Managerial Decisions, Asset Liquidity, and Stock Liquidity

Article *in* SSRN Electronic Journal · February 2009

DOI: 10.2139/ssrn.1342706

Radhakrishnan Gopalan
Washington University in St. Louis

Mikhail Pevzner
University of Baltimore

Managerial Decisions, Asset Liquidity, and Stock Liquidity

*Radhakrishnan Gopalan, Ohad Kadan, and Mikhail Pevzner**

February 2009

Abstract

We predict a positive relationship between the liquidity of the firm's assets and the liquidity of its stock. This relationship depends on market expectations regarding the deployment of the firm's liquid assets. Thus our hypothesis links stock liquidity to managerial actions that change the liquidity of the firm's assets, such as investment, financing, and payout. Consistent with our prediction, we find that after controlling for firm fixed effects, a one standard deviation increase in asset liquidity increases stock liquidity by 14.5%. The relation is stronger when the manager is less likely to convert liquid assets into illiquid assets such as for low market to book and low capital expenditure firms, during economic recessions, and when expected payout is high. Apart from linking corporate finance decisions to stock liquidity, the analysis also promotes a new rationale for several empirical regularities such as the commonality in stock liquidity, and the improvement in stock liquidity following equity issuances.

*Radhakrishnan Gopalan (gopalan@wustl.edu) and Ohad Kadan (kadan@wustl.edu) are with the Olin Business School at Washington Universtity in St. Louis. Mikhail Pevzner (mpevzner@gmu.edu) is with the School of Management at George Mason University. We thank Joel Hasbrouck for graciously providing data on stock liquidity measures and Vanderbilt University's Center for Research on Financial Markets for making available the data on bid-ask spreads. We are also grateful to Tarun Chordia, Paolo Fulghieri, Adriano Rampini, Ronnie Sadka, Mark Seasholes, and Avi Wohl and to seminar participants at Barclays Global Investors, Hong Kong University of Science and Technology, George Mason University, Nanyang Technological University, Singapore Management University, and Washington University for very helpful comments and to Engin Kose and Anirudh Jonnavitula for assistance with data collection.

1 Introduction

An asset is liquid if it can be converted into cash quickly and at a low cost.[1] This definition applies both to real assets and to financial assets. In the finance literature, the term "firm liquidity" has traditionally referred to two separate concepts. The first concept is the liquidity of the firm's real assets, according to which, a firm is liquid if it has relatively high proportions of liquid assets, such as cash, on its balance sheet. The second concept is the liquidity of the firm's traded stock, according to which a firm is liquid if its stock is liquid. While the liquidity of the firm's assets is determined in the market for real assets, stock liquidity is determined in financial markets. In this paper we draw a link between these two notions of liquidity, and highlight how investment, financing, and payout decisions of the manager affect stock liquidity. This analysis enables us to propose new explanations for several well documented empirical regularities.

Our approach is motivated by a large body of market-microstructure models suggesting that stock liquidity is affected by two important factors. The first is uncertainty regarding the valuation of the firm's assets, and the second is adverse selection and informed trading in the firm's stock. These models typically take the firm as a "black box" without specifying the determinants of valuation uncertainty or information asymmetry. In this paper we attempt to open this black box and examine how managerial actions that alter the nature of the firm's assets affect stock liquidity by changing the level of uncertainty and information asymmetry.

Our hypothesis starts from the premise that uncertainty regarding asset valuation and potential insider trading determine the liquidity of the firm's assets just as they determine the liquidity of the firm's stock. For example, highly liquid assets, such as cash and equivalents, can easily be valued and are associated with very little insider trading. By contrast, illiquid assets, such as investments and growth opportunities, are hard to evaluate and are likely to be associated with insider trading (Aboody and Lev (2000)). Since the firm's stock is a claim on the cash flows generated by the underlying assets, the liquidity of the firm's stock should reflect the liquidity of the underlying assets. Thus, we expect the liquidity of the firm's stock to be positively correlated with the liquidity of the firm's assets. This conjecture forms our first prediction.

To test this prediction, we employ four alternative measures of stock liquidity: the illiquidity measure proposed by Amihud (2002), the implicit bid-ask spread proposed by

[1] This definition dates back to Keynes (1930, p. 67) who considered one asset as more liquid than another asset "if it is more certainly realizable at short notice without loss."

Roll (1984) as estimated by Hasbrouck (2006), the effective bid-ask spread calculated from intra-day data, and a measure based on the number of days with zero returns proposed by Lesmond, Ogden, and Trzcinka (1999). While stock liquidity is determined on a daily basis, the focus of this paper is on the relation between stock liquidity and corporate level decisions, which are only announced and recorded periodically. Hence, in our tests we use annual averages of the four stock liquidity measures.

To measure asset liquidity, we sort the firm's assets based on their liquidity and assign liquidity scores between zero and one to each asset class. We then calculate a weighted liquidity score for the firm using the book value of the different assets on the firm's balance sheet as weights. We then normalize this weighted score by the lagged value of total assets of the firm. Using this approach we come up with three alternate measures of asset liquidity that vary on the liquidity scores assigned to the different assets. Our first measure of asset liquidity assigns a score of one to cash and zero to all other assets. Our second measure assigns a score of one to cash, one-half to non-cash working capital and zero to the other assets. Finally, our third measure assigns a score of one to cash, three-fourths to non-cash working capital and one-half to fixed assets. This approach to measuring asset liquidity is similar to Berger and Bouwman (2008).

We separately test for both time-series and cross-sectional correlation between asset liquidity and stock liquidity. We use a panel data of all Compustat firms during the time period 1962-2006. In our main tests, we employ a model with time and firm fixed effects to understand how time-series changes in asset liquidity are related to time-series changes in stock liquidity for a particular firm. Our results indicate that after controlling for known determinants of stock liquidity, there is a positive, robust, and economically significant correlation between the alternative measures of asset liquidity and those of stock liquidity. For example, using our first measure of asset liquidity, for a firm with median level of stock liquidity, one standard deviation change in asset liquidity results in a 14.5% change in Amihud's illiquidity measure.

To measure the extent of cross-sectional correlation between asset liquidity and stock liquidity, in a second set of tests, we adopt the Fama-Macbeth approach and conduct annual regressions of stock liquidity on asset liquidity, and test for significance of the average coefficients. We correct for autocorrelation in the coefficient estimates using the procedure in Fama and French (2002). Consistent with our hypothesis we find strong positive correlation between asset liquidity and stock liquidity in the cross-section as well.

A firm's assets are not static but are constantly modified by managerial decisions. Since the firm's stock is a claim on the future cash flows generated from the firm's assets, the relationship between asset liquidity and stock liquidity should depend on the market's expectations regarding managerial decisions. We term this "*Deployment Uncertainty.*" If a manager is expected to transform liquid assets such as cash into illiquid assets such as investments, then deployment uncertainty is high. In this case, despite the relative liquidity of the *existing* assets, uncertainty regarding valuation of the firm's future assets and potential for informed trading are both likely to be high. Hence the relation between asset liquidity and stock liquidity is expected to be weaker. If, on the other hand, a manager is expected to return cash to the shareholders, then deployment uncertainty is low, and the relation between asset liquidity and stock liquidity is expected to be stronger. This rationale leads to a number of empirical predictions linking investment, financing, and payout decisions to stock liquidity.

First, the relation between asset liquidity and stock liquidity is likely to be weaker for growth firms and firms with higher capital expenditures. Since these firms are more likely to convert liquid assets such as cash into illiquid investments, deployment uncertainty will be high for these firms. By contrast, the relation between asset liquidity and stock liquidity is likely to be stronger for firms with higher payout ratios. Additionally, as asset redeployment is less likely for firms in financial distress, we expect such firms to exhibit a stronger relation between asset liquidity and stock liquidity. Using market to book ratio to identify growth firms, we find that the relationship between asset liquidity and stock liquidity is indeed weaker for firms with higher market to book ratios. Consistent with our other predictions, we also find that the relationship between asset and stock liquidity is weaker for firms with higher capital expenditure, and for firms with lower payout ratios and lower default likelihood.

Since firm investments are more likely when the economy is doing well and less likely in economic downturns, the relation between asset liquidity and stock liquidity is expected to be stronger during economic slowdowns, and weaker during expansions. Our empirical results confirm this prediction. Furthermore, our results also highlight one reason for co-movement in stock liquidity. The commonality and non-diversifiability of stock-liquidity have been pointed out in several prior studies.[2] Our analysis uncovers an interesting potential explanation for these results: systematic variation in investment opportunities related to macroeconomic conditions are not only likely to affect the proportion of cash that firms retain but also how the firms use the cash. Both of these in turn will affect valuation

[2] See Chordia, Roll, and Subrahmanyam (2000), Huberman and Halka (2001), Hasbrouck and Seppi (2002), Pastor and Stambaugh (2003), Acharya and Pedersen (2005), Sadka (2006), and Korajczyk and Sadka, (2007).

uncertainty and potential insider trading in stocks and hence stock liquidity.

To further explore how the relationship between asset liquidity and stock liquidity relates to firm financing decisions, we carry out an event study around seasoned equity offerings (SEOs). Masulis, Eckbo, and Norli (2000) document an increase in stock liquidity following an SEO. An SEO leads to an immediate inflow of cash and an increase in asset liquidity. Hence the increase in stock liquidity following the SEO is consistent with our hypothesis. Furthermore, the extent to which stock liquidity improves is likely to depend on the extent of deployment uncertainty. If the firm uses the cash for investments, then the improvement in stock liquidity is likely to be lower than if the firm retains the cash. Consistent with this prediction we find that stock liquidity in the post-SEO period is positively related to the fraction of the SEO proceeds the firm retains as cash at the end of the year. This offers strong support for our hypothesis.

In the final set of tests, we estimate how the relationship between asset liquidity and stock liquidity varies with the extent of information available to investors about the assets of the firm. If according to our hypothesis, asset liquidity is related to stock liquidity because it reduces the level of uncertainty and information asymmetry with respect to the valuation of the firm's assets, then this effect is likely to be stronger for the sub-set of firms with a high level of ex ante uncertainty and information asymmetry. We use firm size, presence of bond ratings, and the number of analysts following the firm to identify the extent of ex ante uncertainty and information asymmetry surrounding the firm. Consistent with our prediction we find that the relationship between asset liquidity and stock liquidity is stronger for smaller firms, firms without credit rating, and for firms with a lower level of analyst following.

This paper makes a number of contributions. Our results uncover a hitherto unexplored and an economically significant determinant of stock liquidity, namely the liquidity of the firm's underlying assets. The link between asset liquidity and stock liquidity that we uncover helps highlight how managerial investment, financing, and payout decisions, that constantly transform firm's assets can have a significant impact on the liquidity of the firm's stock. Thus our paper establishes an important link between the corporate finance and market microstructure literatures.[3]

Understanding this link is important to evaluate different managerial actions. For example, the effect of high cash balances in improving stock liquidity is an hitherto unknown

[3] A recent line of literature relates stock liquidity to the funding liquidity of traders in the stock (see Brunnermeier and Pedersen, 2008). Unlike this literature's focus on relating the asset structure of traders to stock liquidity, our focus is on relating the asset structure of the firm to the liquidity of its stock.

benefit of cash. The link between asset and stock liquidity also helps us understand some documented empirical regularities. For example, our hypothesis offers a rational explanation for the documented stock under-performance following corporate events that result in cash infusions such as SEOs and IPOs. The improvement in stock liquidity following the cash infusion– as highlighted by our results– is likely to reduce the liquidity risk premium for the stock which in turn is likely to reflect as stock under-performance based on the ex ante risk characteristics. Our hypothesis also helps explain how the under-performance is likely to vary in the cross section. Furthermore, the link between cash balance and stock liquidity may go some way towards explaining the secular increase in both stock liquidity and the level of cash balances that has been documented in the recent years (Chordia, Roll, and Subrahmanyam (2007) and Foley et, al. (2007)). Finally, our results also offer a potential explanation for commonality and non-diversifiability of stock liquidity, namely systematic variation in firms' asset structures stemming from changes in macroeconomic conditions.

