

Stock Liquidity and State Ownership: Evidence from the Banking Industry of Selected Asian Emerging Markets

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ABSTRACT

Manuscript type: Research paper

Research aims: Liquidity creation is deemed important in the emerging markets banking industry. It turns out to be more challenging when subject to ownership issues, particularly state ownership. The government possesses substantial ownership in many large banks in Asian emerging markets and has a significant effect on firms' stock liquidity through trading activity. Hence, state ownership is a key determinant of stock liquidity. This paper investigates the effect of state ownership on stock liquidity in Asian emerging markets.

Design/Methodology/Approach: Using the GMM panel regression model, this study examines a sample of 209 banks in Asian emerging markets including China, India, Indonesia, Malaysia, Pakistan, Philippines, South Korea, Taiwan, and Thailand from 2009 to 2018. For the robustness test, an alternative liquidity measure is conducted.

Research findings: Results show that state ownership is positively related to stock liquidity, implying that the participation of the government provides investors' confidence and perceives these stocks as value-enhancing stocks. However, this positive effect on stock liquidity turns out to be negative when the state ownership surpassed a certain threshold. Thus, this paper finds a non-linear inverse U-shaped relationship between state ownership and stock liquidity. Further analysis also shows that large banks tend to enjoy greater liquidity compared to smaller banks.

Theoretical contribution/Originality: Unlike past studies that focus on other ownership structures, this study focuses on state ownership of large banks in emerging markets. This study contributes by collectively addressing the impact of state ownership on stock liquidity, with a focus on the banking industry in the Asian emerging markets context.

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Practitioner/Policy implications: The findings of this study can benefit investors, policymakers, and other stakeholders to better understand the impact of state ownership on stock liquidity. There are various implications in terms of investment decisions and corporate governance policies pertaining to corporate ownership structure.

Research limitation: Future studies may consider conducting sub-samples using a different threshold of state ownership. Besides, this study focuses on the banking sector and hence the results may not be generalised.

Keywords: Asian emerging markets, Banks, GMM, Non-linear relationship, Stateownership, Stock liquidity, Trading
JEL Classification: G12, G18, G21, G32

1. Introduction

Emerging economies account for two-thirds of the world's GDP growth (McKinsey, 2018). They possess a few idiosyncratic characteristics: a less developed and less sophisticated financial market, inefficient capital market, economic uncertainty, and political instability. Some industries are growing very quickly, such as banking. The value of emerging market banks almost doubled between 2005 and 2010 (Van Horen, 2012), and quadrupled after the financial crisis, which comprises 35% of global bank market value (European Central Bank, 2014). Despite the Covid-19 pandemic, the global banking industry remained resilient. The Asia-Pacific region topped the list and accounted for 55% of global banking profits (The Banker, 2021). Asian banks have been growing quickly over the past decade, which has led to Asia having the world's largest banking industry. Notably, the asset growth rate of emerging Asian markets is the fastest, and they own the third-largest commercial bank asset growth in the world (Forbes, 2018). Emerging market banks are not just growing fast, but are substantial in size. For instance, the world's largest bank is the Industrial and Commercial Bank of China (ICBC) from China (an emerging market in Asia) with total assets of more than US\$4.3trillion as of 2019 (S&P, 2020). The banking industry plays an important role in fuelling economic growth, particularly in emerging markets where the economy is less developed and resources are scarce. Emerging market banks are playing a very important role in the creation and allocation of capital (for example, by extending credit from consumers' savings to corporates' borrowing) to fuel economic growth. Hence, the banking industry is deemed as the core of national economic development in these emerging markets.

Extant studies state that the financial market in these emerging markets is less liquid compared to those in developed markets (ElBannan, 2017; Prommin et al., 2016; Rhee & Wang, 2009). It is undeniable that liquidity plays a very important role in the functioning of financial markets in emerging markets. Handa and Schwartz (1996) emphasise that there are three things investors want from the market: liquidity, liquidity, and liquidity. Liquidity creation and the efficient facilitation of capital allocation are one of the goals for the stock market, and they are deemed important in emerging markets where the economic growth opportunities in these markets are plentiful yet unexploited. Liquidity is essential in the emerging stock markets to be better able at drawing investments. Stock liquidity permits investors to trade corporate stock easily and are able to realise investment returns at a faster pace. This gives investors higher incentives to invest and makes them more willing to contribute more funds in their capital investments. Meanwhile, companies can also count on these resources from the stock market for continuous company growth (Holmström & Tirole, 1993; Levine, 1991). This shows that companies could easily raise capital and at a lower cost when their stock is more liquid (Becker-Blease & Paul, 2006). Nevertheless, it may pose a challenge for financial market development when there is an increase in stock volatility due to lack of liquidity (Rhee & Wang, 2009). Hence, corporate investments and business opportunities could be driven by stock liquidity to promote economic development in emerging markets.

This is supported empirically by Levine and Zervos (1998) and Beck (2003), who prove the importance of financial market and stock liquidity on economic growth. This applies especially in emerging markets where the banking industry is the main pillar for economic development as a whole. When the stock is liquid, investors are more willing to invest in these liquid stocks and at the same time, they can realise returns from their investment more rapidly. These funds will either flow into banks as saving or continue to flow into the stock market for reinvestment. Meanwhile, banks can use these funds to further extend credit for businesses growth. All in all, these resources are important to fuel economic growth in emerging markets. Additionally, Jun et al. (2003) highlight that liquidity is also an important driver for emerging market returns. This is supported by Fang et al. (2009), who find that firms with liquid stock are better performing in the market through improved information on market prices and managerial compensation. Therefore, the stock liquidity of banks is deemed as an important driver of economic growth in the emerging markets context.

