2012. The study suggests that

increased stock liquidity is associated with a lower chance of a stock price crash. Stock liquidity reduces the chance of a stock price crash by preventing managers from hiding negative information and by increasing the quality of stock price information.

Chen et al. (2017) studied the relationship between the effectiveness of internal controls and the chance of stock price declines in Chinese publicly traded firms from 2007 to 2012. The results show a negative relationship between the quality of internal control and the chance of a stock price crash. This negative relationship is especially obvious in firms with poorer governance structures, such as those examined by auditors outside of the Big 4, located in underdeveloped regions, and utilizing less conservative accounting methods.

The relationship between foreign ownership and the chance of stock price crashes in Vietnam from 2007 to 2015 was investigated by Vo (2020). The results indicate a positive relationship between foreign ownership and the likelihood of stock price crashes.

Huang et al. (2021) examined the effects of the pandemic caused by COVID-19 on the chance of stock market crashes for energy firms in China from 2019 to 2020. After COVID-19, the results show that there was a significant decrease in the chance of stock price crashes for energy firms. COVID-19 has a positive impact on energy firms' crash risk, especially when evaluating their corporate social responsibility (CSR) performance. Additionally, the study suggests state-owned enterprises (SOEs) resulted in a reduced chance of significant stock price crashes after COVID-19.

Moreover, the relationship between systematic skewness and stock price crash risk on the Thai stock exchange between 2000 and 2019 was examined by Wattanatorn et al. (2022). The results indicate a negative relationship between systematic skewness and the chance of stock price crashes.

2.2 Stock Liquidity and Stock Price Crash Risk

According to the theory of governance, higher liquidity enhance large shareholders to monitor the management of the firm (Maug, 1988). The accumulation of negative information caused by poor performance of managers can be reduced via enhanced monitoring by blockholders. Holden et al. (2014) also suggest that higher

stock liquidity improves informed trading. Furthermore, Edmans (2009) found that blockholders are more likely to trade as liquidity increases. Thus, the stock price contains information, and significant exits provide as a warning signal that managers may be underperforming. When managers use private information for personal gain, it will cause blockholders to exit, resulting in a decline in the stock price (Edmans et al., 2011). Since managers generally receive compensation based on stock price. When blockholder exit makes managers act in the best interest of shareholders, which keeps managers from doing things that decrease the value of the firm (Admati et al., 2009). According to these reasons, a higher level of stock liquidity correlates with a lower chance of a crash. On the other hand, it is suggested that increased stock liquidity could result in a higher chance of stock crashes. This is because higher liquidity can attract more short-term institutional investors (Porter, 1992; Fang et al., 2014). Investors focusing on short-term profits can lead managers to conceal negative information. When the accumulated negative information is released, it can cause an instant sell-off by these short-term investors, leading to a stock crash.

Previous studies has mainly examined the relationships between stock liquidity and stock price crashes, whereas a recent study found mixed results about the relationship between stock liquidity and stock price crashes. Chauan et al. (2017) find that stock liquidity is decreasing crash risk in India. They show that managers' limitations in hoarding negative information improve price informativeness and blockholder intervention power. In contrast, Chang et al. (2017) found that increasing stock liquidity increases U.S. market crash risk. They suggest managers have more incentives to hoard negative information, limiting short-term investors from selling stocks, which can result in a stock crash when the accumulating negative information becomes public.

2.3 Stock Liquidity and Free Float

The ownership structure of shares has the potential to affect stock liquidity. Since a greater amount of buying and selling of investment portfolios reduces transaction costs, resulting in higher liquidity (Demsetz, 1968; Merton, 1987). And larger ownership can influence information asymmetries, which can lead to lower stock

liquidity. Several studies have shown that information asymmetries have a negative impact on capital market performance. The adverse selection of dealers is higher in firms that have concentrated ownership and access to private information (Heflin et al., 2000). When insiders are present, dealers are compelled to raise bid-ask spreads and lower depths (Glosten et al., 1985; Kyle, 1985). Liquidity decreases as adverse selection costs increase due to information asymmetries between outsiders and insiders.