The rest of the paper is organized as follows. In the next section, we outline our hypotheses and derive the main empirical predictions. Section 3 describes our data, and our measures of stock and asset liquidity. Section 4 discusses our main empirical results while Section 5 concludes.

2 Hypotheses

Liquidity is an important characteristic of an asset and refers to the cost and time involved in converting the asset into cash. A major focus of the market microstructure literature is towards understanding the determinants and characteristics of stock liquidity. Adding further importance to this focus is the evidence that stock liquidity is a determinant of stock returns.

A large body of theoretical work suggests that stock liquidity is driven by two important factors. The first is uncertainty regarding the valuation of the firm's assets, and the second is adverse selection and informed trading in the firm's stock. The importance of valuation uncertainty in determining stock liquidity was originally studied in Stoll (1978), Ho and Stoll (1981, 1983), and O'Hara and Oldfield (1986). These papers build on the risk-aversion of dealers and market-makers who carry inventories of stock. The bid-ask spread compensates the dealers for holding inventories of a risky asset.[4] The effect of adverse selection and informed trading on stock liquidity was developed in Copeland and Galai (1983), Glosten

[4]This relation is not limited to markets with market makers and dealers. For example, Foucault (1999) argues that uncertainty about valuation affects liquidity also in pure limit order markets.

and Milgrom (1985), Kyle (1985), and Easley and O'Hara (1987, 1992), among others. In those papers, the potential for information-based trading by insiders results in lower market liquidity due to the information disadvantage of market-makers. All of these papers treat the firm as a "black box" without specifying the determinants of uncertainty or information asymmetry. Our objective is to open the black box.

Our hypothesis starts from the recognition that the firm's assets vary in the extent of uncertainty regarding valuation and in the potential for insider trading. For example, assets such as cash and equivalents can easily be valued and are associated with very little insider trading and hence are highly liquid. By contrast, investments and growth opportunities are hard to evaluate, are likely to be associated with insider trading (Aboody and Lev (2000)), and hence are illiquid. Since the firm's stock is a claim to the cash flows generated from the underlying real assets we predict that:

P1. The liquidity of the firm's stock should be positively related to the liquidity of the firm's assets.

A firm's assets are constantly modified by managerial actions. Hence the relationship between stock liquidity and the underlying asset liquidity should depend on the market's expectations regarding managerial actions. To see this, consider the example of a firm that raises cash in an IPO/SEO. The cash infusion is likely to result in high cash balances relative to total assets and hence the firm is likely to have high asset liquidity. However, if the manager is expected to invest the cash in projects and growth opportunities – which are inherently illiquid – then despite the high asset liquidity, there is likely to be a lot of uncertainty regarding future value, and informed trading in the stock is likely to be high. Consequently, the relation between the current level of asset liquidity and stock liquidity is likely to be weak.

This example demonstrates that the relation between asset liquidity and stock liquidity depends on the market's expectations regarding the deployment of the existing assets of the firm. We term this "*Deployment Uncertainty.*" If the manager is expected to transform liquid assets such as cash into illiquid assets such as investments, then asset deployment uncertainty is high. In this case, despite the relative liquidity of the *existing* assets, uncertainty regarding valuation of the firm's future assets and potential for informed trading are likely to be higher. Hence the relation between asset liquidity and stock liquidity is expected to be weaker. We expect deployment uncertainty to be high for growth firms and firms undertaking high capital expenditure. This rationale leads to the following prediction:

P2. The relation between asset liquidity and stock liquidity will be weaker for growth firms and firms with higher capital expenditures.

Firm level investments are also related to macroeconomic conditions. Investments and growth opportunities are more likely when the economy is doing well and are less likely in economic downturns. It follows that deployment uncertainty is likely to be higher when the economy is doing well. Hence we predict:

P3. The relation between asset liquidity and stock liquidity will be stronger during recessions as compared to during expansions.

On the other hand, if the manager is expected to return cash to the shareholders, then deployment uncertainty is low and the relation between asset liquidity and stock liquidity is expected to be stronger. This implies:

P4. The relation between asset liquidity and stock liquidity will be stronger for firms with high payout ratios.

Firms in financial distress are less likely to pursue investment opportunities and redeploy their assets. In fact, in the extreme case of asset liquidation, the relation between asset liquidity and stock liquidity should be the strongest as in this case the two kinds of liquidity are basically identical. As long as the firm is not expected to be liquidated with certainty, the relation between asset liquidity and stock liquidity is not one-to-one. Nevertheless, deployment uncertainty is likely to decline as the likelihood of liquidation increases.[5] We therefore predict:

P5. The relation between asset liquidity and stock liquidity will be stronger for firms with high default likelihood.

Financing decisions also influence asset liquidity and consequently stock liquidity. Any capital infusion will immediately increase the amount of cash in the balance sheet and this is likely to increase stock liquidity. The extent to which stock liquidity improves will depend on the utilization of the cash infusion, and hence on the level of deployment uncertainty. This leads us to the following two predictions:

[5] An alternate view emphasizes agency conflicts when firms are in financial distress, and argues that asset liquidity may give managers of such firms greater discretion. Managers may be able to sustain inefficient operations by liquidating the assets (see DeAngelo, DeAngelo, and Wruck (2002)). This view would predict an increase in deployment uncertainty for firms in financial distress and hence a weaker relationship between asset liquidity and stock liquidity. Our empirical tests try to distinguish this view from the one described in the text.

P6a. Stock liquidity will improve following firm financing.

P6b. The improvement in stock liquidity following financing will depend on the extent to which the proceeds are retained as cash.

Note that stock liquidity may improve following firm financing due to the increased disclosure that accompanies such financing. Prediction *P6b.* helps distinguish our hypothesis from this alternative. It highlights that stock liquidity will improve more when the firm, instead of investing, retains a larger fraction of the offering as cash on its balance sheet. The alternative hypothesis does not have any equivalent prediction because firm disclosure policies are not expected to vary with the firm's ex post utilization of the financing proceeds.

Finally, if asset liquidity is related to stock liquidity due to a reduction in the extent of uncertainty and information asymmetry regarding asset valuation, then this effect should be stronger for the sub-set of firms with a high level of uncertainty and information asymmetry about valuation. Small firms, firms without credit rating, and firms with lower number of analyst following are likely to suffer from greater degree of uncertainty and information asymmetry. Hence, we expect that

P7. The relation between asset liquidity and stock liquidity will be stronger for small firms, firms without credit ratings, and firms with lower analyst coverage.

We now describe the data we use to test these predictions.

3 Data and Liquidity Measures

To test our predictions we construct a sample that spans 1964-2006. Our analysis focuses on annual firm level data for non financial firms. We obtain data for two measures of stock liquidity from Joel Hasbrouck's website. We use TAQ data to construct one of our stock liquidity measures. We complement these data with daily stock returns and trading volume from CRSP and annual firm financial data from Compustat. Finally, we use the SDC database to identify SEOs, and IBES database to measure the extent of analyst following. Apart from availability of liquidity measures and financial information in Compustat, we also limit our sample to firms with book value of assets higher than $5 million and with a minimum of two years of financial data. These restrictions ensure that very small firms do not disproportionately influence our results.

In our empirical tests we are broadly interested in examining how the liquidity of the firm's assets affects the liquidity of its stock, and how this relation varies with managerial actions. We use four popular measures of stock liquidity. The first one is the illiquidity measure proposed by Amihud (2002). Since the raw Amihud measure is highly skewed, we use the square root version of the raw measure in our empirical analysis. For every stock in our sample and for every year it is calculated as:

$$Illiq_{i,t} = \frac{1}{N_{i,t}} \sum_{j=1}^{N_{i,t}} \sqrt{\frac{|R_{i,j}|}{Vol_{i,j} \cdot P_{i,j-1}}}$$

where $N_{i,t}$ is the number of trading days for stock i during year t, $R_{i,j}$ is the return on day j, $Vol_{i,j}$ is trading volume in millions of shares, and $P_{i,j-1}$ is the closing stock price. *Illiq* is a price impact measure and captures the stock return per one million dollars of trading volume along the lines of Kyle's (1985) 'lambda'. We obtain the annual average *Illiq* measure for all the stocks in our sample from Hasbrouck's website.

Our second measure of stock liquidity is the implicit bid-ask spread, s, first proposed in Roll (1984). This measure is calculated as the square root of the negative daily autocorrelation of individual stock returns. i.e.

$$s_{i,t} = \sqrt{-Cov(R_{i,j}, R_{i,j-1})},$$

and should correspond to one half of the bid-ask spread. Since the autocorrelation of stock returns is often positive, this measure is not well defined in many cases. To overcome this problem, Hasbrouck (2005) introduced a Gibbs sampler estimate which imposes a negative prior on the autocorrelation. We use this modified version for our empirical analysis. We obtain data on this measure as well from Joel Hasbrouck's website.

Our third measure of stock liquidity is the annual average effective bid-ask spread, *Spread*, calculated from intra-day TAQ data. The bid and ask prices are identified from the intra-day transaction data using the Lee and Ready (1991) algorithm. The effective bid-ask spread for any trade is equal to the ratio of the absolute difference between the trade price and the mid-point of the associated quote to the trade-price. The effective spread is then averaged over the year to obtain *Spread*. This data on the average effective spread was obtained from the web site of the University of Vanderbilt's Center for Research on Financial Markets and is available to us only for the sub-period 1994-2006.

Our final measure of stock liquidity is the proportion of days in a year in which the stock has zero returns, *Zero Ret*. This measure was first proposed by Lesmond, Ogden, and Trzcinka (1999). The rationale is that illiquid stocks are likely to be traded infrequently.

We calculate this measure at annual frequencies using daily stock returns from CRSP.

The main independent variable is a measure of asset liquidity. We assign liquidity scores between zero and one to the assets on the balance sheet based on their level of liquidity. We then calculate a weighted asset liquidity score using the book value of the different assets as weights and normalize using the lagged value of total assets. Using this approach we come up with three alternate measures of asset liquidity. These measures differ in terms of the liquidity score assigned to the balance sheet items. This approach to measuring asset liquidity is similar to Berger and Bouwman (2008).

Our first measure of asset liquidity assigns a liquidity score of one to cash and equivalents and a score of zero to all other assets of the firm. Formally, our first *Weighted Asset Liquidity* (*WAL*) measure for firm i in year t is given by

$$\text{WAL-1}_{i,t} = \frac{\text{Cash \& Equivalents}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 1 + \frac{\text{Other Assets}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 0.$$

Thus, effectively, *WAL-1* is just the proportion of cash and equivalents to the firm's lagged total assets. Clearly, this measure leaves out a lot of information about the liquidity of assets, as it presumes that all assets other than cash and equivalents are perfectly illiquid. Nevertheless, this measure is useful because several of our hypotheses regarding deployment uncertainty can most easily be stated in terms of converting cash into illiquid assets.

