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Published in:
Pacific Basin Finance Journal

DOI:
[10.1016/j.pacfin.2015.10.001](https://doi.org/10.1016/j.pacfin.2015.10.001)

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Recommended citation(APA):
Benson, K., Faff, R., & Smith, T. (2015). Injecting liquidity into liquidity research. *Pacific Basin Finance Journal*, 35(Part B), 533-540. <https://doi.org/10.1016/j.pacfin.2015.10.001>

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Accepted Manuscript

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PII: S0927-538X(15)30011-1
DOI: doi: [10.1016/j.pacfin.2015.10.001](https://doi.org/10.1016/j.pacfin.2015.10.001)
Reference: PACFIN 783

To appear in: *Pacific-Basin Finance Journal*

Received date: 13 March 2015
Revised date: 20 September 2015
Accepted date: 9 October 2015



Please cite this article as: Benson, Karen, Faff, Robert, Smith, Tom, Injecting liquidity into liquidity research, *Pacific-Basin Finance Journal* (2015), doi: [10.1016/j.pacfin.2015.10.001](https://doi.org/10.1016/j.pacfin.2015.10.001)

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Injecting Liquidity into Liquidity Research

Abstract

In this paper, we aim to make more “liquid” our general understanding of liquidity research in finance. Our review of the relevant literature shows that it covers an extensive territory. Indeed, not only is liquidity important to the very existence and viability of markets, but it is also critical to the pricing of assets, the macro economy, funds management and corporate finance.

1. Introduction

This paper reviews the finance literature on liquidity, with the key aim of making the current state of knowledge surrounding this broad topic more accessible and, thus, more “liquid” – particularly to novice researchers looking for key pointers in this rich area of endeavour. We begin by defining liquidity, according to its main variants and then go on to deal with the concept at various levels. Specifically, these alternative academic perspectives are: (a) macro level; (b) corporate finance; (c) asset pricing; (d) market microstructure; and, (e) managed funds. Our review incorporates the broad international literature including studies that focus on the Asia-Pacific markets

For the purposes of our paper, liquidity has two broad meanings – “macro” versus “micro” liquidity. On the one hand, “macro” liquidity refers to the store of liquidity; for example, the level of short-term bonds in the market (Holmstrom and Tirole, 1998). On the other hand, “micro” liquidity refers to the ease with which an asset can be bought or sold and is often reflected through the bid-ask spread (Fleming, 2003). Both micro and macro liquidity are endogenously determined. Markets need macro liquidity to ensure growth, for development and stability. The macro liquidity variant is particularly important in the event of an aggregate market shock, such as a financial crisis. Put simply, if there is no micro liquidity, markets will fail. The crucial role of liquidity traders for the meaningful existence of markets is recognised in the work of Akerlof (1970) in terms of the often cited “market for lemons” concept and also in Kyle (1985).

A liquid market, in the macro sense, provides a supply (or store) of securities sufficient to meet demand. Hence, in this sense, liquidity represents an “insurance” against market shocks (Holmstrom and Tirole, 1998) that may cover either idiosyncratic shocks or aggregate shocks. The private sector might be expected to absorb the idiosyncratic shocks; however, the market may not be able to deal with aggregate shocks (Holmstrom and Tirole,

1998). In cases where firms are liquidity-constrained, their ability to borrow against future cash flows is restricted or even prevented. If there is a higher level of government securities in the market, then other things being equal, the private sector has more flexibility in responding to volatility in income and spending opportunities. This flexibility can improve economic efficiency (Holmstrom and Tirole, 1998 and Woodford, 1990).