Numerous studies show that the ownership structure of shares can influence stock liquidity. Rhee et al. (2009) found a relationship between Institutional investors from abroad and a decline in stock liquidity. They explain this to asymmetries in information between foreign and domestic investors and the restricted trading activity of foreign investors. And findings suggest that the role of common people in stock trading, also known as retail trading, enhances the liquidity of the stock market through the reduction of information asymmetries among participants (Wang et al., 2015). Furthermore, Ding et al. (2016) and El-Nader (2018) found a positive relationship between the number of free floats and stock liquidity. Therefore, firms with a larger proportion of shares in free float, along with high liquidity, can reduce the problem of information asymmetry. (Cohen et al., 2012; Ciner et al., 2008; Ding et al., 2016).

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Crash Risk Measure

The negative coefficient of skewness ($NSKEW_{i,t}$), proposed by Chen et al. (2001), is obtained by dividing the sum of stock i's third moments of weekly returns ($W_{i,t}$) for period t by the third power of the standard deviation of weekly returns, and then multiplying the result by minus one. n represents the total number of weeks within period t. The calculation for NSKEW is as follows:

$$NSKEW_{i,t} = \frac{-(n(n-1)^{\frac{3}{2}} \sum_{t=1}^{T} w_{i,t}^3)}{((n-1)(n-2)(\sum_{t=1}^{T} w_{i,t}^2)^{\frac{3}{2}})}$$

A greater chance of a stock crash is indicated by a higher value of NSKEW.

And this study also uses an alternative crash risk measurement known as down-to-up volatility ($DUVOL_{i,t}$) suggested by Chen et al. (2001). It is defined as the logarithm proportion of the total of the standard deviation of weekly returns ($W_{i,t}$) during UP weeks and that during DOWN weeks of stock i in period t. The UP (DOWN) week refers to the weekly return of a stock i during period t, which is higher (lower) than the weekly average. n_{up} (n_{down}) represents the amount of UP (DOWN) weeks in period t. The calculation for DUVOL is as follows:

$$DUVOL_{i,t} = \log \frac{(n_{up}-1) \sum_{down} w_{i,t}^2}{(n_{down}-1) \sum_{up} w_{i,t}^2}$$

A high value of DUVOL, like NSKEW, implies an increased probability of significant price declines.

3.2 Illiquidity Measures

In this study, two measures of illiquidity that are commonly known were chosen. The details of these measures are explained below.

3.2.1 Adjusted Amihud Illiquidity Ratio

Amihud (2002) suggests the illiquidity measurement to measure the level of illiquidity in stocks. The Amihud illiquidity measurement shows lower effectiveness when applied to stocks with low trading activity in emerging markets. Thus, Kang et al., (2014) introduced the modified Amihud measure ($AdjAmihud_{i,t}$) by using a zero-volume day measurement to accurately measure variations in trading activities.

$$AdjAmihud_{i,t} = \left[\ln\left(\frac{1}{T}\sum_{d=1}^{T}\frac{\left|R_{t,d}^{i}\right|}{V_{t,d}^{i}}\right)\right] \times \left(1 + Zerovol_{i,t}\right)$$

$$Zerovol_{i,t} = \frac{Number\ of\ days\ with\ zero\ trading\ volume\ in\ period\ t}{T}$$

Where $R_{t,d}^{i}$ represents the stock i's return in million baht on day d in period t. $V_{t,d}^{i}$ is the trading volume of stock i in million baht on day d in period t. T is the total number of trading day that occur in period t.

3.2.2 Zero Return

Lesmond et al. (1999) suggest measuring stock liquidity by the proportion of zero return days using daily stock returns.

$$Zero_{i,t} = \frac{Number\ of\ days\ with\ zero\ return\ in\ period\ t}{T}$$

3.3 Free Float

Free Float is the proportion of shares accessible for public trading, excluding strategic shareholders who have a role in managing the firm.

