

Debunking myths about ETF liquidity

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IN BRIEF

- Many investors believe that individual stocks and exchange-traded funds (ETFs) share similar liquidity traits, but ETFs are fundamentally different. Their robust liquidity characteristics are frequently misunderstood.
- A common myth is that small ETFs or those with low trading volume are, by definition, illiquid. Thanks to arbitrage mechanisms that enable ETFs to continuously trade at or near intrinsic value, ETF liquidity is primarily determined by an ETF's underlying securities. Therefore, small or thinly traded ETFs can, in fact, be highly liquid instruments.
- Investors who trade ETFs often mistakenly assume that a stock exchange's order book represents a complete and accurate picture of secondary market ETF liquidity. But the reality is that ETF liquidity often far exceeds what may be displayed "on screen."
- An important tip for trading ETFs: Contact capital markets desks at ETF issuers and/or a broker-dealer prior to executing large ETF trades.

AUTHORS



Ogden H. Hammond
Head of ETF Strategy &
Business Development



Michael Lieder
Head of ETF
Capital Markets

ETFs HAVE TRANSFORMED ASSET MANAGEMENT over the past two decades, and today they are one of the fastest-growing investment vehicles. ETFs offer many benefits to investors, including intraday trading flexibility, tax efficiency and potentially lower costs, but one of the most important ETF features—their liquidity—is also one of the most widely misunderstood.

Loosely translated, liquidity refers to the ability to buy or sell a security quickly, easily, and at a reasonable transaction cost. Given that ETFs and individual stocks both trade on a stock exchange, many investors mistakenly believe that the liquidity characteristics of the two securities must also be similar. They're not. Thanks to the unique features of ETFs and the ecosystem in which they operate, ETF liquidity is often far greater than most investors assume.

In this paper, we explore the mechanics of ETF liquidity and dispel a few common myths, including:

- Myth: ETF asset levels or trading volumes are good proxies for ETF liquidity.
- Myth: Secondary market ETF liquidity is limited to what you see "on screen."
- Myth: It doesn't matter when you trade an ETF.

WHY CARE ABOUT LIQUIDITY?

Liquidity refers to an asset’s ability to sell quickly and purchase quickly and is an important consideration when selecting any investment security. More-liquid securities will usually trade with tight “bid-ask spreads,” which refers to the gap between the price buyers are willing to pay and the price sellers are asking to receive for the security. The tighter the bid-ask spread, the more cost-effective it is to trade a security. Conversely, wide spreads take a bigger bite out of investors’ returns when they buy or sell. In addition, illiquid securities can be prone to sharper price swings than liquid securities in times of market stress.

Myth: ETF asset levels or trading volumes are good proxies for ETF liquidity

Perhaps the most common ETF misconception is that low daily trading volumes or small amounts of assets under management (AUM) indicate that an ETF is illiquid (i.e., difficult and/or expensive to trade). This myth probably persists because ETFs and stocks look similar on so many levels. But the reality is that ETFs function fundamentally differently from individual stocks and this difference has a direct bearing on liquidity.

