

Stock Market Liquidity and Firm Investment: Evidence from Vietnam

Doan Thanh Ha¹ & Vo Xuan Vinh²

Abstract

It is interesting to explore whether corporate managers follow stock market signals when making corporate financial decisions. However, the literature concerning the relationship between stock market liquidity and corporate investment is still limited. This paper investigates the impact of stock liquidity on firm investment in the Vietnamese context, where stock market has grown at a significant pace in the recent years but the finance literature seems to ignore this small emerging economy. This relationship is tested in a panel of firms listed on the Vietnam Stock Market over an extended time period. We aim to achieve more robust estimation results by employing the econometric technique of GMM estimator for panel data analysis. Moreover, we use a number of indicators to proxy for firm investment including both the aggregated indicators and disaggregated indicators. Consistent with previous findings, we find that corporate managers use market liquidity as an input for firm investment decision. However, our results are different from previous findings of papers employing advanced countries data in the outcome that stock market liquidity affects different investment growth indicators differently. More importantly, these findings are fully explainable by the context of emerging markets.

Keywords: liquidity, investment, Vietnam

1. Introduction

The question of whether managers should follow the stock market signals when making corporate decision is of central importance in finance. Many papers in the current literature attempt to establish the link between stock market signals and corporate decisions, however, no agreement has been made. For example, stock market indicators have been considered by firm managers when making investment decision (Barro 1990; Blanchard et al. 1993). Likewise, Barro (1990) states that changes in stock prices have substantial explaining powers for investment, even in the presence of cash flow variables. Hoshi et al. (1991) present evidence suggesting that information and incentive problems in the capital market affect corporate investment. Polk & Sapienza (2009) test a catering theory describing how stock market mispricing might influence corporate investment decision. This theory outlines that through “catering channel”, stock market can influence corporate managers in making corporate investment decision.

In this study, we explore whether corporate managers use stock market signals to make corporate decisions in the context of emerging markets. More specially, we investigate whether stock market liquidity affects firm investment employing a dataset of firms listed on the Ho Chi Minh City stock exchange for the period from 2006 to 2015. Our paper differentiates previous papers in the current literature in the sense that we consider this issue in the context of emerging markets. Our paper is motivated by a number of perspectives. Firstly, the paper is motivated by the current literature on the relation between market microstructure, particularly market liquidity and corporate decisions (Cheung et al. 2016). Investment is an important corporate decision and the relationship between stock market liquidity and firm investment are subjects for constant debate in the extant literature.

¹ Banking University of Ho Chi Minh, Vietnam, 36 Ton That Dam Street, District 1, Ho Chi Minh City

² School of Banking - University of Economics Ho Chi Minh City and CFVG Ho Chi Minh City, 59C Nguyen Dinh Chieu Street, District 3, Ho Chi Minh City

More importantly, we follow the approach of Muñoz (2013), which is one of the very few work centered on the relationship between stock market liquidity and corporate investment. Specially, we tackle the discussion on the relationship between stock market liquidity and firm investment issue in the context of Vietnam. Previous papers present strong evidence to support that corporate managers follow market signal when making investment decision. Particularly, the early work of Schaller (1993) and more recently, Muñoz (2013) map the way for further research on the relationship between stock market liquidity and corporate investment. Asker et al. (2011) report that publicly traded firms are subject to stock market pressures, which results in underinvestment and lower sensitivity to investment opportunities compared to private firms. It is interesting to shed further lights into the question of stock market liquidity on firm investment decision.

The second motivation is the importance of market liquidity in emerging markets context. Especially, stock market liquidity remains an important indicator for equity investors and firm management. Accordingly, a huge volume of papers in the current literature focus on examining liquidity in stock markets over the last few decades. However, most of the previous work concern liquidity in the context of developed markets and studies employing emerging markets data seem to be limited. Liquidity is more profound in emerging markets since emerging markets are normally characterized by low level of liquidity. Theoretically, illiquidity is considered as a risk in emerging markets even though the stock returns in these market are substantial (Lesmond 2005). Many studies report interesting results that liquidity is not even priced in emerging markets (Batten & Vo 2014; Vo & Bui 2016).

Stock markets are increasingly considered as investment funds in many emerging markets (Hearn et al. 2010). The remarkable development highlights the importance to shed further light in Vietnam stock market. Since the establishment of the first stock exchange in Ho Chi Minh City in 2000 with a few listed companies, Vietnam stock market has made a remarkable progress in terms of both number of listed firms and trading volume. This stock market development in Vietnam also draws strong interest from different parties (Vo forthcoming). The active participation of foreign investors in Vietnam stock market particularly reflects this fact.