A liquid market, in the micro sense, allows transactions to be quickly executed with negligible price impact (Borio, 2000). Lippman and McCall (1986) embed the process of selling an asset in a search environment and define liquidity as the expected time until the asset is sold, while pursuing an optimal policy (in the sense of maximization of expected discounted net proceeds). Hence, we can identify the key dimensions of micro liquidity as the familiar dimensions: cost, depth, breadth and resilience. Cost refers to the expense incurred when executing a trade. Liquid markets are those where trades can occur at a low cost (Fleming, 2003). Depth refers to the market's capacity to absorb a temporary imbalance between demand and supply without any significant price change. High liquidity in terms of breadth means that there are a large number of market participants buying and selling the asset. A resilient market is one that is able to absorb unusually large trades - the more resilient the more liquid is the market. These dimensions of micro-liquidity are typically measured using: bid-ask spread, trade size, quote size, Kyle's lambda, trade frequency, trade volume and liquidity spread¹ (Fleming, 2003).

In the context of liquidity research in finance, the concepts of micro and macro liquidity are not mutually exclusive and the impact of liquidity on firms and markets cannot always be cleanly dichotomized. Nevertheless, we find these alternative characterizations of liquidity very helpful guiding core elements within our review. The remainder of the paper proceeds as follows. Section 2 reviews the literature on macro liquidity. Section 3 examines

¹ Further liquidity measures will be discussed in Section 5, Market Microstructure.

liquidity concepts in the corporate sector. Section 4 examines liquidity and asset pricing. Section 5 examines discusses the measures of micro liquidity and reviews market microstructure research. Section 6 examines the importance of liquidity to portfolio managers.² The paper ends with some closing comments in Section 7.

2. Macro Liquidity

If we apply the Arrow-Debreu model of general equilibrium, there is no special role for liquidity. Instead firms can create liquidity by either issuing new securities, borrowing from financial institutions; or holding claims on other firms. However, if the assumptions of the model are relaxed to be more realistic – e.g. allowing moral hazard and aggregate liquidity shocks, then it is no longer possible for firms to meet all of their liquidity demands (Holmstrom and Tirole, 1998). This scenario provides a need for government securities and a role for the government in actively managing the supply of these securities, subject to the market state. Where government securities are issued ex-ante and are ongoing; firms are able to establish a liquidity buffer through investment in the securities. Importantly, should there be an aggregate liquidity shock the firms have a buffer and avoid the need to liquidate positive net present value projects. The government can manage liquidity to ensure the value of government securities is high when there is aggregate uncertainty and low when there is no uncertainty. In a pareto optimal world, firms will be prepared to pay a premium for the securities. If there is a liquidity shock, firms need to be able to liquidate their government security holdings.

² We recognise that the areas covered herein are not exhaustive. To illustrate, we offer three examples below. First, there is an interesting pocket of literature that examines the linkage between liquidity and innovation (e.g. Fang, Tian and Tice, 2014). Second, there is liquidity and banking – though we do include one lone representative in this space, Jung and Kim (2015), in the context of macro liquidity (Section 2). Third, there is the emerging literature that looks into the inter-related nature of asset liquidity versus equity and debt liquidity (e.g. Gopalan and Pevzner 2012).

In the event of a financial crisis we might see a ‘flight-to-quality’ where investors rebalance their portfolios preferring less risky and more liquid securities. However, it is not clear as to whether the requirement for lower risk and/or the need for higher liquidity is driving this ‘flight-to-quality’. Interestingly, Beber, Brandt and Kavajecz (2009) show that in times of market stress investors chase liquidity rather than credit quality.

Gennotte and Leland (1990) examine the role of hedging in market crashes. They develop a rational expectations model in which prices play an important role in shaping expectations. In their framework, markets are much less liquid than in traditional models and discontinuities or crashes can occur even with relatively little hedging.

Chordia, Sarkar and Subrahmanyam (2005) explore cross stock-bond market liquidity dynamics. They find that innovations to stock and bond market liquidity and volatility are significantly correlated, implying that common factors drive liquidity and volatility in these markets. Volatility shocks are found to be informative in predicting shifts in liquidity. Adrian and Shin (2009) argue that in a market-based financial system, banking and capital market developments are inseparable and funding conditions are closely tied to fluctuations in the leverage of market-based financial intermediaries. Consequently the balance sheet growth of broker-dealers provides a sense of the availability of credit and contractions in these balance sheets tend to precede declines in real economic growth.