While cash and equivalents are perfectly liquid, non-cash current assets (CA) are semi-liquid. That is, they can be converted to cash relatively quickly and at a low cost. Thus, for our second measure of asset liquidity we assign non-cash current assets a liquidity score of one-half. Our second *WAL* measure is,

$$\text{WAL-2}_{i,t} = \frac{\text{Cash \& Equivalents}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 1 + \frac{\text{Non Cash CA}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 0.5 + \frac{\text{Other Assets}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 0.$$

Non-current assets can broadly be divided into tangible and non-tangible assets with tangible assets such as property, plant, and equipment being more liquid than non-tangible assets such as growth opportunities and goodwill. Following this logic we calculate our third measure with a liquidity score of one for cash, three-quarters for non-cash current assets, one half for tangible fixed assets, and zero for the rest. We calculate tangible fixed assets as the difference between the book value of total assets and the sum of current assets, and book value of goodwill and intangibles.[6] This gives rise to our third *WAL* measure,

$$\text{WAL-3}_{i,t} = \frac{\text{Cash \& Equivalents}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 1 + \frac{\text{Non Cash CA}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 0.75 + \frac{\text{Tangible Fixed Assets}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 0.5 + \frac{\text{Other Assets}_{i,t}}{\text{Total Assets}_{i,t-1}} \times 0.$$

We use additional independent variables to account for firm and market characteristics that are likely to affect stock liquidity. We control for firm size, which is an important determinant of stock liquidity using the log of the market capitalization of the firm's stock, *Log(Mkt. Cap.)*. We also control for the extent of growth opportunities using the ratio of market value of equity to the book value of equity, *Market to Book*, and using the ratio of capital expenditures to total assets, *Capital Expenditure*. We also control for firm performance using return on assets, *ROA*– which is the ratio of operating income to lagged value of total assets– and using the annual buy and hold abnormal return during the previous year, *BHAR*. We measure abnormal return as the difference between the return on the firm's stock and the return on the value weighted portfolio of all stocks traded in the NYSE, Amex, and Nasdaq. Firms with more transparent earnings and firms with better disclosure policies are also likely to be associated with higher liquidity (Diamond and Verrecchia (1991), Bhattacharya, Desai, and Venkataraman (2007)). In most of our specifications we employ firm fixed effects and this is likely to control for most of the variation across firms in the disclosure policies. In addition, we also control for the quality of a firm's earnings using the level of discretionary accruals normalized by lagged value of total assets. We calculate this measure following the procedure outlined in Jones (1991) modified by including controls for earnings performance as proposed in Kothari, Leone, and Wasley (2005).[7] Finally, we control for stock return volatility, *Volatility*. We measure stock volatility as the standard deviation of monthly stock returns during the sixty months preceding the current year.

We also use the control variables to identify managerial actions and policies, which we then use to test our predictions on how the relation between asset liquidity and stock liquidity is likely to vary in the cross-section. For example, we use *Market to Book* and *Capital Expenditures* to identify growth firms and firms undertaking capital expenditures respectively. Another important variable that plays a role in our analysis is the likelihood that the firm goes bankrupt. We proxy for this using a modified version of the Merton-KMV expected default probability as outlined in Bharath and Shumway (2008).

Table I presents summary statistics for the key variables in our sample. To reduce the

[6] We obtain book values of goodwill and intangibles from Data204 and Data33 in Compustat.

[7] The reported results used the signed discretionary accruals. The results are similar when using the absolute value of the discretionary accruals instead (not reported).

effects of outliers, all our variables are winsorized at the 1% level. The median value of *Illiq* in our sample is 0.321. Average Roll's estimate of the half spread is about 1% implying an average relative spread during the entire sample period of approximately 2%. Consistent with this, the average effective half spread as estimated from the TAQ data, *Spread* in our sample is about 0.9%. Recall that this measure is estimated only during the sub-period 1994-2006. The average probability of zero-return in the sample is 17.6%.

The mean value of *WAL-1* is 0.153. That is, for firms in our sample book value of cash constitutes about 15% of the value of previous year's total assets. The mean value of *WAL-2* is 0.377, whereas the mean value of the *WAL-3* is 0.682. Note that the maximum value of all three of our weighted asset liquidity measures is greater than one because we normalize the weighted liquidity score by lagged total assets and not contemporaneous total assets. We do this to avoid spurious correlation between contemporaneous total assets and stock liquidity. The average market capitalization of equity in our sample is $1476.6 million, whereas the median is $113.6 million. Since market capitalization is highly skewed, we use the logarithm of market capitalization in all our analysis. The average market to book ratio of equity in our sample of 2.53 is comparable to other studies. The average expected default probability of our sample firms is 6% while the 90^{th} percentile is 21.3% (Not reported in the table). This ensures that there is sufficient variation in default probability in our sample. Firms in our sample have an average return on assets of 12.1%, and experience an average annual buy and hold abnormal return of 5.1%. The average abnormal return is positive because our sample requirements of minimum book value of total assets of $5 million, and availability of more than two years of data tilts our sample towards the better performing firms. This is unlikely to bias our results because one of the reasons for stipulating minimum size requirements is to ensure that the very small firms do not drive our results. About 17% of firms in our sample have short term credit rating from S&P while the average number of analysts following firms in our sample is 7.8.

[Table I goes here]

Table II presents the correlations among the key variables in our analysis. As expected, the four measures of stock liquidity are highly correlated with each other. The measures of asset liquidity are also highly correlated. Unconditionally, while *WAL-1* is uniformly negatively correlated with the four measures of stock illiquidity, the pattern with the other two measures of asset liquidity is mixed. Note that these are both time series and cross-sectional correlations. In our tests we try to separately estimate the time series and cross-sectional correlations after controlling for known determinants of stock liquidity and find that all three measures of asset liquidity are uniformly negatively correlated with the stock illiquidity measures. Many of our control variables also are significantly correlated with the stock illiquidity measures, justifying the need to include them in the regressions.

[Table II goes here]

4 Empirical Results

4.1 The Basic Effect

We begin our empirical analysis by testing whether on average there is a positive relation between asset liquidity and stock liquidity (Prediction P1). We estimate panel models with both firm fixed effects and time effects as follows:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \gamma Controls_{i,t} + \mu_i + \mu_t + \epsilon_{i,t}. \quad (1)$$

Here $Y_{i,t}$ is one of the four measures of stock liquidity for firm i during year t, $X_{i,t}$ is one of the three asset liquidity measures, μ_i are firm fixed-effects, and μ_t are year dummies. The control variables are *Log(Mkt. Cap.)*, *Capital Expenditure*, *Market to Book*, *ROA*, *BHAR*, *Volatility*, and *Discretionary Accruals*. We use robust standard errors clustered at the firm level.[8]

The use of firm fixed effects eliminates the cross-sectional variation in the data. Thus, the model in (1) examines how changes in asset liquidity over time at the firm level are associated with changes in stock liquidity. Table III reports the results for all twelve different combinations of measures of stock liquidity and asset liquidity. Since all four measures of stock liquidity are, in fact measures of stock illiquidity, the expected sign of β is negative.

In Panel A the dependent variable is either *Illiq* or *s*. Columns (1)-(3) have *Illiq* as the dependent variable and correspond to the three different measures of asset liquidity: *WAL-1*, *WAL-2*, and *WAL-3*. The coefficients on *all* three different measures are significant and have the expected negative sign. Furthermore, the results are economically significant. For example, for a firm with a median level of stock liquidity, a one standard deviation increase in *WAL-1* reduces *Illiq* by 14.5%. Similarly, one standard deviation increase in

[8] Since stock liquidity is correlated across stocks at a point in time, in alternate empirical specifications, we repeat our tests clustering standard errors at the year level and obtain results similar to the ones reported. Alternatively, we also tried clustering standard errors both at the firm and year level, but given the large number of fixed effects in our specifications, the estimates failed to converge.

WAL-3 reduces *Illiq* by 15.9% for a firm with a median level of stock illiquidity. Note that the R^2 in all our regressions are high because of the use of firm fixed effects.

All our control variables are significant and have coefficients along expected lines: Smaller firms and firms with high market to book ratios have less liquid stock. Additionally, firms that do not undertake large capital expenditure, firms with low levels of profitability and abnormal stock returns have illiquid stocks.

In Columns (4)-(6) we repeat our estimation with Roll's measure as the dependent variable and obtain results consistent with those in the earlier columns. Here again we find that an increase in the proportion of liquid assets in the firm's balance sheet increase stock liquidity. The results are also economically significant. For example, the estimate in Column (4) indicates that for a firm with median level of stock liquidity, a one standard deviation increase in *WAL-1* improves liquidity by 9%, while the estimate in Column (6) indicates that a one standard deviation increase in *WAL-3* improves liquidity by 11%. In Panel B we repeat the estimation using the *Spread* and *Zero Ret* as the dependent variables. The results are similar to the ones in the previous panel.

[Table III goes here]

Our results so far highlight a strong positive relationship between asset liquidity and stock liquidity. Since we employ firm fixed effects in all our specifications, the correlations that we document are between time series changes in asset liquidity and stock liquidity. Our hypothesis also predicts that, ceteris paribus, there should be a positive correlation between asset liquidity and stock liquidity in the cross-section. To highlight this correlation, in Table IV, we employ the Fama-Macbeth approach. We conduct annual cross-sectional regressions of stock liquidity on measures of asset liquidity and the full set of control variables, and report the average coefficients along with the standard errors. Since stock liquidity is quite persistent, we adjust for autocorrelation by correcting the reported standard errors. To do this, we follow Fama and French (2002) and Cooper, Gulen, and Schill (2008), and multiply the standard errors of the average parameters by $\sqrt{\frac{1+\rho}{1-\rho}}$, where ρ is the first-order autocorrelation in yearly parameter estimates. To conserve space we suppress the coefficients of the control variables other than *Log(Market Cap)*. The results in Panel A and B of Table IV confirm the positive correlation between asset liquidity and stock liquidity in the cross-section. The coefficient estimates are in most cases larger than the ones in Table III.

[Table IV goes here]

The positive correlation between asset liquidity and stock liquidity that we highlight is likely to be present not only for public firms, but also for other asset classes such as closed-end mutual funds.[9] While, testing our hypothesis in the context of closed-end funds is likely to highlight its general applicability, the difficulty in measuring asset liquidity of closed-end funds makes such a test challenging. Since funds invest in both public and private securities, categorizing the liquidity of fund holdings is not straightforward. Also, measuring the liquidity of individual holdings is involved. Notwithstanding this caveat, we test our hypothesis in the context of closed end funds using fund holdings obtained from the N-Q statements from the SEC EDGAR database. We construct measures of asset liquidity using the fund holdings categorized along broad heads such as stock and bonds. We also construct Amihud's measure of stock liquidity (*Illiq*) for the fund using daily price, return and volume data. Using a model similar to (1) we find that measures of asset liquidity are positively correlated with stock liquidity for closed-end funds. We do not report the details to conserve space. Details are available upon request.

In summary, our first prediction appears to be supported by the data. Asset liquidity and stock liquidity are positively correlated, both across time and in the cross-section. The magnitude of the effect is also large.

4.2 Managerial Decisions and the Link Between Asset Liquidity and Stock Liquidity

Having established the average link between asset liquidity and stock liquidity, we turn now to identifying how this link depends on firm characteristics. This analysis allows us to connect managerial decisions to the liquidity of their company's stock. Specifically, in this section we test Predictions P2-P6. The driving force behind these predictions is the investors' expectations regarding the likelihood that the manager will convert liquid assets such as cash into illiquid assets such as investments. Our empirical approach here is to utilize cross-sectional variations in this likelihood.

Prediction P2 indicates that the relationship between asset liquidity and stock liquidity should be weaker for growth firms and firms that undertake large capital expenditure. We test this prediction in Table V. In Panel A, we use market-to-book ratios to identify growth firms. Firms with high market-to-book ratios typically posses significant investment opportunities and hence are expected to convert cash into investments. We divide our sample into firms with above and below median market-to-book ratios in each year and

[9] We thank Tarun Chordia for suggesting this.

repeat our tests in the two sub-samples. To conserve space, we only report the results for Amihud's stock illiquidity measure. Similar results obtain for the other three stock liquidity measures.

The results in Column (1) and (2) indicate that *WAL-1* has a greater impact on stock liquidity for firms with low (below median) market to book ratios (-.316) in comparison to firms with above median market to book ratios (-.176). The row titled Δ *Coef* shows that the coefficients across the two sub-samples are significantly different from each other. Note that asset liquidity has almost twice the impact on stock liquidity for value firms as compared to growth firms. Qualitatively similar differences obtain from comparing Columns (3) to (4) and (5) to (6).

