

ANALYZING ETF LIQUIDITY

BEYOND BID/ASK SPREAD

In this piece, we will review how to evaluate ETF market quality and trade executions. It is a common misperception to judge an ETF's market quality and execution solely based upon its bid/ask spread. A detailed analysis of trade and execution data can provide a more complete picture of ETF market quality. At ProShares, we record and analyze every execution for our ETFs, and those of our major competitors, so that we can provide a more complete picture of market quality.

Trade Size: Execution quality can vary depending on the size of a trade. While smaller trades may source liquidity primarily through the secondary market, larger trades are influenced more by the cost to create and redeem shares (See Analyzing ETF Liquidity Part I – ETF Structure). Before trading, investors should consider the execution quality of trades of a similar size to that which they are planning.

Evaluating Execution Quality: There are a couple of options for evaluating execution quality. One way is to consider whether trades typically occur at prices between the bid/ask spread or not. ETFs with wider onscreen spreads may have a higher percentage of the trading executed at prices inside the bid/ask spreads compared to funds with tighter onscreen bid/ask spreads. Another way is to research the difference between the fair value of the ETF and its execution price at the time of the trade. This is also known as the Premium/Discount. It may be more appropriate to use the Indicative Value (IV) or the midpoint of the bid/ask spread as a suitable benchmark for fair value, depending on the type of fund.

Analysis of Hypothetical ETF Execution Quality: In the below example, we'll highlight key findings from a hypothetical ETF.

1. Average spreads are much tighter than the industry average (52 bps).
2. Average Daily Share Volume is lower than the industry median (144,150).
3. Most trades are not executed inside the spread, but this should be expected if the median spread is just over \$.01.
4. Most importantly, Median Estimated Execution Cost is consistently within a few basis points of fair value, at all trade sizes, and for buys and sells.

Total Shares	Number of Trades	Trades Inside the Spread		Median Estimated Execution Cost (bps)	
		No	Yes	Buys	Sells
0 - 100	371,935	83%	17%	1.65	1.28
101 - 1,000	214,188	81%	19%	1.99	1.40
1,001 - 10,000	17,666	79%	20%	2.49	1.78
10,000 - 25,000	253	87%	13%	5.49	2.74
25,000 - 50,000	53	98%	2%	4.57	2.47
> 50,000	30	100%	0%	3.53	4.43