Its importance to emerging contexts aside, stock liquidity is challenging and complicated when subjected to ownership issues. The literature shows that ownership structure is a well-recognised determinant of liquidity, particularly block ownership. This study focuses on one prominent form of block ownership in the Asian emerging context, state ownership (also known as government ownership). Tran et al. (2018) claim that state ownership is a kind of concentration ownership where the government maintains massive control in numerous public corporations in the stock market, making state ownership a key determinant of stock liquidity. Prior studies show that block ownership has a significant effect on firms' stock liquidity through trading activity and the field of information (Bolton & Thadden, 1998; Brockman et al., 2009; Heflin & Shaw, 2000). Others contend that liquidity helps to reduce agency issues (Admati & Pfleiderer, 2009; Maug, 2002; Palmiter, 2002).

State ownership is still pervasive in the Asian emerging banking industry despite the substantial privatisation that took place over the past few decades. This is especially the case in emerging markets, where the government holds vast ownership in many large banks. The reason being the crucial role played by banks—since they fuel national economic development, the government cannot risk letting them fail. Government bailouts of financial institutions were seen in emerging markets during previous financial crises. According to Hossain et al. (2013), state ownership involvement is substantially higher in Asia as compared to other regions. This increased significantly after the recent financial crises. Besides upholding the sustainability of the banking system, the government plays an important social role of reciprocating for market failures that leave socially profitable investments underfinanced. These are its social objectives, such as improving resource allocation, ensuring competition, stimulating growth, providing consumer protection, safeguarding the banks' solvency, and improving macroeconomic stability (Stiglitz, 1993). Government participation is deemed crucial in these emerging markets since the banking industry is essential in the creation and allocation of capital for national economic development. Improving resource allocation helps to stimulate economic growth. This increasing role of state ownership in emerging markets is the primary motivation for the present study.

Past studies on the effects of ownership structure on stock liquidity predominantly deal with ownership concentration (Prommin et al., 2016; Rubin, 2007; Tran et al., 2018; Yeddou & Pourroy, 2020) or foreign ownership (Lee & Chung, 2018; Ng et

al., 2016; Rhee & Wang, 2009). Other issues with stock liquidity as a dependent variable include family ownership (ElBannan, 2017), foreign equity flow (Liew et al., 2018), firm leverage (Nadarajah et al., 2018), second blockholder (Pombo & Taborda, 2017), and investor risk perceptions (Ma et al., 2019). From our observation, state ownership is largely absent from past literature. Plus, over half of these studies were conducted in developed countries such as the United States, Western European countries, Latin America and Australia. Little attention has been given to state ownership in the context of emerging markets. Recently, studies by Ding and Suardi (2019) and Boubakri et al. (2020) investigated the relationship between state ownership and stock liquidity. Ding and Suardi focus on non-financial A-share firms in China, and find that state ownership is related to higher stock liquidity. Boubakri et al. (2020), meanwhile, focus on newly-privatised firms (NPF) and show the presence of a non-monotonic association between state ownership and stock liquidity. The contradicting findings from these studies further motivated us to investigate the relationship between state ownership and stock liquidity. Instead of focusing on a single market or country, this study sheds light on the effect of state ownership on stock liquidity in the Asian emerging banking industry due to the growing importance of these markets to global GDP growth, as well as the central role played by the banking industry in fuelling economic development.

Thus, this study fills the research gap and contributes to the literature by collectively addressing state ownership and stock liquidity in the Asian emerging markets banking industry (China, India, Indonesia, Malaysia, Pakistan, Philippines, South Korea, Taiwan, and Thailand). In other words, this study provides a better and more comprehensive understanding of the role of state ownership on stock liquidity in the Asian emerging markets context. We find that state ownership is associated with higher stock liquidity. Since the emerging banking industry is the main pillar in fuelling the national economic development, this finding suggests that government participation in many public listed banks increases investor confidence, who perceive these stocks to be value-enhancing. Hence, investors prefer and would trade these stocks more frequently, thereby, boosting liquidity. On the other hand, we find that the positive effect on stock liquidity turns out to be negative after passing the threshold of 48.25% state ownership. This indicates that investors view extensive government intervention in emerging markets as detrimental to stock return. Investors believe that the

cost of substantial authority held by the government exceeded the benefits they received from its protection, and hence, stay away from trading such stocks. Therefore, this paper finds a non-linear inverse U-shaped relationship between state ownership and stock liquidity. In addition, this paper conducts further analysis on bank size effect, with the findings suggesting that large banks tends to enjoy greater liquidity than smaller banks.

The remainder of this paper is organised as follows. Section 2 reviews the related literature and hypothesis development of this study. Section 3 introduces the data, variables measurement and methodology. This is followed by the results and discussion in Section 4, robustness checks in Section 5, and lastly, the conclusion and implications in Section 6.

2. Literature Review and Hypothesis Development

The literature shows that the presence of blockholders can reduce agency costs in a firm and improve value due to their monitoring role (Morck et al., 1988). Another strand of literature argues that the presence of blockholders could be costly. This is due to monitoring granting blockholders access to private or insider information (Heflin & Shaw, 2000). State ownership is a type of blockholding that is prevalent in the Asian emerging market context, where the government holds substantial ownership in public listed firms.