The current paper has some important contributions to the literature. Firstly, we add to the extant literature on the relation between stock market microstructure, particularly stock market liquidity and corporate investment decisions. Secondly, we consider the issue in the context of emerging markets where stock markets are characterized by a low level of liquidity. This is an important contribution given the fact that papers using data from emerging economies seem to be limited in the current literature. Thirdly, we use a wide range of indicators to proxy for corporate investment for a more comprehensive analysis. Finally, we use the econometric technique of GMM estimator for panel data analysis to provide a more robust result.

The current paper provides some interesting results. Firstly, we find that stock market liquidity affects different investment growth measures differently. Overall, the analysis reports a positive impact of stock market liquidity on total assets growth and fixed assets growth while highlights a negative effect on inventory growth. More importantly, our results in the context of Vietnam are not consistent with previous results. However, this finding is clearly relevant in the context of emerging markets. Particularly, our finding is explained by the different institutional context of Vietnam. Clearly, the outcome of current paper further reinforces the importance of considering the rational of corporate managers' decision in different contextual settings. The rest of paper proceeds as follows. Section 2 reviews the literature concerning the relationship between stock market liquidity and corporate investment decision. Section 3 presents the model and estimation methodology. Section 4 shows the results and provides discussions of results. The final section concludes the paper.

2. Literature Review

In the current literature, there are two important strands of research on the topic of liquidity. The first strand investigates the impact of stock market liquidity on the real economy at the macroeconomic level while the second strand focuses on analyzing the impact of stock market liquidity on firm decisions at the microeconomic level. This paper fits in the second strand of research. In particular, we focus on addressing the question of whether stock market liquidity affects firm investment decisions. In a related literature, many papers investigate the impacts of stock market liquidity on different firm decisions. For example, Fang et al. (2009) examine the relation between stock liquidity and firm performance. The results of this study show that firms with liquid stocks have better performance as measured by the firm market-to-book ratio. The result is also robust to different measures of stock market liquidity.

The explanation for this relationship is that liquidity increases the information content of market prices and of performance-sensitive managerial compensation, and accordingly, firm value. Khanna & Sonti (2004) identify equilibrium trading strategies of traders and equilibrium price setting by a market maker. This work addresses the question of whether traders have an incentive to manipulate prices to get firms to undertake certain investments. Consequently, this paper proves that stock market liquidity is positively related to firm value. This outcome is reinforced by the finding of Cheung et al. (2015) who further suggest that stock market liquidity is relevant for firm value through corporate governance. A number of papers focus on examining the relationship between stock market liquidity and the capital structure decision of firms (Morellec 2001; Lesmond et al. 2008; Bharath et al. 2009; Lipson & Mortal 2009; Sibilkov 2009). These papers argue that firm managers tend to be influenced by stock market signal in their corporate finance decisions. Moreover, greater stock market liquidity facilitates the entry and exit of the large shareholders, and consequently affects firm's investment policy. For example, Gillan & Starks (2003) and Ferreira & Matos (2008) state that foreign investors tend to be more active than local investors in advocating better firm level corporate governance which might influence investment policy. Muñoz (2013) outlines three different channels that relate stock market liquidity and firm's real investment. These three different channels drive three distinctive relationship types including a neutral, a positive and a negative relationship. We summarize the three channels as follows.

First, models based on agency problems and information in the stock prices suggest that there is a relationship between stock liquidity and firm investment. However, these approaches do not predict a specific sign of the relationship. The relationship between stock market liquidity and firm investment can be explained by the channel that increased stock market liquidity facilitates the entry of informed shareholders, which makes the price more informative for the "stakeholders", thus improving the results of operations and relaxing financial constraints.

The second view suggests that improved stock market liquidity leads to higher firm investment. This is because of the asset mispricing problem in the financial markets. For example, Grinblatt & Keloharju (2009) develop a model focus on a mechanism based on share issuing where the dispersion of beliefs and short-sale constraints can lead to stock market bubbles, these being exploited by firms issuing new shares with an inflated price. In addition, high stock market liquidity is associated with cheap financing costs and hence, increased investment. Further, trading volume can be a proxy for disagreement among investors generating a positive relationship between trade volume and firm investment (Hong & Stein 2007; Banerjee & Kremer 2010).