In Panel B of Table V we repeat the analysis using the firm's capital expenditure to proxy for investors' expectations regarding future deployment of cash and liquid assets. Firms with a high level of capital expenditure (above median) are expected to convert cash into investment and thereby possess a relatively high level of deployment uncertainty. We expect asset liquidity to have a weaker effect on stock liquidity for such firms. Consistent with our prediction, the results in Column (1) and (2) of Panel B shows that *WAL-1* has a greater impact on stock liquidity for firms with low capital expenditure. From Δ *Coef.* we find that the coefficients are significantly different from each other across the two sub-samples. In Columns (3)-(6) we repeat our estimates successively with *WAL-2* and *WAL-3*. The results again show a stronger effect of asset liquidity on stock liquidity for firms with low capital expenditures.

In Panel C of Table V we test Prediction P3, that indicates a stronger relationship between asset liquidity and stock liquidity during economic downturns. This follows from the fact that firm investments are more likely during periods of expansion as compared to periods of recession and hence deployment uncertainty is more pronounced during expansions. We test this prediction by dividing our sample into periods of recessions and expansions. Following the classification in the NBER website, we define the years 1969-70, 1974-75, 1981-82, 1990-91 and 2001 as recessionary periods. The other years are classified as expansionary. The results in Column (1) and (2) shows that *WAL-1* has a greater impact on stock liquidity during recessions as compared to during expansions. We also find that the estimates in the two columns are significantly different from each other at less than ten percent significance level. In Columns (3)-(4) we repeat our estimates using *WAL-2* obtaining similar results. In Columns (5)-(6) we use *WAL-3* as a measure of asset liquidity and also find that asset liquidity improves stock liquidity more during recessions.

When the firm is likely to return cash to shareholders, uncertainty regarding the deployment of the cash is low, resulting in a stronger link between asset liquidity and stock liquidity. In Panel D of Table V we test this prediction (P4) by repeating our estimation on sub-samples of firm-years identified based on the level of payout to shareholders. We measure total payout to shareholders as the sum of dividends and share repurchases. We then classify our sample into firm-years with positive payout and those with zero payout and repeat the estimation in the two sub-samples. We expect asset liquidity to have a greater impact on stock liquidity for firms with positive payout ratios. Consistent with this prediction the results in Column (1) and (2) of Panel D show that *WAL-1* has a greater impact on stock liquidity for firms with positive payout ratios although the coefficients are not different from each other at conventional levels of statistical significant. In Columns (3) and (4) we repeat the estimates using *WAL-2* and find that asset liquidity has a significantly greater impact on stock liquidity for firms with positive payout ratios as compared to firms with zero payout ratios. In Columns (5) and (6), when we use *WAL-3* as a measure of asset liquidity, while asset liquidity does have a greater effect on stock liquidity for firms with positive payout, the difference between payers and non-payers is not statistically significant.

Firms in financial distress are less likely to undertake new investment projects and redeploy their assets. Hence, such firms have a lower level of deployment uncertainty. This gives rise to Prediction P5, which suggests that the relation between asset liquidity and stock liquidity will be stronger for firms in distress. We test this prediction in Panel E of Table V. We use the Merton-KMV measure as a proxy for financial distress. We estimate this measure using a methodology similar to that in Bharath and Shumway (2008). We distinguish between firms whose expected default probability is above/below the sample median. The results in Columns (1) and (2) of Panel E show that *WAL-1* has almost twice the effect on stock liquidity for firms with high default probability in comparison to firms with low default probability (-.279 in comparison to -.154). We also find that the coefficients are statistically different from each other. In Columns (3)-(6) we repeat our estimates successively using *WAL-2* and *WAL-3* and find that in both cases asset liquidity improves stock liquidity more for firms that are closer to default.

[Table V goes here]

Overall, the results in Table V show that cross-sectional variations in the level of deployment uncertainty result in appropriate variations in the link between asset liquidity and stock liquidity. In particular, the link is stronger for firms that are not expected to transform liquid assets into illiquid ones: low market to book and low capital expenditure firms, in periods of economic slowdown, high payout firms, and financially distressed firms.

Our next analysis focuses on financing decisions. We test Prediction P6a which suggests that stock liquidity should improve following firm financing since the liquidity of the firm's assets is improved. Furthermore, Prediction P6b suggests that the improvement in stock liquidity should be greater if the firm retains a larger fraction of the issue proceeds as cash. We focus on seasoned equity offerings (SEOs), and relate the stock liquidity in the post issue period to the fraction of issue proceeds that the firm retains as cash.

We first identify a sample of SEOs from SDC with issue date during the period 1970-2006 and that have non-missing and positive values for number of primary shares offered, issue proceeds, and issue price. We also confine the sample to SEOs with a minimum size of $10 million. We combine the SEO data with CRSP and COMPUSTAT to obtain stock price information during the pre- and post-issue period and firm financial data. This procedure results in a sample of 5756 SEOs. The summary statistics for the key variables for this SEO sample is provided in Panel A of Table VI. The average size of the issue in our sample is $117.8 million and this constitutes about 31% of the book value of total assets as of the end of the previous year. This indicates that the average SEO is large in comparison to firm size. We use daily stock return data to calculate *Illiq* during the pre- and post-issue period. $Illiq_{-30,0}$ ($Illiq_{-60,0}$) is Amihud's illiquidity measure estimated during the thirty days (sixty days) prior to the SEO while $Illiq_{15,45}$ ($Illiq_{15,75}$) represents a similar measure estimated during the thirty days (sixty days) following the SEO. In calculating the illiquidity measures, we ignore the fifteen day period immediately following the SEO so as to ensure that our measures are not contaminated by abnormal trading immediately following the SEO. As can be seen, stock liquidity significantly improves after the SEO. This can be seen by noting that in Panel A $Illiq_{15,45}$ and $Illiq_{15,75}$ are smaller in comparison to $Illiq_{-30,0}$ and $Illiq_{-60,0}$ respectively. This result is consistent with the finding in Masulis, Eckbo, and Norli (2000) and it offers preliminary evidence consistent with Prediction 6a. *Fraction Retained* is the ratio of the difference in cash balance between the end of the financial year immediately following and immediately before the SEO to the total SEO proceeds. We use this as a measure of the amount of the SEO proceeds that the firm retains as cash by the end of the year. We find that firms on average retain about 42% of the SEO proceeds as cash by the end of the year of the SEO. We now proceed to tests that relate the stock liquidity in the post-issue period to the fraction of the SEO proceeds that the firm retains as cash.

We use a model similar to (1) to estimate how the liquidity in the post-SEO period is related to the fraction of the SEO proceeds that the firm retains as cash. Since our analysis here is cross-sectional, we do not employ firm fixed effects in this estimation. Our main dependent variable for this analysis is either $Illiq_{15,45}$ or $Illiq_{15,75}$, while the main independent variable is *Fraction Retained*. Prediction 6b indicates that the stock liquidity during the post-issue period should be positively related to *Fraction Retained*. We control this regression for the stock liquidity in the pre-issue period, *Market to Book*, *Log(Mkt. Cap)*, and *ROA*.

In Column (1) of Panel B we have $Illiq_{15,45}$ as the dependent variable and our results show that the stock liquidity in the post-issue period is positively related to the fraction of the issue proceeds that the firm retains as cash. In Column (2) we repeat our estimation with $Illiq_{15,75}$ as our dependent variable and obtain similar results. In Column (3) we repeat our estimation after dropping the SEOs that happen within a period of two months before the year end. We do this to avoid any overlap between the time period used to calculate the post-issue illiquidity measures and the date we use to calculate the cash balance. This test is consistent with the notion that stock liquidity in the post-issue period reacts to the amount of cash that the firm is *expected* to retain by the end of the year.

The results in all the specifications show that the stock liquidity in the post issue period depends on the fraction of the issue proceeds that the firm retains as cash. In Column (4) we repeat our estimation after including an interaction term *Fraction Retained*Proceeds/*TA_{t-1} to see if the stock liquidity in the post-issue period is higher for firms that conduct a larger SEO in comparison to firm size and that retain a larger fraction of the issue. The results indicate that it is indeed the case. Note that in these regressions, we do control for the size of the SEO.

[Table VI goes here]

In sum, the results in this section show how investment, payout and financing decisions interact with the relation between asset liquidity and stock liquidity. Expectations regarding the deployment of the firm's assets play a major role in the analysis. Higher deployment uncertainty is associated with a weaker link between asset liquidity and stock liquidity.

4.3 Overall Uncertainty and the Relation Between Asset Liquidity and Stock Liquidity

An increase in the liquidity of the firm's assets is likely to improve stock liquidity when the overall level of uncertainty regarding the valuation of the assets is high. This is the basis for Prediction P7, which suggests that the relation between asset liquidity and stock liquidity is stronger in small firms, firms without credit ratings, and firms covered by fewer analysts.

We test this prediction in Table VII. In Panel A we distinguish between firms with above and below median market capitalization of equity, and repeat our basic analysis for the two sub-samples. Small firms are likely to have higher overall level of uncertainty regarding valuation. The results indicate that an increase in asset liquidity has a much greater impact on stock liquidity for firms with below median market capitalization in comparison to firms with above median market capitalization. For example, from Columns (1) and (2) one can see that the effect of asset liquidity on stock liquidity is stronger by a factor of more than six for small firms. Similar results hold for the other asset liquidity measures.

In Panel B of Table VII we use the presence of credit ratings as a measure of overall uncertainty about valuation. Firms with credit ratings are likely to have a lower level of uncertainty in comparison to firms without credit ratings. We divide the sample into firms with and without credit ratings. The results in Columns (1) and (2) indicate that, consistent with our prediction, an increase in *WAL-1* has more than twice the effect on stock liquidity for firms without credit rating in comparison to firms with credit rating (-.075 in comparison to -.215). In Columns (3) and (4) we repeat our estimates using *WAL-2* and in Columns (5) and (6) we use *WAL-3* and obtain similar results.

Finally, in Panel C of Table VII we use the number of analysts as a measure of valuation uncertainty. Our hypothesis predicts that asset liquidity is likely to have a lower impact on stock liquidity for firms with above median analyst following. Consistent with our hypothesis we find that asset liquidity has more than four times the impact on stock liquidity for firms with below median number of analyst following as compared to firms with above median level of analyst following. The coefficients on *WAL-1* for large and small analyst following firms are -0.037 and -0.211, respectively. In Columns (3)-(6) we repeat our estimates successively with *WAL-2* and *WAL-3* as measures of asset liquidity and find that in both cases asset liquidity improves stock liquidity more for firms with lower level of analyst following.

[Table VII goes here]

5 Conclusion

Liquidity of an asset refers to the cost and time associated with converting the asset into cash. In this paper we note that the liquidity of real assets of a firm should be reflected in the liquidity of claims to the cash flows generated from these assets. In particular, we argue that stock liquidity and asset liquidity are positively related. Based on classic theories from market microstructure, both asset liquidity and stock liquidity should be driven by the extent of valuation uncertainty and potential insider trading associated with the firm's assets. Moreover, we predict that market expectations regarding the deployment of the firm's assets is an important driver of this relation. Liquid assets such as cash can be transformed by the manager into illiquid assets such as investments. As a result, managerial policies concerning investments, financing, and payout affect the liquidity of the firm's stock.

Our empirical analysis confirms these predictions. We establish an economically significant link between the liquidity of the firm's assets and the liquidity of its stock. We further show that the link is stronger for firms with lesser deployment uncertainty. These are firms with low expected investments, high expected dividends, and firms in financial distress. Using an event study analysis we show that asset liquidity has a stronger effect on stock liquidity when cash raised in an SEO is not converted into illiquid investments. Finally, we show that the link between asset liquidity and stock liquidity is stronger for firms with higher levels of overall valuation uncertainty, such as small firms, non-rated firms and those with less analyst following.

Our analysis uncovers a hitherto unexplored determinant of stock liquidity related to managerial actions. While it has long been known that valuation uncertainty and insider trading affect stock liquidity, prior studies of stock liquidity have viewed the firm as a "black box." In this paper we open this box and point out a natural channel by which managerial actions and decisions may affect stock liquidity. Furthermore, as stock liquidity has pricing effects, such corporate decisions may also have a significant effect on stock returns and the cost of capital.

