Understanding ETF liquidity and trading

ETF liquidity and trading can seem complex. For example, you may have heard that ETFs with lower average daily trading volumes (ADVs) aren't as liquid as others with higher ADVs. In fact, ADV is only a small part of an ETF's total liquidity profile.

Here, we explain why ADV provides an incomplete measure of ETF liquidity, explore the sources of ETF liquidity and offer some ETF trading best practices.

Why ETF volume doesn't equal ETF liquidity

To understand ETF liquidity, it helps to remember the basic differences between ETFs and shares.

A single share's price is based on market supply and demand. Is there a buyer or seller for the share? Or is there any type of market news or news about the company that could drive the share price higher or lower throughout the day?

An ETF is a portfolio made up of multiple securities. While market supply and demand could affect its price in certain circumstances, a much greater factor is the value of the ETF's underlying portfolio.

The relationship between ADV and liquidity is also different for ETFs and shares. A single share's liquidity is based on its trading activity on the stock exchange, which reflects investor demand for a fixed supply of shares. Since ADV measures trading activity, it provides a good indication of a share's liquidity.

With ETFs, ADV provides only a partial indication of liquidity. That's because unlike single shares, the supply of ETFs is open-ended. New ETF shares can be created and existing shares redeemed based on investor demand.

ETF creation and redemption works by tapping into the liquidity of an ETF's underlying portfolio of securities. The benefit to investors is they can trade ETFs in amounts that far exceed an ETF's ADV without significantly affecting the ETF's price.

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Figure 1. Some differences between ETFs and single shares

	ETFs	Single shares
Price	Based on the value of the underlying portfolio	Based on supply of/demand for available shares
Supply of shares	Open-ended	Closed-ended
Primary source of liquidity	Trading activity of securities in the underlying portfolio	Trading activity of the share
Best measure of liquidity	ADV of securities in underlying portfolio	ADV of the share

Source: The Vanguard Group, Inc.

The sources of ETF liquidity

Before we explore how ETFs get liquidity from their underlying securities, let's look at some other sources of ETF liquidity. We'll begin with one that's easiest to see — an ETF's trading activity on the stock exchange.

Visible liquidity on the stock exchange

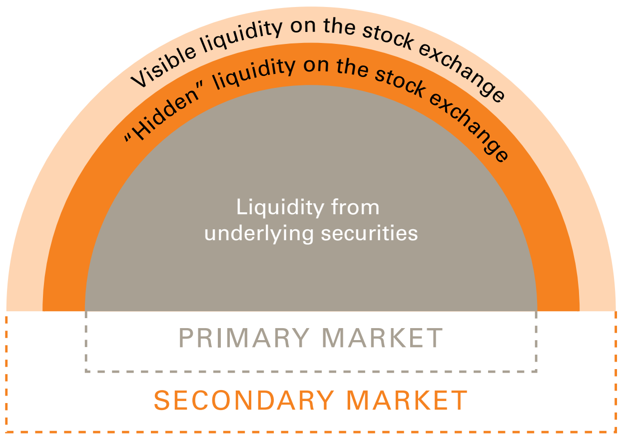
The most visible source of ETF liquidity is the trading activity of buyers and sellers in the secondary market that takes place on an exchange. ADV is a measure of this trading activity, but it doesn't indicate an ETF's total liquidity.

The natural liquidity of ETFs trading in the secondary market is enhanced by exchange-registered traders called market makers. Market makers help maintain a fair and orderly market by selling ETF shares to potential buyers and by buying ETF shares from potential sellers. In the absence of another buyer or seller, a market maker can often match the other side of a pending order.

"Hidden" liquidity on the stock exchange

Not all of an ETF's liquidity in the secondary market is readily visible. If you're a typical investor, your "on screen" view is probably limited to what's available through public financial websites. This means you'll have access to an ETF's highest bid and lowest ask, but you won't be able to see all the quotes in an ETF's order book. These quotes are another source of ETF liquidity because they represent additional prices at which ETF shares can be traded.

Figure 2. The layers of ETF liquidity



Source: The Vanguard Group, Inc.

An ETF's liquidity can be hidden in other ways too. For example, many ETFs trade on more than one exchange. So your "on screen" view may display an ETF's trading volume on the LSE but not show its volume on other exchanges such as Euronext or the SIX Swiss Exchange.

Finally, some ETF trading activity takes place off exchanges altogether. Sometimes called over-the-counter (OTC) trading, this activity is generally not reflected in the volume data provided by stock exchanges. The bottom line? Without seeing consolidated trading information, you can't accurately assess an ETF's liquidity.

Liquidity from underlying securities

Although trading activity and market depth on the stock exchange contribute to an ETF's secondary market liquidity, most of an ETF's liquidity comes from its underlying securities, as shown in **Figure 3**. ETFs tap into this liquidity with the help of large institutions who act as authorised participants (APs) to create and redeem large blocks of ETF shares directly from the ETF manager. This activity takes place in what's called the primary market.