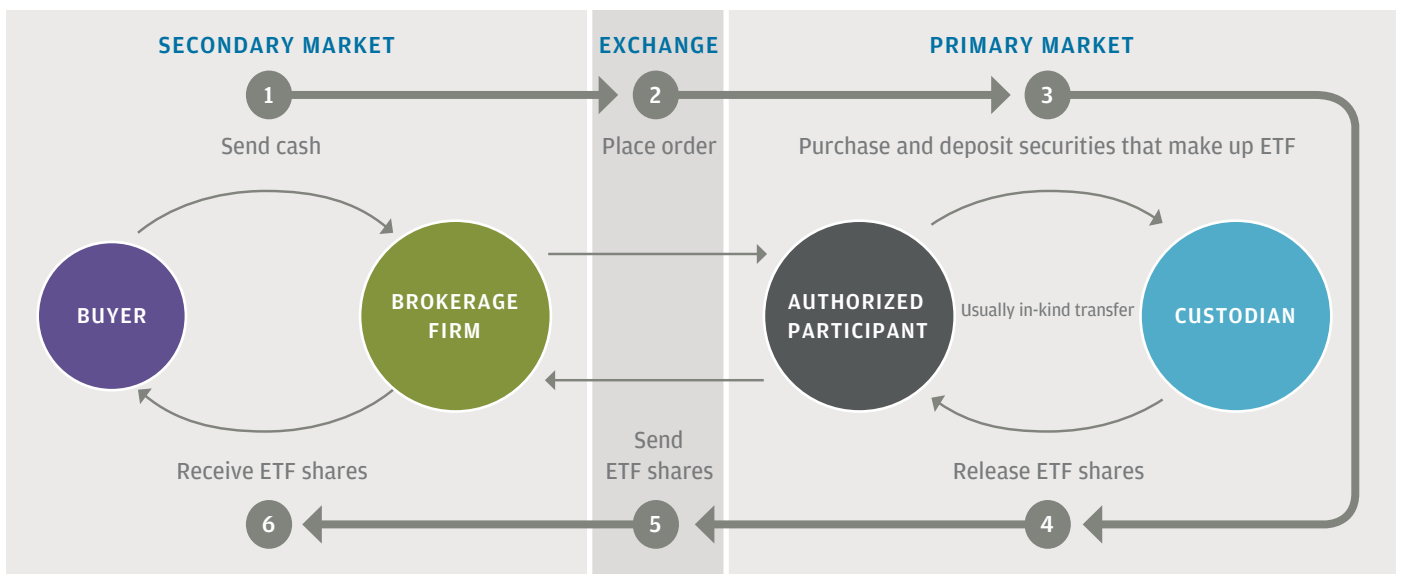
Fact: ETF assets or volume ≠ ETF liquidity

Unlike individual stocks or closed-end funds, which usually have a fixed supply of shares in circulation on the secondary market, ETFs are open-ended investment vehicles. This means that ETFs are able to issue or withdraw shares on the secondary market, according to investor supply and demand (a process known as creation and redemption). This ability gives ETFs a unique liquidity profile in comparison with individual stocks, and it helps explain why metrics like ETF assets or trading volume are not particularly helpful in estimating ETF liquidity. Thanks to the creation and redemption mechanism, ETF liquidity is predominantly determined by the liquidity of the underlying individual securities that make up the ETF.

To illustrate how ETFs issue and withdraw secondary market shares and how this activity impacts ETF liquidity, one must first examine the mechanics of the ETF ecosystem. ETF shares are created when professional investors—known as “Authorized Participants,” or APs—place an order directly with the ETF manager. In exchange for in-kind or cash payment, the AP receives ETF shares, which can then be sold by the AP into the secondary market.

ETF trading occurs in the secondary market, while ETF creation and redemption happens in the primary market

EXHIBIT 1: THE ETF ECOSYSTEM



Source: J.P. Morgan; for illustrative purposes only.

APs occupy a unique position in the ETF environment: They are the only entities allowed to deal directly with an exchange-traded fund, buying and selling ETF shares at intrinsic, or net asset value (NAV), (just like traditional mutual fund subscriptions and redemptions). All other ETF investors must buy or sell ETF shares in the secondary market (such as a stock exchange) where investors bargain continuously over the ETF price. Secondary market price discovery typically leads ETFs to trade at prices close to, but rarely exactly equal to, net asset value. If secondary market supply and demand becomes significantly imbalanced, an arbitrage opportunity opens for APs, and they will restore balance (i.e., trading at or near NAV) through the creation and redemption process. For further explanation of the ETF ecosystem and how creation and redemption functions, please see **EXHIBIT 1** on the previous page and the sidebar “Primer on ETF mechanics.”

CASE STUDY IN ETF LIQUIDITY

For readers who may be skeptical that small- or low-trading-volume ETFs can be highly liquid, real-life examples abound. Consider the following case, which is representative of many ETFs shortly after launch. **EXHIBIT 2** on the next page charts trading volume and pricing of the JPMorgan Diversified Return Global Equity ETF (ticker: JPGE) over its first 60 days of trading.¹ JPGE invests in a broad basket of developed market equities and, as such, the stocks it holds tend to be highly liquid. As is typical with many new ETFs, however, JPGE did not trade much at first and trades that did occur were generally modest in size. Nevertheless, two large trades (highlighted) of 40,000 shares (~\$2 million) and 94,304 shares (~\$4.7 million) were successfully executed during that period and barely moved the ETF’s price—evidence of deep liquidity in this particular ETF. These trades represented 10 to 30 times JPGE’s average daily volume (ADV) at that time and up to a quarter of total AUM, further demonstrating that ADV or asset levels are poor indicators of ETF liquidity. This example also provides evidence that ETFs reflect the liquidity of their underlying securities, due largely to the creation and redemption process previously described.