Jung and Kim (2015), investigate the extent to which Korean banks lending practices during times of market-wide liquidity shocks are affected by the bank’s funding structure. Among other findings, they document an interesting countervailing phenomenon during such turbulent times – namely, that large banks with a stable funding base (i.e. largely funded from “stable” retail sources) show a tendency to increase their corporate lending. As such, these banks play an important role as “absorbers” of market-wide liquidity shocks.

Duygan-Bump, Parkinson, Rosengren, Suarez and Willen (2013) examine the Federal Reserve's response to the financial crisis by creating emergency lending facilities. They find that this facility helps stabilize asset outflows from money market funds and reduces asset-backed commercial paper yields significantly.

Yang and Hamori (2014) investigate the spillover effect from US monetary policy to ASEAN stock markets. They find the existence of two distinct regimes for both US monetary policy and the stock markets with US interest rates having a negative effect on ASEAN stock markets during economic expansionary periods but that this kind of effect disappears during economic crisis periods. Thus spillover effects from US monetary policy seem to influence ASEAN stock markets only during tranquil times.

Zeldes (1989) argues that empirical rejections of the permanent income/life cycle model are due to the existence of liquidity constraints. Zeldes finds support for the hypothesis that an inability to borrow against future labor income affects the consumption of a substantial portion of the population. Jappelli and Pagano (1994) examine liquidity constraints in an overlapping generations model. They argue that such constraints increase the savings rate and the effect of growth on savings and they suggest that financial deregulation in the 1980s could have contributed to the decline in national savings and growth rates in OECD countries.

In an Australian setting, Murik (2013a) evaluates the ability of the fixed-income market in forecasting future movements in monetary policy. To this end, he finds that the market is quite effective in forecasting cash rate movements over horizons of up to six months and that there is important information in fixed-income market pricing regarding expected cash rate movements over the one to three-year horizon.

3. Liquidity and Corporate Finance

In this section we look at liquidity in a corporate finance setting. We first examine liquidity constraints and entrepreneurship and then liquidity and the cost of capital, liquidity and debt, and liquidity and corporate governance. We then consider liquidity in a behavioural framework followed by liquidity and insider trading. We conclude by looking at the effect of liquidity on corporate events such as cross listing, takeovers and announcements such as those relating to dividend decisions.

3.1 Liquidity and entrepreneurship

Evans and Jovanovic (1989) examine whether liquidity constraints are binding for entrepreneurs and find evidence in favour of this view. Using a unique dataset comprising people who have received an inheritance, Holtz-Eakin, Joulfaian and Rosen (1994) find evidence consistent with entrepreneurs being liquidity constrained. Hurst and Lusardi (2004) show that the relationship between wealth and entrepreneurship is non-linear, with a flat surface for the first 95% and only beyond this point does a positive relationship reveal itself. Fairlie and Krashinsky (2012), using a new dataset, find evidence in support of Evans and Jovanovic (1989) view that entrepreneurs are liquidity constrained. The influence of liquidity on entrepreneurial behaviour is further examined in Siddiqi (2011), Cho and Lee (2013) and Davila, Foster, He, and Shimizu (2014).

3.2 Liquidity and the cost of capital

Diamond and Verrecchia (1991) show that using disclosure to reduce information asymmetry can lead to lower cost of capital by increasing liquidity for a firm's securities. Grullon, Kanatas and Weston (2004) argue that firms with larger advertising expenditures have greater liquidity and that this has flow-on effects to the cost of capital and the value of the firm. Xu,

Liu and Huang (2014) find that in the Chinese market, firms with a higher corporate social responsibility index have a lower cost of capital and that this effect is more pronounced in down markets than in boom markets. Finally, Chang, Cheng, Pinegar and Yu (2012) find that short-sale restrictions lead to a lower cost of capital.