3.4 Control Variables

The study used lagged NSKEW and lagged DUVOL as one of the control variables since Chen et al. (2001) showed that stock return skewness ($NSKEW_{i,t}$) and the down-to-up volatility ($DUVOL_{i,t}$) persists over time. Second, the standard deviation of firm-specific weekly returns ($SD_{i,t}$) of stock i of period t since there is a higher chance of a stock price decline with highly volatile stocks. Third, the logarithm of market capitalization ($SIZE_{i,t}$) of stock i of period t, as indicated by Harvey et al. (2000), Chen et al. (2001), and Hutton et al. (2009), because there is a positive relationship between firm size and firm growth opportunity and the probability of a stock price crash. Lastly, the average of firm-specific weekly returns ($RET_{i,t}$) of stock i for period t since high past returns could potentially accumulate, increasing the likelihood of a significant price decline in the future as suggested by Harvey et al. (2000) and Chen et al. (2001). And the expected sign for the control variables is presented in the table below.

Table 3.1 Expected Signs for Control Variables

Variables	**Description**	**Expected Sign**	**Reason**
$NSKEW_{i,t-1}$	The negative coefficient skewness of the firm-specific weekly return of stock i of pertod t	+	High-lagged stock price crash risk increases future price crash risk.

Table 3.1 Expected Signs for Control Variables (Cont.)

Variables	Description	Expected Sign	Reason
$DUVOL_{i,t-1}$	The down-to-up volatility of the firm-specific weekly return of stock i of period t	+	High-lagged stock price crash risk increases future price crash risk.
$SD_{i,t-1}$	The standard deviation of the firm-specific weekly return of stock i of period t	+	Stocks with high volatility are more likely to experience a crash in their stock prices.
$SIZE_{i,t-1}$	The logarithm of market capitalization of stock i of period t	+	The average skewness of the stock price is more negative for the large-cap firm.
$RET_{i,t-1}$	The average of firm-specific weekly return of stock i for period t	+	High past returns, according to the stochastic bubble model, indicate that bubbles have been accumulating for an extended period of time.

3.5 Regression Model

$$Crash\ Risk_{i,t} = \alpha + \beta_i LIQ_{i,t-1} + \sum_{j=1}^{m} \beta_j Control\ Variable_{j,t-1} + IND_t + time_t + \varepsilon_{i,t}$$

Where. IND_t Industry fixed effects

$time_t$ Time fixed effects

$\varepsilon_{i,t}$ Error term of stock i of period t

3.6 Data

The data on Thai stocks listed on the Stock Exchange of Thailand (SET) is collected from Refinitiv Eikon. The sample period spans from 2000 to 2019. The final sample consists of 392 firms after removing insufficiency and winsorizing data at the 1% of both tails.

Table 3.2 Data from Refinitiv Eikon

Variables	**Frequency**
The market excess return	Daily
The stock i's return	Daily
Trading volume	Daily
The free float number of shares	Daily
Market Capitalization	Daily

CHAPTER 4
EMPIRICAL RESULTS

4.1 Descriptive Statistics and Variable Correlation

In this study, the coefficients of illiquidity measures are multiplied by -1 for easier presentation of the relationship between stock liquidity and stock price crash risk. (Cheuathonghua et al., 2022).

This study uses the negative coefficient of skewness, NSKEW, and the down-to-up volatility, DUVOL, as crash risk measures. And the liquidity measures include the Amihud liquidity measure, the Zero return liquidity measure, and free float, respectively. Table 4.1 displays the descriptive statistics for each variable. Furthermore, Table 4.2 presents the mean values for significant variables, which are NSKEW, DUVOL, and liquidity, during the term of each year. The study presents the average values of both crash measures, NSKEW and DUVOL, with values of -0.318 and -0.235, respectively. And the graphs in Figures 4.1, 4.2, and 4.3 represent the time series of the means value of liquidity variables by year. The graph also shows that Thai firms had less liquidity around the subprime mortgage crisis in the United States during 2008. Additionally, the correlation matrix of NSKEW and DUVOL in Table 4.3 and Table 4.4 displays a consistent relationship with the summary statistics. It shows a negative relationship between all liquidity measures and crash risk measures, including NSKEW and DUVOL.

