HAMMOND ASSOCIATES

Research Note

Exchange-Traded Funds

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Product Background

In January 1993, the first successful exchange-traded fund (ETF), the Standard & Poor's Depository Receipts (SPDRs), nicknamed "Spiders", debuted on The American Stock Exchange (AMEX). The product can trace its roots to exemptions from the Investment Company Act of 1940 ('40 Act) that were granted by the SEC to several other failed ETF introductions. At first, the reception to ETFs was lukewarm, as assets totaled less than half a billion dollars after the Spiders' first year of operation. Today, ETFs are one of the fastest-growing investment vehicles, with an estimated $80 billion in total assets and over 100 products. ETF assets have grown over four fold since 1998 and nearly doubled in 2000, which is particularly impressive given the retreat of many equity markets that year. As of February 2001, the S&P 500 SPDRs rank as the fifteenth largest "mutual fund" in terms of total assets, with nearly $28 billion.[1]

ETF Features

Essentially, ETFs are hybrid securities that are both exchange-traded, like stocks, and open-ended, like open-ended mutual funds, meaning new shares are continuously offered. Simply put, ETFs are index funds that trade like stocks. However, there are important differences between ETFs and traditional index mutual funds. First, because ETFs are traded on stock exchanges (almost exclusively on AMEX at this time), they can be traded whenever the exchange is open. Open-ended mutual funds, on the other hand, can only be purchased or redeemed at the ending net asset value (NAV) for the day. In this regard, open-ended mutual funds must be bought

[1] According to Morningstar.

and sold "blind", meaning the investor is unaware of the price per share at the time the order is submitted.

Although closed-end mutual funds are exchange-traded throughout the day, they are actively managed and often trade at significant premiums or discounts to NAV, or the market value of the fund's assets. ETF premiums and discounts exist; however, as we will discuss in greater detail in the sections that follow, unlike closed-end mutual funds, the structure of ETFs precludes *significant* premiums or discounts to NAV.

Exchange listing results in greater trading flexibility for ETFs. For example, ETFs can be shorted, purchased on margin, purchased by way of stop or limit orders, and are not subject to the up-tick rule.[2] Options can be written or bought on some ETFs, and, in most cases, as few as one ETF share can be purchased, whereas traditional mutual funds typically have far greater minimum investment requirements. Furthermore, while some traditional index mutual funds have short-term trading restrictions, ETFs do not. As such, they can be used to equitize cash, or as a short-term holding place for transitory cash that provides equity exposure. A downside to this strategy is that ETFs, like stocks, have a three-day settlement, whereas open-ended mutual funds offer next day settlement.

A wide variety of ETFs exist, and they are offered by a number of different trustees, or advisors. For example, State Street Global Advisors is the trustee for S&P 500 SPDRs and Diamonds, which track the S&P 500 and the Dow Jones Industrial Average, respectively; Barclays Global Advisors is the advisor for iShares, which track a gambit of broad-based, industry sector, and MSCI country indexes; and the Bank of New York is the trustee for "Cubes", which track the Nasdaq-100 index, and are the most actively traded security on AMEX. The considerable breadth of ETF alternatives provides investors with the ability to invest in indexes that were previously unavailable. Additional varieties of ETF investment options have been recently introduced or are coming to market shortly, such as REIT, fixed income, and enhanced index ETFs. Actively managed ETFs may soon be available.

ETF Structure

ETFs are structured as either unit trusts or mutual funds, and several differences between the two formats exist. The appeal of a unit trust structure is its lower cost, because a board of directors, and its associated cost, is not required. However, unit trusts are required to keep cash accrued through dividends in non-interest bearing accounts until those dividends are paid to investors quarterly. The result is a slight cash drag, or tracking error to the index, caused by not being fully invested. In ETF circles, this is commonly referred to as the "dividend drag". It should be noted that the cash drag associated with traditional mutual funds might well exceed the cash drag of ETFs, even those structured as unit trusts. This is because traditional mutual funds typically keep cash on hand, often in amounts greater than that received from dividends, to facilitate redemptions. The ETF creation/redemption process, as we will discuss later, precludes the need for ETFs to maintain cash balances for redemption purposes.

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[2] The up-tick rule applies to traditional securities and requires that short sells follow a positive price change. This requirement does not hold for ETFs.