¹ Source: Bloomberg; data from June through September 2014.

² From a legal and regulatory perspective, most ETFs in the U.S. are organized as registered investment companies under the Investment Company Act of 1940.

PRIMER ON ETF MECHANICS

The exchange-traded fund ecosystem and the market mechanics that support it represent an important innovation in the fund industry. The act of listing and trading a fund on a stock exchange was not new or innovative; closed-end funds had been doing that for decades before the first ETFs. What was new about ETFs was that they addressed a particular challenge of closed-end funds, which often trade at significant discounts or premiums to NAV because the supply of shares is largely fixed and therefore investor demand (or lack thereof) manifests itself in the fund’s trading price. ETFs address this challenge with their “open-end” investment structure,² which allows ETFs to dynamically adjust their supply of shares to match changes in investor demand. This feature enables ETFs to trade at prices that typically closely approximate NAV.

ETF creation and redemption is the process by which ETF shares are added to or removed from the secondary market. This process is managed by one or more intermediaries, called Authorized Participants (AP), designated by the fund. APs straddle both the primary market (i.e., creation and redemption) and the secondary market (e.g., trading on an exchange), and this unique position enables them to benefit from an arbitrage opportunity whenever an ETF’s secondary market price deviates too widely from the NAV.

For example, if investor demand is strong for a particular ETF, that ETF’s share price on the secondary market might be pressured above the value of its underlying securities. Whenever this happens, the AP can construct an arbitrage trade that sells short an “overpriced” ETF and buys the ETF’s underlying portfolio of securities at a lower price than the ETF itself. At the end of the trading day, the AP delivers the underlying securities to the ETF manager in exchange for newly created ETF shares, which negates the AP’s liability associated with having sold short the “overpriced” ETF. APs will repeat this trade until the ETF’s secondary market price more closely aligns with the underlying portfolio’s NAV and the arbitrage trade becomes uneconomic.

The process works the same in reverse. If an ETF begins to trade lower than its NAV, an AP can buy ETF shares on an exchange at discounted prices, sell short the underlying ETF portfolio, and then redeem the ETF shares with the fund for the underlying securities to close the short position. APs keep the price differential between the “underpriced” ETF and the fair value of the underlying securities (NAV), which essentially constitutes a payment for the service of keeping ETF pricing accurate and efficient.

Myth: Secondary market ETF liquidity is limited to what you see “on screen”

Many ETF investors mistakenly assume that since the primary ETF market is reserved for APs, trades by non-APs cannot take advantage of the additional liquidity options offered by ETF creation and redemption. Further, ETF investors might also believe that secondary market liquidity is limited to what they see on screen, in the form of bid and offer sizes published by a stock exchange. Both premises are false, and this insight has some very practical trading implications for ETF investors.

Fact: ETF liquidity can be much greater than meets the eye

The reality is that ETF investors often can access significant “hidden” ETF liquidity beyond what is directly observable in the secondary market. One source of this additional liquidity is the primary market; investors with large ETF trades³ can tap into the primary market by working directly with an AP to create or redeem ETF shares with the fund company.