Table 4.1 The Descriptive Statics of Variables

	Obs	Mean	Std. Dev	Min	Max
NSKEW	14,107	-0.3184	2.4623	-6.3415	6.3662
DUVOL	14,107	-0.2354	1.8730	-5.2638	5.4237
Adjamihud	14,107	-12.2965	6.4564	-31.6402	-2.7768
Zero	14,107	-0.3784	0.2480	-1.0000	0.0000
Freefloat	14,107	0.5752	0.1917	0.1800	0.9500
SD	14,107	0.0217	0.0140	0.0028	0.0776
SIZE	14,107	7.8654	1.7739	4.0220	12.8169
RET	14,107	0.0003	0.0049	-0.0142	0.0163

Note: All illiquidity measure coefficients are multiplied by -1

Table 4.2 The Distribution of Key Variables by Year

Year	Obs	NSKEW	DUVOL	AdjAmihud	Zero	FreeFloat
2000	486	-0.0333	0.0251	-17.8062	-0.3910	0.6565
2001	497	-0.5622	-0.5170	-15.8998	-0.3596	0.6761
2002	520	-0.3807	-0.2767	-13.8955	-0.3187	0.6616
2003	552	-0.6728	-0.5737	-12.3847	-0.2982	0.6699
2004	608	-0.2096	-0.1184	-12.8346	-0.3282	0.6783
2005	671	-0.2257	-0.1881	-13.0395	-0.3822	0.6580
2006	703	-0.3294	-0.3078	-13.1370	-0.3875	0.6427
2007	720	-0.0692	0.0096	-13.2601	-0.4040	0.6717
2008	750	-0.0691	-0.1290	-14.6412	-0.4289	0.5702
2009	765	-0.4823	-0.3698	-14.5542	-0.4463	0.5485
2010	779	-0.7295	-0.4930	-12.0580	-0.4186	0.5456
2011	784	-0.6264	-0.4253	-12.1085	-0.4068	0.5539
2012	784	-0.7791	-0.6266	-10.7975	-0.3837	0.5579
2013	784	-0.0729	-0.0112	-10.3304	-0.3238	0.5768
2014	784	-0.4628	-0.3372	-10.4042	-0.3494	0.5727
2015	784	-0.6723	-0.4943	-10.5214	-0.3523	0.5757
2016	784	-0.1478	-0.1350	-10.4557	-0.3679	0.5896
2017	784	-0.1482	-0.0820	-9.8270	-0.3920	0.5729
2018	784	0.1895	0.1819	-11.1030	-0.4003	0.5680
2019	784	0.0701	0.0846	-12.0459	-0.4288	0.5652
Total	14107	-0.3184	-0.2354	-12.2965	-0.3784	0.5752