The third view is that stock market liquidity is negatively related to firm investment. This is based on the argument of Porter (1992) that high stock market liquidity facilitates entry and exit of institutional investors who trade based on current earning news and whose trading may lead to misevaluation and underinvestment of innovation. Moreover, as stated by Stein (1988, 1989), the presence of asymmetry information among different stakeholders could induce managers to scarify investment for higher current profits to keep the stock from becoming undervalued. A number of papers empirically investigate the link between stock market liquidity and corporate investment decision in the same vein. For example, Fang et al. (2014) report a negative relationship between liquidity and long-run investment where long run investment is measured by innovation (patents). Polk & Sapienza (2009) investigate whether stock mispricing in the stock market has consequence for corporate investment policy and the results confirm that firm managers tend to follow stock market signals in their investment decisions. Gilchrist et al. (2005) argue that dispersion among investor beliefs can lead to stock market bubbles. This higher variance in the stock market prediction results in higher liquidity and hence increased firm investment. This paper also reports that the dispersion among investors causes increase in share issuance and Tobin's Q.

3. Data and Research Methodology

We follow Muñoz (2013) in modeling the relationship between liquidity and investment. The regression equation is represented as follows:

$$\frac{Investment_{it}}{K_{it}} = \alpha_i + \alpha_t + \beta Liquidity_{it} + \theta X_{it} + \epsilon_{it}$$

where i and t stand for firm and year respectively.

The dependent variable is the corporate investment indicator. In this paper, we use three measures of investment indicators, which are the growth in total assets (TA_Growth), the growth in fixed assets (property, plant and equipment) (PPE_Growth), and the growth in inventories (Inv_Growth).

Different investment indicators represent different aspects of corporate investment decisions. The use of different variables allows us to achieve a more comprehensive analysis. *LIQ* is the stock market liquidity measure, which is calculated as the ratio of total trading volume in the year to the total share outstanding over the year³.

$$LIQ_{i,t} = \frac{Traded\ Shares_{it}}{Total\ Shares\ Outstanding_{it}}$$

X is a number of control variables which have been identified by previous papers in the current literature as potential explanatory factors affecting corporate finance, for example, Muñoz (2013) and Moon & Sharma (2014). Specially, in this paper, our control variables include the followings.

- LEV is the firm leverage, measured by the ratio of the total liabilities to total assets⁴.
- SIZE is a proxy for the firm size. This is calculated as the logarithm of the total assets.
- TOBIN's Q is the stock market value of a firm. This indicator is measured by the ratio of market to book value of firm assets. Specially, this ratio is calculated as the sum of stock market capitalization and the value of total debt of a firm, divided by the total assets of a firm in a year.
- PROFIT is the profitability indicator, which is calculated as the return on assets at year end.

Estimation Methods

We closely follow the fairly standard approach for panel data analysis which are popular in many previous papers (Batten & Vo 2015; Vo 2015, 2016a, 2016b). The characteristics of our dataset allow us to use panel data estimators as a natural choice. The use of panel data analysis allows us to better control for firm heterogeneity. Further, panel data estimation also reduce the problem of collinearity among the variables. Likewise, employing this panel data technique to estimate our model allows us to eliminate the potential biases in the resulting estimates due to correlation between unobservable individual effects and the explanatory variables. Moreover, another problem is commonly associated with panel data in corporate finance is the endogeneity. Hence, to achieve a more robust result, we employ the dynamic regression approach to estimate the model. Particularly, we use the dynamic GMM estimator developed by Arellano and Bover (1995), and Blundell and Bond (1998) to estimate the dynamic regression model. This is very useful approach in the sense that our data set is in panels containing many firms and a small number of time period. Hence, this estimator controls for the presence of unobserved firm-specific effects and for the endogeneity explanatory variables potentially inherent in our model. The instrument variables used in this estimation depend on the assumption made of whether the variables are endogenous or predetermined, or exogenous. To address the over-identifying issue, we use the Sargan test of over-identifying restrictions to confirm the instrument validity for the GMM model.

The use of GMM estimator in our analysis is an important contribution of our paper. It is commonly accepted that the GMM estimators generally yield more reasonable estimates of the autoregressive dynamics than the basic first-differenced estimators. For example, Wintoki et al. (2012) state that the use of the dynamic panel GMM estimator (Holtz-Eakin et al. 1988; Arellano & Bond 1991; Arellano & Bover 1995; Blundell & Bond 1998) provides advantages over other estimators.