There are two theoretical viewpoints with regard to the effect of state ownership on stock liquidity. The first view suggests that state ownership could improve stock liquidity. Prior studies claim that financial markets and the overall economy will perform better with government involvement. The findings from Yeyati et al. (2004) provide evidence that government intervention in financial markets contributed to the success of the economic growth of East Asia during the mid-1990s. Past studies argue that the involvement of the state in a bank is mainly to uphold the safety and sustainability of the banking system, reduce costly and asymmetric information that would trigger market failure, finance socially profitable projects, promote financial development, correct market deficiencies such as externalities and imperfectly competitive market structures (Jung, 1997; Yeyati et al., 2004). This is consistent with social lending theory, which highlights the role of the public sector to reciprocate for market failures that leave socially profitable investments underfinanced, such as projects to increase job creation that could not be funded by private financing. For instance, the agriculture and infrastructure construction industries usually do not have sufficient cash flow for

business growth and development. Thus, the state improves resource allocation by granting funding to support these industries. This view is also consistent with soft budget constraint theory, which looks at the financial support granted by the government. Government ownership is viewed as advantageous to banks, as it enables them to enjoy several benefits from government support, such as easier access to financing and capital injection (Chaney et al., 2011; Cull et al., 2009), explicit and implicit guarantee, particularly at times of financial crisis (Borisova & Megginson, 2011; Boubakri et al., 2012; Faccio, 2010; Faccio et al., 2006).

As we can infer from prior financial crises, the government is largely unwilling to let large banks fail and likely to bail them out. Hence, the guarantee provided by the government reduces such cost. This is particularly relevant in the emerging markets context, where the banking sector is dominant and plays an essential role in ensuring long-term national economic development. Besides, Hearn and Piesse (2013) suggest that the state is part of the external control system which brings more efficient corporate governance to a firm. Hence, the involvement of the state in a firm provides shelter and protection to minority shareholders. Hossain et al. (2013) show that state ownership is viewed positively by global bank investors, and suggest that greater state involvement helped to lower losses on bank share price during the global financial crisis. Also, Jung (1997) claims that state involvement in the Korean economy has brought favourable outcomes which contributed to the country's rapid economic growth. A recent study by Ding and Suardi (2019) also show a positive outcome from state ownership, indicating that it is positively associated with stock liquidity. All in all, the first perspective proposes that state ownership is seen as advantageous in many ways (i.e., easier access to funds, explicit and implicit guarantee provided by the government, reducing the cost, uncertainty and adverse selection scenario). Hence, investors may view government support as value-added and will be more likely to trade such stock, thereby improving liquidity. This shows that the presence of state ownership enhances firms' stock liquidity. Thus, we propose the first hypothesis as follows:

H₁: The relationship between state ownership and stock liquidity is positive.

The second view, however, argues that state ownership reduces stock liquidity. Past studies show that bureaucrats very often have intentions that are dominated by political interests, i.e., fulfilling their individual political objectives through banking activities. For

instance, the government may achieve their political objectives through allocating resources for their supporters as a return for their votes and political contributions (Hossain et al., 2013; Iannotta et al., 2013; Shleifer & Vishny, 1986). This is supported by the political view, where the government tends to intervene through political channel. Some studies show that firms that are politically connected are highly likely to be bailed out by the state compared to non-politically connected firms (Faccio et al., 2006). This is often the case when the government holds substantial authority in a firm that they have dominating power over, where it can affect the firm's decisions or direction. Apart from this, the government may possess private information of firms in which they are a major shareholder, causing uninformed traders to be unwilling to trade against informed traders (in this case, the government). Uninformed traders are concerned about potential losses if they were to trade against informed traders, causing increasing spreads, which in turn, reduces stock liquidity (Copeland & Galai, 1983; Glosten & Milgrom, 1985; Kyle, 1985). This is in line with the agency theory, where a discrepancy of interests arises between major and minor shareholders. This occurs when the government, as a powerful shareholder, exerts pressure on minority shareholders to achieve state objectives. Prommin et al. (2016) show the possibility of a smaller number of shareholders having less trading frequency due to large shareholding by the state, which in turn reduces liquidity. Claessens et al. (2002) and Pombo and Taborda (2017) point to the expropriation of minority shareholders in the presence of large shareholders, particularly state ownership. They claim that the management team will most likely focus on the interests of a large shareholder in a bank at the cost of other minority shareholders. This is supported by empirical evidence from Heflin and Shaw (2000) and Rubin (2007), who find significant positive and large spreads on stock with block ownership.

All in all, this second view suggests that the presence of large state ownership in a firm may discourage other shareholders from trading due to the above issues. Investors may view substantial government ownership as being detrimental to a firm, and will therefore be unwilling to trade such stock, thereby reducing liquidity. Despite the first view showing that state ownership provides several benefits to investors, the effect may be reversed when the level of state ownership is high. Therefore, we argue that the effect of state ownership on stock liquidity varies according to the extent of government participation. The positive effect on stock liquidity may be reversed when the government holds majority ownership in a

firm. In short, we expect state ownership to have a positive effect on stock liquidity in general, but after a certain threshold (where the government holds substantial authority in a firm), it will then negatively affect liquidity. Hence, we expect that the relationship between state ownership and stock liquidity to be non-linear. The empirical evidence from past studies also prove that state ownership has a quadratic function with firm performance (Gunasekarage et al., 2007; Yu, 2013) and risk-taking (Uddin, 2016). From the liquidity literature perspective, Boubakri et al. (2020) show the presence of a non-linear relationship between state ownership and stock liquidity, while Thanatawee (2016) shows that there is a non-linear relationship between stock liquidity and share repurchases. Following these views, this paper further investigates if there is a possibility of a non-linear relationship between state ownership and stock liquidity in the Asian emerging markets context. Hence, we form the following hypothesis:

H₂: The relationship between state ownership and stock liquidity is non-linear.