Note: All illiquidity measure coefficients are multiplied by -1

Figure 4.1

Time Series of Adjusted Amihud Illiquidity Ratio

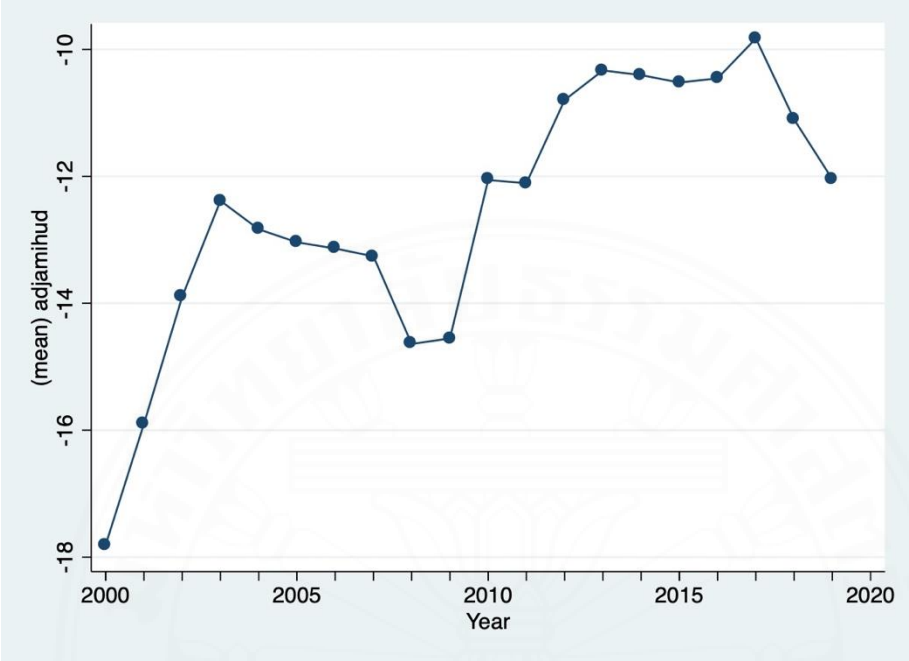

Figure 4.2

Time Series of Zero Return

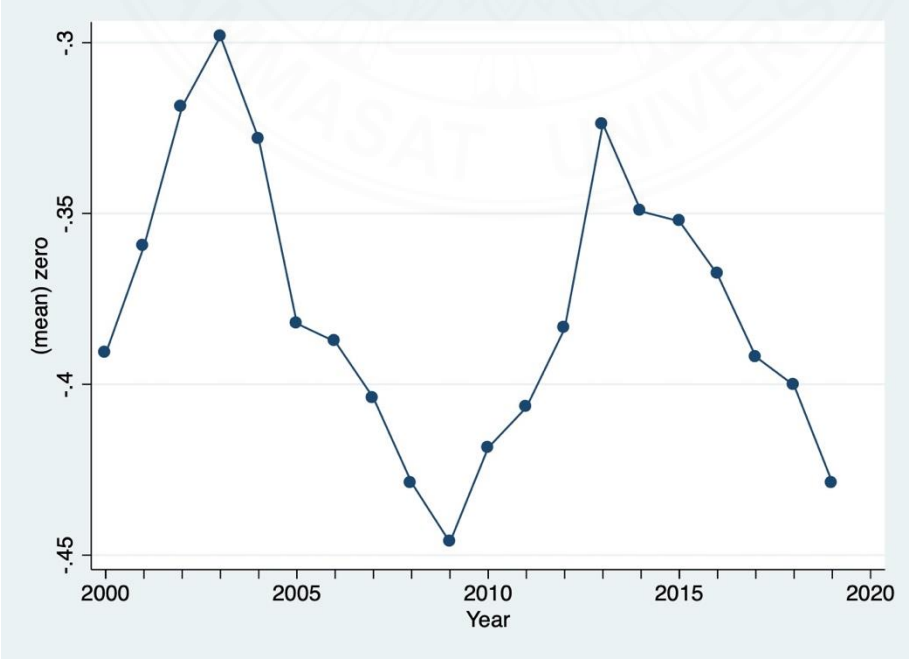

Figure 4.3

Time Series of Free Float

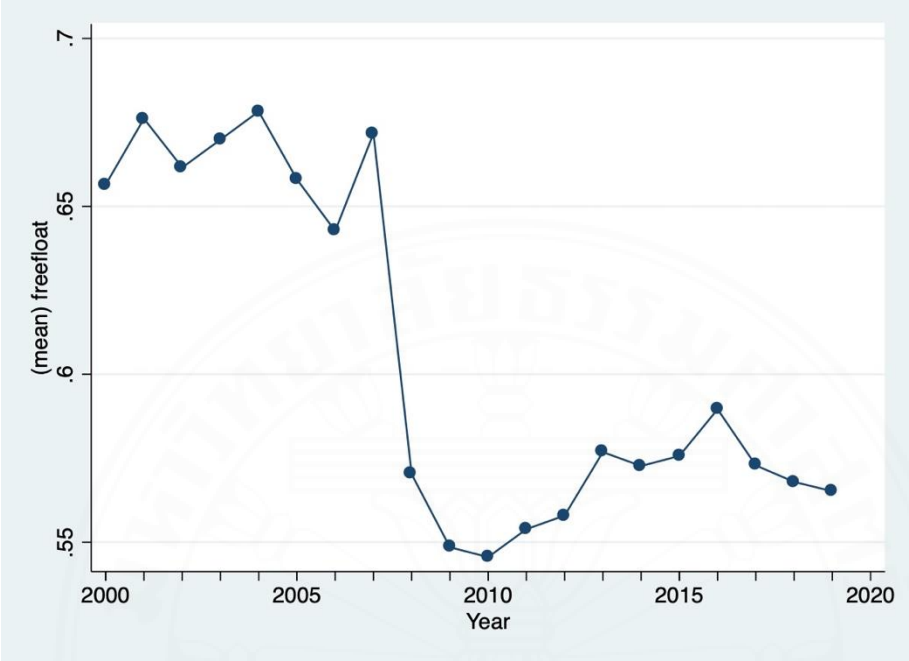

Table 4.3 The Correlation Matrix of NSKEW

Panel A: Correlations Matrix of NSKEW and Adjusted Amihud Illiquidity Ratio

	NSKEW	AdjAmihud	SD	SIZE	RET
NSKEW	1				
AdjAmihud	-0.068***	1			
SD	-0.114***	-0.178***	1		
SIZE	-0.030***	0.656***	-0.272***	1	
RET	-0.710***	0.028***	0.159***	0.009	1