The creation/redemption process supports ETF liquidity by regulating the supply of ETF shares in the secondary market as needed to meet investor demand. It also allows investors to execute large buy and sell orders for lower-volume ETFs — with little or no market impact.

An example: The ETF creation/redemption process

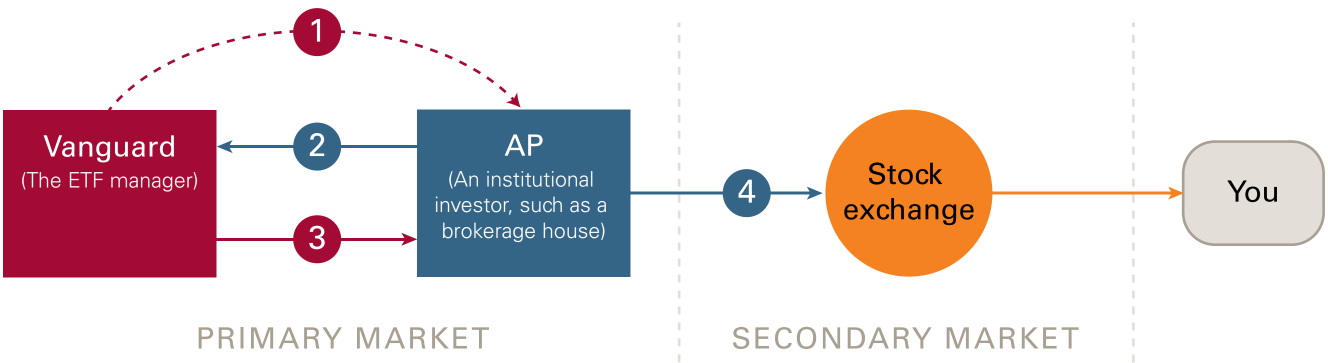
Imagine you want to buy $100 million of Vanguard S&P 500 UCITS ETF (VUSD). You happen to notice that VUSD's 20-day ADV is only about $30 million (consolidated across listings), so you contact your broker to make sure liquidity exists for the trade.

Your broker then considers the best way to source liquidity for your order. In this particular case, it's determined that new shares of VUSD should be created.

Even though your order is more than three times VUSD's ADV, an AP can easily source liquidity for the trade using the ETF creation process shown in Figure 3.

The redemption process is simply the reverse of the creation process. To create liquidity for a large sell order, an AP can buy ETF shares from the seller and then redeem them with the ETF manager in exchange for the underlying basket securities.

Figure 3. The ETF creation process in action



Step 1: Vanguard publishes a list of holdings that constitute VUSD's creation basket.

Step 2: The AP has the option to deliver cash or assemble and deliver the basket of securities to Vanguard for the creation of $100 million of new VUSD shares.

Step 3: Once Vanguard receives the cash or basket of securities, it delivers $100 million of new VUSD shares to the AP.

Step 4: The AP sells $100 million of new VUSD shares to you on the stock exchange (or OTC at an agreed upon price).

Note: *APs can fill ETF orders in several ways, including using their existing inventory, purchasing shares in the secondary market, borrowing shares or using the creation process to create shares. As a result, Step 4 may occur simultaneously to Steps 2 and 3.*

What motivates APs to play such an active role in ETF liquidity? APs earn a commission on their transactions. For example, an AP can acquire ETF shares from the ETF manager at the cost of acquiring the underlying securities, then sell the ETF shares in the secondary market at a small margin above that cost. Fortunately, competition between APs helps minimise the costs investors incur.

A notable aspect of ETF creation/redemption is how little of each underlying security an AP may need to trade in order for the process to work.

In our creation example, the order amount was more than three times greater than VUSD's ADV. But as **Figure 4** shows, creating new ETF shares for a $100 million trade required a maximum trade of only 0.28% of the ADV of any single underlying share.

The creation/redemption process allows ETFs to get most of their liquidity from their underlying securities. As long as an AP can efficiently trade the securities in the ETF basket, it can adjust the supply of ETF shares in the secondary market as needed to meet investor demand. In our example, VUSD's basket of shares had ample liquidity to support the creation of new ETF shares.

Every ETF has a unique liquidity profile that is based on how easy it is to trade the ETF's underlying securities, the costs associated with the creation/redemption process and other considerations. Understanding these facets is critical to your ability to execute trades within an acceptable price range.

As we've seen, ADV may be the most visible measure of ETF liquidity, but it tells only a small part of the story.