3. Data, Variables and Methodology

3.1 Sample Banks

The sample of this study consists of 209 banks from Asian emerging markets for ten years, from 2009 to 2018. We obtained the data for liquidity, ownership and firm-level characteristics from Thomson Reuters Datastream Advance 5.1 database. The final sample of this study excluded banks with missing data. Following Hossain et al. (2013) and Lee and Hooy (2020), the list of Asian emerging markets is collected based on the MSCI Emerging Markets Index. The Asian emerging markets under this category include China, India, Indonesia, Malaysia, Pakistan, Philippines, South Korea, Taiwan, and Thailand.

3.2 Variables Measurement

3.2.1 State Ownership

According to Clarke and Paul (2005), state ownership refers to property interests that are entrusted in a state or a public body symbolising a community instead of an individual or private party. The main interest of this paper is to examine the effect of state ownership on stock liquidity in Asian emerging markets. Hence, this paper focuses on state ownership in banks. The state ownership

data (henceforth SO) is a continuous variable presented as the total percentage of ownership owned by the government and government institutions.

3.2.2 Liquidity

The main purpose of this study is to examine the effect of state ownership on stock liquidity. The dependent variable of this study, stock liquidity, is proxied by quoted spread (hereafter referred to as QS). One of the characteristics of liquidity is measured by the cost of turning around a position over a short period of time (Kyle, 1985). In other words, liquidity is captured as the trading cost which is the difference between the bid price and ask price. QS is generally employed in most of the extant finance studies while examining stock liquidity. This can be seen in studies conducted by ElBannan (2017), Lee and Chung (2018), Liew et al. (2018), Ma et al. (2019), Rhee and Wang (2009) and Rubin (2007). The QS employed in this study is also known as closing percent quoted spread, with daily closing stock price, closing ask price and closing bid price readily available in the Thomson Reuters Datastream database. The 'spread' signifies the supply and demand of a specific stock. When there is a greater discrepancy between the two, this will result in higher trading costs, causing QS to be high. As QS signifies an inverse measure of liquidity, a high QS means low liquidity and vice versa. QS is computed using the formula below:

$$\text{Quoted Spread (QS)}_{it} = \frac{\text{Closing Ask Price}_{it} - \text{Closing Bid Price}_{it}}{M_{it}}$$

where M_{it} is the average of closing ask price and bid price for stock i on day t .

3.2.3 Control Variables

Aside from the variables above, there are four bank-level characteristics that act as control while investigating the relationship between state ownership and stock liquidity. They are bank size (SIZE), return volatility (VOL), turnover ratio (TURN), and leverage ratio (LEV). Bank size is a variable most researchers employ in their studies. Díaz and Huang (2017), ElBannan (2017), Heflin and Shaw (2000), Liew et al. (2018), Prommin et al. (2016), Rubin (2007) and Tran et al. (2018) use controlled firm size when examining the relationship between ownership and liquidity. As with past studies,

bank size is measured as the logarithm of market capitalisation. Bank size is predicted to have a positive relationship with stock liquidity, showing that larger banks enjoy better liquidity. Some of the stock characteristics that explain liquidity include return volatility, turnover ratio and leverage ratio. They are also widely used in literature related to stock liquidity. Following Heflin and Shaw (2000), Liew et al. (2018), Prommin et al. (2016) and Rubin (2007), return volatility is the annualised volatility estimated by the standard deviation of daily stock return.

According to ElBannan (2017), Prommin et al. (2016), and Rhee and Wang (2009), the high volatility in emerging stock markets tends to hold back financial market development, thereby reducing stock liquidity. In other words, return volatility is negatively associated with stock liquidity. However, we argue that this phenomenon will be diminished when there is government participation. The crucial role played by the government in national economic development will still provide confidence to investors to trade stocks regularly, despite the volatility of stock return. Hence, we predict a positive relationship between return volatility and stock liquidity. Moreover, the turnover ratio is measured as the total number of shares traded to the total number of shares outstanding. They are then averaged to obtain annualised value (Liew et al., 2018; Rhee & Wang, 2009). A greater share turnover is expected to come with greater liquidity. Thus, we expect a positive relationship between turnover ratio and stock liquidity. Moreover, there is a possibility that an incremental increase in debt leads to higher risk exposure in banks, which would also impact stock liquidity. Following Prommin et al. (2016) and Tran et al. (2018), the leverage ratio in this study is measured as total debt to total assets. A higher leveraged firm tends to take on more debt, and shareholders who have residual claims on company profits or assets may see this as detrimental to their benefits. Hence, investors may avoid investing in higher leveraged firms. Therefore, we predict that leverage ratio is negatively related to stock liquidity.