Moreover, GMM estimator advances ordinary least squares (OLS) or traditional fixed-effects estimates in at least one of three important ways. Firstly, unlike OLS estimation, firm-fixed effects can be included to account for (fixed) unobservable heterogeneity. Secondly, unlike traditional fixed-effects estimates, the GMM estimator allows current governance to be influenced by previous realizations of, or shocks to, past performance. Thirdly, unlike either OLS or traditional fixed-effects estimates, a key insight of the dynamic panel GMM estimator is that if the underlying economic process itself is dynamic.

4. Results and Discussion of Results

Table 1 presents the data descriptive statistics of the variables employed in this paper. Overall, the average total assets growth of Vietnamese firms is about 21% per year and the fixed assets growth is about 18% per year.

³ See Lesmond (2005) for a discussion on the efficacy of different liquidity measures.

⁴Lipson & Mortal (2009) provide an in-depth analysis of the relationship between liquidity and capital structure

Interestingly, the average inventory growth is 2% per year suggesting the improvement in inventory management of Vietnamese firms.

Table 1 Descriptive Statistics of the variables

	TA_Growth	PPE_Growth	Inv_Growth	LIQ	SIZE	TOBIN Q	LEV	PROFIT
Mean	0.2126	0.1825	-0.0292	0.9685	12.0388	1.1327	0.4726	0.0639
Median	0.0090	0.0953	0.0682	0.4291	11.9969	0.8690	0.5007	0.0534
Maximum	14.4153	6.0592	30.6203	15.0176	14.1629	20.9330	0.9925	0.7837
Minimum	-1.0000	-1.0000	-303.1125	0.0004	9.9576	0.0481	0.0020	-0.3831
Std. Dev.	1.0276	0.4102	8.6721	1.4600	0.5552	1.0202	0.2091	0.0753
Obs	1245	1245	1245	1245	1245	1245	1245	1245

Table 2 reports the correlation matrix for all variables employed in the analysis. We observe that the correlation between total assets growth and fixed assets growth is about 0.5. This highlights the contribution of investment in fixed assets in total firm assets. Particularly, Vietnamese firms tend to invest more in fixed assets.

Table 2 Correlation Matrix

	TA_Growth	PPE_Growth	Inv_Growth	LIQ	SIZE	TOBINQ	LEV	PROFIT
TA_Growth	1							
PPE_Growth	0.4680	1						
Inv_Growth	-0.0094	-0.0451	1					
LIQ	0.0107	0.0821	-0.0624	1				
SIZE	0.0541	0.0626	-0.0116	-0.0598	1			
TOBINQ	0.0421	0.1465	0.0332	-0.0076	-0.1640	1		
LEV	0.0008	0.0294	0.0647	-0.0812	0.2869	-0.0910	1	
PROFIT	0.0673	0.1302	-0.0362	-0.0884	-0.0689	0.2045	-0.4357	1

Table 3 shows the results of the GMM regression analysis. Overall, the results are interesting. We find the evidence that firm managers tend to follow the stock market signals when making corporate investment decision. We find that firms with higher stock market liquidity tend to invest more in fixed and total assets but less in inventory. More specially, we find that stock market liquidity is positively correlated with total assets growth and fixed assets growth. However, we find that liquidity is negative but not significant in explaining fixed asset growth. Contrary, we find that inventory growth is negatively and significantly associated with stock market liquidity.

Interestingly, the analysis presents a unique result for the context of emerging markets on the relationship between stock market liquidity and firm investment. More importantly, this finding highlights the different results in the context of Vietnam. Particularly, our results are inconsistent with the findings of Fang et al. (2014) who report a negative relationship between stock market liquidity and long-term investment measured by innovation (patents) in the context of an advanced market. Our results also contradicts the results of Muñoz (2013) who report a positive relationship between inventory growth and stock market liquidity. A remarkable aspect of the current paper is that the analysis offers different findings in comparison with results obtained by most of the previous papers employed data of advanced countries. However, our results are fully explainable given the context of emerging markets. More specially, our finding might be explained by the institutional characteristics of emerging markets. Particularly, Vietnam is bank based economy and most of firm investments are financed by bank credit. Fixed assets investment is more likely to be financed by bank loan since fixed assets could be used as collaterals for cheaper funding costs.