Our work attempts to link corporate finance decisions to stock liquidity and asset pricing. This interdisciplinary approach has further potential implications, the empirical study of which is beyond the scope of this paper. One example is the commonality in stock liquidity. We show that the relation between asset liquidity and stock liquidity depends strongly on investment opportunities. Such opportunities co-vary at the industry, economy and global level. This suggest that stock liquidity may have a common component not only at the market level, but also at the industry and global level. Another example of an implication is the long-term stock under-performance after firm financing. The improvement in stock liquidity following such financing – as highlighted by our results– is likely to reduce the liquidity risk premium for the stock which in turn is likely to reflect as under-performance based on the ex ante risk characteristics.

References

[1] Aboody, David and Baruch Lev, 2000, Information asymmetry, R&D, and insider gains. *Journal of Finance* 55, 2747-2766.

[2] Acharya, Viral V. and Lasse H. Pedersen, 2005, Asset pricing with liquidity risk, *Journal of Financial Economics* 77, 375–410.

[3] Amihud, Yakov, 2002, Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets* 5, 31-56.

[4] Berger, Allen and Christa Bouwman, 2008, Bank Liquidity Creation, Review of Financial Studies, forthcoming.

[5] Bharath, Sreedhar and Tyler Shumway, 2008, Forecasting Default with the Merton Distance-to-Default Model *Review of Financial Studies* 21, 1339-1369.

[6] Bhattacharya, Neil, Hemang Desai, and Kumar Venkataraman, 2007, Earnings quality and information asymmetry: Evidence from trading costs Available at SSRN: http://ssrn.com/abstract=962765.

[7] Brunnermeier, Markus K. and Lasse H. Pedersen, 2008, Market liquidity and funding liquidity, *Review of Financial Studies* forthcoming.

[8] Chordia, Tarun, Richard Roll, and Avanidhar Subrahmanyam, 2000, Commonality in liquidity, *Journal of Financial Economics* 56, 3-28.

[9] Chordia, Tarun, Richard Roll, and Avanidhar Subrahmanyam, 2007, Why has trading volume increased?, *Working Paper Anderson School, UCLA*.

[10] Cooper, Michael J., Huseyin Gulen and Michael J. Schill, 2008, Asset growth and the cross-section of stock returns, *Journal of Finance* 63, 1609-1651.

[11] Copeland, Thomas and Dan Galai, 1983, Information effects on the Bid-Ask Spread, *Journal of Finance*38, 1457-1469.

[12] DeAngelo, Harry, Linda DeAngelo and Karen H. Wruck, 2002, Asset liquidity, debt covenants, and managerial discretion in financial distress: the collapse of L.A. Gear , *Journal of Financial Economics* 64, 3-34.

[13] Diamond, Douglas and Robert E. Verrecchia, 1991, Disclosure, Liquidity, and the Cost of Capital , *Journal of Finance* 46, 1325-1360.

[14] Easley, David, and Maureen O'Hara, 1987, Price, Trade Size, and Information in Securities Markets, *Journal of Financial Economics* 19, 69-70.

[15] Easley, David, and Maureen O'Hara, 1992, Time and the Process of Security Price Adjustment, *Journal of Finance* 47, 577-606.

[16] Easley, David, Soeren Hvidkjaer and Maureen O'Hara, 2002, Is information risk a determinant of asset returns? *Journal of Finance* 57, 2185-2221.

[17] Fama, Eugene and Kenneth French, 2002, Testing tradeoff and pecking order predictions about dividends and debt, *Review of Financial Studies* 15, 133.

[18] Foley, Fritz C., Jay C. Hartzell, Sheridan Titman, and Garry Twite, 2007, Why do firms hold so much cash? A tax-based explanation, *Journal of Financial Economics* 86, 579-607.

[19] Foucault, Thierry., 1999, Order Flow Composition and Trading Costs in a Dynamic Limit Order Market, *Journal of Financial Markets* 2, 99-134.

[20] Glosten, Lawrence R., and Paul Milgrom, 1985, Bid, Ask, and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders, *Journal of Finacial Economics* 21, 123-142.

[21] Hasbrouck, Joel, 2005, Trading Costs and Returns for US Equities: Estimating Effective Costs from Daily Data, *NYU Stern Working Paper*.

[22] Hasbrouck, Joel and Duane J. Seppi, 2001, Common factors in prices, order flows and liquidity. *Journal of Financial Economics* 59, 383-411

[23] Ho, Thomas., and Hans Stoll, 1981, Optimal Dealer Pricing Under Transactions and Return Uncertainty, *Journal of Financial Economics* 9, 47-73.

[24] Ho, Thomas., and Hans Stoll, 1983, The Dynamics of Dealer Markets Under Competition, *Journal of Finance* 38, 1053-1074.

[25] Huberman, Gur, and Dominika Halka, 2001, Systematic Liquidity. *Journal of Financial Research* 24, 161-178.

[26] Jones, Jennifer., 1991, Earnings Management During Import Relief Investigations, *Journal of Accounting Research* 29(2), 193-228.

[27] Keynes, John M., 1930, Treatise on Money, London: Macmillan.

[28] Korajczyk, Robert A. and Ronnie Sadka, 2007, Pricing the Commonality across Alternative Measures of Liquidity, *Journal of Financial Economics*, forthcoming.

[29] Kothary, S.P., Andrew Leone, and Charles Wasley 2005, Performance matched discretionary accrual measures, *Journal of Accounting and Economics*,39(1), 163-197.

[30] Kyle, Albert S., 1985, Continuous Auction and Insider Trading, *Econometrica* 53, 1315-1336.

[31] Lee, Charles M.C. and Ready, Mark J., 1991. Inferring trade direction from intraday data. *Journal of Finance* 46 , 733746.

[32] Lesmond, David A., Joseph P. Ogden and Charles A. Trzcinka, 1999, A new estimate of transactions costs. *Review of Financial Studies* 12, 1113-1141.

[33] Masulis, Ronald W., Espen B. Eckbo and Oyvind Norli, 2000, Seasoned Public Offerings: Resolution of the 'New Issues Puzzle', *Journal of Financial Economics* 56, 251-291.

[34] O'Hara, Maureen, and George S. Oldfield, 1986, The Microeconomics of Market Making, *Journal of Financial and Quantitative Analysis* 21, 361-376.

[35] Pastor, Lubos and Robert Stambaugh, 2003, Liquidity risk and expected stock returns, *Journal of Political Economy* 111, 642–685.

[36] Roll, Richard, 1984, A simple implicit measure of the effective bid-ask spread in an efficient market. *Journal of Finance* 39, 1127-1139.

[37] Sadka Ronnie, 2006, Momentum and post-earnings-announcement drift anomalies: The role of liquidity risk, *Journal of Financial Economics* 80, 309-349.

[38] Stoll, Hans, 1978, The Supply of Dealer Services in Security Markets, *Journal of Finance* 33, 1133-1151.

Appendix: Description of Variables

Variable Name	Description
Illiq	Square Root of average annual Amihud (2002) Illiquidity measure. Amihud's measure is the ratio of the absolute daily stock return and the daily dollar volume. Data for this variable was obtained from Hasbrouck's website
s	Gibbs sampler estimate of Roll's (1984) implicit measure of trading costs. Data for this variable was also obtained from Hasbrouck's website
Zero Ret	Annual percentage of zero return days estimated from CRSP daily data
Spread	Average intra-day daily effective percentage bid-ask spread estimated from TAQ. The data on the effective spread was obtained from the web site of the University of Vanderbilt's Center for Research on Financial Markets and is available to us only for the sub-period 1994-2006.
WAL-1	Ratio of the of cash and cash equivalents to lagged value of total assets
WAL-2	Ratio of the sum of cash and one half times the value of non-cash current assets, to lagged value of total assets
WAL-3	Ratio of the sum of cash, 0.75 times the value of non-cash current assets and one half times the value of other tangible fixed assets, to lagged value of total assets
Log(Mkt. Cap)	Natural log of a firm's market value of equity (Data25*Data199)
Def. Prob.	Expected Default Probability estimated using the approach in Bharath and Shumway (2008)
Capital Expenditure	Ratio of a firm's capital expenditures (Data128) to lagged total assets (Data6). When Data128 is missing, this variable is set to zero
Rated	A dummy variable that identifies firms with non-missing S&P Long-term credit rating in Compustat
ROA	Ratio of earnings before depreciation, interest, and taxes over lagged value of total assets
BHAR	Buy-and-hold annual abnormal stock return. It is the difference between the annual return on the firm's stock to the return on the value weighted portfolio of all NYSE, Amex, and Nasdaq stocks.
Disc. Accruals	Measure of a firm's abnormal accruals originally proposed in Jones (1991) and modified to control for performance per Kothari et al. (2005)
Volatility	Standard deviation of a firm's stock returns over 60 months preceding the beginning of a current fiscal year.
Fraction Retained	Ratio of the change in cash balance between the year ending after the SEO to the year ending before the SEO deflated by the size of the SEO.
Proceeds	The ratio of the size of the SEO in $ million to lagged value of total assets.
$\text{Illiq}_{-30,0}$	Average *Illiq* over thirty trading days prior to the SEO.
$\text{Illiq}_{-60,0}$	Average *Illiq* over sixty trading days prior to the SEO.
$\text{Illiq}_{15,45}$	Average *Illiq* over the period of fifteen to forty-five trading days following the SEO.
$\text{Illiq}_{15,75}$	Average *Illiq* over the period of fifteen to seventy-five trading days following the SEO.

Table I: Summary Statistics

This table reports the summary statistics of the key variables used in our analysis. *Illiq* is the square root of average annual Amihud (2002) Illiquidity measure. *s* is the Gibbs sampler estimate of Roll's (1984) implicit measure of trading costs, *Zero Ret* is the annual percentage of zero return days estimated from CRSP daily data, *Spread* is the average intra-day daily effective percentage bid-ask spread estimated from TAQ. *Log(Mkt. Cap)* is the natural logarithm of a firm's market value of equity, *WAL-1* is the ratio of cash and cash equivalents to lagged value of total assets, *WAL-2* is the ratio of the sum of cash and one half times the value of non-cash current assets, to lagged value of total assets, *WAL-3* is the ratio of the sum of cash, 0.75 times the value of non-cash current assets and one half times the value of other tangible fixed assets, to lagged value of total assets. *Market to Book* is the ratio of market value of equity to book value of equity, *Def. Prob.* is the expected default probability as estimated using the approach in Bharath and Shumway (2008), *Capital Expenditure* is the ratio of a firm's capital expenditures (Data128) to lagged total assets. *ROA* is the ratio of earnings before depreciation, interest and taxes to lagged value of total assets, *BHAR* is the Buy-and-hold annual abnormal stock return calculated as the difference between stock return and the return on the value weighted portfolio of all NYSE, Amex, and Nasdaq stocks, *Rated* is a dummy variable that identifies firms with S&P Long-term credit rating, *Analysts* is the number of security analysts following the firm's stock, *Volatility* is the standard deviation of a firm's stock returns over sixty months preceding the beginning of a current fiscal year, *Disc. Accruals* is a measure of a firm's abnormal accruals originally proposed in Jones (1991) and modified to control for performance using the methodology of Kothari et al. (2005). The sample includes all firms with financial data in Compustat during the years 1964-2006. Effective Spread data is only for 1995-2006. All variables are winsorized at the first and the ninety-ninth percentile.