3.3 *Model Specification*

Equation (1) is the baseline model used to examine the relationship between state ownership and stock liquidity in Asian emerging markets. SIZE, VOL, TURN and LEV are the control variables for bank i in year t . SO is the main interest of this paper, which questions the impact of state ownership on stock liquidity. All regressions include year and country effects. As shown in the equations below, equation (1) is the benchmark model in studying the relationship

between state ownership and stock liquidity. Equation (2) is used to study the non-linear relationship between state ownership and stock liquidity, represented by SO^2 . In addition, equation (3) is an extended model used to study whether there is a greater extent of the non-linear effect.

$$Liquidity_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 VOL_{it} + \beta_3 TURN_{it} + \beta_4 LEV_{it} + \beta_5 SO_{it} + \varepsilon_{it} \quad (1)$$

$$Liquidity_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 VOL_{it} + \beta_3 TURN_{it} + \beta_4 LEV_{it} + \beta_5 SO_{it} + \beta_6 SO^2_{it} + \varepsilon_{it} \quad (2)$$

$$Liquidity_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 VOL_{it} + \beta_3 TURN_{it} + \beta_4 LEV_{it} + \beta_5 SO_{it} + \beta_6 SO^2_{it} + \beta_7 SO^3_{it} + \varepsilon_{it} \quad (3)$$

The interaction of bank size and state ownership is tested using equation (4) below. $SIZE$ is the logarithm of market capitalisation represented in dummy for bank i in year t . It is equal to one if the bank size is located in the top quantile distribution.

$$Liquidity_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 VOL_{it} + \beta_3 TURN_{it} + \beta_4 LEV_{it} + \beta_5 SO_{it} + \beta_6 (SO \times SIZE)_{it} + \varepsilon_{it} \quad (4)$$

A number of studies have shown that ownership is endogenous, since Demsetz (1983) and Demsetz and Lehn (1985) first demonstrated that ownership is endogenously determined to attain a trade-off between numerous costs advantages and disadvantages in a firm. For instance, Himmelberg et al. (1999) state that ownership is endogenous to performance due to the individual heterogeneity that impacts the value of a firm and hence, affects its ownership structure. They further argue that negligence of these characteristics in the regression model could give rise to inaccurate estimations. This finding is further supported by Palia (2001) and Gugler and Weigand (2003) who confirm the endogenous effect on ownership. The dynamic nature of ownership also matters since firm value could be affected by past ownership structure, due to postponed effect or future ownership structure changes due to market expectations (Thomsen et al., 2006). From these studies, we can see that the past and expected firm performance may pose an impact on ownership changes rather than a one-way effect from the former. Many existing studies revolve around the ownership-performance relationship and there is little empirical evidence on ownership-liquidity

relation. The theoretical views in Section 2 illustrate the effect of state ownership on liquidity. At the same time, Fazzari et al. (1988) show that investment decisions could be affected by liquidity as well. This means that liquidity may affect an investor's investment decisions, which in turn affects the ownership structure in a firm. A firm with higher liquidity could raise more money, may have more investment opportunities, and have higher firm value, hence, they invest more. Cho (1998) also shows that investment affects a firm value and consequently its ownership structure. The empirical evidence from past studies tells us that the endogenous effect on ownership seems to be the case these days. Given that the presence of unobserved heterogeneity and endogeneity may generate inconsistent parameter or biased estimates, the solution is the generalised method of moments (GMM) approach. The system GMM estimator improves efficiency by including lags of instrumented variables into the regression model and provides unbiased estimates, despite the presence of heterogeneity and endogeneity (Roodman, 2009). As with previous studies (see Alhadi et al., 2020; Garfatta & Zorgati, 2021; Wellalage & Locke, 2011), system GMM is employed as the baseline estimate in these studies. Therefore, this study sheds light on the endogenous and dynamic nature of the state ownership and liquidity relation using system GMM estimation.

3.4 *Descriptive Statistics*

The summary statistics of this study are presented in Table 1 below. The definition of each variable is also provided in the table. The control variables data value is winsorised at 1% level (first and 99th percentiles) to remove the effects of outliers. According to Ma et al. (2019), who conducted studies in multiple countries, QS is relatively lower in developed countries compared to emerging markets. This indicates that developed countries enjoy greater liquidity. This statement is supported by Prommin et al. (2016), who show that emerging economies enjoy lower liquidity since the capital markets in these economies are less sophisticated. However, another strand of the literature shows that emerging markets enjoy greater liquidity compared to developed countries (Qin, 2007). For studies conducted in a single country where such comparison is unattainable, we see that QS is, on average, 0.007 in Malaysia (Liew et al., 2018), 0.033 in Vietnam (Tran et al., 2018), 0.041 in Indonesia (Rhee & Wang, 2009), 0.0432 in Egypt (ElBannan, 2017) and 0.211 in China (Ding & Suardi, 2019). This study finds an average of 1.5882 in Asian emerging markets. These numbers show that the liquidity in emerging markets

is relatively lower compared to Rubin's (2007) study with an average of 4.71 QS in the United States. We have reviewed the liquidity measure in these articles and found that the level of liquidity reported varies depending on country, despite the QS measure being the same across these studies. Is state ownership in emerging markets associated with greater or lower liquidity? The inconsistent view from the past studies motivated us to examine the association between state ownership and stock liquidity in the context of Asian emerging markets.

Regarding the main interest of this study, Lassoued et al. (2016) found an average of 14.49% SO in MENA countries. In another study by Ding and Suardi (2019), a similar study conducted relative to government ownership and stock liquidity, Ding and Suardi found an average of 27.71% of government ownership in China. By focusing on a more comprehensive study in Asian emerging markets, this study has an average of 14.90% SO. This indicates that government involvement in Asian emerging markets is relatively high. This statement further strengthens the finding by Hossain et al. (2013), who claim that the state ownership involvement in Asia is significantly higher compared to other regions.