A mutual fund structure, on the other hand, while it requires a board of directors, can reinvest dividends back into the portfolio, thereby reducing cash drag. In addition, mutual funds are allowed to lend securities, which is a possible source of additional income, while unit trusts cannot lend securities. Finally, mutual funds are allowed to "optimize" their portfolios, whereas unit trusts must track the index through full replication, or by owning each security in its relative index weighting. Optimization affords a manager flexibility in tracking its benchmark, as they are allowed to employ futures, options, or highly correlated substitute securities.

ETFs (both those structured as unit trusts and those structured as mutual funds) are Registered Investment Companies as defined by the '40 Act. As such, they are subject to the rules of the '40 Act. Ironically, these rules sometimes force ETFs to optimize. For instance, the '40 Act requires that no single issue constitute more than 25% at purchase in any fund. An example of the application of this rule can be seen with the Barclays iShares Dow Jones US Industrial Sector Index Fund. As of December 2000, General Electric comprised approximately 28% of the index; however, as a result of the '40 Act restriction, GE only comprised 21% of the ETF. Securities that are highly correlated to GE are included in the ETF to ensure proper tracking to the index, despite the underweighting to GE.[3]

Other '40 Act rules include the 5%/25% Rule and 5%/50% Rule, which require the total amount of securities that have a 5% weighting to be limited to no more than 25% of the total fund for diversified funds and 50% of the total fund for nondiversified funds, respectively.

ETF Creation/Redemption Process

Just like traditional index mutual funds, ETFs represent an actual interest in the basket of securities that constitute a particular index. The key difference between traditional mutual funds and ETFs is the unique creation/redemption process inherent to ETFs. In the case of traditional index mutual funds, an investor deposits cash with the mutual fund company in exchange for shares in the mutual fund. The mutual fund company, in turn, purchases the constituent securities to the index in the capital markets on a *cash* basis. At the point in time when those holdings are sold, a taxable event results.

ETFs, on the other hand, have two types of investors—investors that deal directly with the ETF and investors that trade ETFs in the secondary market on the exchange.[4] ETF shares that are purchased on the secondary market were created by an *in-kind exchange* with the fund. The basket of securities that comprise the index is exchanged for ETF shares. ETF shares cannot be individually redeemed from the fund. Rather, the reverse exchange occurs—shares of the ETF are submitted for equivalent value shares of the constituent securities. The fact that ETF shares are redeemed via an in-kind exchange, rather than a cash transaction, results in a significant tax advantage to taxable investors, as we will discuss later.

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[3] The full replication requirement of ETFs that are structured as unit trusts effectively precludes them from tracking indexes that require optimization.

[4] ETF shares can be created/redeemed with the fund in "Creation Units", which are typically 50,000 shares. Given the size of these transactions, large institutions, specialists, or market makers are typically the only investors dealing directly with the fund.

As previously mentioned, closed-end mutual funds, much like ETFs, trade on exchanges throughout the day. As a result, the market price of a closed-end mutual fund may fluctuate from its underlying NAV, based on market supply and demand for the fixed number of closed-end mutual fund shares that exist. Therefore, closed-end mutual fund prices often include significant premiums or discounts, or market prices above or below the fund's net asset value.

Fortunately, the creation/redemption process precludes extreme ETF premiums/discounts. Because new shares of the ETF can be created or redeemed by delivering or accepting the underlying bundle of constituent securities, arbitrage keeps ETF prices at or near NAV levels. In other words, if the ETF is richly priced, that is, priced above its NAV, institutional traders can short the fund and create new ETF shares with the constituent securities to cover the short. Although, at times, premiums and discounts are priced into ETFs, the arbitrage mechanism likely precludes *significant* premiums and discounts from occurring.[5]

Tax Implications

The unique creation and redemption process of ETFs provides a significant benefit to taxable investors. Unlike traditional index mutual funds, investors in ETFs are not subjected to taxes that are created by the liquidation activities of *other* investors. To illustrate, let's say an investor holds a traditional index mutual fund. Throughout the year, other investors in the fund liquidate their shares. To meet the cash required to honor the liquidations, the fund manager may need to sell some of the holdings in the portfolio, many of which may have unrealized taxable gains. To minimize these gains, the manager will typically sell the high cost lots first; however, this practice leaves the lowest cost lots, and substantial future capital gains, embedded in the fund. The capital gains incurred from such sales are distributed on a *pro rata* basis to *all* of the fund's current investors when the fund pays capital gains (typically once a year). In other words, the actions of liquidating investors impact the tax liability of all investors. Ironically, the investors whose redemptions triggered the capital gains may not pay those capital gains, because they no longer hold the fund (although they will be responsible for taxes on the appreciated value of the fund over their holding period).