Figure 4. APs can create/redeem ETF shares by trading a fraction of the underlying shares' ADV

Underlying share	Amount required to create $100 million of VUSD	20-day ADV	% of ADV traded to create $100 million of VUSD
Berkshire Hathaway Inc. Class B	$1,313,000	$461,267,171	0.28%
Brown-Forman Corp. Class B	$81,000	$31,071,935	0.26%
Johnson & Johnson	$1,708,000	$667,671,838	0.26%
Procter & Gamble Co.	$1,289,000	$604,454,874	0.21%
General Electric Co.	$1,461,000	$685,546,141	0.21%
Exxon Mobil Corp.	$2,279,000	$1,075,437,152	0.21%
PepsiCo Inc.	$797,000	$378,467,203	0.21%
Wells Fargo & Co.	$1,400,000	$685,337,984	0.20%
Berkshire Hathaway Inc. Class A	$118,000	$59,460,746	0.20%
Marsh & McLennan Cos. Inc.	$162,000	$81,918,950	0.20%

Source: Vanguard, Bloomberg L.P.

Note: The table shows the shares that will be most heavily traded (as a percentage of each share's ADV) in the creation of $100 million of VUSD. This is a hypothetical example only. The data are provided for informational purposes only and are not intended for trading purposes.

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Best practices for ETF trading

When you buy or sell an ETF, you want to execute your trade as effectively as possible. You're more likely to do so, even when markets are volatile, by being aware of a few trading best practices.

Remember these basics

Use limit orders. A limit order lets you set the price at which you buy or sell an ETF. If you use a market order instead, you may pay more or receive less than you would have liked. With a limit order, however, shares may not be available at your specified price and not all of your trade may be executed. **Figure 5** lists other common order types and explains how they are used.

Consider market volatility. Market conditions can affect bid-ask spreads, or the difference between the price at which an investor can sell a security and the higher price required to buy the same security. During volatile periods, fewer shares may be listed at best-bid and best-ask prices, increasing the importance of using the appropriate order type and monitoring your trades.

Keep abreast of the news. ETFs can briefly trade at a premium or a discount to the net asset value of their underlying holdings. Such swings can result from a number of events, including the release of economic indicators or statements from central banks, as well as earnings and other news from companies that are large constituents of an ETF and its benchmark.

Understand liquidity. Remember that ETF shares can be created or redeemed at any time, so the liquidity of the underlying securities in the creation/redemption basket is what matters most. When the underlying securities are difficult to trade, the market maker's costs may increase, resulting in wider bid-ask spreads than usual or compared with ETFs in other asset classes. Liquidity of the underlying securities is known as primary market liquidity, while an ETF's ADV is known as secondary market liquidity.

Figure 5. Some common order types

Market order	You buy or sell immediately at the best available current price. When you place a market order, your priority is making the trade quickly, not securing a particular price.
Stop order	You set a price — the stop price — at which you automatically buy or sell. When the market hits the stop price, *your stop order becomes a market order*. The price you then get is the best available current price. That price may have changed, for better or worse, in the moments after your stop price triggered your market order. When you place a stop order, your priority is trying to limit a loss or protect a profit.
Limit order	You set a price and execute your trade only if shares are available at that price or better. Limit orders protect you from executing a trade at an undesirable price. When you place a limit order, your priority is securing a certain price, not speed of execution.
Stop-limit order	Similar to a stop order, but in addition to setting the stop price, you also set a limit price. When the market hits the stop price your stop order becomes a limit order, at the limit price you specified. When you place a stop-limit order, your priority is trying to limit a loss or protect a profit without the unpredictability of a market order.

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Heed the clock and the calendar

Spreads can widen at certain times each day or on certain days of the year.

At the market's open. Some of an ETF's underlying securities may not begin trading at the open, perhaps because of material news about a security. In such situations, the market maker can't price the ETF with certainty.

When the bond market is closed but the stock market is open. ETFs trade like shares, even when they seek to track bond indices. So fixed income ETFs trade whenever the stock market is open — even if the bond market is closed and, as a result, the market maker doesn't have a pricing source. For example, a European government bond ETF listed in London will continue to trade while the LSE is open, even if European markets (where the underlying bonds trade) are closed.

When international markets are closed. It's generally preferable to trade international ETFs at times that coincide with the trading hours of the underlying securities' local markets. For example, prices of international ETFs traded in Europe tend to be closer to the value of the underlying securities and typically trade with narrower bid-ask spreads when their respective markets are open and overlap with European trading hours.

At the market's close. Fewer firms may make markets in an ETF at the market's close, so fewer shares may be listed for purchase and sale than at other times of the day.

Use a block desk

A block desk, if one is available to you, can use its trading tools and network of relationships to help you when you place a large order. Your block desk may be able to:

- Review the depth of interest in an ETF before placing a trade. You may be able to determine from your trading screen only how many shares are available at best-bid and best-ask prices. Your block desk can evaluate additional availability of shares.
- Trade in increments to manage any effect that large trades could have on prices.
- Create and redeem ETF shares directly with the ETF issuer.
- Obtain a quote to execute the entire trade.

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Vanguard's ETF Capital Markets Team can help

If you'd like to learn more about ETF liquidity or ETF trading best practices, contact your sales executive, who can work with you and Vanguard's ETF Capital Markets Team.

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