Variable	N	Mean	Min	Median	Max	Std. Dev.
Illiq	79999	0.631	0.011	0.321	4.221	0.800
s	79999	0.011	0.001	0.007	0.059	0.011
Spread	34155	0.009	0.000	0.007	0.042	0.009
Prop. Zero Ret.	79999	0.176	0	0.163	0.573	0.117
Mkt. Cap_{t-1}	79998	1476.6	0.4	113.6	596475.8	9809.8
WAL-1	70127	0.153	0.000	0.070	1.208	0.211
WAL-2	69431	0.377	0.042	0.345	1.413	0.226
WAL-3	69431	0.682	0.064	0.668	1.833	0.251
Market to $Book_{t-1}$	78281	2.525	-3.291	1.700	19.161	2.933
Def. Prob.	59199	0.060	0	0.000	0.998	0.142
Capital Expenditure	79276	0.080	0	0.055	0.704	0.085
ROA	70248	0.121	-0.740	0.140	0.502	0.173
$BHAR_{t-1}$	76783	0.051	-1.210	0.017	1.891	0.512
Rated	79999	0.174	0	0	1	0.379
Analysts	38869	7.792	1	5	51	7.663
$Log(Volatility)_{t-1}$	70387	-3.502	-4.583	-3.518	-2.254	0.514
Disc. Accruals	69760	-0.059	-18.830	-0.044	12.406	0.393

Table II: Correlations

This table reports the summary statistics of the key variables used in our analysis. The sample includes all firms with financial data in Compustat during the years 1964-2006. Effective Spread data is only for 1995-2006. All variables are winsorized at the first and the ninety-ninth percentile. All variables are defined in the Appendix

	Illiq	s	Spread	Prop. Zero Ret.	WAL-1	WAL-2	WAL-3-1	Log(Mkt. Cap)$_{t-1}$
Illiq	1.000							
s	0.809	1.000						
Spread	0.831	0.877	1.000					
Prop. Zero Ret.	0.508	0.571	0.648	1.000				
WAL-1	-0.100	-0.001	-0.025	-0.159	1.000			
WAL-2	-0.053	0.033	0.040	-0.071	0.859	1.000		
WAL-3	-0.053	0.027	0.045	0.006	0.670	0.821	1.000	
Log(Mkt. Cap)$_{t-1}$	-0.132	-0.135	-0.177	-0.177	-0.022	-0.060	-0.039	1.000
Market to Book$_{t-1}$	-0.188	-0.123	-0.167	-0.202	0.266	0.233	0.201	0.202
Def. Prob.	0.323	0.306	0.272	0.136	-0.075	-0.136	-0.170	-0.070
Capital Expenditure	-0.052	-0.017	-0.072	0.027	0.014	-0.074	0.254	0.003
Not Rated	-0.310	-0.308	-0.404	-0.286	-0.201	-0.284	-0.238	0.246
Analysts	-0.409	-0.362	-0.479	-0.365	-0.069	-0.152	-0.085	0.468
ROA	-0.158	-0.225	-0.204	-0.066	-0.363	-0.211	-0.053	0.114
BHAR$_{t-1}$	-0.202	-0.218	-0.219	-0.308	0.194	0.218	0.212	0.020
Log(Volatility)$_{t-1}$	0.363	0.480	0.466	0.032	0.335	0.302	0.180	-0.171
Disc. Accruals	0.023	0.047	0.047	0.064	0.022	0.029	0.033	-0.010

	Market to Book$_{t-1}$	Def. Prob.	Capital Expenditure	Not Rated	Analysts	ROA	BHAR$_{t-1}$	Volatility$_{t-1}$
Market to Book$_{t-1}$	1.000							
Def. Prob.	-0.105	1.000						
Capital Expenditure	0.080	-0.119	1.000					
Not Rated	0.041	0.031	-0.026	1.000				
Analysts	0.186	-0.113	0.069	0.521	1.000			
ROA	-0.033	-0.180	0.221	0.143	0.204	1.000		
BHAR$_{t-1}$	0.193	-0.258	0.100	-0.004	-0.025	0.104	1.000	
Log(Volatility)$_{t-1}$	0.011	0.338	-0.036	-0.329	-0.343	-0.391	0.081	1.000
Disc. Accruals	0.006	0.024	-0.004	-0.013	-0.007	-0.112	-0.026	0.026

Table III: Asset Liquidity and Stock Liquidity - Time Series Evidence

This table reports the results of the regression relating firm's asset liquidity to stock liquidity. Specifically, we estimate the panel corrected OLS regression: $Y_{i,t} = \alpha + \beta X_{i,t} + \gamma Controls_{i,t} + \mu_i + \mu_t + \epsilon_{i,t},$, where Y is *Illiq* in Columns (1)-(3) of Panel A, s in Columns (4)-(6) of Panel A, *Zero Ret* in Columns (1)-(3) of Panel B, and *Spread* in Columns (4)-(6) of Panel B. *Illiq* is the square root of average annual Amihud (2002) Illiquidity measure. s is the Gibbs sampler estimate of Roll's (1984) implicit measure of trading costs, *Zero Ret* is the annual percentage of zero return days estimated from CRSP daily data, *Spread* is the average intra-day daily effective percentage bid-ask spread estimated from TAQ. *WAL-1* is the ratio of cash and cash equivalents to lagged value of total assets, *WAL-2* is the ratio of the sum of cash and one half times the value of non-cash current assets, to lagged value of total assets, *WAL-3* is the ratio of the sum of cash, 0.75 times the value of non-cash current assets and one half times the value of other tangible fixed assets, to lagged value of total assets. *Log(Mkt. Cap)* is the natural logarithm of a firm's market value of equity, *Disc. Accruals* is a measure of a firm's abnormal accruals originally proposed in Jones (1991) and modified to control for performance using the methodology of Kothari et al. (2005). *Market to Book* is the ratio of market value of equity to book value of equity, *Capital Expenditure* is the ratio of a firm's capital expenditures (Data128) to lagged total assets. *ROA* is the ratio of earnings before depreciation, interest and taxes to lagged value of total assets, *Volatility* is the standard deviation of a firm's stock returns over sixty months preceding the beginning of a current fiscal year, *BHAR* is the Buy-and-hold annual abnormal stock return calculated as the difference between stock return and the return on the value weighted portfolio of all NYSE, Amex, and Nasdaq stocks. The sample includes all firms with financial data in Compustat during the years 1964-2006. Effective Spread data is only for 1995-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% ($***$), 5% ($**$) and 10% ($*$) levels.

Panel A: Illiq & Roll's Measure (s)

	Illiq			Roll's Measure (s)		
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.220 (.019)***			-.003 (.0003)***		
WAL-2		-.271 (.016)***			-.004 (.0002)***	
WAL-3			-.203 (.012)***			-.003 (.0002)***
Log(Mkt. Cap)$_{t-1}$	-.208 (.006)***	-.213 (.006)***	-.215 (.006)***	-.002 (.00007)***	-.002 (.00007)***	-.002 (.00007)***
Disc. Accruals$_t$	-.010 (.005)*	-.006 (.005)	-.005 (.005)	-.0002 (.00007)***	-.0001 (.00007)**	-.0001 (.00007)**
Market-to-Book$_{t-1}$	.011 (.001)***	.012 (.001)***	.011 (.001)***	.0001 (.00002)***	.0001 (.00002)***	.0001 (.00002)***
Capital Expenditure$_t$	-.373 (.041)***	-.323 (.041)***	-.202 (.042)***	-.007 (.0006)***	-.006 (.0006)***	-.004 (.0006)***
ROA$_t$	-.342 (.028)***	-.283 (.028)***	-.280 (.028)***	-.006 (.0004)***	-.005 (.0004)***	-.005 (.0004)***
Volatility$_{t-1}$	.252 (.014)***	.249 (.014)***	.249 (.014)***	.008 (.0002)***	.008 (.0002)***	.008 (.0002)***
BHAR$_{t-1}$	-.153 (.005)***	-.146 (.005)***	-.148 (.005)***	-.003 (.00008)***	-.003 (.00008)***	-.003 (.00008)***
Obs.	60391	59942	59942	60391	59942	59942
R^2	.776	.777	.777	.769	.771	.771

Panel B: Effective Bid-Ask Spread and Prop. of Zero Return

	Effective Bid-Ask Spread (*Spread*)			Prop. of Zero Return (*Zero Ret*)		
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.002			-.021		
	(.0002)***			(.003)***		
WAL-2		-.002			-.034	
		(.0002)***			(.002)***	
WAL-3			-.001			-.030
			(.0001)***			(.002)***
Log(Mkt. Cap)$_{t-1}$	-.002	-.002	-.002	-.027	-.027	-.028
	(.00006)***	(.00006)***	(.00006)***	(.0008)***	(.0008)***	(.0008)***
Disc. Accruals$_t$	-.0001	-.00008	-.00007	-.002	-.001	-.001
	(.00005)**	(.00005)	(.00005)	(.0006)***	(.0005)***	(.0005)**
Market-to-Book$_{t-1}$	.00006	.00007	.00007	.0008	.001	.001
	(1.00e-05)***	(1.00e-05)***	(1.00e-05)***	(.0002)***	(.0002)***	(.0002)***
Capital Expenditure$_t$	-.003	-.003	-.002	-.094	-.088	-.069
	(.0005)***	(.0005)***	(.0005)***	(.006)***	(.006)***	(.007)***
ROA$_t$	-.004	-.003	-.003	-.084	-.076	-.074
	(.0003)***	(.0003)***	(.0003)***	(.004)***	(.004)***	(.004)***
Volatility$_{t-1}$	.004	.004	.004	.007	.006	.006
	(.0002)***	(.0002)***	(.0002)***	(.002)***	(.002)***	(.002)***
BHAR$_{t-1}$	-.001	-.001	-.001	-.025	-.024	-.024
	(.00006)***	(.00006)***	(.00006)***	(.0006)***	(.0006)***	(.0006)***
Obs.	25424	25186	25186	60391	59942	59942
R^2	.874	.874	.873	.807	.808	.808

Table IV: Asset Liquidity and Stock Liquidity - Cross-Sectional Evidence

This Table reports the results of Fama-Macbeth regressions relating firm's asset liquidity to stock liquidity. Specifically, we estimate annual OLS regression: $Y_{i,t} = \alpha + \beta X_{i,t} + \gamma Controls_{i,t} + \epsilon_{i,t}$, and report the average of the annual coefficients. Y is *Illiq* in Columns (1)-(3) of Panel A, s in Columns (4)-(6) of Panel A, *Zero Ret* in Columns (1)-(3) of Panel B, and *Spread* in Columns (4)-(6) of Panel B. The specification is similar to the ones in Panel A and B of Table III. We suppress the coefficients of the control variables to conserve space. To adjust for autocorrelation, we correct the reported standard errors of the average parameters by multiplying with $\sqrt{\frac{1+\rho}{1-\rho}}$, where ρ is the first-order autocorrelation in yearly parameter estimates. The sample includes all firms with financial data in Compustat during the years 1964-2006. Effective Spread data is only for 1995-2006. All variables are winsorized at the first and the ninety-ninth percentile. Asterisks denote statistical significance at the 1% ($***$), 5% ($**$) and 10% ($*$) levels.