Now let's assume the same investor holds shares in an ETF, rather than the traditional index mutual fund. In most cases, investors simply sell the ETF shares on the exchange. Just like the mutual fund scenario, those investors incur capital gains on any appreciation of the fund's value over their holding period. However, unlike the traditional mutual fund, the ETF does not have to sell constituent shares to raise the necessary cash. Therefore, no gains are realized within the fund and no capital gains are passed along to current ETF investors. Said differently, each ETF investor has the ability to manage their own tax liabilities, rather than having those liabilities triggered by the actions of other investors.

Should other ETF investors redeem their shares with the ETF, they would receive shares of the underlying stocks in the index. In other words, the ETF is "unwound" into its constituent securities. In an effort to manage future

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[5] The bid/ask spread essentially *ensures* ETF premiums or discounts embedded in every trade; however, the spread can be thought of as a cost of trading. The arbitrage process should preclude these spreads from becoming excessive.

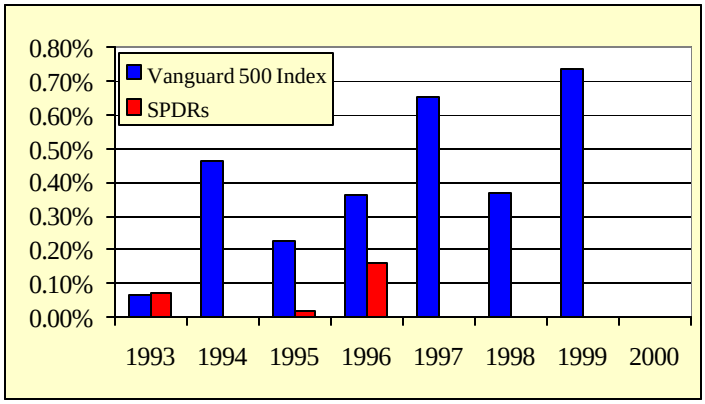
taxable gains, the fund will ship out the lowest cost basis stocks, leaving the highest cost basis stocks in the fund.

In addition to the structural tax benefits outlined above, the very nature of ETFs offers tax benefits. The fact that ETFs are passively managed, or indexed, typically provides tax advantages versus actively managed funds, because actively managed funds generally have much higher levels of portfolio turnover, which often results in taxable gains. For instance, the S&P 500 index, the widely accepted proxy for US large-cap stocks, typically has an annual turnover of only 5%, because the majority of its constituents rarely change. On the other hand, the average US large-cap active mutual fund turns over roughly 100% of its holdings each year.[6] Obviously, lower turnover is a major attraction to index funds and ETFs for taxable investors.

When indexes, like the S&P 500, are reconstituted, ETFs, just like traditional index mutual funds, will likely incur capital gains in order to reshuffle their holdings to mimic those of the index. Once again, the ETF possesses tax-friendly advantages. Recall that with the ETF redemption process, lower cost basis securities are exchanged out of the fund first, leaving higher cost basis securities in the portfolio. With the traditional index mutual fund, these actions are most often reversed, essentially postponing the payment of the larger capital gains. Therefore, when cash transactions are required due to index reconstitution or restructuring activities to the constituent securities, the ETF often has a higher cost basis portfolio and, thus, will likely incur lower taxable gains. In addition, ETFs have the opportunity to exchange, rather than sell, the outgoing securities, avoiding capital gains.

Chart 1, below, graphically details the annual capital gains as a percentage of net asset value for the Vanguard 500 Index fund and the SPDRs. Both investment vehicles track the same bogey, the S&P 500 index, but, as the chart illustrates, the SPDRs have historically displayed greater tax efficiency. Neither product paid capital gains in 2000.

Chart 1: Capital Gain Distributions as a Percentage of NAV



Source: American Stock Exchange and Morningstar

[6] According to Morningstar.

Although the tax efficiency of ETFs is easily demonstrated, caution is still warranted with some ETFs. Given the phenomenal growth in ETF assets, the marketplace has been flooded with new products. However, as the ETF market matures, consolidation is likely to incur. Those ETF products for which there is not a lot of demand are likely to be discontinued. In such a scenario, the investor *would* be subject to the embedded capital gains of the constituent securities. This situation is more likely to occur with the narrowly-focuses ETFs, such as the less frequently traded sector funds. In addition, as ETFs grow in popularity, the IRS may reexamine ETF operations and rescind or alter the provisions that provide the tax advantages.