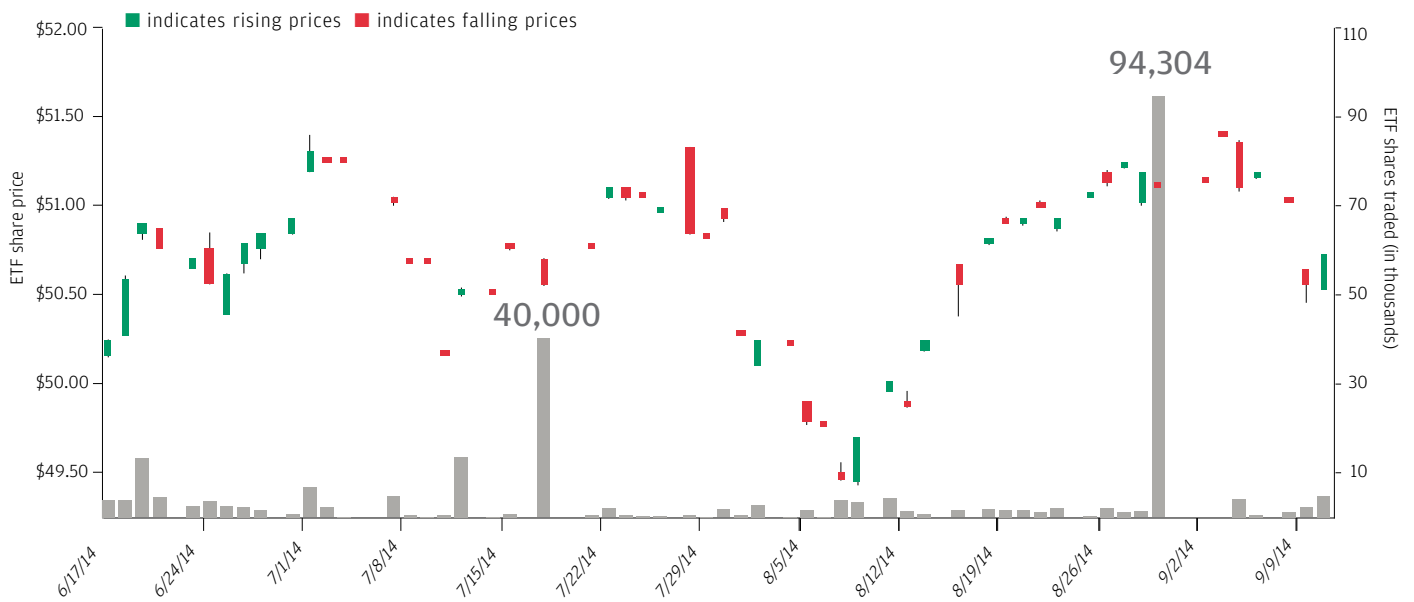
While investors whose orders aren’t large enough for ETF creation or redemption may have fewer liquidity options than large investors, there is still often much more secondary market liquidity available than many investors realize, particularly if those investors gauge liquidity by looking solely at the exchange order book.⁴ (See **EXHIBIT 3** on the next page for an example of an order book.) The reason is that market makers, who maintain continuous two-way ETF orders (bid and offer), are a key input to exchange order books, and they typically display only a small fraction of the volume they are willing to trade. For example, a market maker might publish an order to buy 1,000 shares (a “bid”) and an offer to sell 1,000 shares (an “ask”) even though it might actually be willing to trade tens of thousands of shares at the same price. Small quote sizes enable market makers to manage the financial risk associated with unexpected events, such as sharp market moves or trading algorithm malfunctions. The implication for ETF investors? They must take a few simple steps when trading ETFs to ensure they receive best execution.

³ All ETFs have a minimum unit size (number of ETF shares required to create or redeem directly with the fund). This threshold is set by ETF sponsors and described in the prospectus. ETF units are typically at least 50,000 shares.

⁴ Order books provide an inventory of open bid and ask orders (including both price and size) for a given security.

Investors can execute large trades in thinly traded ETFs without significantly impacting the ETF price

EXHIBIT 2: TRADING VOLUME AND SHARE PRICE OF JPGE SHORTLY AFTER LAUNCH



Source: Bloomberg; data for JPMorgan Diversified Return Global Equity ETF (NYSE ticker: JPGE) from June through September 2014. Shown for illustrative purposes.

ETF order books display standing orders on both the buy and sell sides

EXHIBIT 3: A HYPOTHETICAL ETF ORDER BOOK

Exchange	Time	Size	\$ Bid	\$ Ask	Size	Time	Exchange
NYSE	13:15	100	205.09	205.11	200	13:15	NYSE
NYSE	13:15	200	205.09	205.11	100	13:15	NASDAQ
NYSE	13:15	200	205.09	205.11	100	13:15	NASDAQ
NASDAQ	13:15	50	205.08	205.12	50	13:15	NYSE
NASDAQ	13:15	100	205.08	205.13	200	13:15	BATS
NASDAQ	13:15	50	205.07	205.13	200	13:15	BATS
BATS	13:15	100	205.06	205.14	200	13:15	NYSE

Source: J.P. Morgan; for illustrative purposes only.

