Influence of Stock Liquidity to Firm Value in Indonesian Stock Market

Shilvia Hansen
Alumni of Magister Management of Business School of UniversitasPelitaHarapan,
email address: shilvia_86@yahoo.com.

Kim SungSuk
Lecturer of Business School of UniversitasPelitaHarapan,
email addresss: sungsuk.kim@uph.edu

This research checks whether stock liquidity has positive influence on firm value in Indonesian stock market. Liquidity was calculated using relative effective spread using intraday data from 2009 to 2010. Other important variable used are Tobin's Q, operating income-to-price ratio, leverage, operating income on assets, and other firm characteristic variables. Results using panel data regression show that high liquid firm, lower financial leverage, and high operating profitability has high return in stock market. And also results show that liquidity premium or sentiment investor cause positive effect on stock liquidity and firm performance in Indonesian Stock Market.

INTRODUCTION

There are strong theoretical reasons to suspect that stock liquidity will positively influence firm performance. In theoretical analyses, liquid stocks have been proven to allow non blockholders to intervene and become blockholders (Maug, 1998), facilitate the information of toehold stake (Kyle and Villa, 1991), encourage management compensation being more efficient (Holmstrom and Tirole, 1993), reduce managerial opportunism (Edmans, 2009), stimulate trade by informed investors so that improving investment decision through more informative share price (Subrahmanyam and Titman, 2001; Khana and Sonti, 2004). Thus, based on prior empirical research, positive influence between stock liquidity and firm value is plausible.

This study shows that stocks with high liquidity have a higher firm performance as measured by the firm market-to-book ratio. The market-to-book ratio then split into the components: price-to-operating earnings ratio, leverage ratio, and operating return on assets ratio. Higher liquid stock have higher operating returns on their assets and more equity in their capital structure. Otherwise, their price-to-operating earnings ratio similar to less liquid stocks. These results hold when control for industry and firm fixed effects,

stock return momentum, idiosyncratic risk, and endogeneity using two-stage least squares.

The paper outline are: Section 2, reviewing prior work. Section 3, describes the samples, data sources, and variable measurement.Section 4,describes empirical tests. Section 5, concludes.

HYPOTHESIS DEVELOPMENTS

Influence between liquidity and performance has received much attention from a variety of perspectives. Maug (1998) with models a large relationship investor's monitoring decision. The investors monitor and trade in order to profit from price increases caused by his monitoring activities. Maug concludes that the liquid stocks, far from being a hindrance to corporate control, tend to support effective corporate governance.

Edmans (2009), Admati and Pfleiderer (2009), if management compensation related to the current stock price, the increased liquidity increases the oppurtunism costs for managers to facilitate informed selling or "dumping".The distinguishing characteristic of the causes of agency theory is that they predict that the effect of liquidity on performance would be related to the extent of agency conflicts within the firm.

Subrahmanyam and Titman (2001); Khana and Sonti (2004) showed liquidity may positively affect firm performance even when there is no agency conflict. In this setting liquidity stimulates the entry of informed investors that makes prices more informative to stakeholders.As shown in Khana and Sonti (2004), informed traders factor the effect of their trades on managerial behavior into their trading strategy, trading more aggresively, and thus makeinformatives prices.These feedback effects enhance operating performance and relaxes financial constraints. Both effects improve firm performance.

Moreover, non-financial stakeholders' decision to stay or go influence firm cash flow. This is especially valuable when the relationship between stakeholders and the firm that fragile or have high cash flow uncertainty with respect to existing projects.This is because positive cascades most valuable in this setting. Feedback theory implies that the liquidity effect is comparable to the sensitivity of firm operations for the information content of stock prices.

H1. Liquid stocks have a higher firm performance.

However, liquidity may also influence firm value by changing the discount rate. If the marginal investors value liquidity in Holmstrom and Tirole (2001), illiquid stocks should trade at a discount. If the marginal investorsconcern liquidity, liquid stocks should trade at a premium. So higher liquidity firms have higher firm Q ratios due to a lower required rate of return.

