

Dilution by a Thousand Costs: The Case for Index-Based ETFs over Mutual Funds

Why index-based bond ETFs are a more efficient, less costly alternative to index-based mutual fund cousins.

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I sometimes hear people say that they prefer index-based mutual funds to index-based ETFs because they can purchase and sell mutual fund shares at net asset value (NAV) whereas they must pay a bid-ask spread and may have to pay a premium to NAV to acquire an ETF (or accept less than NAV to dispose of it).

While this may sound like a reasonable conclusion at first glance, careful analysis of the different ways in which shares are created and redeemed in mutual funds and ETFs suggests that in the absence of significant brokerage commissions, long-term investors are better served by the ETF structure.

The Share Creation / Redemption Process in Mutual Funds and ETFs

To see why the ETF structure favors long-term investors, consider that any type of index-based pooled investment fund is always in one of three states:

| State | Purchase Orders v. Sale Orders | Portfolio Consequences |
|--------------|--|---------------------------------|
| 1. Growing | Purchase orders exceed sale orders and fund experiences net inflow of assets | Fund must acquire securities |
| 2. Stable | Purchase orders matched by sale orders and fund experiences neither net inflow nor net outflow of assets | None |
| 3. Shrinking | Sale orders exceed purchase orders and fund experiences net outflow of assets | Fund must dispose of securities |

Acquiring and disposing of portfolio securities generally entails incurring transaction costs in the form of the bid-ask spread, which is the difference between prices at which market participants are willing to buy and sell a security. This is where mutual funds and ETFs part company. Because of differences in how shares are created and redeemed, transaction costs associated with net inflows and net outflows are borne by different parties to different degrees depending upon whether a pooled investment fund is a mutual fund or an ETF.

In the case of mutual funds, investors transact directly with the fund at NAV, generally on a cash basis (while in-kind subscriptions and redemptions are permitted in mutual funds, they are not common). With ETFs, only certain large investors known as “authorized participants” are authorized to transact directly with the ETF at NAV and usually do so only on an in-kind basis (meaning that they deliver a basket of portfolio securities to the fund in exchange for shares of the ETF).

Since individual investors can generally only purchase or sell shares of ETFs on securities exchanges at negotiated prices, the market price an individual investor pays or receives for shares of an ETF may, and generally does, differ from its NAV.

Hypothetical Example: Transaction Costs for Growing Funds

To see how differences in the share creation / redemption process influence who bears the incidence of portfolio transaction costs caused by net inflows of assets into a fund, consider a hypothetical purchase by an individual investor of five million shares of two identical index-based funds (one a mutual fund and the other an ETF) that each have \$100 million of net assets immediately prior to the purchase. Assume that the following assumptions apply:

- Prior to the purchase, each fund has 10 million shares outstanding with an NAV per share of \$10.00.
- Each fund’s NAV per share is calculated using the mid-point of the bid-ask spread of each of the fund’s portfolio securities to determine the aggregate value of the fund’s portfolio holdings.
- The weighted-average bid-ask spread for each fund’s portfolio securities is 0.50%.
- The purchase transaction constitutes net inflows for each fund, meaning each fund must acquire portfolio securities equal to the amount of the purchase to achieve its investment objective of tracking an underlying index.
- In the case the mutual fund, investors transact directly with the mutual fund on a cash basis at NAV (with no sales load or other transaction fees).
- In the case of the ETF, investors must pay a purchase price of \$10.04/share (inclusive of commissions, the bid-ask spread and any premium to NAV) to acquire shares that have an NAV of \$10.00/share.

Set forth below are the number of shares outstanding, net assets and NAV per share for each of the mutual fund and ETF immediately prior to the purchase transaction.

| | Mutual Fund | ETF |
|--------------------|--------------------|---------------|
| Shares Outstanding | 10,000,000 | 10,000,000 |
| Net Assets | \$100,000,000 | \$100,000,000 |
| NAV/Share | \$10.00/Share | \$10.00/Share |

In connection with the purchase transaction, the investor pays cash (either to the fund in the case of the mutual fund or to an authorized participant in the case of the ETF) in exchange for five million shares of the mutual fund or ETF. Here's how the transaction looks from the perspective of the purchaser depending upon whether he purchases the mutual fund or the ETF:

| | Mutual Fund | ETF |
|----------------------------|--------------------|--------------|
| Number of Shares Purchased | 5,000,000 | 5,000,000 |
| Price Per Share | \$10.00 | \$10.04 |
| Total Cost to Investor | \$50,000,000 | \$50,200,000 |

From the perspective of the funds, the purchase transaction results in each of the mutual fund and ETF issuing five million shares in exchange for consideration representing \$10.00/share. In the case of the mutual fund, the consideration takes the form of \$50 million of cash. It must then use this cash to acquire new portfolio securities at each portfolio security's respective ask price, which on a weighted average basis is 0.25% greater than the price of the security at which NAV is computed.