Working with an ETF issuer’s capital markets desk

To take advantage of the wider range of liquidity options available to them, investors making large trades are well advised to contact the ETF issuer directly and ask for the capital markets desk. An issuer’s capital markets desk maintains relationships with APs and institutional trading desks to help facilitate trade execution for large ETF clients. Most ETF capital markets desks can help investors assess secondary and primary market liquidity and connect them to liquidity providers. Even if a trade is not large enough to justify contacting an ETF issuer, many broker-dealers also provide trading services that can help advisors and investors locate ETF liquidity and trade efficiently.⁵

A real-life example of how this works is shown in **EXHIBIT 4**, which provides additional detail for the 94,304-share (~\$4.7 million) purchase of the JPMorgan Diversified Return Global Equity ETF (ticker: JPGE). This trade was placed on the Friday before the extended Labor Day weekend in the U.S.—a day that traditionally witnesses some of the lowest NYSE trading volumes of the year—so one might expect less liquidity for all tradable securities. Immediately before the trade, JPGE traded at a bid of \$51.10 for 1,000 shares, with an ask of \$51.14 for 1,000 shares. The buyer of the 94,304 shares was initially concerned about JPGE’s liquidity and whether the buyer would be able to execute the trade at a reasonable price, because the trade was almost 95 times larger than the size of the best ask quote (1,000 shares) and represented roughly 30 times JPGE’s average daily volume. This investor contacted the ETF sponsor’s capital markets desk, however, and

⁵ These services can be especially valuable for advisors trading across many individual accounts, as many small trades can be aggregated for execution and then allocated back to the individual accounts.

On-screen quotes and order sizes don’t always provide a full picture of ETF liquidity

EXHIBIT 4: A SNAPSHOT OF JPGE BID-ASK QUOTES AND TRADES ON AUGUST 29, 2014

Time	Bid/Trade/Ask	Size
12:57:45	51.10/51.14	1,000/1,000
12:58:55	51.12	94,304
12:59:53	51.11/51.14	500/500
12:59:56	51.11/51.15	500x800
12:59:56	51.11/51.15	1,000x800
12:59:56	51.11/51.15	500/800
12:59:56	51.10/51.15	1,000/1,000
13:00:07	51.11/51.15	500/1,000
13:00:07	51.11/51.15	1,000/1,000

Source: Bloomberg. Shown for illustrative purposes.

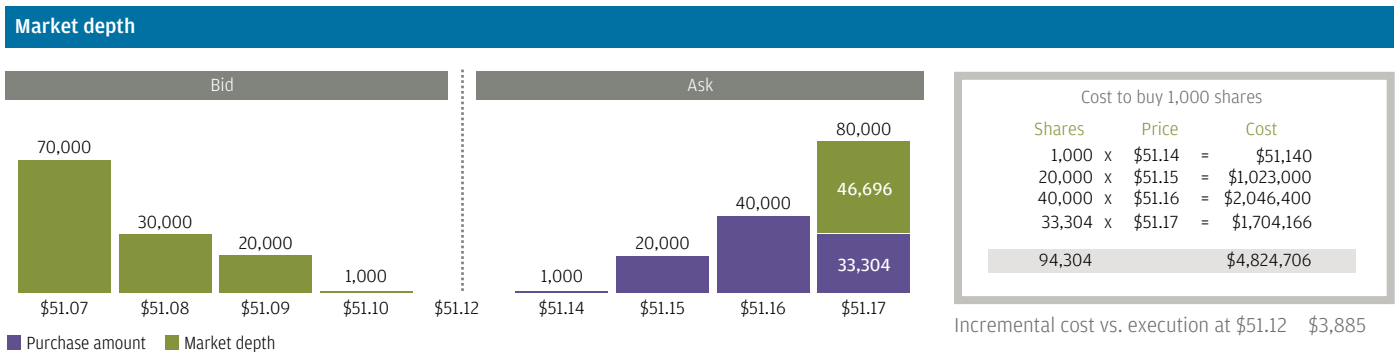
learned that a few market makers had JPGE inventory that was not displayed on the exchange order book. They could easily fill the entire order in a single trade. As a result, the 94,304-share JPGE buy order executed at 12:58pm at \$51.12—two cents better than the best on-screen asking price. Not only was the trade executed at a very favorable price, but there was no negative impact on JPGE’s trading or displayed liquidity, as demonstrated by the fact that the bid-ask spread remained in line after the trade.