Table 1: Descriptive statistics

Variables	Definition	Obs.	Mean	Std. Dev.	Min	Max
Liquidity measures						
QS	Quoted spread	1,758	1.5882	4.4562	0.0000	54.0200
ES	Effective spread	1,757	1.4739	3.4415	0.0610	36.3768
Ownership measure						
SO	Percentage of ownership by government and government institutions	1,815	14.8959	26.4022	0.0000	97.0000
Control variables						
SIZE	Logarithm of market capitalisation	1,901	5.1700	1.1181	2.2041	8.7577
VOL	Return volatility	1,799	77.3490	72.6459	6.6403	436.9790
TURN	Turnover ratio	1,790	0.2097	0.2728	0.0001	1.4984
LEV	Leverage ratio	1,745	12.3748	9.6547	0.1300	36.1400

Table 2 presents the correlation matrix of all variables employed in this study. The correlation coefficients among these variables range from -0.2208 to 0.2224. These values do not exceed 0.8 which signals multicollinearity is not a concern in this study. Furthermore, the variance inflation factor (VIF) of this study does not exceed 5. This shows that they are within the acceptable range and hence, indicating there is no multicollinearity issue in our model.

Table 2: Correlation matrix

	QS	SO	SIZE	VOL	TURN	LEV	VIF
QS	1.0000						
SO	-0.1488	1.0000					1.03
SIZE	0.1097	0.1157	1.0000				1.03
VOL	-0.1602	0.1200	-0.1045	1.0000			1.04
TURN	-0.1890	-0.0256	-0.1632	0.1335	1.0000		1.09
LEV	-0.2208	-0.0956	-0.0497	0.0632	0.2224	1.0000	1.06
Mean VIF							1.05

Note: QS denotes the dependent variable of this study, known as quoted spread. SO is the percentage of state ownership. SIZE is the logarithm of market capitalisation. Return volatility (VOL) is the annualised volatility estimated by the standard deviation of daily stock return. TURN and LEV are turnover ratio and leverage ratio respectively.

4. Results and Discussion

Table 3 below presents the baseline result of this study. Column (1) shows the regression result consists only of the bank-level characteristics that acted as control in this study, bank size (SIZE), return volatility (VOL), turnover ratio (TURN), and leverage ratio (LEV). State ownership is added in column (2) and acts as the benchmark model in this study. Bank size, return volatility and turnover ratio are found to be negatively related to QS whilst leverage ratio is found to be positively related to QS. The sign and level of significance for these variables are consistent across all four models in columns (1) and (4). Since QS signifies an inverse measure of liquidity, a lower QS implies greater liquidity. These statistical results enlighten that larger banks, higher volatility and higher frequency of stock trading are significantly associated with higher stock liquidity. On the other hand, higher leveraged banks are associated with lower stock liquidity. Moving onto the main variable of this study, SO is significantly and negatively associated with QS at a 99% confidence level. The coefficient suggests that a 10% increase

in state ownership is connected with a lower quoted spread of 2.3%. Since QS signifies an inverse measure of liquidity, this indicates state ownership boost stock liquidity. Hence, H_1 is supported. This finding supports Ding and Suardi's (2019) evidence of a positive relationship between state ownership and stock liquidity. This result further supports the first view of theory, showing that the role of government in developing the nation, and the explicit and implicit guarantees it provides, boosts traders' confidence in trading such stocks, which in turn, increases stock liquidity. This shows that the participation of state investors in banks is viewed as a value enhancement to other investors.

Columns (3) and (4) are regression models used to test the second hypothesis of this study, which is to examine the possibility of a non-linear effect of state ownership and stock liquidity. The quadratic term (SO^2) and cubic term (SO^3) are added in columns (3) and (4) respectively. The significant SO^2 at 99% confidence level shows that there is a non-linear relationship between SO and QS. The positive coefficient of SO^2 implies a U-shaped relationship between the two. The effect of cubic function of state ownership, SO^3 in column (4) is found to be very small and regarded as unimportant. This signals that there is only one turning point in this relationship. Since QS signifies an inverse measure of liquidity, the inverted U-shaped implies a positive effect on stock liquidity when the state ownership is lower. However, the effect turns negative after a certain threshold of state ownership. This study found a turning point of 48.25%, showing that the stock liquidity will fall when the level of state ownership in a bank surpasses 48.25%. This finding supports the second view of state ownership participation presented in Section 2. The result suggests that when the state investors hold a substantial authority in a bank, there is a greater discrepancy of interest arises between the major and minor shareholders. When the government hold a substantial authority in a bank, they have dominating power to influence its decisions or direction, and may expropriate the interest of other minority shareholders to achieve certain objectives through banking activities. Investors view the extensive government intervention in emerging markets as inimical to stock return. These investors believe that the cost of substantial authority held by the government exceeds the benefits obtained from the first view of theory. Hence, they keep away from trading such stocks, which in turn, reduces liquidity. This finding further supports the evidence provided by Boubakri et al. (2020) of a non-linear relationship between state ownership and stock liquidity. Therefore, H_2 is supported.

Table 3: Baseline regression result

	(1)	(2)	(3)	(4)
SIZE	-0.0283*	-0.0963***	-0.1110***	-0.1208***
	(0.0960)	(0.0000)	(0.0000)	(0.0000)
VOL	-0.0036***	-0.0030***	-0.0029***	-0.0030***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
TURN	-0.8872***	-0.9717***	-1.0030***	-1.0032***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0161***	0.0162***	0.0200***	0.0195***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
SO		-0.0023***	-0.0193***	-0.0558***
		(0.0000)	(0.0000)	(0.0000)
SO ²			0.0002***	0.0015***
			(0.0000)	(0.0000)
SO ³				-0.0000***
				(0.0000)
Lagged QS	0.6754***	0.5852***	0.5806***	0.5828***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Constant	0.5535***	0.9991***	1.0973***	1.0503***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
AR(1) test statistic	-1.9160*	-1.7668*	-1.7666*	-1.7696*
	(0.0554)	(0.0773)	(0.0773)	(0.0768)
AR(2) test statistic	0.6768	1.1076	1.1079	1.1107
	(0.4985)	(0.2680)	(0.2679)	(0.2667)
Hansen test of over-identification	151.1846	168.5169	179.6341	178.2101
	(0.2448)	(0.6237)	(0.9366)	(0.9995)
No. of instruments	162	198	234	270
No. of observations	1361	1319	1319	1319

Note: SIZE is the logarithm of market capitalisation. Return volatility (VOL) is the annualised volatility estimated by the standard deviation of daily stock return. TURN and LEV are turnover ratio and leverage ratio respectively. SO is the percentage of state ownership. ***, ** and * denote the statistical significance at 1%, 5% and 10% levels respectively. All regressions include year and country effects.