Median Spread: \$.0125

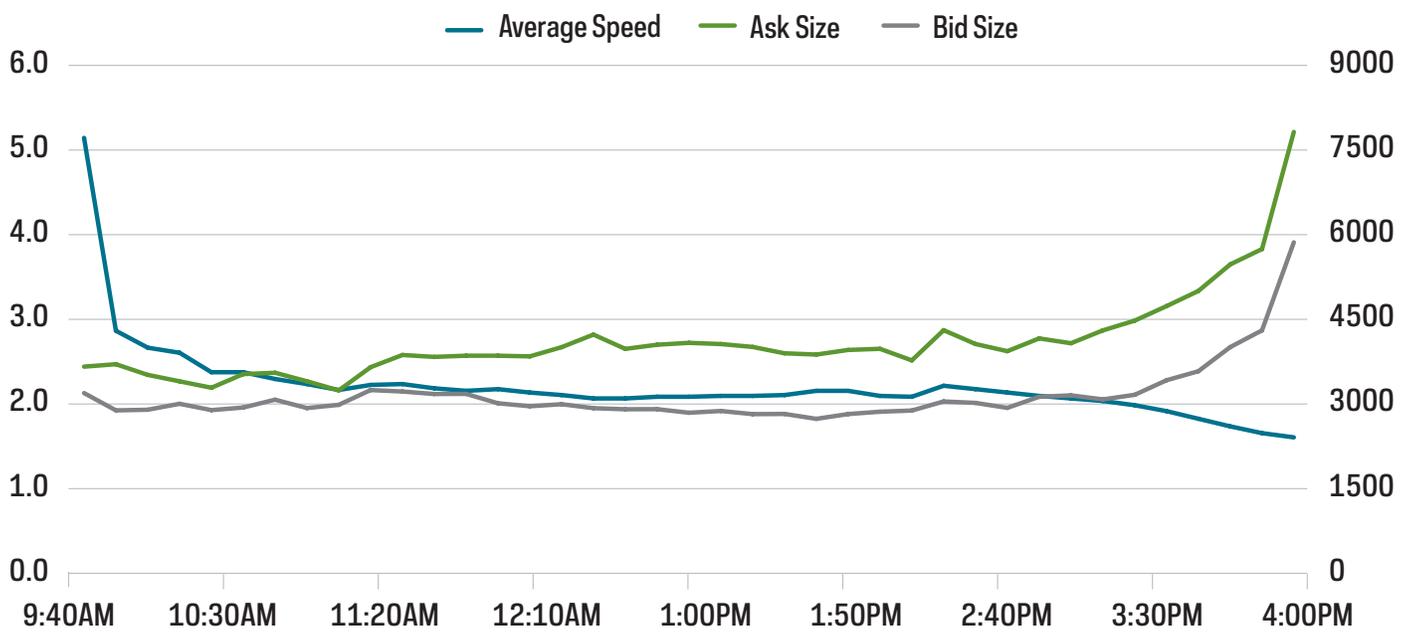
Average spread: 2.00 bps

Average Daily Shares Volume: 20,501

Average Daily \$ Volume: \$1,325,502

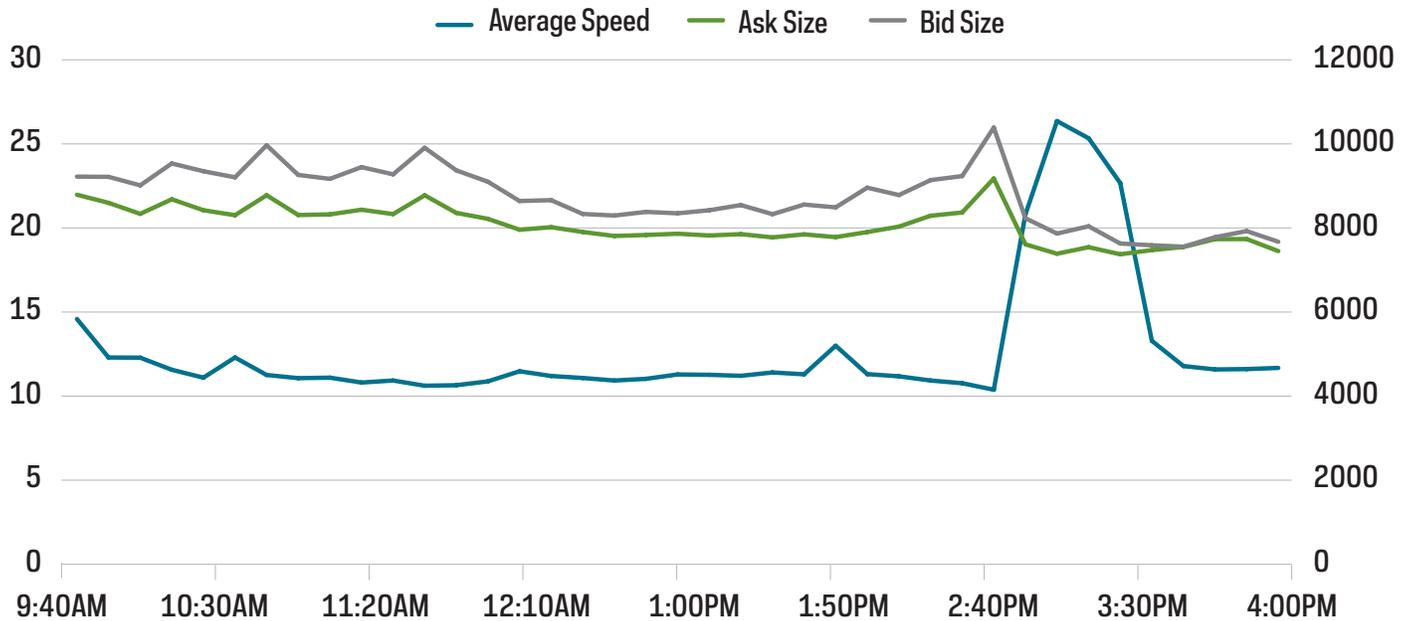
Time of Day: The underlying asset class can have a meaningful impact on liquidity during the trading day. While a domestic equities ETF may have more depth and tighter spreads later in the trading day, a fund where the underlying asset class closes during trading hours may result in a decline of market quality. Market depth can be measured by the average number of shares displayed in the National Best Bid and Offer (NBBO), or by the average spread throughout the day.

Average Spread and Quote Size Throughout Trading Day - Hypothetical Domestic Equity ETF



Oil futures tend to have more liquidity prior to 2:30 ET.

Average Spread and Quote Size Throughout Trading Day – Hypothetical Oil ETF



Domestic equities tend to be more liquid throughout the trading day.

Premium/Discounts: A premium or discount occurs when the market price of an ETF rises above or falls below its fair value. If the market price is higher than the Net Asset Value (NAV), the ETF is said to be trading at a "premium." If the price is lower than the NAV, it is trading at a "discount." When a fund is trading at a premium, there tends to be more buyers than sellers. When a fund is trading at a discount, there tends to be more sellers than buyers. This may provide insight into potential investor trends and whether the fund is trading further away from its fair value or not.

Other Liquidity Trends: An ETF may have higher or lower levels of liquidity depending on market conditions, structural changes to a fund, other secondary market influences, or some combination of these factors.

Key terms

Indicative Value (IV): The IV is one method for establishing a point of reference for the value of an ETF during the trading day. It is disseminated to the public at least every 15 seconds, and it provides an intraday indicative value of an ETF based on the market values of its underlying constituents. There are limitations to the usefulness of IVs in specific asset classes, such as international or fixed income ETFs, where the price of the underlying security or bond may be stale.

Bid/Ask Midpoint: The "Bid" is the price that someone is willing to pay for an ETF at a specific point in time. The "Ask" is the price someone is willing to offer an ETF for sale at a specific point in time. Using the midpoint of the bid/ask spread may be a more accurate reflection of the fair value of an ETF for asset classes where the underlying securities may be stale, such as international or fixed income ETFs.

National Best Bid and Offer (NBBO): NBBO is a regulation by the United States Securities and Exchange Commission that requires brokers to execute customer trades at the best available ask price when buying securities, and the best available bid price when selling securities, as governed by Regulation NMS.

Bid/Ask Spread: The bid/ask spread is the difference between the highest price that a market maker or buyer is willing to pay for an asset and the lowest price that a market maker or seller is willing to accept for it.

Depth of the Market: Market depth is the quantity of shares resting at the NBBO.

Average Daily Volume (ADV): ADV is the average number of shares traded within a day in a given ETF. Daily volume is how many shares are traded each day, but this can be averaged over a specific time period to find the average daily volume during that period.

This information is not meant to be investment advice.

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