BRIDGEWAY

A PRACTITIONER'S GUIDE TO TRADING ETFS

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Exchange-traded funds (ETFs) have seen tremendous growth since their initial launch in 1993. As with mutual funds, they hold a collection of securities. Unlike mutual funds, which trade at the end of the day at net asset value (NAV), ETFs trade throughout the day on exchanges like individual stocks, but at a premium or discount to the NAV of the underlying securities.

Because ETFs trade throughout the day at prices which differ from the underlying value of the securities they hold, greater care should be taken to achieve best execution when trading them. In this paper, we provide a brief guide to trading ETFs. These points should be useful to both individual investors and advisors executing smaller trades on their own, and for larger institutional investors and advisors with access to institutional quality trading desks.

1. **Liquidity**. While ETFs trade on an exchange, their trading is different than individual stocks. Transactions for ETFs occur on both a primary and secondary market. The primary market is where Authorized Participants (APs) create or redeem shares in an ETF. These transactions are typically done via in-kind transfers and are the source of the increased tax efficiencies of ETFs. The liquidity in the primary market for APs is directly influenced by the liquidity of the underlying fund holdings. The secondary market is where individual trades of the ETF occur. The volume quoted for an ETF reflects this secondary market activity and doesn't account for the primary market liquidity. An ETF with typically low secondary market volume can still have large transactions occur within the spread based on the primary market liquidity. Thus, for most ETFs, liquidity available is beyond what is quoted in the secondary market.
2. **Avoid market open and close.** Similar to individual stocks, prices tend to be more volatile around the open and close of the market, which can lead to wider bid-ask spreads in ETFs. Since the spread of an ETF reflects the spreads of the securities it holds, the price you trade at near the market open and close may be further from the NAV of those underlying securities. A good rule of thumb is to trade between 10:00 AM and 3:30 PM Eastern Time, avoiding the first and last 30 minutes of the trading day.
3. **Use limit orders when possible.** Market orders are certainly convenient, as you are guaranteed certainty of execution. But if there is insufficient interest on the other side of the trade for a market order, you can exhaust the limit order book and pay a substantial spread to fair value. Instead, place limit orders with your brokers, adjusting as needed for market moves. This is especially true for larger orders and at times of lower liquidity. While market orders demand liquidity, limit orders provide liquidity and thus can potentially take advantage of the spread.
4. **Consider your overall trading.** When cash is being invested or withdrawn, just a single ETF may be traded. But other times, such as during rebalancing or tax loss harvesting, multiple ETFs and mutual funds may be bought and sold. In this case, consider the timing and interaction of the trades to minimize slippage from market movement.

5. **Make use of your advisory firm's trading desk.** As trades get larger and more complicated, selecting between various techniques and executing them well may appear daunting. But, many financial advisors are affiliated with a larger firm that provides trading services. The trading desk can aggregate the trades of multiple advisors to get a better understanding of liquidity and access methods available with scale. The trading desk has the time, experience, and tools to focus on the best methods for executing your ETF trades, allowing advisors to focus on what they do best. If you have access to a centralized trade execution team, they will be the preferred solution when trading ETFs. For larger orders, consider the following techniques:

    a. **Use an RFQ with your broker for large orders.** If you are placing a large order that exceeds a creation unit size (this varies by fund but can be 25,000 shares or more), consider getting in touch with the ETF trading desk you work with and receive a request for quote (RFQ). With an RFQ, an institutional investor solicits bids from several brokers for a larger trade to get better pricing.
    b. **Place a direct creation/redemption with your broker.** Some brokers are also APs. For a sufficiently large order, they can place direct creations and redemptions. Much like mutual funds, the ETF price will be market at closing NAV. This may result in lower costs, depending on the fees charged by the broker/AP.
    c. **Utilize your custodian's ETF desk.** Many custodians maintain ETF trading desks. With their expertise, they can often uncover hidden liquidity and arrange trades to get great pricing and execution. Contact your custodian trading desk to request automatic review of any large market order, typically over 10,000 shares. Many custodians offer to watch your trading master for large orders. Once they identify the order, they will trade them for best execution.

ETFs have some notable advantages, which have led to their tremendous growth. The use of APs allows for the avoidance of capital gains within the fund. The transaction costs of cash flows into and out of the ETF are borne by those trading and not the ETF itself. But this also means that one must be careful when trading ETFs, to minimize slippage and achieve best execution. In this paper, we have provided tips that should be helpful when trading ETFs for the benefit of you and those you serve. After all, the purpose of trading ETFs is to invest in ETFs and realize the benefits they offer.

Disclosure

The opinions expressed here are exclusively those of Andrew L. Berkin, Ben Lanning, and Christine Wang. Information provided herein is educational in nature and for informational purposes only and should not be considered investment, legal, or tax advice.

Investing involves risk, including possible loss of principal. In addition, market turbulence and reduced liquidity in the markets may negatively affect many issuers, which could have an adverse effect on such investments.

About the Authors

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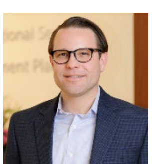
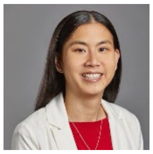
Andrew Berkin, PhD, is head of research and oversees the development and implementation of Bridgeway's statistically driven, evidence-based investment strategies. He also produces thought leadership material for clients and prospects as well as for external publications. Andrew joined Bridgeway in 2013. Prior to joining Bridgeway, Andrew was co-chief investment officer and director of research for Vericimetry Advisors. He previously was a senior member and director of the quantitative research group at First Quadrant, where he spent 14 years in a variety of responsibilities, including the development and implementation of stock selection models in both taxable and tax-exempt portfolios. Andrew has published numerous research articles on quantitative investing in peer-reviewed journals and co-authored two books. He is a reviewer for the Financial Analysts Journal and served two terms on its editorial board. Andrew earned his BS with honors in Physics from the California Institute of Technology and a PhD of Philosophy in Physics from the University of Texas, where he concentrated his studies in general relativity and astrophysics.



Ben Lanning
Director of Portfolio Management
Buckingham Strategic Wealth

When he joined Buckingham Strategic Wealth in 2005, Ben Lanning already knew he loved the investment business. What he discovered when he came to Buckingham was that he'd found the perfect place to do it. Ben serves as the director of portfolio management, working with

Buckingham's dedicated team of portfolio managers to monitor clients' portfolios and ensure appropriate allocations. Previously, he was a relationship director and director of trading operations, working with both advisors and with clients to make sense of the technical, research-based philosophy behind the firm's fixed income and equity trading approach. Ben started with the firm as an equity trader and fell in love with client-first, bottom line second attitude his colleagues espoused. Knowing he could make recommendations without bias, that his colleagues spent their days collaborating on how best to solve a problem for a client and being a part of the evidence-based movement keeps Ben excited and engaged. Prior to joining Buckingham, Ben was a senior trader with Raymond James. He is a graduate of St. Petersburg College and Eckerd College. He and his wife, Natalie, live in St. Louis with their two children.



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Christine's responsibilities include portfolio management, investment research, and statistical modeling. Prior to joining Bridgeway, she worked in public accounting with a focus on energy trading and risk management. Christine holds an MS in Accounting from the University of Virginia and a BA in Sociology and Managerial Studies from Rice University. She is a CFA charterholder and is licensed as a Certified Public Accountant in Texas. She participated in Bridgeway's service trip to Peru. On Bridgeway's service trips to Honduras and El Salvador, she helped build water wells with Living Water International.