4.1 Bank Size Effect and Stock Liquidity

This section presents further analysis of the bank size effect in the relationship between state ownership and stock liquidity. In general,

larger banks have access to greater resources and gain more support from various stakeholders (i.e., suppliers, clients, business partners, government, etc). The existing theoretical perspective and bailout incidents over the past two decades show that governments are reluctant to let large banks collapse. The study by Tran, Nonneman, and Jorissen (2014) shows that the interaction of firm size and state ownership prove that higher state ownership in larger firms improves firm profitability. With this view, we assume that large banks take precedence in the market due to their advantageous position. Besides, the presence of the ‘too big to fail’ (TBTF) policy and government guarantees are believed able to create more value for the stock by large banks. In the light of these views, we hypothesise that large banks will enjoy greater stock liquidity compared to smaller banks. Table 4 below presents the result of the bank size effect. The significant negative coefficient for the interaction between state ownership and bank size at a 99% confidence level implies that large banks correspond to lower spreads, implying higher liquidity. These findings support the above views, suggesting that the impact of state ownership on stock liquidity is greater for larger banks.

Table 4: State ownership, bank size and stock liquidity result

SIZE	-0.0936*** (0.0000)
VOL	-0.0024*** (0.0000)
TURN	-1.0938*** (0.0000)
LEV	0.0088*** (0.0000)
SO	-0.0025*** (0.0000)
SO x SIZE	-0.0036*** (0.0000)
Lagged QS	0.5826*** (0.0000)
Constant	1.1422*** (0.0000)
AR(1) test statistic	-1.7665* (0.0773)

AR(2) test statistic	1.0993 (0.2716)
Hansen test of over-identification	174.7108 (0.9638)
No. of instruments	234
No. of observations	1319

Note: SIZE is the logarithm of market capitalisation represented in dummy and equals to one if the bank size is located in the top quantile distribution. Return volatility (VOL) is the annualised volatility estimated by the standard deviation of daily stock return. TURN and LEV are turnover ratio and leverage ratio respectively. SO is the percentage of state ownership. SO x SIZE is the interaction term of state ownership and bank size dummy. ***, ** and * denote the statistical significance at 1%, 5% and 10% levels respectively. All regressions include year and country effects.

5. Robustness Check

The baseline result of this study shows a non-linear inverse U-shaped relationship between state ownership and stock liquidity in the context of Asian emerging markets. Following this result, we conducted a robustness check using an alternative liquidity measure. The baseline model is re-estimated with another liquidity measure, known as effective spread (hereafter referred to as ES).

5.1 Alternative Liquidity Measure

As noted in Kyle (1985), one of the characteristics of liquidity is measured by the cost of turning around a position over a short period of time. Hence, effective spread (ES) is employed as one of the liquidity measures in this study. The formula of ES is shown as below:

$$\text{Effective Spread (ES)}_{it} = \frac{2Q_{it}(P_{it} - M_{it})}{M_{it}}$$

where P_{it} is the closing price for stock i on day t . Q_{it} is an indicator showing the type of trading on day t , whether it is a buyer-initiated or seller-initiated trade. M_{it} is the average of ask price and bid price for stock i on day t .

First, we obtain the daily closing price, closing ask price and closing bid price for stock i on day t from the Thomson Reuters Datastream database. Second, we calculate the midpoint ($M_{i,t}$) by summing up both the closing ask price and bid price and obtain the mean for stock i on day t . Third, following Ding and Suardi (2019),

we identify the type of trade ($Q_{i,t}$) as + 1 if $P_{i,t}$ is higher than $M_{i,t}$ (known as buyer-initiated trade). $Q_{i,t}$ is identified as - 1 if $P_{i,t}$ is lower than $M_{i,t}$ (known as seller-initiated trade). We apply the tick test of Lee and Ready (1991) in the condition where $P_{i,t}$ is equal to $M_{i,t}$. In this situation, $Q_{i,t}$ is identified as + 1 if the price at t is higher than the price at $t - 1$. It is identified as - 1 if the price at t is lower than the price at $t - 1$.

The regression result using ES as an alternative liquidity measure is reported in Table 5 below. By comparing this result with the baseline result reported in Table 3, the sign for each variable across columns (1) to (4) is consistent. The level of significance is also consistent among all variables. Similarly, ES signifies an inverse measure of liquidity. The negative coefficient of SO and ES indicates that stock liquidity is improved when there is government ownership in banks. Consistent with the finding presented earlier, the positive coefficient of SO² infers an inverse U-shaped relationship in response to stock liquidity. Thus, the finding from Table 5 confirmed the main finding of this study, showing that state ownership in banks improves liquidity; however, the impact turns negative after a certain threshold.