3.3 Liquidity and debt

Diamond (1991) argues that liquidity risk affects the maturity of debt. Whited (1992) finds that problems of asymmetric information affect firms' ability to obtain finance, with the result that these firms suffer in the allocation of real investment over time. Adding financial constraints to a production Euler equation greatly improves the empirical fit of the equation. Myers and Rajan (1998) argue that while liquid assets lead to greater value in a liquidation setting, holding excessive liquid assets can make it harder for a firm to raise external capital. Anderson and Carverhill (2012) examine the optimal policy to determine the holding of liquid assets by a firm. They find that optimal cash holdings are a non-monotonic function of business conditions and an increasing function of the amount of long term debt.

Iyer, Peydró, da-Rocha-Lopes and Schoar (2014) examine the effect of the European 2007 to 2009 credit crunch. They find that credit supply reduction is stronger for firms that are smaller, with weaker banking relationships and that small firms cannot compensate for the credit crunch with other sources of debt.

3.4 Liquidity and governance

Holmstrom and Tirole (1993) show that stock prices contain valuable performance information that can be used to structure managerial incentives, with the quantity of information contained in prices dependent upon liquidity. They show that concentrated ownership reduces liquidity and, thus, weakens managerial incentives and monitoring. In a

similar vein, Maug (1998) looks at the tradeoff between liquidity and monitoring by large shareholders.³ On one hand, a liquid market weakens incentives for large shareholders to monitor, as they can sell their shares more easily in a liquid market. On the other hand, a liquid market makes it easier to buy a large stake and to increase that stake. This investment nimbleness is important when monitoring is costly and liquidity mitigates the problem of small shareholders free riding on monitoring. Maug (1998) concludes that, on balance, liquid markets make corporate governance more effective. Edmans, Fang and Zur (2013) also reinforce the positive effect of liquidity on corporate governance, since liquidity encourages large shareholders to take a stake in the firm.

3.5 Liquidity and behavioural considerations

Baker and Stein (2004) build a model in which high liquidity comes from the market being dominated by irrational investors and they show that these increases in liquidity are associated with lower subsequent returns both on an individual firm and aggregate market level. Ahn et al (2014) examine the impact of a reduction in the minimum trade unit on the equity market. They find that the number of individuals trading increases liquidity but also increases the informativeness of prices. Chae and Yang (2013) find commonalities in the trading of individual investors, as well as commonalities in liquidity, with commonalities in trading helping to predict future stock returns. Lowe (2014) provides a demand side explanation for commonalities in liquidity.

3.6 Liquidity and insider trading

Cheng, Firth, Leung and Rui (2006) find that spreads widen and depth falls on days when insiders trade, indicating that increased informed trading activity leads to decreased liquidity.

³ See also: Bhide (1993), Bolton and Thadden (1998), Roosenboom, Schlingemann and Vasconcelos (2013) and Chu, Liu and Tian (2014).

This is consistent with Glosten (1989) who finds that insider trading reduces liquidity because market makers reduce liquidity as an optimal response to the possibility of being on the losing end of a transaction induced by an informational advantage. Similar to Cohen, Malloy and Palmoski (2012), Tirapat and Visaltanachoti (2013) propose a framework to distinguish between insider liquidity trades versus insider opportunistic trades. Consistent with their predictions, the latter authors find that opportunistic trades earn significantly higher returns.