H1a. Liquidity Premium: high liquidity firms have higher firm Q due to a lower required rate of return

A positive relation between stock liquidity and market price based performance measures such as Tobin's Q. Baker and Stein (2004) show that liquidity may be related to the assessment as a sentiment indicator. In their model, high liquidity stocks are overvalued. Fang, Noe, and Tice (2009) show that liquidity has a positive relationship with firm performance, more equity in their capital structure or low financial leverage, and higher operating profitability.

H1b. Sentiment: high liquidity firms have higher firm Q ratio as they are overvalued.

DATA AND VARIABLE CONSTRUCTION

Data

Using stock price closing monthly data, market price closing data (IHSG) monthly, intradays trade, firm's financial data from Indonesia Stock Exchange database.The sample observation are from 2009, 2010 with some consideration is the firm that recorded at Indonesia Stock Exchange at least since Desember 2007. The final sample that used is 566 firms. Table 1 shows variable definition and summary statistic for main variable that used in this study.

Variable construction

Liquidity measures

Liquidity is measured by using relative effective spread that is calculated by using intradays data. Relative Effective spread is defined as the difference between the execution price and the midpoint of the prevailing bid-ask quote divided by the midpoint of the prevailing bid-ask quote. Like study such as Amihud and Medelson (1986), the

effective spread is standardized to adjust for the stock price level converting it to a relative effective spread, RESPRD.

For eliminating error potential in calculate then is done outlier elimination with calculation 1% from all observations i.e. six data. Data is sorted from the highest to the lowest, so the value of the sixth highest positive data and the sixth lowest negative data is replaced with the value of the seventh highest positive data and the seventh lowest negative data.The arithmetic mean of the relative effective spread for each daily stocks trading become the daily relative effective spread. Finally, arithmetic mean of the monthly relative effective spread become the yearly relative effective spread. Due to non-normality of effective spread, the natural logarithm of RESPRD is used in all cross-sectional regression.

FIRM PERFORMANCE

In studying the relationship between firm performance and stock liquidity, a proxy for Tobin's Q, based on Kaplan and Zingales (1997), is used as the main measure of firm performance. Proxies for Tobin's Q (the ratio of the firm's market value to the replacement cost of its assets) have been used as a measure of firm performance in an ernomous number of studies (e.g., Morck, Shleifer, and Vishny, 1988; Yermack, 1996; Gompers, Ishii, and Metrick, 2003). Proxies from Tobin's Q based on Gompers, Ishii, and Metrick (2003).Q is measured as the market value of assets divided by the book value of assets measured at a firm's fiscal year end. The market value of assets is defined as the market value of equity plus the book value of assets minus the book value of equity and minus the balance sheet deferred taxes. The denominator of Q, the replacement value of firm assets, is assumed to be the book value of firm assets.

Next, the market-to-book ratio split into three components: price-to-operating earnings, financial leverage, and operating profitability. The operating earnings-to-price ratio, OIP, is equal to operating income after depreciation divided by market value of common equity. The financial leverage ratio, LEVERAGE, is defined as the fraction of the value of a firm's assets coming from common equity. Operating return on assets, OIOA, is equal to operating income after depreciation divided by book value of assets. Q and its three components are all measured at a firm's fiscal year end.

Table 1 Variable definitions

Variable	Definition
Panel A : Variable definitions	
Q	$\frac{marketvalueofassets}{bookvalueofassets} = \frac{\begin{array}{c}marketvalueofequity \\ +bookvalueofassets \\ -bookvalueofequity \\ -balancesheetdeferredtaxes\end{array}}{bookvalueofassets}$
OIP	$\frac{operatingincomeafterdepreciation}{marketvalueofequity}$
LEVERAGE	$\frac{marketvalueofequity}{marketvalueofassets}$
OIOA	$\frac{operatingincomeafterdepreciation}{bookvalueofassets}$
LOG_RESPRD	Natural Logarithm of Relative Effective Spread (*RESPRD*)
	$RESPRD = \frac{executionprice - midpointofprevailingbidaskquote}{midpointo\ prevailingbidaskquote}$
DUM_LQ45	A dummy variable indicating inclusion LQ45
LOG_AGE	Natural Logarithm of firm age which is approxiamated as the number of year listed to fiscal year
LOG_BVTA	Natural Logaritm a of book value of asset measured at fiscal year end
LOG_RESPRD $_{t-1}$	One periode lag of *LOG_RESPRD*
IDIORISK	Standard deviation of OLS regression residual. The OLS regressions are estimated using minimum 24 monthly returns prior to fiscal year end
CUMRET	Compounded market-adjusted montly returns for six months prior to fiscal year end for firm i's
Z1	Mean*LOG_RESPRD*of two firms in firm i's industry that have the closest market value of equity to firm i's market value of equity