The ETF, on the other hand, receives \$50 million of portfolio securities valued in the same fashion that the fund computes its NAV (i.e., at the mid-point of their bid-ask spreads). The impact of the purchase transaction on the funds' net assets and NAV/share is set forth in the table below:

| | Mutual Fund | ETF |
|-----------------------------|--------------------|---------------|
| Net Assets Pre-Transaction | \$100,000,000 | \$100,000,000 |
| Securities Received | \$0 | \$50,000,000 |
| Cash Received | \$50,000,000 | \$0 |
| Transaction Costs | (\$125,000) | \$0 |
| Net Assets Post-Transaction | \$149,875,000 | \$150,000,000 |
| Shares Outstanding | 15,000,000 | 15,000,000 |
| NAV/Share Post-Transaction | \$9.9917 | \$10.00 |

It is easy to see why the purchaser in this hypothetical transaction might prefer to buy a mutual fund rather than an ETF. With the mutual fund he pays \$50,000,000 and receives shares representing net assets of about \$49,958,332. With the ETF he pays \$50,200,000 and receives shares representing net assets of \$50,000,000. In other words, he loses approximately 8 basis points (0.08%) to transaction costs with the mutual fund (through a decreased NAV) and loses 40 basis points (0.40%) to transaction costs with the ETF.

The case for mutual funds is less favorable for the long-term investor, however. Consider a long-term investor who has held five million shares in the mutual fund for several years. Before the purchase transaction, this investor owned five million shares in the mutual fund representing net assets of \$50,000,000. Following the transaction, he owns five million shares representing net assets of \$49,958,332. In other words, the purchase transaction has diluted the value of shares held by the long-term investor. Had the long-term investor held shares in the ETF, his investment would have been unchanged by the purchase transaction.

ETFs Force Short-Term Traders to Internalize Transaction Costs

The outcome of the hypothetical transaction outlined above illustrates a fundamental difference between mutual funds and ETFs. With mutual funds, the fund as a whole bears the transaction costs associated with buying or selling portfolio securities and long-term investors effectively subsidize the transaction costs generated by short-term traders. With ETFs that handle subscriptions and redemptions on an in-kind basis, the transaction costs associated with buying or selling portfolio securities are internalized by the traders who cause them and long-term investors incur no dilution subsidizing the transaction costs generated by short-term traders.

While the hypothetical example above involved funds that were receiving net inflows of assets, the result would have been the same for the long-term investor if the funds were experiencing net outflows. In each instance, assuming portfolio securities are valued at the midpoint of their bid-ask spread, the long-term investor experiences NAV dilution as a result of transaction costs generated by net inflows or net outflows of assets. For this reason, the ETF structure represents a superior alternative to mutual funds for the long-term investor.

It should be noted that the hypothetical example outlined above is intended as an illustrative device and not as a definitive analysis of the relative costs associated with owning mutual funds and ETFs. In certain cases, such as when a fund is stable and not experiencing net inflows or net outflows, there will be no share creations or redemptions and therefore no associated transaction costs to be paid by any party. Similarly, in funds that invest in the most liquid large capitalization stocks (such as funds that seek to track the S&P 500 Index), transaction costs to trade portfolio securities may be so low as to be immaterial.

But consider a rapidly growing or rapidly shrinking mutual fund that invests in less liquid securities, such as small capitalization stocks or corporate bonds. In such a mutual fund, the long-term investor is forced to bear a portion of transaction costs every time the purchases or sales of short-term traders result in net inflows to or net outflows from the fund.

While the magnitude of these costs in any given instance may not be as significant as those illustrated in the hypothetical example above, the frequency with which such costs are incurred can generate cumulative effects over time that materially reduce returns for long-term investors.

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