

Chapter 36

MARKET LIQUIDITY ¹

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Abstract

Liquidity, which is integrally related to trading costs, refers to the ability of individuals to trade at reasonable prices with reasonable speed. As such, liquidity is a major determinant, along with risk and return, of a company's share value. Unfortunately, an operational, generally accepted measure of liquidity does not exist. This entry considers the following proxy measures: the bid-ask spread, the liquidity ratio (which relates the number or value of shares traded during a brief interval to the absolute value of the percentage price change over the interval), and the variance ratio (which relates the volatility of short-term price movements to longer-term price movements). The determinants of liquidity considered are the size of the market for a stock and market structure. The paper concludes by stressing that illiquidity increases the cost of equity capital for firms, but that trading costs can be reduced and liquidity enhanced by the institution of a superior trading system.

Keywords: bid-ask spread; cost of equity capital; liquidity; liquidity ratio; market structure; risk and return; share value; trading costs; trading system; variance ratio

Liquidity refers broadly to the ability of individuals to trade quickly at prices that are reasonable in light of underlying demand/supply conditions. Liquidity, risk, and return are the major determinants of a company's share value. Risk constant and

expected return must be higher and a company's cost of capital greater, if the market for its shares is less liquid. A number of authors have studied the cross-sectional relationship between liquidity and asset prices (see, for example, Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996; Easley et al., 2002; Pastor and Stambaugh, 2003), as well as the time series relationship (Jones, 2002). However, a comprehensive understanding of the impact and determinants of liquidity is still lacking. The problem is that an operational, generally accepted measure of liquidity does not exist.

Liquidity is often described by the depth, breadth, and resiliency of the market for an asset. A market has depth and breadth if orders exist at an array of prices in the close neighborhood above and below the values at which shares are currently trading, and if the buy and sell orders exist in substantial volume. A market is resilient if temporary price changes due to order imbalances quickly attract new orders that restore reasonable share values.

Liquidity (and its converse, illiquidity) can also be defined in terms of the transaction costs incurred to obtain a fast execution. Transaction costs include an explicit component such as commissions, and an implicit component such as a bid-ask spread and market impact. The ask quotation is the price at which shares can be purchased with immediacy, and the bid quotation is the price at which shares can be sold with immediacy. The difference, known as the bid-ask spread, is the cost of a round-trip, and half of the spread is

typically viewed as the cost of buying or selling shares immediately.

Market impact exists when a buy order drives the ask up, or a sell order drives the bid down. This occurs because the volume of shares at the quotes may be small relative to the size of the order, and/or because of the dissemination of the information that a large trader has arrived in the market. The spread and market impact are large if a market lacks depth and breadth.

Bid-ask spreads are directly quantifiable, but market impact is very difficult. The problem is two-fold. First, because of information leaks and front-running, an order can impact prices before it reaches the market. Second, prices are constantly changing due to news and liquidity trading, and thus a reasonable benchmark against which to assess the implicit cost components of a transaction price is not readily available.

Prices are also distorted due to the difficulty of finding equilibrium values in the marketplace. Errors in price discovery occur because prices depend on the order flow while simultaneously orders are priced with imperfect information about the underlying consensus values. Analogous to the market impact effect, transaction prices can be pushed up if impatient buyers outnumber impatient sellers, or can be pushed down if impatient sellers outnumber impatient buyers (Ho et al., 1985). In a resilient market, errors in price discovery are quickly corrected.

None of the attributes of liquidity thus far discussed provide an unambiguous measure of the concept. One commonly used measure is the bid-ask spread (Amihud and Mendelson, 1986). Another is the liquidity ratio, which relates the number or value of shares traded during a brief time interval to the absolute value of the percentage price change over the interval. The larger the ratio of shares traded to the percentage price change, the more liquid the market is presumed to be. This view underlies measures of specialist performance that have been used by various stock exchanges, and characterizes the approach taken by some researchers to measure and to contrast

the liquidity of different market centers (Cooper et al., 1985; Hui and Heubel, 1984).

The liquidity ratio, however, can be misleading. If news causes prices to change, a large liquidity ratio that is attributed to heavy trading volume would suggest that prices have adjusted too slowly in response to the informational change. This is because a bid that is too high attracts market orders to sell, and an ask that is too low attracts market orders to buy. Consequently, to the extent that trading is triggered by informational change (rather than by idiosyncratic investor needs), trading volume is less, and the liquidity ratio is smaller (not larger) in a more efficient market.

Another measure of liquidity is the variance ratio, which relates the volatility of short-term price movements to the volatility of longer-term price movements. Transaction prices jump up and down as executions bounce between the bid and the ask, as large orders impact prices, and as transaction prices fluctuate around equilibrium values due to price discovery errors. Thus, implicit execution costs increase the volatility of short-term price movements. Because the effect attenuates as the interval over which price changes are measured is lengthened, it is possible to proxy liquidity by the variance ratio. Hasbrouck and Schwartz (1988), for example, find that an appropriately adjusted ratio of two-day to half-hour returns variance is predominantly less than unity (the value expected for a perfectly liquid market) for a large sample of NYSE, Amex and OTC stocks. Ozenbas et al. (2002) report an accentuation of intra-day volatility that is most pronounced in the first half-hour of a trading day in five markets – the New York Stock Exchange and NASDAQ in the United States, and the London Stock Exchange, Euronext Paris and Deutsche Börse in Europe.

A primary determinant of liquidity is the size of the market for a stock (or inversely, thinness). Size can be measured as the number or value of shares outstanding, the number or value of shares traded, and/or the number of shareholders. Empirical studies have shown that spreads are wider, market impact greater, and price discovery less accurate for thinner issues (Cohen et al., 1986; Schwartz and

Francioni, 2004). But even for larger issues, markets can be thin, particularly for big, institutional investors. This is because, during any trading session, only a relatively small number of individuals actually seek to trade. For small-cap and mid-cap stocks, the problem may be particularly striking within a trading day: at any given moment, only a handful of individuals (if any) may be actively looking to buy or to sell shares.

Market structure also affects the liquidity of individual issues, and the U.S. Securities and Exchange Commission has required that execution venues report their execution quality on multiple dimensions (see SEC, 2000). The primary market makers in certain market centers are dealers and specialists, whose role is to supply immediacy to public traders. In this context, the provision of immediacy is essentially synonymous with the provision of liquidity, the ability to transact quickly at reasonable prices. Liquidity may also be enhanced by other market structure mechanisms. One important approach would be to increase the depth and breadth of a market by encouraging public traders to place more limit orders. The imposition of rules to prevent destabilizing trades (i.e. tick-test rules) and the time bunching of orders are two other ways to increase liquidity. In 2001, the NYSE and NASDAQ completed a conversion from fractional to decimal prices under pressure from the SEC. The switch has resulted in sharply reduced quoted spreads. However, there is evidence that the inside market depth has been reduced for the large traders (Sofianos, 2001).

Public orders generally execute at inferior prices in illiquid markets. As a consequence, expected returns on securities traded in less liquid markets must be higher and the cost of capital for the listed companies is greater. The important insight is that the costs of trading can be decreased by the institution of a superior trading system. In the limit, as a market becomes frictionless, the issues traded in it become perfectly liquid.

NOTE

1. This material is modified from an equivalent entry from: *The New Palgrave Dictionary of Money and Finance*, by: Newman, Peter. Reprinted with permission of Palgrave Macmillan. Copyright © Newman, Peter.

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