Control variables

The control variables used by Gompers, Ishii, and Metrick (2003) in their firm performance regression are included in the baseline specification in this study. These controls include the natural logarithm of total asset (LOG_BVTA) and the natural logarithm of firm age (LOG_AGE). Firm age is defined as the number of years of financial data prior to a firm's fiscal year end. Because of this study is done on stocks in Indonesia Stock Exchange, so one of the control variables is used by Gompers, Ishii, and Metric (2003) i.e. DUM_S&P500 is replacedtoDUM_LQ45 with consideration that stocks included in LQ45 shows liquid stocks as on S&P500.

Firm idiosyncratic risk is included as a control in firm performance regression. Okpara and Nwezeaku (2009) test two empirical: liquidity is negatively correlated with return while idiosyncratic risk is positively correlated with return. They found that idiosyncratic risk is a stronger predictor of returns than liquidity. In other words, controlling for idiosyncratic risk eliminates the power of liquidity to explain returns. To control for the possibility that idiosyncratic risk is the underlying factor which drive the relationship between firm performance and stock liquidity, a stock's idiosyncratic risk, IDIORISK, is included in firm performance regressions as an explanatory variable. IDIORISK is then defined as the standard deviation of the OLS residuals. The regressions are estimated using minimum 24 monthly returns prior to fiscal year end.

Stock return momentum is included as a control in the firm performance regression. The compensation structure of mutual fund managers may cause mutual fund managers to trade stocks of high Q firms. Mutual fund managers are compensated based on the amount of assets under management. If investors have a behavioral preference for momentum stocks (cross-sectional winners), mutual fund managers will invest in it or risk losing assets under management. They will move around between various momentum stocks to buy them when they go up and sell them when they begin to underperform.

Since cross-sectional winners would most likely experience an increase in firm Q, and momentum may be correlated with liquidity, momentum might be driving higher firm Q, not liquidity. In fact, Gutierrez and Pirinsky (2007) find empirical support for the prediction that institutions chase high relative returns and buy cross-sectional return winners. They also found that cross-sectional winners tend to be stocks with high market-to-book ratio. To control this possibility, a measure of momentum is included in the baseline specification as an explanatory variable.

Momentum, CUMRET, is defined as the compounded market-adjusted monthly return for stock i over the six months prior to the end of fiscal year t.

Correlation matrix

Table 2 presents Pearson and Spearman rank correlation between the main liquidity measure (LOG_RESPRD), the firm performance measure, and all of control variables used in this study.

As shown in Table 2, relative effective spread, LOG_RESPRD, has significantly negative Pearson and Spearman correlations with three firm performance: Q, LEVERAGE, and OIOA.

In other words, firm with liquid stocks tend to have better firm performance, less debt in their capital structure, and higher operating profitability. LOG_RESPRD is not significantly Pearson and Spearman correlation with operating income to price, OIP

Table 2
Correlation matrix
Defination of variables are in Table 1 Panel A. Number of observations used in the correlation matrix is 566. Pearson correlations are reported above the main diagonal. Spearman correlations are reported below the diagonal.