3.7 Liquidity and corporate events

With regard to how liquidity plays a role in the investigation of corporate events, consider the following illustrative set of papers. Ng, Yong and Faff (2013) find that liquidity is a driver in both short- and long-term returns of cross-listed firms. Doukas and Wang (2013) investigate the impact of short-sale constraints on liquidity in the Hong Kong stock market. They find that following the repeal of short-sale restrictions, only large inactive low-liquidity firms experience an increase in liquidity with the remaining firms exhibiting decreased liquidity. Roosenboom, Schlingemann and Vasconcelos (2013) examine takeovers seeking to assess whether liquidity affects acquirer returns through its hypothesised effect on institutional monitoring. They find that acquirers with lower liquidity have higher acquirer gains for private targets but not for public targets. So and Wang (2014) examine earnings announcements and use short-term reversals as a proxy for the return market makers demand for providing liquidity. They find that uncertainty attaching to the information in the earnings release, induces increases in expected returns to liquidity provision and that such increases significantly affect the dynamics and information content of market prices. Bugeja, Patel and Walter (2015) also find an increase in spreads and the probability of informed trading prior to takeover announcements. The event of newly indexed firms, and its relation to liquidity, is

examined by Platikanova (2015). This event results in firms holding less cash but it improves their access to capital.

4. Liquidity and Asset Pricing

Amihud and Mendelson (1986) show that expected return is an increasing function of the bid-ask spread, the latter of which they use as their measure of illiquidity. Amihud and Mendelson (1991) find a liquidity effect in the bond market, as does Murik (2013b). Notably, Eleswarapu and Reinganum (1993) find that the liquidity effect in the stock market is only significant in the month of January.

Stambaugh (2003) finds that expected return is higher for stocks that have high sensitivity to aggregate liquidity, with the difference between high sensitivity and low sensitivity stocks coming in as high as 7.5% per annum. Chan and Faff (2003) and Chai, Faff and Gharghari (2013) also find a similar result in the Australian market, while Nguyen and Lo (2013) do not find a significant liquidity effect in New Zealand. Acharya and Pedersen (2005) propose a model in which expected returns are related to a stock's own liquidity as well as its sensitivity to market liquidity. Liu (2006) finds that liquidity is an important source of priced risk over and above that predicted by either the CAPM or the Fama French three factor model. Bekaert, Harvey and Lundblad (2007) find that local market liquidity is an important driver of expected returns in emerging economies.

In more recent work, Narayan and Zheng (2010) find that including liquidity in asset pricing tests helps capture financial market anomalies with the notable exception of momentum in Chinese markets. Nagel (2012) finds that liquidity and the VIX index are closely linked and that the expected return related to the provision of liquidity, spikes during periods of market turmoil. Shin and Kim (2015), employing a Korean sample, find that liquidity is an important determinant of the variation in corporate bond yield spreads before

and during the GFC, while credit risk is more prominent after the crisis. Finally, we note that Subrahmanyam (2009) argues that since liquidity and liquidity risk are priced in financial markets, policies to enhance liquidity should be encouraged.

5. Liquidity and Market Microstructure

This section looks at liquidity from a market microstructure point of view. We start by discussing papers that advocate alternative measures of liquidity, then investigate commonalities in liquidity and finish by looking at specific features of markets and liquidity.

5.1 Alternative liquidity measures

There are many alternative measures of liquidity using intraday data including: quoted bid-ask spread, effective bid-ask spread, variations of Kyle's lambda, quote size, trade size, trade volume and trade frequency.⁴ Measures using daily data include Pastor and Stambaugh (2003), Amihud (2002) and Liu (2006).⁵ The Pastor and Stambaugh (2003) measure of liquidity is based on reversals of the previous days order flow shock. The Amihud (2002) measure is based on the ratio of absolute returns to trading volume. The Liu (2006) metric is one of a set of measures that uses zero trading days, more specifically based on the proportion of zero trading volume days augmented by a turnover measure which helps to settle ties for firms which do not have any zero trading days. These measures have been extensively examined in several studies including Goyenko, Holden and Trzcinka (2009) and Korajczyk and Sadka (2008) with the result that effective spread, Amihud (2002) and Liu (2006) type measures show up as the most robust liquidity metrics. Kang and Zhang (2014) incorporate the non-trading frequency measure with the Amihud ratio and apply their measure to emerging markets.