Using limit orders for ETF trading

This example of a successful large trade in a thinly traded ETF could have had a significantly different outcome if the investor had opted to simply enter the 94,304-share purchase as a standard market order. A market order would have been filled for 1,000 shares at the \$51.14 asking price, and then the remaining 93,304 shares would have automatically escalated to progressively higher prices in the order book until the order was completely filled—costing the buyer significantly more (see **EXHIBIT 5** on the next page for a hypothetical illustration). The hypothetical trade in **EXHIBIT 5** would have cost \$3,885, or 8.1 basis points (bps) more than if the entire 94,304-share trade had executed at \$51.12. Trading ETFs using market orders is a common, costly—and entirely avoidable—mistake. A good rule of thumb for ETF investors, especially when dealing in thinly traded ETFs, is to enter orders—even the smallest trades—as limit orders and not as market orders. A limit order enables investors to define a specific maximum (buy limit) or minimum (sell limit) price for their trade and helps protect against the risk that the trade is fulfilled at a price that deviates significantly from NAV.

Market orders for ETFs can lead to unpredictable execution costs

EXHIBIT 5. ILLUSTRATIVE ETF ORDER BOOK AND TRADE EXECUTION FOR A HYPOTHETICAL MARKET ORDER



Source: J.P. Morgan; for illustrative purposes only.

Myth: It doesn't matter when you trade an ETF

Many ETF investors assume that ETF liquidity remains fairly constant throughout the trading day and that it therefore does not make much difference whether they trade at 9:45am, 1pm, or 3:45pm.

Fact: ETF liquidity fluctuates during the day

Trading ETFs without considering natural liquidity fluctuations during the trading day can result in less cost-efficient ETF transactions, but a little vigilance and preparation can avoid such challenges. ETF liquidity is variable largely because ETFs reflect the liquidity of their underlying securities and most underlying securities do not have constant liquidity. Fluctuations in ETF liquidity become evident when looking at ETF bid-ask spreads, which narrow when underlying security liquidity is robust and widen when it is not. Experienced ETF investors keep this in mind when planning a trade.

Certain ETF liquidity patterns tend to repeat and are well known to veteran traders. For example, U.S. equity markets tend to be less liquid during the first 30 to 60 minutes after markets open and the last 30 to 60 minutes before trading closes. At the start of the trading day, markets attempt to digest overnight news and orders may be lined up, waiting for execution at the opening bell. As a result, early-morning

liquidity can be limited as orders are executed en masse. At the end of the trading day, liquidity for ETFs and underlying securities can diminish as late orders flood in before the close, making it challenging for ETF market makers and APs to execute hedges on ETFs' underlying securities. The end result is that ETFs may be quoted with wider bid-ask spreads at the start and close of the trading day.

U.S. ETFs with underlying securities in international markets are subject to additional liquidity considerations, notably the fact that the stock exchanges on which the underlying securities trade may be closed while U.S. exchanges are still trading. In that interval, the underlying securities are less liquid, which can result in wider bid-ask spreads for that ETF. Whenever possible, ETF investors should aim to trade at times when the U.S. and local market trading hours overlap. For example, if ETF investors want to buy a U.S. ETF focused on German stocks, they should ideally trade the ETF when the German stock market is open. This enables APs and market makers to better hedge their risks in the underlying markets when they sell the U.S. ETF, and this, in turn, should support tighter bid-ask spreads on the U.S.-based ETF. Still, it is worth noting that in recent years market makers have become much more proficient at estimating fair value when overseas markets are closed. As a consequence, an investor's incremental cost of trading when overseas markets are closed has also improved.