Note: All illiquidity measure coefficients are multiplied by -1
*** p<0.01, ** p<0.05, * p<0.1

Panel B: Correlations Matrix of NSKEW and Zero Return

	NSKEW	Zero	SD	SIZE	RET
NSKEW	1				
Zero	-0.091***	1			
SD	-0.114***	0.028***	1		
SIZE	-0.030***	0.495***	-0.272***	1	
RET	-0.710***	0.054***	0.159***	0.009	1

Note: All illiquidity measure coefficients are multiplied by -1
*** p<0.01, ** p<0.05, * p<0.1

Panel C: Correlations Matrix of NSKEW and Free Float

	NSKEW	FreeFloat	SD	SIZE	RET
NSKEW	1				
FreeFloat	-0.01	1			
SD	-0.114***	0.068***	1		
SIZE	-0.030***	-0.005	-0.272***	1	
RET	-0.710***	0.003	0.159***	0.009	1

Note: All illiquidity measure coefficients are multiplied by -1
*** p<0.01, ** p<0.05, * p<0.1

Table 4.4 The Correlation Matrix of DUVOL

Panel A: Correlations Matrix of DUVOL and Adjusted Amihud Illiquidity Ratio

	DUVOL	AdjAmihud	SD	SIZE	RET
DUVOL	1				
AdjAmihud	-0.059***	1			
SD	-0.110***	-0.178***	1		
SIZE	-0.029***	0.656***	-0.272***	1	
RET	-0.784***	0.028***	0.159***	0.009	1

Note: All illiquidity measure coefficients are multiplied by -1
*** p<0.01, ** p<0.05, * p<0.1

Panel B: Correlations Matrix of DUVOL and Zero Return

	DUVOL	Zero	SD	SIZE	RET
DUVOL	1				
Zero	-0.085***	1			
SD	-0.110***	0.028***	1		
SIZE	-0.029***	0.495***	-0.272***	1	
RET	-0.784***	0.054***	0.159***	0.009	1

Note: All illiquidity measure coefficients are multiplied by -1
*** p<0.01, ** p<0.05, * p<0.1

Panel C: Correlations Matrix of DUVOL and Free Float

	DUVOL	FreeFloat	SD	SIZE	RET
DUVOL	1				
FreeFloat	-0.014	1			
SD	-0.110***	0.068***	1		
SIZE	-0.029***	-0.005	-0.272***	1	
RET	-0.784***	0.003	0.159***	0.009	1

Note: All illiquidity measure coefficients are multiplied by -1
*** p<0.01, ** p<0.05, * p<0.1

4.2 Regression Results

Based on a traditional liquidity measure, there is a negative and significant relationship between stock price crash risk and liquidity at a 1 percent confidence level, except for the liquidity measure based on free float. Thus, the effect of liquidity measure on negative coefficient of skewness, NSKEW, is typically greater compared to the down-to-up volatility, DUVOL. The result shows that stocks with higher liquidity have fewer chances of experiencing crash risk, as the firm's management is unlikely to hoard negative information when stocks have higher liquidity. And the Zero return liquidity measure performs the most effectively among the liquidity measures since it has a significant impact of 0.890% on crash risk.

For control variables, most of them correspond with both theoretical frameworks and empirical findings from previous studies.

First, a negative coefficient of lagged NSKEW and DUVOL indicates that there is a negative relationship between crashes that occur during adjacent time periods, which results in a lower value of future price crash risk.

This result aligns with An et al. (2013) by showing that a negative coefficient of lagged NSKEW suggests a negative relationship between crashes in consecutive time periods, leading to a lower future price crash probability.