Table 5: Robustness check with alternative liquidity measure

	(1)	(2)	(3)	(4)
SIZE	-0.0300*	-0.0691***	-0.0799***	-0.0828***
	(0.0816)	(0.0000)	(0.0000)	(0.0000)
VOL	-0.0029***	-0.0023***	-0.0022***	-0.0024***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
TURN	-0.4739***	-0.5580***	-0.5639***	-0.5993***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0013**	0.0058***	0.0109***	0.0089***
	(0.0483)	(0.0000)	(0.0000)	(0.0000)
SO		-0.0011***	-0.0171***	-0.0537***
		(0.0000)	(0.0000)	(0.0000)
SO2			0.0002***	0.0015***
			(0.0000)	(0.0000)
SO3				-0.0000***
				(0.0000)
Lagged ES	0.7295***	0.6183***	0.6101***	0.6152***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)

	(1)	(2)	(3)	(4)
Constant	0.4909*** (0.0000)	0.8756*** (0.0000)	0.9340*** (0.0000)	0.9397*** (0.0000)
AR(1) test statistic	-2.5644** (0.0103)	-2.5600** (0.0105)	-2.5515** (0.0107)	-2.5658** (0.0103)
AR(2) test statistic	0.4085 (0.6829)	1.8866 (0.0592)	1.8790 (0.0603)	1.8939 (0.0582)
Hansen test of over-identification	148.2052 (0.3013)	179.8212 (0.3855)	172.7452 (0.9716)	178.3057 (0.9995)
No. of instruments	162	198	234	270
No. of observations	1360	1318	1318	1318

Note: SIZE is the logarithm of market capitalisation. Return volatility (VOL) is the annualised volatility estimated by the standard deviation of daily stock return. TURN and LEV are turnover ratio and leverage ratio respectively. SO is the percentage of state ownership. ***, ** and * denote the statistical significance at 1%, 5% and 10% levels respectively. All regressions include year and country effects.

6. Conclusion and Implication

The Asian emerging banking industry plays a crucial role in economic development. These banks have been growing very quickly over the past decade. In the emerging markets context, banks' stock liquidity is regarded as an important driver of economic growth, since companies can raise capital more easily and at a lower cost when their stock is more liquid. The emerging banking industry gets more challenging when subjected to ownership issues. From past studies, it is noted that the government is often involved in these emerging markets to foster economic growth. Despite substantial privatisation occurring over the past few decades, state ownership is still very much pervasive in the Asian emerging banking industry, particularly with large banks. Hence, this study focuses on a prominent form of block ownership in the Asian emerging context, state ownership. Government participation is believed to bring a substantial impact on the banks' stock liquidity in these emerging markets. Moreover, the two contradicting views relating to state ownership and stock liquidity are ambiguous and worthy of further investigation. This paper contributes to the existing literature by examining the effect of state ownership on stock liquidity in the Asian emerging markets.

Using a sample of 209 banks from Asian emerging markets for a period of ten years (2009 to 2018), the finding of this study shows

the existence of a non-linear inverse U-shaped relationship between state ownership and stock liquidity. The result proves that state ownership improves stock liquidity, but the positive effect turns out to be negative after a threshold of 48.25%. At a lower level of state ownership, investors perceive these stocks as value-enhancing and thus, more likely to trade these stocks. This supports the first theoretical view presented in Section 2, showing the role of the state in promoting financial development and national development. The guarantee provided by the state reduces the cost of market failures and hence increases investors' confidence to trade stocks, therefore boosting the stock liquidity. However, the investors presumed these benefits to fall behind the cost of severe agency issues when the government holds a substantial shareholding in a bank. In these cases, investors are reluctant to trade against such large investors, due to concerns over the private information owned by large shareholders and the likelihood of being expropriated by them. Hence, investors view extensive government intervention in the emerging markets as detrimental to stock return. Therefore, the finding of this study suggests that state ownership improves stock liquidity to a certain extent and impairs stock liquidity when the government holds more than 48.25% of ownership in a bank. The statistically significant robustness result strengthens the main finding of this study, proving that the relationship between state ownership and stock liquidity is non-linear. In addition, this paper finds that large banks, as compared to smaller banks, tend to enjoy greater liquidity due to their advantageous position in the market and implicit guarantee provided by the government. This finding has proven the presence of the TBTF policy in the Asian emerging markets banking industry.

The present study has several implications for Asian emerging markets. First, the findings of this study suggest that the significant role played by the state to stimulate national growth enhances investors' confidence in trading the bank stocks in Asian emerging markets, thereby boosting stock liquidity. In other words, state ownership creates value for stock investment. Therefore, Asian governments should continue to participate in the banking industry in order to attract more investments and resources to fuel economic growth. Second, the nonlinearities found in the relationship suggest that over interference by the government may impair stock liquidity. Hence, this study proposes that policymakers and government should be aware of this adverse effect when setting investment policy. The government should continue to invest in these banks, but not be extensively involved. Also, they might want to bring in

a more diversified ownership structure in banks to improve stock liquidity, which strengthens the flow of resources and at a lower cost. Third, the supported TBTF policy indicates that policymakers should remodel this support, since the explicit and implicit guarantee provided by the government to the large banks may create unfair competition. This would impair financial stability, and at the same time, encourage moral hazard behaviour among management that could potentially be threatening to the entire banking system.

In fact, the banking industry is an essential industry in emerging markets that plays a vital role in the creation and allocation of capital in fuelling economic growth. Government participation in the emerging markets banking industry is of great concern since a liquid stock is certainly able to attract more funds from investors for business and economic growth. Therefore, this study provides the notion of the crucial role played by the government in strengthening stock liquidity in emerging markets, to a certain extent.

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