Guidelines for determining liquidity and trading ETFS

Do's	Dont's
<ul style="list-style-type: none"> • Look through to an ETF's underlying securities to assess overall liquidity. Total ETF liquidity is made up of both ETF shares traded in the secondary market and shares that can be created and redeemed in the primary market. 	<ul style="list-style-type: none"> • Don't rely solely on trading volume or on-screen indicators to gauge ETF liquidity. ETF ADV only represents the number of shares traded in the secondary market. Investors must also consider "hidden" secondary market liquidity and liquidity accessible through the primary market.
<ul style="list-style-type: none"> • Use limit orders as the default order type when trading ETFS. A limit order—an order to buy or sell a set number of shares at a specified price or better—gives investors some control over the price at which the trade is executed. 	<ul style="list-style-type: none"> • Rarely, if ever, use market orders to trade ETFS (especially thinly traded ETFS). Market orders— an order to buy or sell immediately at the best available current price—may end up being executed at prices far higher (or lower) than expected as the order sweeps through standing orders on the order book.
<ul style="list-style-type: none"> • Consider the time of day when placing ETF trades. The start and end of trading in U.S. markets are typically more volatile than the rest of the trading day, which means greater risk for market makers and usually wider bid-ask spreads on ETFS. For ETFS holding international securities, try to trade during the trading hours of the underlying securities' local markets. 	<ul style="list-style-type: none"> • Avoid trading at the open or close of trading or when a significant portion of an international ETF's underlying markets are closed. As a general rule, trading at times when it is difficult for market makers and other institutional traders to hedge underlying securities in an ETF will likely result in wider spreads and less efficient trades.
<ul style="list-style-type: none"> • When in doubt, call for help. Most ETF providers have capital markets desks whose role is to work with everyone in the ETF marketplace—including portfolio managers, APs, market makers and stock exchanges—to encourage and promote an efficient ETF marketplace. 	<ul style="list-style-type: none"> • Don't go it alone, especially when placing large trades. Capital markets desks at ETF providers and/or trading desks at your broker-dealer or custodian can often help locate liquidity for large trades and potentially enhance the quality of ETF trade execution.

CONCLUSION

Having debunked several common myths related to ETF liquidity, what insights have we gleaned about trading ETFS? The table above summarizes some of these key insights and translates them into a handful of practical ETF trading tips.

Although ETFS have many characteristics that are similar to stocks, liquidity is not one of them. ETF liquidity is, in fact, deeper and much more dynamic than stock liquidity. In evaluating liquidity in the ETF market, it is important to look beyond trading volume and on-screen indicators of liquidity, which are often misleading. When considering large ETF trades in which liquidity is a significant concern, contact the ETF provider's capital markets desk directly, as it has the tools to help assess true ETF liquidity and assist with efficient trade execution.

INVESTMENT INSIGHTS

J.P. MORGAN ASSET MANAGEMENT

270 Park Avenue | New York, NY 10017
844-cap-mkts (844-227-6587)

Exchange-traded funds: Exchange-traded funds (ETFs) are a type of investment fund combining features of both individual securities and traditional mutual funds. Like a mutual fund, ETFs may hold a broad range of securities—including stocks, bonds, commodities, or combinations. Like a stock, ETFs are typically listed on a securities exchange (i.e., NYSE), which provides investors the ability to trade ETF shares throughout the day.

Although J.P. Morgan believe that market makers will take advantage of differences between the NAV and the trading price of the ETF shares through arbitrage opportunities, we cannot guarantee that they will do so.

Investors should carefully consider the investment objectives and risks as well as charges and expenses of the ETF before investing. The prospectus contains this and other information about the ETF. Read the prospectus carefully before investing. Call 1-844-4JPM-ETF or visit www.jpmorganetfs.com to obtain a prospectus.

Investing involves risk, including possible loss of principal. Shares are bought and sold market price, and are not individually redeemed from the fund. Brokerage commissions will reduce returns. When comparing individual stocks and exchange-traded funds, it should be remembered that management fees associated with fund investments are not borne by investors in individual stocks. Buying and selling shares of ETFs will result in brokerage commissions. In addition, there may be fees associated with opening and maintaining a brokerage account. The fund may not track the return of its underlying index for a number of reasons, such operating expenses incurred by the fund that are not applicable to the index, and the time difference between calculating the value of the index and the net asset value of the fund.

There is no guarantee that a fund will meet its investment objective. Diversification may not protect against market loss. This information is for education purposes only. It is not meant to be investment advice.

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