However, it is not inconsistent with other studies. Chen et al. (2001) found that a positive coefficient for lagged NSKEW indicates a direct relationship between crashes in consecutive time periods and an increased likelihood of future price crashes. Similarly, studies conducted by Chauan et al. (2017) and Chang et al. (2017) both discovered positive coefficients for lagged NSKEW, suggesting a positive correlation between price crashes in adjacent time periods and a higher chance of price crashes in the future.

Second, the results of stock return volatility in this study show that a negative coefficient of stock return volatility indicates a adverse correlation between stock return volatility and crash risk, which is aligned with the momentum strategies by Harvey et al. (2000). The portfolios of losers have a larger positive skewness, which suggests lower volatility.

The results of this study are align with the studies done by Chen et al. (2001) and An et al. (2013). Both studies show a negative coefficient of stock return volatility. The negative coefficient indicates a negative relationship between the probability of stock price crashes and stock return volatility.

In contrast to Chauan et al. (2017), their study finds that there is a positive coefficient of stock return volatility. This indicates that there is a positive relationship between stock price crashes and the volatility of stock returns. Stocks with high volatility are more likely to experience a sudden decline in their stock values. Similarly, Chang et al. (2017) discovered a positive coefficient of stock return volatility, which indicates a positive relationship between stock price crashes and the volatility of stock returns.

Third, the results of size in this study show that a positive coefficient of size suggests that there is a direct correlation between crash risk and size, which suggests that large-cap firms are more likely to have negative skewness.

The results of this study are in line with the research performed by Chen et al. (2001), Chang et al. (2017), and An et al. (2013). The studies consistently demonstrate a positive correlation between firm size and the chance of a stock price crash, suggesting that larger firms with higher market capitalization are at a higher risk of experiencing a stock price crash. Larger firms are more likely to have negative skewness, indicating an increased chance of stock price crashes.

In contrast, Chauan et al. (2017) discovered a negative coefficient of size, which is not consistent with this study. The negative relationship among size and crash risk implies a lower probability of negative skewness in large-cap companies.

Lastly, the past returns have a positive coefficient and are statistically significant. Therefore, stocks that have experienced a significant increase in their past returns are likely to show higher levels of negative skewness, indicating an increased probability of experiencing crashes.

The results are consistent with the studies conducted by Chen et al. (2001), An et al. (2013), Chauan et al. (2017), and Chang et al. (2017). All of the studies show a positive coefficient related to past returns, suggesting a positive relationship between stock price crashes and past returns. This indicates the formation of a bubble, increasing the likelihood of a significant price drop.

Table 4.5 Main Results

	NSKEW	DUVOL	NSKEW	DUVOL	NSKEW	DUVOL
$AdjAmihud_{i,t-1}$	-0.0439***	-0.0334***				
	(-4.72)	(-4.65)				
$Zero_{i,t-1}$			-0.890***	-0.684***		
			(-4.78)	(-4.75)		
$FreeFloat_{i,t-1}$					-0.0335	-0.0438
					(-0.10)	(-0.18)
$NSKEW_{i,t-1}$	-0.0607***		-0.0643***		-0.0893***	
	(-4.36)		(-4.64)		(-4.89)	
$DUVOL_{i,t-1}$		-0.0717***		-0.0759***		-0.114***
		(-4.48)		(-4.77)		(-5.40)
$SD_{i,t-1}$	-5.412**	-3.437**	-4.502**	-2.946*	-5.513*	-5.695**
	(-2.44)	(-2.00)	(-2.08)	(-1.75)	(-1.84)	(-2.46)
$SIZE_{i,t-1}$	0.222***	0.194***	0.143***	0.113***	0.280***	0.214***
	(-4.77)	(-5.41)	(-3.48)	(-3.59)	(-4.94)	(-4.93)
$RET_{i,t-1}$	0.0979	-3.103	-0.741	-4.413	0.55	-6.624
	(-0.01)	(-0.49)	(-0.10)	(-0.70)	(-0.06)	(-0.79)

Table 4.5 Main Results (Cont.)