Panel A: Illiq & Roll's Measure (s)

	Illiq			Roll's Measure (s)		
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.269			-.003		
	(.058)***			(.001)***		
WAL-2		-.321			-.0047	
		(.098)***			(.0014)***	
WAL-3			-.063			-.002
			(.032)*			(.00067)***
Log(Mkt. Cap)$_{t-1}$	-.239	-.213	-.236	-.001	-.001	-.001
	(.021)***	(.006)***	(.021)***	(.0002)***	(.0003)***	(.0003)***
Obs.	43	43	43	43	43	43

Panel B: Effective Bid-Ask Spread and Prop. of Zero Return

	Effective Bid-Ask Spread (*Spread*)			Prop. of Zero Return (*Zero Ret*)		
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.031			-.019		
	(.0072)***			(.002)***		
WAL-2		-.004			-.057	
		(.0005)***			(.005)***	
WAL-3			-.0005			-.022
			(.0003)			(.006)***
Log(Mkt. Cap)$_{t-1}$	-.002	-.002	-.002	-.031	-.032	-.030
	(.0002)***	(.0002)***	(.0002)***	(.003)***	(.004)***	(.004)***
Obs.	12	12	12	43	43	43

Table V: Asset Liquidity and Stock Liquidity - Panel A: High vs Low Market to Book Firms

This table reports the results of the regression relating firm's asset liquidity to stock liquidity. Specifically, we estimate the panel corrected OLS regression: $Y_{i,t} = \alpha + \beta X_{i,t} + \gamma Controls_{i,t} + \mu_i + \mu_t + \epsilon_{i,t}$, where Y is *Illiq*. *Illiq* is the square root of average annual Amihud (2002) Illiquidity measure. *WAL-1* is the ratio of cash and cash equivalents to lagged value of total assets, *WAL-2* is the ratio of the sum of cash and one half times the value of non-cash current assets, to lagged value of total assets, *WAL-3* is the ratio of the sum of cash, 0.75 times the value of non-cash current assets and one half times the value of other tangible fixed assets, to lagged value of total assets. *Log(Mkt. Cap)* is the natural logarithm of a firm's market value of equity, *Disc. Accruals* is a measure of a firm's abnormal accruals originally proposed in Jones (1991) and modified to control for performance using the methodology of Kothari et al. (2005), *Market to Book* is the ratio of market value of equity to book value of equity, *Capital Expenditure* is the ratio of a firm's capital expenditures (Data128) to lagged total assets. *ROA* is the ratio of earnings before depreciation, interest and taxes to lagged value of total assets, *Volatility* is the standard deviation of a firm's stock returns over sixty months preceding the beginning of a current fiscal year, *BHAR* is the Buy-and-hold annual abnormal stock return calculated as the difference between stock return and the return on the value weighted portfolio of all NYSE, Amex, and Nasdaq stocks. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the high and low market to book sub-samples. The sample includes all firms with financial data in Compustat during the years 1964-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% ($***$), 5% ($**$) and 10% ($*$) levels.

	High Mkt-Book	Low Mkt-Book	High Mkt-Book	Low Mkt-Book	High Mkt-Book	Low Mkt-Book
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.176	-.316				
	(.015)***	(.045)***				
WAL-2			-.202	-.373		
			(.014)***	(.038)***		
WAL-3					-.155	-.244
					(.011)***	(.028)***
Log(Mkt. Cap)$_{t-1}$	-.157	-.263	-.161	-.270	-.162	-.272
	(.007)***	(.009)***	(.007)***	(.009)***	(.007)***	(.009)***
Disc. Accruals$_t$	-.008	-.0001	-.005	.006	-.005	.007
	(.005)	(.009)	(.005)	(.008)	(.005)	(.008)
Market-to-Book$_{t-1}$	.007	.014	.008	.016	.008	.016
	(.001)***	(.009)	(.001)***	(.009)*	(.001)***	(.009)*
Capital Expenditure$_t$	-.309	-.348	-.267	-.299	-.179	-.152
	(.042)***	(.070)***	(.042)***	(.070)***	(.043)***	(.073)**
ROA$_t$	-.132	-.871	-.093	-.764	-.092	-.773
	(.027)***	(.059)***	(.027)***	(.062)***	(.026)***	(.062)***
Volatility$_{t-1}$	.171	.255	.169	.250	.170	.250
	(.017)***	(.018)***	(.017)***	(.018)***	(.017)***	(.018)***
BHAR$_{t-1}$	-.123	-.167	-.119	-.161	-.120	-.164
	(.006)***	(.009)***	(.006)***	(.009)***	(.006)***	(.009)***
Obs.	28193	32198	28026	31916	28026	31916
R^2	.802	.8	.802	.801	.802	.8
Δ Coef	.140		.171		.089	
	(.047)***		(.041)***		(.030)***	

Table V: Asset Liquidity and Stock Liquidity - Panel B: High vs Low Capital Expenditure Firms

This panel reports the results of the regression relating firm's asset liquidity to stock liquidity with the sample split into firms with above and below median levels of capital expenditure. The dependent variable is *Illiq*. All variables are defined in Panel A. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3*, across the high and low capex sub-samples. All variables are winsorized at the first and the ninety-ninth percentile. The sample includes all firms with financial data in Compustat during the years 1964-2006. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% ($***$), 5% ($**$) and 10% ($*$) levels.

	High Cap. Ex.	Low Cap. Ex.	High Cap. Ex.	Low Cap. Ex.	High Cap. Ex.	Low Cap. Ex.
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.184	-.279				
	(.021)***	(.030)***				
WAL-2			-.217	-.326		
			(.020)***	(.026)***		
WAL-3					-.158	-.242
					(.016)***	(.020)***
Log(Mkt. Cap)$_{t-1}$	-.164	-.249	-.169	-.255	-.170	-.258
	(.007)***	(.009)***	(.007)***	(.009)***	(.007)***	(.009)***
Disc. Accruals$_t$	-.004	-.005	-.002	.001	-.002	.004
	(.004)	(.011)	(.004)	(.010)	(.004)	(.010)
Market-to-Book$_{t-1}$	.011	.009	.011	.010	.011	.010
	(.001)***	(.002)***	(.001)***	(.002)***	(.001)***	(.002)***
Capital Expenditure$_t$	-.258	-1.639	-.232	-1.272	-.142	-1.016
	(.043)***	(.292)***	(.043)***	(.293)***	(.044)***	(.295)***
ROA$_t$	-.275	-.442	-.228	-.377	-.222	-.385
	(.034)***	(.045)***	(.035)***	(.045)***	(.035)***	(.045)***
Volatility$_{t-1}$	.212	.227	.212	.225	.212	.225
	(.018)***	(.019)***	(.018)***	(.019)***	(.018)***	(.019)***
BHAR$_{t-1}$	-.135	-.146	-.132	-.139	-.134	-.140
	(.007)***	(.008)***	(.007)***	(.008)***	(.007)***	(.008)***
Obs.	30343	30048	30198	29744	30198	29744
R^2	.804	.796	.804	.797	.804	.797
Δ Coef	.095		.109		.084	
	(.036)***		(.032)***		(.025)***	

Table V: Asset Liquidity and Stock Liquidity - Panel C: Recessions vs Expansions

This panel reports the results of the regression relating firm's asset liquidity to stock liquidity with the sample split into periods of recession and expansion. Based on the data in the NBER website we classify the periods 1969-70, 1974-75, 1981-82, 1990-91 and 2001 as recessionary and the other years as expansionary. The dependent variable is *Illiq*. All variables are as explained in Panel A. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the recession and expansion sub-samples. The sample includes all firms with financial data in Compustat during the years 1964-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% ($***$), 5% ($**$) and 10% ($*$) levels.

	Recession	Expansions	Recession	Expansions	Recession	Expansions
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.348 (.075)***	-.216 (.018)***				
WAL-2			-.398 (.065)***	-.262 (.016)***		
WAL-3					-.301 (.049)***	-.195 (.012)***
Log(Mkt. Cap)$_{t-1}$	-.229 (.012)***	-.200 (.006)***	-.237 (.012)***	-.205 (.006)***	-.238 (.012)***	-.206 (.006)***
Disc. Accruals$_t$	.031 (.029)	-.012 (.005)**	.046 (.028)	-.008 (.005)*	.053 (.029)*	-.008 (.005)*
Market-to-Book$_{t-1}$	.016 (.005)***	.009 (.001)***	.017 (.005)***	.010 (.001)***	.017 (.005)***	.010 (.001)***
Capital Expenditure$_t$	-.242 (.110)**	-.345 (.041)***	-.172 (.111)	-.295 (.041)***	.029 (.116)	-.182 (.042)***
ROA$_t$	-.567 (.098)***	-.312 (.028)***	-.457 (.102)***	-.256 (.028)***	-.464 (.103)***	-.253 (.028)***
Volatility$_{t-1}$	.262 (.030)***	.241 (.014)***	.263 (.030)***	.238 (.014)***	.260 (.030)***	.238 (.014)***
BHAR$_{t-1}$	-.191 (.016)***	-.133 (.005)***	-.188 (.016)***	-.126 (.005)***	-.189 (.016)***	-.128 (.005)***
Obs.	10822	49569	10730	49212	10730	49212
R^2	.873	.787	.874	.788	.873	.788
Δ Coef	-.132 (.077)*		-.136 (.067)**		-.106 (.051)**	

Table V: Asset Liquidity and Stock Liquidity - Panel D: Payers vs Non-Payers

This panel reports the results of the regression relating firm's asset liquidity to stock liquidity with the sample split into firms that make any dividend or stock repurchase payments to equity holders (Payers) and those that do not (Non-Payers). $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the payers and non-payers sub-samples. All variables are defined in Panel A. The sample includes all firms with financial data in Compustat during the years 1964-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% (∗∗∗), 5% (∗∗) and 10% (∗) levels.

	Payers	Non Payers	Payers	Non Payers	Payers	Non Payers
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.249	-.220				
	(.030)***	(.029)***				
WAL-2			-.319	-.251		
			(.028)***	(.025)***		
WAL-3					-.232	-.190
					(.020)***	(.019)***
Log(Mkt. Cap)$_{t-1}$	-.195	-.252	-.201	-.256	-.203	-.258
	(.008)***	(.011)***	(.008)***	(.011)***	(.008)***	(.011)***
Disc. Accruals$_t$	-.010	-.005	-.007	.00004	-.006	.001
	(.007)	(.010)	(.006)	(.010)	(.006)	(.010)
Market-to-Book$_{t-1}$	.013	.009	.014	.010	.014	.010
	(.002)***	(.002)***	(.002)***	(.002)***	(.002)***	(.002)***
Capital Expenditure$_t$	-.311	-.399	-.277	-.331	-.124	-.228
	(.055)***	(.071)***	(.055)***	(.072)***	(.057)**	(.074)***
ROA$_t$	-.422	-.388	-.339	-.339	-.338	-.339
	(.046)***	(.045)***	(.048)***	(.044)***	(.047)***	(.044)***
Volatility$_{t-1}$	.194	.342	.192	.337	.191	.336
	(.016)***	(.028)***	(.016)***	(.028)***	(.016)***	(.028)***
BHAR$_{t-1}$	-.146	-.156	-.140	-.150	-.142	-.151
	(.007)***	(.009)***	(.007)***	(.009)***	(.007)***	(.009)***
Obs.	36704	16128	36322	16081	36322	16081
R^2	.807	.806	.808	.807	.808	.807
Δ Coef	-.029		-.068		-.042	
	(.042)		(.027)*		(.03)	

Table V: Asset Liquidity and Stock Liquidity - Panel E: High vs Low Default Probability Firms

This panel reports the results of the regression relating firm's asset liquidity to stock liquidity with the sample split into firms with above and below median default probability. We measure default probability using Bharath and Shumway (2008) methodology. The dependent variable is *Illiq*. All variables are defined in Panel A. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the sub-samples with high- and low-default probabilities. The sample includes all firms with financial data in Compustat during the years 1970-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% (∗∗∗), 5% (∗∗) and 10% (∗) levels.

	High Def. Prob.	Low Def. Prob.	High Def. Prob.	Low Def. Prob.	High Def. Prob.	Low Def. Prob.
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.279	-.154				
	(.039)***	(.019)***				
WAL-2			-.330	-.158		
			(.031)***	(.016)***		
WAL-3					-.231	-.111
					(.024)***	(.011)***
Log(Mkt. Cap)$_{t-1}$	-.281	-.117	-.286	-.121	-.287	-.122
	(.010)***	(.006)***	(.010)***	(.006)***	(.010)***	(.006)***
Disc. Accruals$_t$	-.012	-.003	-.006	-.002	-.005	-.002
	(.010)	(.003)	(.010)	(.003)	(.010)	(.003)
Market-to-Book$_{t-1}$	.005	.008	.006	.008	.005	.008
	(.002)***	(.001)***	(.002)***	(.001)***	(.002)***	(.001)***
Capital Expenditure$_t$	-.490	-.177	-.412	-.152	-.295	-.091
	(.078)***	(.040)***	(.078)***	(.041)***	(.082)***	(.041)**
ROA$_t$	-.666	-.273	-.585	-.243	-.586	-.242
	(.053)***	(.033)***	(.054)***	(.032)***	(.054)***	(.032)***
Volatility$_{t-1}$	.320	.066	.314	.067	.313	.066
	(.024)***	(.014)***	(.024)***	(.014)***	(.024)***	(.014)***
BHAR$_{t-1}$	-.157	-.079	-.150	-.077	-.152	-.079
	(.008)***	(.006)***	(.008)***	(.005)***	(.008)***	(.005)***
Obs.	22436	23024	22241	22799	22241	22799
R^2	.792	.849	.793	.849	.793	.849
Δ Coef	-.125		-.172		-.120	
	(.043)***		(.035)***		(.027)***	

Table VI: Proceeds Retained in SEOs and Stock Liquidity

Panel A reports summary statistics for the key variables that we use in the tests with the SEO sample. *Proceeds* is the total proceeds in the SEO, *Proceeds/TA* is the ratio of SEO proceeds to lagged book value of total assets. $Illiq_{i,j}$ is Amihud's illiquidity measure as estimated from day i to day j relative to the SEO date. *Fraction Retained* is the ratio of change in year-end cash balance around the SEO to the total SEO proceeds. All other variables are defined in the Appendix. The sample includes all SEOs from SDC database floated during the years 1970-2006, with a minimum size of $10 million, by firms with financial data in Compustat.