	Q	OIP	LEVERAGE	OIOA	LOG_RESPRD	DUM_LQ45	LOG_AGE	LOG_BVTA	IDIORISK	CUMRET
Q		-0.133	0.598	0.566	-0.314	0.326	0.023	0.138	0.092	0.267
OIP	-0.191		-0.220	0.410	0.010	-0.058	0.037	0.095	-0.018	0.062
LEVERAGE	0.499	-0.284		0.474	-0.276	0.206	0.005	-0.076	0.042	0.223
OIOA	0.437	0.604	0.431		-0.321	0.275	0.076	0.216	-0.063	0.289
LOG_RESPRD	-0.366	-0.024	-0.268	-0.331		-0.588	0.062	-0.548	0.191	-0.098
DUM_LQ45	0.307	-0.073	0.201	0.218	-0.519		0.007	0.531	-0.185	0.022
LOG_AGE	0.034	0.094	-0.006	0.125	0.030	0.017		0.054	0.085	0.119
LOG_BVTA	0.260	0.073	-0.042	0.190	-0.516	0.484	0.087		-0.176	0.127
IDIORISK	-0.080	-0.042	-0.048	-0.121	0.302	-0.273	0.070	-0.206		0.175
CUMRET	0.355	0.105	0.230	0.338	-0.164	0.075	0.148	0.178	0.013	

EMPIRICAL RESULTS

Influence on Performance

To assess whether stock liquidity increase firm performance, a proxy for Tobin's Q is regressed on the liquidity measure and several control variables. This model is estimated using random fixed effect model. Table 3 column 1 shows that coefficients on the relative effective spread (LOG_RESPRD) are negative and significantly affect Q. These results support Hypotheses H1 since higher stock liquidity (lower relative effective spread) is correlated with higher firm performance. An increase in liquidity (a decrease in LOG_RESPRD) of one standard deviation or -1.00 leads to increase in Q of 0.01 or 1%.

All of the control variables in the regression is significant. DUM_LQ45 has significant positive coefficients, shows that LQ45 companies have higher firm performance. LOG_BVTA has a significant positive coefficients, shows that large companies have higher firm performance on average. LOG_AGE has a significant positive coefficient, shows that older firms tend to have higher firm performance. IDIORISK has a significant negative coefficients, shows that stocks with high idiosyncratic risk have higher required returns. CUMRET has a significant negative coefficients, shows that the higher the recent cross-sectional momentum in a stock's return have higher firm Q.

To gain further insight into the source of higher firm performance for stocks with high liquidity, the firm performance measure, Q, is split into three components: operating

income-to-price ratio (OIP), financial leverage ratio (LEVERAGE), and operating income-to-assets ratio (OIOA).

Liquidity measure (LOG_RESPRD) does not significantly affect operating income-to-price ratio (OIP) in column 2 in Table 3. Shown in Table 3 column 3, liquidity measure (LOG_RESPRD) negative and significantly affect OIOA. Stocks with high stock liquidity (lower relative effective spread) tend to have higher operating profitability. An increase in liquidity (a decrease in LOG_RESPRD) of one standard deviation or -1.00 leads to an increase in OIOA of 0.005 or 0.5%.

Liquidity measure (LOG_RESPRD) negative and significant affect LEVERAGE in column 4. Stock with high stock liquidity (lower relative effective spread) tend to have a higher fraction of equity in their capital structure or less financial leverage. An increase in liquidity (a decrease in LOG_RESPRD) of one standard deviation or -1.00 leads to an increase in LEVERAGE 0.02 or 2%.

Table 3 Random Effect Model baseline specification

Random Effect Model regression results for the baseline specification model Qit = a + b LOG_RESPRDit + c DUM_LQ45it + d LOG_AGEit + eLOG_BVTAit+ fIDIORISKit + g CUMRETit + INDj + YRt+ errorit. Variable definitions on Table 1 Panel A.

Dependent variabel	Q (1)	OIP (2)	OIOA (3)	LEVERAGE (4)
INTERCEPT		-0.536*		1.135
LOG_RESPRD	-0.017*	0.016	-0.006*	-0.29*
DUM_LQ45	0.103*	-0.034	0.010*	0.069*
IDIORISK	-0.029*	-0.277	0.017*	0.369*
LOG_BVTA	0.036*	0.022*	-0.000*	-0.027*
LOG_AGE	0.001*	0.007	-0.003*	-0.013
CUMRET	0.383*	-0.143	0.071*	0.629*

* significance at 5% significance level

If higher firm values for firms with more liquid stocks based on liquidity premium (Hypotheses 1A) or investor sentiment (Hypotheses 1B), high liquidity stocks should have higher price-to-operating income ratio but similar financial leverage and operating profitability ratio as low liquidity stocks. From the empirical results, shows that price-to-operating income ratio does not significantly affect stock liquidity, because of that it is not appear to be explanations hypotheses H1A or hypotheses H1B for the higher firm value of more liquid stocks. This study shows that stock with high liquidity have better firm performance, more equity in their capital structure (low financial leverage) and higher operating profitability levels.