Expenses and Trading Costs

Because they are not subject to the high cost of actively managing a portfolio, ETFs offer extremely low expense ratios relative to active managers. In addition, most ETF expense ratios are lower than traditional index mutual funds. For example, Table 1, below, compares the annual expense ratios between several Barclays iShares ETFs, the Vanguard mutual fund that tracks the same index, and the average active mutual fund in that particular asset class.[7] As the data in the table demonstrate, ETFs offer lower annual expense ratios than the comparable Vanguard retail mutual fund and significant management fee savings relative to actively managed mutual funds.

Table 1: Expense Ratio Comparison as of February 28, 2001

Index	Barclays iShares (%)	Vanguard Mutual Fund (%)	Avg Active Mutual Fund (%)
S&P 500 Index	0.09	0.18	1.32
S&P 500/BARRA Value Index	0.18	0.22	1.41
S&P MidCap 400 Index	0.20	0.25	1.44
Russell 2000 Index	0.20	0.25	1.44

The Vanguard Group is the most widely used index fund family and generally regarded as the low-cost leader in traditional index mutual funds. It should be noted, however, that institutional classes of shares, as well as commingled index products, are available for most broad-based indexes. Such products boast expense ratios comparable to those of ETFs. International ETFs are less competitively priced than their domestic counterparts.

Unfortunately, expense ratios are not the only cost that ETF investors have to bear. Because they are exchange-traded, ETFs incur additional costs that are not directly applicable to traditional mutual funds.[8] These additional costs include commissions and the bid/ask spread. Traditional index mutual funds can be purchased directly from the fund family without any

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[7] According to Morningstar. Active mutual fund averages were selected based on Morningstar's category definitions.

[8] Mutual fund managers incur trading costs, such as commissions, but those costs are wrapped into the mutual fund's annual expense ratio, not explicitly charged to each investor.

transaction charges, in most cases. These funds can also be purchased through brokerage accounts, which may result in a modest transaction charge (e.g., $100 per trade). ETFs, on the other hand, incur commissions, just like stock transactions. If an investor is incurring commissions between $0.03 and $0.05 per share, the purchase or sale of ETFs can be a significant cost. When an investor with such a commission schedule buys an ETF priced between $40 and $120 per share, commissions constitute between 0.03% and 0.13% in up-front cost. Of course, this cost would apply again at the time the position is liquidated. In addition, any time a portfolio is rebalanced or assets are sold to meet cash requirements, the ETF will likely generate higher transaction costs than a traditional index mutual fund.

In addition to commissions, another trading cost, the bid/ask spread, is applicable to ETFs, but not applicable to the purchase of traditional index mutual funds. The "bid" represents the price at which buyers are willing to purchase an exchange-traded security. The "ask" price is the price at which holders of the security are willing to sell. Trades rarely stray from within the bid/ask spread. Essentially, the bid/ask spread is the round trip cost to get into and out of a security. Because traditional mutual funds are not exchange traded, their purchase or sale is not subject to the bid/ask spread. Depending upon the volume of shares traded on the ETF, as well as the liquidity of the underlying baskets of securities, the bid/ask spread can be a significant cost. Table 2, below, details the average bid/ask spread for several ETFs during September 2000.

Table 2: Bid/Ask Spreads

ETF	Average Spread (%)
S&P 500 SPDRs	0.078%
iShares S&P 500	0.085%
iShares S&P MidCap 400	0.181%
iShares Russell 2000	0.338%

Source: Salomon Smith Barney

The data contained in Table 2 are revealing. First, consider the SPDRs and iShares, which track the same index, the S&P 500. The SPDRs' average spread was 0.078%, while the iShares' was only slightly higher at 0.085%. These results are surprising considering that the SPDRs traded at roughly 50 times the volume of the iShares during the period in question. In the equity markets, average daily volume is a major factor in the width of the bid/ask spread; however, in the case of ETFs, the liquidity of the underlying stocks is also an important factor in determining the spread. For instance, the iShares Russell 2000 index traded at an average spread of 0.338%, while the iShares S&P MidCap 400 index traded at nearly half that, at 0.181%, on average. At first glance, the spread difference is surprising, because the iShares Russell 2000 had *higher* trading volume than the iShares MidCap 400; however, mid-cap stocks are more liquid than small-cap stocks, and, thus, are less costly to bundle and exchange into ETF shares.