⁴ See, e.g., Fleming (2003) and Aitken and Comerton-Forde (2003).

⁵ For zero trading based measures see also Lesmond, Ogden and Trzcinka (1999).

5.2 Liquidity commonality

Chordia, Roll and Subrahmanyam (2000) move away from focusing on the liquidity of individual stocks and look at the common determinants of liquidity.⁶ Moreover, they develop the concept of liquidity commonality, essentially captured by a liquidity “beta” in a market model type regression that uses liquidity change measures rather than returns as input variables. After allowing for firm-specific characteristics they find significant common influences. Chordia, Roll and Subrahmanyam (2001) examine market liquidity and find that daily changes in market liquidity and trading activity are highly volatile and negatively serially dependent and that liquidity plummets significantly in down markets.

Hasbrouck and Seppi (2001) also examine commonalities in liquidity and find that returns and order flows are characterised by common factors with commonality in order flows explaining two thirds of the commonalities of return. Karolyi, Lee and Van Dijk (2012) examine how supply and demand determinants affect liquidity across countries and over time. They find that commonality in liquidity is greater when: (a) volatility is high; (b) the proportion of international investors is high; and (c) trading activity is more highly correlated.⁷ Mayordomo, Rodriguez-Moreno and Pena (2014) find liquidity commonalities in the credit default swap market. Most recently, Chung and Chuwonganant (2014) find that the effect of VIX on stock liquidity is greater than the combined effects of all other determinants of stock liquidity.

5.3 Specific features of markets and liquidity

Stoll and Whaley (1997) examine liquidity around the expiration of All Ordinaries futures contracts and find that although volume is significantly higher, price movements are not.

⁶ See also Grossman and Miller (1988).

⁷ See also Pukthuanthong-Le and Visaltanachoti (2009), Chang, Faff and Hwang (2010), Wang (2013), Chae and Yang (2013) and Mazouz, Alrabadi and Yin (2012).

Alampieski and Lepone (2009) examine the effect of a change in the minimum tick size of treasury bonds and find that liquidity is significantly increased.⁸ Aitken, Comerton-Forde and Frino (2005) examine the effect of call auctions at the close of trading on liquidity and conclude that under these circumstances trading is consolidated without any effect on the cost of trading. Frino, Lecce and Segara (2011) find that trading halts impair liquidity for markets that operate open electronic limit order books. Naidu and Rozeff (1994) find that automated trading increases liquidity, while Hendershott, Jones and Menkveld (2011) find that algorithmic trading improves liquidity for large stocks in particular. Sharif, Anderson and Marshall (2013) find that the introduction of short selling in China leads to a reduction in liquidity. Bai and Qin (2014) find that the winding back of short-sale constraints leads to an increase in liquidity only for large inactively traded firms.

⁸ See also Aitken and Comerton-Forde (2005).

6. Liquidity and Portfolio Management

Liquidity plays a role in portfolio trading strategies especially around momentum trading and value and size based trading. Demir, Muthuswamy and Walter (2004) examine momentum strategies in the Australian market and find that returns are not hampered by liquidity concerns. In contrast, Bettman, Sault and von Reibnitz (2010) find that liquidity is a concern for momentum profits in the Australian environment and that insignificant dollar profits are obtained from implementing a momentum strategy focused on liquid stocks.⁹

Yet, with a different message, Li, Stork, Chai, Ee and Ang (2014) find that there are still significant momentum returns when the strategy is confined to the relatively liquid ASX 200 stocks but that the momentum effect is more pronounced for winner stocks. Chee, Sloan and Uysal (2013) consider the effects of liquidity on value investing in the Australian market, while Docherty, Chan and Easton (2013) examine size and value strategies and conclude that because of liquidity concerns investing in large cap stocks seems to be the best way to exploit the size and value strategies.¹⁰

Chen, Hong, Huang and Kubik (2004) examine the role of liquidity in eroding large fund's performance. They conclude that the size of the fund acts to impair performance because of the interaction of liquidity and organizational diseconomies. Tang, Wang and Xu (2012) find similar results in a study of Chinese mutual funds.