Influence on Performance after control Endogeneity

Two stage least squares is used to control for endogeneity. Two stage least squares estimation is needed because the main liquidity measure LOG_RESPRD is endogenous variables with firm performance measures, Q, OIP, OIOA, and LEVERAGE. Instrumental variables for the liquidity measure, LOG_RESPRD is needed. Using one lag of the liquidity measure (LOG_ RESPRDt-1) and the mean LOG_RESPRD of two firms in firm i's industry that have the closest size (market value of equity) to firm i (Z1) as exogenous variables that are correlated with liquidity but uncorrelated with the error term.

For LOG_RESPRD as the dependent variable, based on two stage least squares estimation on Table 4, shows that the coefficient on the liquidity variable, LOG_RESPRD, is negative and significant with firm Q as the dependent variable. For OIP as the dependent variable, based on two stage least squares estimation on Table 4, shows that the coefficient on the liquidity variable, LOG_RESPRD, does not significant with OIP as the dependent variable.

For OIOA as the dependent variable, based on two stage least squares estimation on Table 4, shows that the coefficient on the liquidity variable, LOG_RESPRD, is negative and significant with OIOA as the dependent variable. For LEVERAGE as the dependent variable, based on two stage least squares estimation on Table 4, shows that the coefficient on the liquidity variable, LOG_RESPRD, is negative and significant with LEVERAGE as the dependent variable.

Tabel 4 Influence of Liquidity to Firm Performance after Control Endogeneity

Two-stage least squares (2SLS) regression results for model $LOG\_RESPRD_{it} = a + b\ LOG\_RESPRD_{i,t-1} + c\ Z1_{it} + d\ DUM\_LQ45_{it} + e\ LOG\_AGE_{it} + f\ LOG\_BVTA_{it} + g\ IDIORISK_{it} + h\ CUMRET_{it} + IND_j + YR_t + error_{it}$ and $Q_{it}(OIP_{it}$ atau LEVERAGE$_{it}$ atau $OIOA_{it}) = a + b\ FIT\_LOG\_RESPR_{it} + c\ DUM\_LQ45_{it} + d\ LOG\_AGE_{it} + e\ LOG\_BVTA_{it} + f\ IDIORISK_{it} + g\ CUMRET_{it} + IND_j + YR_t + error_{it}$.

Dependent variabel	LOG_RESPRD (1)	Q (2)	OIP (3)	OIOA (4)	LEVERAGE (5)
INTERCEPT	1.359	2.219*	-0.548*	-0.098	1.576*
FIT_LOG_RESPRD		-0.298*	0.012	-0.027*	-0.098*
LOG_RESPRDt-1	0.677*				
Z1	0.044				
DUM_LQ45	-0.416*	0.535*	-0.066*	0.009	0.087*
IDIORISK	-0.897	2.759*	-0.139	-0.073	0.277
LOG_BVTA	-0.104*	-0.081*	0.227*	0.001	-0.056*
LOG_AGE	0.080	-0.012	0.002	0.002	0.011
CUMRET	-0.421	3.594*	0.231	0.414*	0.898*

* significance at 5% significance level

SUMMARY AND CONCLUSION

This study explores whether stock liquidity has positive affect with firm value in Indonesia Stock Exchange and also explores whether liquidity premium or sentiment investors causes stock liquidity has positive affect with firm value in Indonesia Stock Exchange.

Higher stock liquidity (lower relative effective spread) have higher firm value. Price-to-operating income ratio does not significantly affect stock liquidity. Positive affect between stock liquidity and firm value does not explained by liquidity premium or sentiment investor. Liquidity enhances firm performance primarily through higher operating. However, this study shows that stock with high liquidity have better firm performance, more equity in their capital structure (low financial leverage) and higher operating profitability levels.

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