Panel A: Summary Statistics

Variable	N	Mean	Min	Median	Max	Std. Dev.
Proceeds ($ Million)	5756	117.808	10.000	60.050	12126.000	259.520
Proceeds/TA_{t-1}	5540	0.311	0.001	0.135	101.534	1.857
$Illiq_{-30,0}$	5756	0.176	0.012	0.102	1.452	0.228
$Illiq_{15,45}$	5756	0.115	0.011	0.080	0.727	0.115
$Illiq_{-60,0}$	5756	0.162	0.012	0.098	1.300	0.200
$Illiq_{15,75}$	5756	0.121	0.011	0.082	0.760	0.123
Market Capitalization ($ Million)	5686	1722	2	519	386402	7638
Fraction Retained	5435	0.420	-2.613	0.180	6.205	1.039

Panel B: Proceeds Retained in SEOs and Stock Liquidity

This panel reports the results of the regression relating post-SEO stock liquidity to the fraction of SEO proceeds retained by the firm. The dependent variable is $Illiq_{15,45}$ in Column (1) and $Illiq_{15,75}$ in Columns (2)-(4). In Column (3) the sample is confined to SEOs that happen more than two months before the financial year end. All variables are defined in the Appendix. The sample includes all SEOs from SDC database for firms with financial data in Compustat during the years 1980-2006. The regression includes year fixed effects. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% (∗∗∗), 5% (∗∗) and 10% (∗) levels.

	$Illiq_{15,45}$	$Illiq_{15,75}$		
	(1)	(2)	(3)	(4)
Fraction Retained	-.002	-.003	-.002	-.017
	(.001)**	(.0009)***	(.001)**	(.002)***
Proceeds/TA_{t-1}				.001
				(.0005)**
Fraction Retained*Proceeds/TA_{t-1}				-.055
				(.006)***
$Illiq_{-30,0}$	.325			
	(.006)***			
$Illiq_{-60,0}$		.451	.436	.438
		(.006)***	(.007)***	(.006)***
Mkt. To $Book_{t-1}$	-.0001	.00009	.00008	.0006
	(.0002)	(.0002)	(.0002)	(.0002)***
ROA	-.014	-.014	-.015	-.019
	(.003)***	(.003)***	(.003)***	(.003)***
Log(Mkt. $Cap)_{t-1}$	-.021	-.016	-.018	-.019
	(.0008)***	(.0008)***	(.001)***	(.0008)***
Obs.	4588	4588	3184	4588
R^2	.65	.728	.73	.733

Table VII: Asset Liquidity and Stock Liquidity Panel A: Small vs Large Firms

This table reports the results of the regression relating firm's asset liquidity to stock liquidity. Specifically, we estimate the panel corrected OLS regression: $Y_{i,t} = \alpha + \beta X_{i,t} + \gamma Controls_{i,t} + \mu_i + \mu_t + \epsilon_{i,t},$, where Y is *Illiq*. In Panel A we estimate the regression in sub-samples with above and below median market capitalization. *Illiq* is the square root of average annual Amihud (2002) Illiquidity measure. *WAL-1* is the ratio of cash and cash equivalents to lagged value of total assets, *WAL-2* is the ratio of the sum of cash and one half times the value of non-cash current assets, to lagged value of total assets, *WAL-3* is the ratio of the sum of cash, 0.75 times the value of non-cash current assets and one half times the value of other tangible fixed assets, to lagged value of total assets. *Log(Mkt. Cap)* is the natural logarithm of a firm's market value of equity, *Disc. Accruals* is a measure of a firm's abnormal accruals originally proposed in Jones (1991) and modified to control for performance using the methodology of Kothari et al. (2005), *Market to Book* is the ratio of market value of equity to book value of equity, *Capital Expenditure* is the ratio of a firm's capital expenditures (Data128) to lagged total assets. *ROA* is the ratio of earnings before depreciation, interest and taxes to lagged value of total assets, *Volatility* is the standard deviation of a firm's stock returns over sixty months preceding the beginning of a current fiscal year, *BHAR* is the Buy-and-hold annual abnormal stock return calculated as the difference between stock return and the return on the value weighted portfolio of all NYSE, Amex, and Nasdaq stocks. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the high and low market capitalization sub-samples. The sample includes all firms with financial data in Compustat during the years 1964-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% (***), 5% (**) and 10% (*) levels.

	High Mkt. Cap	Low Mkt. Cap	High Mkt. Cap	Low Mkt. Cap	High Mkt. Cap	Low Mkt. Cap
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.049	-.334				
	(.007)***	(.030)***				
WAL-2			-.057	-.368		
			(.006)***	(.025)***		
WAL-3					-.039	-.278
					(.005)***	(.020)***
Log(Mkt. Cap)$_{t-1}$	-.055	-.412	-.056	-.416	-.056	-.419
	(.002)***	(.010)***	(.002)***	(.010)***	(.002)***	(.010)***
Disc. Accruals$_t$	-.002	-.002	-.002	.006	-.001	.007
	(.001)*	(.009)	(.001)	(.008)	(.001)	(.009)
Market-to-Book$_{t-1}$	.003	.007	.003	.008	.003	.008
	(.0004)***	(.002)***	(.0004)***	(.002)***	(.0005)***	(.002)***
Capital Expenditure$_t$	-.119	-.463	-.111	-.382	-.089	-.222
	(.019)***	(.064)***	(.019)***	(.064)***	(.020)***	(.067)***
ROA$_t$	-.104	-.725	-.091	-.645	-.093	-.639
	(.014)***	(.044)***	(.014)***	(.044)***	(.014)***	(.044)***
Volatility$_{t-1}$	.029	.295	.028	.291	.028	.291
	(.005)***	(.021)***	(.006)***	(.021)***	(.006)***	(.021)***
BHAR$_{t-1}$	-.036	-.190	-.035	-.182	-.036	-.184
	(.002)***	(.008)***	(.002)***	(.008)***	(.002)***	(.008)***
Obs.	31730	28661	31359	28583	31359	28583
R^2	.777	.75	.778	.751	.777	.751
Δ Coef	.285		.311		.239	
	(.031)***		(.026)***		(.020)***	

Table VII: Asset Liquidity and Stock Liquidity Panel B: Rated vs Not Rated Firms

This panel reports the results of the regression relating firm's asset liquidity to stock liquidity with the sample split into firms with and without short term credit rating. The dependent variable is *Illiq*. All variables are defined in Panel A. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the rated and not-rated sub-samples. All variables are winsorized at the first and the ninety-ninth percentile. The sample includes all firms with financial data in Compustat during the years 1964-2006. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% (∗∗∗), 5% (∗∗) and 10% (∗) levels.

	Rated	Not Rated	Rated	Not Rated	Rated	Not Rated
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.075 (.024)***	-.215 (.021)***				
WAL-2			-.112 (.023)***	-.267 (.018)***		
WAL-3					-.082 (.016)***	-.211 (.014)***
$\text{Log(Mkt. Cap)}_{t-1}$	-.082 (.008)***	-.260 (.007)***	-.085 (.008)***	-.264 (.007)***	-.086 (.008)***	-.266 (.007)***
Disc. Accruals_t	-.002 (.003)	-.006 (.006)	-.002 (.003)	-.001 (.006)	-.002 (.003)	-.00009 (.006)
$\text{Market-to-Book}_{t-1}$	.003 (.0008)***	.011 (.001)***	.003 (.0008)***	.012 (.001)***	.003 (.0008)***	.012 (.001)***
$\text{Capital Expenditure}_t$	-.126 (.056)**	-.367 (.045)***	-.105 (.059)*	-.313 (.045)***	-.058 (.060)	-.189 (.047)***
ROA_t	-.147 (.033)***	-.400 (.031)***	-.107 (.033)***	-.343 (.031)***	-.098 (.032)***	-.337 (.031)***
Volatility_{t-1}	.061 (.017)***	.273 (.016)***	.061 (.017)***	.269 (.016)***	.061 (.017)***	.269 (.016)***
BHAR_{t-1}	-.050 (.007)***	-.166 (.006)***	-.049 (.007)***	-.160 (.006)***	-.049 (.007)***	-.160 (.006)***
Obs.	11677	48714	11353	48589	11353	48589
R^2	.808	.776	.809	.777	.809	.777
Δ Coef	.140 (.032)***		.155 (.029)***		.129 (.021)***	

Table VII: Asset Liquidity and Stock Liquidity Panel C: High vs Low Analyst Following Firms

This panel reports the results of the regression relating firm's asset liquidity to stock liquidity with the sample split into firms with above and below median level of analyst following. The analyst following data is obtained from IBES. The dependent variable is *Illiq*. All variables are defined in Panel A. $\Delta Coef$ represents the difference between the coefficients on *WAL-1*, *WAL-2*, and *WAL-3* across the high and low analyst following sub-samples. The sample includes all firms with financial data in Compustat during the years 1964-2006. All variables are winsorized at the first and the ninety-ninth percentile. The standard errors are clustered at individual firm level. Asterisks denote statistical significance at the 1% (∗∗∗), 5% (∗∗) and 10% (∗) levels.

	High Analyst	Low Analyst	High Analyst	Low Analyst	High Analyst	Low Analyst
	(1)	(2)	(3)	(4)	(5)	(6)
WAL-1	-.037 (.007)***	-.211 (.025)***				
WAL-2			-.045 (.007)***	-.241 (.022)***		
WAL-3					-.026 (.005)***	-.165 (.017)***
Log(Mkt. Cap)$_{t-1}$	-.046 (.002)***	-.231 (.009)***	-.046 (.002)***	-.236 (.009)***	-.046 (.002)***	-.238 (.009)***
Disc. Accruals$_t$	-.002 (.001)	-.013 (.006)**	-.001 (.001)	-.010 (.006)*	-.001 (.001)	-.010 (.006)*
Market-to-Book$_{t-1}$	.003 (.0005)***	.008 (.002)***	.003 (.0005)***	.009 (.002)***	.003 (.0005)***	.009 (.002)***
Capital Expenditure$_t$	-.098 (.018)***	-.477 (.073)***	-.090 (.017)***	-.427 (.073)***	-.077 (.018)***	-.345 (.075)***
ROA$_t$	-.074 (.014)***	-.441 (.041)***	-.063 (.015)***	-.390 (.041)***	-.066 (.015)***	-.391 (.041)***
Volatility$_{t-1}$	.022 (.005)***	.224 (.021)***	.021 (.005)***	.217 (.020)***	.020 (.005)***	.218 (.020)***
BHAR$_{t-1}$	-.025 (.002)***	-.132 (.009)***	-.023 (.002)***	-.126 (.009)***	-.024 (.002)***	-.128 (.009)***
Obs.	14912	15400	14629	15330	14629	15330
R^2	.826	.792	.826	.793	.826	.792
Δ Coef	.174 (.026)***		.196 (.023)***		.139 (.02)***	