Table 3 Dynamic GMM estimation results

Dependent variable	TA_Growth		PPE_Growth		Inv_Growth	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Lag(DependentVar)	0.0178	0.3362	-0.0066	0.7621	0.7213**	0.0224
LIQ	0.0950*	0.0742	0.0052	0.8625	-0.1322*	0.0996
SIZE	-0.5054*	0.0605	-0.2384*	0.0879	-0.0448	0.9565
TOBIN's Q	-0.5009***	0.0017	-0.0729	0.3155	0.1071	0.7009
LEVERAGE	-0.8575	0.1979	-0.6980**	0.0182	1.5565	0.3366
PROFIT	6.3570***	0.0001	4.0647***	0.0000	3.9769	0.1961
J-statistic	21.7519		21.6204		5.4682	
Prob(J-statistic)	0.7499		0.7564		0.9999	

Note: *, **, *** indicates significance at the 10%, 5% and 1% respectively

We also find evidence of other factors affecting corporate investment. Interestingly, we find that the coefficients for firm size are negative and mostly significant in all regressions (the exception is regression explaining inventory growth). This suggests that the investment growth rate of Vietnamese firms is higher for small firms. The coefficients for Tobin Q is negative and significant in regression where total assets growth is the dependent variable. This outcome contradicts the fairly standard in the literature in which Tobin Q is a proxy for investment opportunities and firms with higher investment opportunities have invested more. Interestingly, our result for Vietnam stock market is inconsistent with the finding obtained by Polk & Sapienza (2009) for the US firms.

Importantly, we find that higher leverage firms is negatively and significantly associated with firm fixed assets investment. This outcome tends to support the evidence of over-investment channel in Vietnam. Moreover, this implies the practice of financing investment through bank credit in Vietnamese firms. However, this is not a surprising result since Vietnam is a bank based economy where most of firm financing needs are funded by bank credit. Here, our results are inconsistent with the results of previous studies for other country, for example, Aivazian et al. (2005) and Muñoz (2013). This suggests that firms with high leverage level will need greater cash flow to pay for interest and capital and hence reducing the ability to invest in new projects in the future.

Finally, similar to previous findings, the coefficients for profit are positive and significant in regressions explaining total and fixed assets. However, we observe that profit is not significant in explaining inventory growth. If a company is not facing financial constraints because they have higher profits, they tend to have higher investment. This outcome is similar to the finding of Almeida & Campello (2007).

5. Conclusion

Stock market liquidity is an important topic in finance. Evidence from many papers suggests that it is also a key input for investment decision making process. More specially, it is important to investigate whether firm managers follow the stock market signals when making corporate decision. This topic has been more interesting given the increasing importance of emerging markets. Liquidity is even more important in emerging markets since these markets are characterized by lack of liquidity given their limited access to global capital markets. Similarly, our paper recognizes that liquidity may affect corporate investment (Schaller 1993; Muñoz 2013) in different fashions. For instance, Xiong & Su (2014) investigates the relationship between stock liquidity and capital allocation efficiency based on the ground of market microstructure theories and evidence. Using data of the Chinese listed companies over the period from 1998 to 2011, Xiong & Su (2014) finds that stock market liquidity helps to improve investment efficiency and mitigate both overinvestment and underinvestment problems. However, we investigate the issue in the context of emerging markets. In addition, the literature contains a number of previous papers confirming the relationship between stock market signals and corporate policies. These papers state that firm managers tend to follow the market signals in making corporate policy. These arguments and empirical evidence drive strong attention for further research on the link between stock market liquidity and corporate investment decision. In other words, it is important to investigate whether corporate managers consider stock market liquidity in making investment decision. Overall, we find that stock market liquidity is positively associated with firm total assets investment growth and fixed assets investment growth while negatively correlated with inventory growth. Our results might be explained by the notion that firms with higher stock liquidity have more investment simply because they have more opportunities in obtaining external funding.

This result tends to fit well with the proposition that firm managers are influenced by the stock market signals when making corporate investment. However, the influence of market signals on the corporate decision making process is different in emerging markets. An important contribution of our paper is that we fill the gap by addressing this issue in the context of an emerging market. Investors have shifted attention to emerging markets in the last decades however the academic literature tend to ignore this context. Particularly, this paper examines the relationship between the liquidity and corporate investment in the Vietnamese context. Using a detailed and updated data set and employing the econometric analysis techniques for panel data estimation, we find that stock market liquidity is negatively associated with corporate investment. Notably, this is an interesting result since it seems that Vietnamese firms do not take advantage of the lower cost of capital to finance the investments. A relevant implication of our results is the importance of context in corporate financial decisions in firms in the context of emerging markets. In particular, the finding of the relationship between investment growth and stock market liquidity in this paper is different with previous studies. This highlights the need for further research taking into account the legal, institutional and cultural differences in corporate finance studies.

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