The spreads detailed in Table 2 represent a significant cost to the ETF investor. For instance, recall that the iShares Russell 2000 has a lower annual expense ratio than the Vanguard Small Cap Index by 0.05%. Unfortunately, this savings would be swamped by the bid/ask spread of

nearly 0.34%. Factoring in commissions of roughly 0.055% (assuming $0.05 per share), the additional cost for the ETF is nearly 0.40%. Assuming that both the ETF and index fund underperform their bogey at an amount equal to their fees, it would take almost eight years before the lower ETF expense ratio overcomes the additional trading costs of its purchase. This example ignores trading costs that would result from rebalancing or raising cash over the eight-year period, and also ignores the time value of money. When these factors are considered, the period for the ETF to recover the additional trading costs and become a "less expensive" investment would be considerably longer. To the taxable investor, however, the after-tax performance advantage of the ETF will likely outweigh its additional costs.

Performance Issues

Understanding performance reporting methodology is an additional consideration for ETF investors. ETF performance, as calculated by databases such as Morningstar, is based on the prices contained in the financial press and data reporting services. At first glance, these data suggest a disconcerting level of tracking error. For example, the S&P 500 SDPRs trailed the index by 0.4% in February 2001 (-9.5% versus -9.1%). However, this margin of tracking error is not entirely accurate.

Like stocks, the daily closing price of ETFs reflects the price of the *last* trade for the day. ETFs are traded until 4:15 p.m. Eastern time, while the indexes that they track are settled at 4:00 p.m. In the case of an actively traded ETF, like the S&P 500 SPDRs, the closing quote likely reflects a trade from 4:15 p.m., which is *after* the index value has been calculated. As a result, additional information that impacts the ETF price may come to market over this 15-minute period. This new information will likely impact the index value as soon as the market opens the following day; however, should this situation occur on the last day of the month, performance calculations may be adversely impacted, as was likely the case in February 2001.

Another example of "perceived" tracking error is the performance of the iShares MidCap 400, which underperformed its bogey by 0.5% in January 2001 (1.7% versus 2.2%). The iShares MidCap 400 is a far less actively traded ETF than the SPDRs. As such, the last trade of the day may be completed several hours *before* the index is calculated. After that trade, the index value is likely to change, giving the appearance of tracking error. At all times, however, the ETF arbitrage mechanism ensures the price will be an accurate reflection of the current value of the underlying securities, less trading costs. For instance, if an index rose by 0.5% in the final few hours of trading on the last day of the month (as was likely the case in this example), an ETF trade would be filled based on the index's current value, not the last ETF trade from several hours prior. In many cases, the apparent tracking error is nothing more than a timing issue. As such, we would expect these differences to "wash out" over time.

Conclusion

ETFs provide investors with a variety of features previously unavailable with mutual funds. Their ability to be sold short or bought on margin provides investors with additional tools to manage asset class or style risk at the portfolio level. The fact that ETFs can be bought throughout the trading day provides a greater degree of flexibility to those who wish to implement a tactical asset allocation strategy that seeks to capitalize on short-term trends in capital markets. While such strategies may have a place in a portfolio if undertaken with prudence, these strategies may prove to be costly to those investors that employ ETFs in the pursuit of short-term objectives that jeopardize long-term goals. For a strategic asset allocation

based on long-term expectations for capital markets, the ability to trade intra-day is of little value.

Despite the additional trading costs resulting from the "exchange-traded" portion of their moniker, the advantages that ETFs provide to *taxable* investors will likely offset the additional transaction charges.[9] However, the additional trading costs of ETFs inhibit their effectiveness for periodic purchases through a dollar cost-averaging program. **This exception not withstanding, we recommend ETFs as a passive manager for domestic asset classes for taxable investors.**

The case for ETFs in a tax-exempt portfolio is not as clear cut. A balance must be struck between the additional trading costs of ETFs and the annual savings in operating expenses they may provide relative to traditional index mutual funds. Although it is easy to calculate the cost impact of the initial ETF purchase, ongoing trading costs resulting from rebalancing and the generation of cash to cover spending needs are difficult, if not impossible, to accurately quantify. **As such, the decision to include ETFs in a tax-exempt portfolio should be made on a case-by-case basis. Consideration should be given to the applicable commission schedule, the dollar size of the mandate, the spending needs of the institution, the institution's rebalancing policy, and the time horizon of the proposed investment.**

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[9] Before investing in ETFs, taxable investors should carefully consider the capital gains embedded in their current holdings. The significant capital gains realized in liquidating a current investment may swamp the future tax benefits associated with an ETF.

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