Given that liquidity is crucial in executing fund strategies, the ability to time market liquidity so that transactions are implemented when liquidity is high is highly desirable. To this end, Cao, Chen, Liang and Lo (2013) examine the liquidity timing ability of a sample of hedge funds and find strong evidence of liquidity timing. Aragon and Strahan (2012) using a natural experiment around the Lehman bankruptcy also find evidence that hedge funds act as

⁹ See also Abinzano, Muga and Santamaria (2013).

¹⁰ See also Gallagher, Gardner, Schmidt and Walter (2013).

liquidity providers and conclude that shocks to traders' funding liquidity reduce the market liquidity of the assets that they trade.

Commonalities in liquidity for country-based ETFs are studied by Lee, Tseng and Yang (2014) who find that there is strong commonality of liquidity across 21 such instruments and that this commonality is stronger during financial crises. Lowe (2014) advances a demand side explanation for commonalities of liquidity and, using Taiwan as his “laboratory”, concludes that correlated trading among institutions generates co-movement in liquidity. Also in Taiwan, Chen, Chow and Shiu (2015) examine correlated trades (“herding”), distinguishing between large individual and small retail investors. Most notably, they document a “big divide” in the relative impact of these correlated trading measures – large individual (small retail) investors correlated trades move (are inversely related to) contemporary prices and positively (negatively) predict future returns.

Chen, Foster, Gallagher and Lee (2013) examine the benefits of “emulation” funds which are designed to minimize transactions by combining the trades of the various fund managers in a multi-manager fund. They find that there is no strong evidence to support the use of emulation funds from a cost-benefit perspective in the Australian environment. Cullinan and Zheng (2014) examine the effect of liquidity on closed-end fund discounts and find that liquidity is more important when these funds trade at a premium.

7. Conclusion

We review the finance literature on liquidity. Our paper shows a very broad influence of liquidity across many mainstream segments of finance that will provide important landmark guidance for novice and experienced researchers alike. Specifically, we examine liquidity at the macro and micro level and explore the role of liquidity in the context of corporate finance; asset pricing; market microstructure; and portfolio management. At the macro level

the literature establishes the need for government securities to provide liquidity to firms. However, linkages between the banking and capital markets, bond and stock markets and, consumption, growth and savings all impact macro liquidity. In the corporate setting we learn that entrepreneurs are liquidity constrained and liquidity has both direct and indirect impacts on the cost of capital, debt characteristics and governance. With respect to corporate activities the literature covers a broad range of relations between liquidity and: insider trading, short selling, cross-listing and takeovers. Our review identifies that liquidity impacts asset prices across a geographically broad group of markets. In the microstructure literature we review the common measures of liquidity and note that the Amihud (2002) and Liu (2006) measures are the most robust. We summarize the various determinants of liquidity and note that recent literature shows that VIX has a greater impact on stock liquidity than other determinants. The final section of this paper demonstrates the relevance of liquidity to various types of portfolios including mutual funds, ETFs and hedge funds. Liquidity timing is an important dimension for portfolio managers.

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Injecting Liquidity into Liquidity Research

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Abstract

In this paper, we aim to make more “liquid” our general understanding of liquidity research in finance. Our review of the relevant literature shows that it covers an extensive territory. Indeed, not only is liquidity important to the very existence and viability of markets, but it is also critical to the pricing of assets, the macro economy, funds management and corporate finance.

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Highlights:

- We inject liquidity into liquidity research
- We review the extensive relevant literature
- liquidity is important to the very existence and viability of markets
- liquidity is also critical to the pricing of assets
- the macro economy, funds management and corporate finance