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Liquidity and Asset Prices

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Abstract

We review the theories on how liquidity affects the required returns of capital assets and the empirical studies that test these theories. The theory predicts that both the level of liquidity and liquidity risk are priced, and empirical studies find the effects of liquidity on asset prices to be statistically significant and economically important, controlling for traditional risk measures and asset characteristics. Liquidity-based asset pricing empirically helps explain (1) the cross-section of stock returns, (2) how a reduction in stock liquidity result in a reduction in stock prices and an increase in expected stock returns, (3) the yield differential between on- and off-the-run Treasuries, (4) the yield spreads on corporate bonds, (5) the returns on hedge funds, (6) the valuation of closed-end funds, and (7) the low price of certain hard-to-trade securities relative to more liquid counterparts with identical cash flows, such as restricted stocks or illiquid derivatives. Liquidity can thus play a role in resolving a number of asset pricing puzzles such as the small-firm effect, the equity premium puzzle, and the risk-free rate puzzle.

1

Introduction*

This survey reviews the literature that studies the relationship between liquidity and asset prices. We review the theoretical literature that predicts how liquidity affects a security's required return and discuss the empirical connection between the two.

Liquidity is a complex concept. Stated simply, liquidity is the ease of trading a security. One source of illiquidity is *exogenous transaction costs* such as brokerage fees, order-processing costs, or transaction taxes. Every time a security is traded, the buyer and/or seller incurs a transaction cost; in addition, the buyer anticipates further costs upon a future sale, and so on, throughout the life of the security.

Another source of illiquidity is *demand pressure* and *inventory risk*. Demand pressure arises because not all agents are present in the market at all times, which means that if an agent needs to sell a security quickly, then the natural buyers may not be immediately available. As a result, the seller may sell to a market maker who buys in anticipation of being able to later lay off the position. The market maker, being exposed to the risk of price changes while he holds the

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asset in inventory, must be compensated for this risk – a compensation that imposes a cost on the seller.

Also, trading a security may be costly because the traders on the other side may have *private information*. For example, the buyer of a stock may worry that a potential seller has private information that the company is losing money, and the seller may be afraid that the buyer has private information that the company is about to take off. Then, trading with an informed counterparty will end up with a loss. In addition to private information about the *fundamentals* of the security, agents can also have private information about *order flow*. For instance, if a trading desk knows that a hedge fund needs to liquidate a large position and that this liquidation will depress prices, then the trading desk can sell early at relatively high prices and buy back later at lower prices.

Another source of illiquidity is the difficulty of locating a counterparty who is willing to trade a particular security, or a large quantity of a given security. Further, once a counterparty is located, the agents must negotiate the price in a less than perfectly competitive environment since alternative trading partners are not immediately available. This *search friction* is particularly relevant in over-the-counter (OTC) markets in which there is no central marketplace. A searching trader incurs financing costs or opportunity costs as long as his trade is delayed, and, further, he may need to give price concessions in the negotiation with the counterparty that he eventually finds. Alternatively, he may trade quickly with a dealer and bear illiquidity cost. In general, a trader faces a tradeoff between search and quick trading at a discount.

These costs of illiquidity should affect securities prices if investors require compensation for bearing them. In addition, because liquidity varies over time, risk-averse investors may require a compensation for being exposed to liquidity risk. These effects of liquidity on asset prices are important. Investors need to know them in designing their investment strategies. And if liquidity costs and risks affect the required return by investors, they affect corporations' cost of capital and, hence, the allocation of the economy's real resources.

Liquidity has wide ranging effects on financial markets. As our survey shows theoretically and empirically, liquidity can explain the cross-section of assets with different liquidity, after controlling for other assets' characteristics such as risk, and the time series relationship between liquidity and securities returns. Liquidity helps explain why certain hard-to-trade securities are relatively cheap, the pricing of stocks and corporate bonds, the return on hedge funds, and the valuation of closed-end funds. It follows that liquidity can help explain a number of puzzles, such as why equities commanding high required returns (the equity premium puzzle), why liquid risk-free treasuries have low required returns (the risk-free rate puzzle), and why small stocks that are typically illiquid earn high returns (the small firm effect).

The liquidity literature is vast. In this survey we restrict our attention to papers that link liquidity to securities' required return, that is, to the literature on liquidity and asset pricing. Hence, we will not survey the large literature on market microstructure, which studies trading mechanisms and the origins of illiquidity, e.g., in the form of bid–ask spreads or market impact. Surveys of market microstructure include O'Hara (1995), Madhavan (2000), Biais et al. (2002), and Harris (2003). Further, Easley and O'Hara (2003) survey papers on microstructure and the relationship to asset pricing, and Cochrane (2005) surveys recent NBER papers on liquidity and asset pricing. We apologize that we cannot survey every paper on liquidity and asset pricing; the literature is simply too large and too rapidly expanding. Our final apology is that our own papers are probably among the least overlooked; in our defense, these are the papers that we know best, and they ask the questions that originally drew us into this field.

In what follows, the theory of liquidity-based asset pricing is surveyed in Section 2 and the empirical evidence is reviewed in Section 3. The theory section proceeds from basic models with exogenous (expected) holding periods to ones incorporating additional elements of risk and endogenous holding periods. The empirical section reviews the evidence on the liquidity premium for stocks, bonds, and other financial assets.

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