	NSKEW	DUVOL	NSKEW	DUVOL	NSKEW	DUVOL
$RET_{i,t-2}$	12.88**	11.29***	12.51**	10.80***	9.613	8.06
	(-2.57)	(-2.93)	(-2.51)	(-2.82)	(-1.48)	(-1.63)
$RET_{i,t-3}$	13.25***	8.980**	13.82***	8.747**	16.15**	11.33**
	(-2.67)	(-2.36)	(-2.81)	(-2.31)	(-2.52)	(-2.31)
$RET_{i,t-4}$	14.22***	10.77***	13.97***	10.23***	17.55***	13.74***
	(-2.91)	(-2.86)	(-2.88)	(-2.74)	(-2.78)	(-2.84)
$RET_{i,t-5}$	7.814	6.214*	7.332	5.622	13.87**	12.28***
	(-1.64)	(-1.69)	(-1.55)	(-1.55)	(-2.24)	(-2.59)
α	-2.185***	-1.932***	-1.561***	-1.264***	-1.329**	-1.185***
	(-5.00)	(-5.74)	(-4.20)	(-4.41)	(-2.29)	(-2.66)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.033	0.036	0.032	0.033	0.047	0.051

Note: All illiquidity measure coefficients are multiplied by -1

t statistics in parentheses

* p<0.10, **p<0.05, *** p<0.01

CHAPTER 5
CONCLUSION

This study examines the relationship between stock liquidity and stock price crash risk on the Stock Exchange of Thailand (SET) from 2000 to 2019 to evaluate the performance of liquidity measurement by utilizing fixed-effect panel regression models to analyze traditional liquidity measures and free float as measured by both a negative coefficient of skewness, NSKEW, and the down-to-up volatility, DUVOL, crash risk measurement.

The inconsistent findings in the prior literature regarding the relationship between stock liquidity and the risk of a stock price crashing because of the various liquidity measures are examined in this study. This study performs tests based on the three different types of liquidity measurement, which consist of free float and traditional liquidity measures, including the Amihud liquidity measure and the Zero return liquidity measure. The results are insufficient to support the hypothesis that free float can be utilized as a measure of liquidity. However, the results show that stocks with higher liquidity lower the likelihood of a crash, as measured by the traditional liquidity measure. This result aligns with the study conducted by Chauan et al. (2017). And the Zero return liquidity measure was shown to be the most effective among the liquidity measures, which is consistent with the study by Cheuathonghua et al. (2022).

Liquidity encourages shareholders to participate more actively in trading and monitoring activities. As a result, managers are less likely to hoard negative information. This leads to more informative pricing that can accurately reflect the performance of managers. Thus, the results of this study have significant policy implications. Regulators should focus on improving market liquidity to address issues related to information asymmetry. A liquid market enhances transparency, making it difficult for insiders to access private information and reducing information asymmetry. If regulators focus on increasing market liquidity, policymakers can create an environment that is fairer for all participants. This implies that all individuals in the market have equal chances to obtain information. As a result, the negative impacts of information asymmetries on the market are finally reduced.

Several countries have implemented policies to enhance liquidity and reduce information asymmetries in their financial markets.

In the United States, the Sarbanes-Oxley Act of 2002, known as SOX, is a federal law aiming to improve firm transparency, accountability, and accuracy of financial reporting to protect investors and the public from misleading or false financial practices.

In the European Union, the Market Abuse Regulation, known as MAR, is designed to enhance transparency in financial markets and prevent market abuse to protect investors. Due to the fact that MAR prohibits insider trading, market manipulation, and unlawful disclosure of private information,.

In the United Kingdom, the Financial Conduct Authority, known as the FCA, regulates the financial markets with a particular focus on encouraging market transparency.

In Japan, the Financial Instruments and Exchange Act, known as FIEA, controls the regulation of securities markets. It provides provisions that aim to prevent insider trading and market manipulation.

In conclusion, this study enhances comprehension regarding the relationship between stock liquidity and the risk of stock price crashes in the Thai stock market. Furthermore, it demonstrates that the level of liquidity significantly impacts the crash risk in the Thai stock market. Previous studies on the relationship among liquidity and corporate governance have shown that higher levels of liquidity are associated with higher levels of corporate governance and higher levels of firm value. As a result, the regulator should concentrate on monitoring the liquidity of the Thai stock market.

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