

Navigate Premiums and Discounts Accurately

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A premium or discount is the difference between a fund's share price and its Net Asset Value (NAV). In order to understand why premiums and discounts can occur in ETFs, investors first need to understand the basics of ETF pricing, both in terms of NAV and market price. Both are important measures of an ETF's value, and their significance can vary depending on what the investor is measuring and trying to achieve.

How is NAV calculated?

NAV is a measurement of a fund's value, including the fund's holdings as well as any liabilities, such as accrued expenses or borrowing. Both ETFs and mutual funds calculate NAV once per day. For domestic equities, the calculation is straightforward and will generally be based on the closing prices of the stocks held in the portfolio. For funds holding international securities that trade in a different time zone, the NAV may be based on the closing price of the securities in their local markets, in which case the NAV may not represent a contemporaneous value of those securities, although there would likely be an adjustment to account for changes in foreign currencies. Alternatively, some fund companies may use estimated fair values of these holdings which reflect changes in market value after the stocks ceased to trade in their local markets. This estimate, typically provided by a third party and overseen by the fund manager, includes not only changes in foreign exchange rates but also general movements in the domestic equity market when foreign markets were closed. The goal of these various methodologies is to generate the fairest valuation of a fund's assets in order to calculate as accurate a NAV as possible.

Bonds provide additional challenges. Because bonds trade over-the-counter (OTC), there is no centralized or aggregated source for pricing. In fact, some bonds in certain markets may not trade at all on a given day. For example, average daily trading volume in both the U.S. municipal and corporate bond markets equated to less than 0.5% of the overall

market, on average, in 2019.¹ Even within broad fixed income benchmarks, which tend to include larger and more liquid issues, trading activity can be scarce. For example, in January 2020, approximately 30% of the Bloomberg Barclays US Investment Grade Index traded fewer than once per day, on average.² However, valuations must be determined for each bond every day in order to calculate the daily NAV. Similar to international equities, security valuations are provided by an independent, third party pricing service. The process is also overseen by the fund manager, with strict guidelines around challenging the prices provided by the independent service. Bonds that do not trade may be grouped together with bonds that have similar characteristics to determine changes in their values, using "matrix pricing." Inputs to determine this value include yield curve movements, credit spread movements, transactions in similar securities, and earlier transactions in the security being priced. Bond valuations are not inclusive of trading costs (i.e. liquidity, cost-to-carry, etc.). Another consideration regarding the NAV calculation for a bond fund includes whether the securities are priced based on the bid level or a mid-price. There are merits to both approaches; but when examining ETF premiums and discounts it is important to know which is used.

The main difference between valuation of equities and valuation of many bonds, is that equity valuations are typically based on a closing price on an exchange, where actual trades can be observed. Bond valuations are generally an estimate of the fair value of the bonds.

¹ Sources: MSRB, based on data from MSRB, Federal Reserve, FINRA, SIFMA, S&P, and World Federation of Exchanges for calendar year 2019.

² Source: MarketAxess

NAV has importance to investors beyond the fair estimation of a fund's value. Mutual fund investors can transact at NAV, as can the Authorized Participants who can create and redeem ETF shares. Unlike mutual fund investors, however, ETF investors generally buy or sell their shares at the market price quoted by ETF market makers throughout the day on a stock exchange. These secondary market prices reflect not only the market makers' valuation of these bonds but also any anticipated trading costs. Differences between the market price and NAV are measured by the premium or discount.

How is an ETF's market price determined?

When discussing ETF premiums and discounts, it's important to distinguish between the NAV, intraday NAV, market price and the ETF portfolio's "true value". Since NAV is calculated once per day, its intraday market price cannot reasonably be compared to its prior day's NAV to determine whether the market price is fairly valued. Intraday NAV can be used as an estimate for some ETFs, but this measure is less reliable than the end of day NAV calculation, and for international or fixed income securities may not be meaningful. ETF market makers rely on their own pricing models and generally disregard the intraday NAV. Intraday ETF market prices therefore reflect market makers' best estimate of the real time value of the fund's holdings.

What ensures that these market quotes are "fair"? Competition for trading volume among market makers is a key driver, and it is not unusual for premiums and discounts and wider bid-ask spreads to be more prevalent in smaller ETFs or those that do not exhibit strong two-way trading flows (i.e. both buying and selling). For all ETFs, however, the arbitrage potential created by the creation/redemption process provides boundaries on the extent to which market prices typically deviate from NAV, since Authorized Participants transact with the ETF at NAV and provide or receive the underlying securities at their market value. As a result, significant deviations between an ETF's market price and a portfolio's NAV, are typically short-lived.

Major Inputs into NAV Calculation:

Domestic Equities

Closing market price

Expenses

International Equities

Closing market price

Currency values

Domestic equity market

Expenses

Bonds

Recent transaction prices

Bid/ask spreads

Interest rates

Income accruals

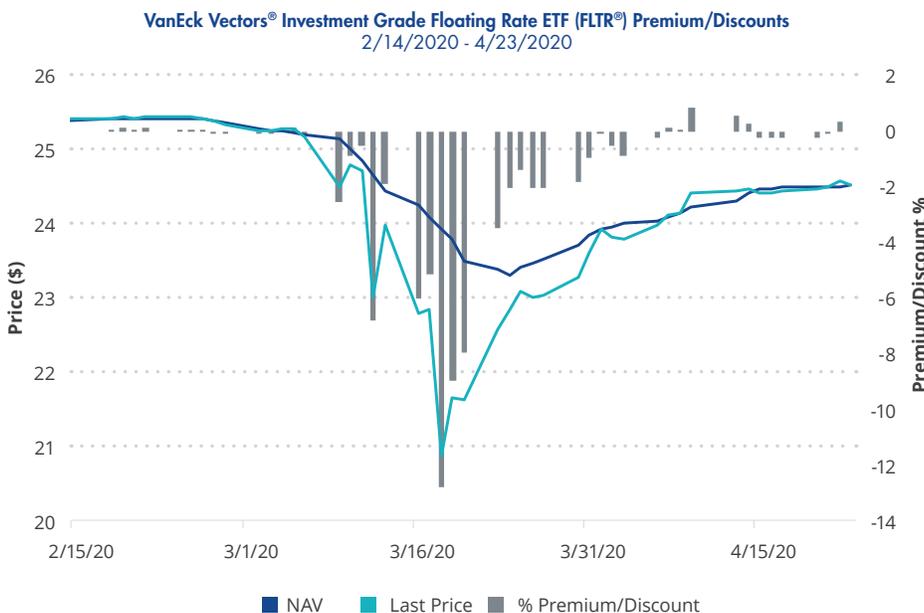
Credit spreads

Maturity

Credit rating

Sector

Expenses



Source: VanEck as of 4/23/2020.

The ability of an AP to buy ETF shares and redeem them for the underlying securities and realize any difference as profit is what generally keeps the ETF market price and the NAV close together. However, there are costs to the AP involved in trading the ETF and creating or redeeming shares. The factors impacting the quoted price of an ETF can vary based on market conditions, and may include borrowing or hedging costs, internal balance sheet usage or risk charges, the bid-ask margin of the underlying securities in the ETF, and a built in profit margin. Importantly, the AP or market maker will incorporate these costs into the market prices they quote, so that these costs are borne by the transacting shareholders. These costs are therefore reflected by the bid and ask prices for the ETF on any exchange. Some of the costs to market makers will increase during periods of high market volatility, low liquidity or acute dislocations. Certainly the bid-ask margin for many bonds will move wider in these environments, and one would expect the market makers to build in a greater margin in their quotes when there is less certainty around the ability to execute the arbitrage. It stands to reason that in environments where bid-offer spreads widen significantly on underlying securities due to market conditions, ETF discounts or premiums will also widen.

Equitable distribution of costs

A premium or discount incorporates costs that shareholders otherwise would incur if they were to replicate the fund's portfolio and are costs that would be borne by the mutual fund buying those same securities. The difference is that with an ETF, the costs are paid by transacting shareholders. For example, if ETF investors' selling of shares results in a redemption, those sellers pay for the costs of the redemption, because the market maker will have incorporated these costs into their prices. Shareholders who remain in the fund do not bear these transaction costs because the redemption is satisfied via the in-kind delivery of securities, and those securities are valued for the purpose of the redemption based on that day's NAV. As a result, ETF portfolio managers generally do not have to sell securities for redemptions. On the other hand, mutual fund investors who redeem their shares at NAV are effectively transferring the execution risk, and all the associated costs, to shareholders who remain in the fund. To the extent that the underlying securities are sold at market values that are less than those used to calculate the

NAV, it is the remaining shareholders who will experience that loss. This is an important distinction that we will return to in a later section. Note that if there is active buying and selling in the ETF shares, ETF market prices may reflect lower transaction costs (through a narrower bid-offer spread) since the secondary layer of liquidity provided by the ETF structure reduces the need to trade the underlying securities. In that case, not only are existing shareholders protected, but transacting shareholders benefit from tighter bid-offer spreads.

Fair value versus a firm price

There are both explicit and implicit costs associated with the trading of an ETF's underlying securities and the risk assumed by ETF market makers, which NAV may not incorporate. Whether those costs are borne by transacting shareholders or existing shareholders, a "fair" value, as measured by NAV, is not necessarily the same as an executable price. There can be a meaningful difference, particularly in times of market stress when these costs can increase substantially. That can directly lead to a widening of premiums or discounts to NAV. However, rather than indicating that ETF pricing is 'broken' or unreliable, the market price can be interpreted as a better real-time assessment of the portfolio's executable value for those shareholders who seek to transact in such conditions.

ETF Discounts in Stressed Markets

Because most discussions around market selloffs are focused on ETF redemptions and discounts, we will focus on that scenario for the following discussion. However, it is important to keep in mind that market stress could also relate to premiums to NAV as well (for example if a market is closed for an extended period of time while the ETF continues to trade).

Consider a period of severe market stress and high volatility. Bid-offer spreads of underlying securities may widen, perhaps significantly, representing a lack of liquidity or pricing uncertainty. For bonds, which already have wider bid-ask spreads compared to equities, this can be particularly acute given the lack of observable transactions in that market. There can be a significant difference between indicative quotes that are provided on screen for a particular security compared to an actual firm quotation that a trading counterparty may be willing to provide.

Market makers may choose to manage their risk in a multitude of ways but we wanted to highlight two specifically – redeeming in-kind and hedging.

- In an in-kind redemption scenario, market makers receive the underlying securities. They can then sell the securities, but this may take time given liquidity conditions and uncertainty around pricing. They may have to utilize their balance sheet in order to hold these securities, which in times of severe market stress and reduced liquidity may be costly.
- Alternatively, market makers can put on a hedge to flatten out their risk. But again, in times of market stress hedging costs can go up. And for certain asset classes such as municipal bonds, hedging options are more limited.

All of these risks have a cost, and market makers build these costs directly into their ETF quotes. ETFs that have stronger two way trading flows help to reduce the risk to market makers since they may not have to redeem shares and sell bonds to manage their risk nor hedge accumulated inventory; they may be able to cut their risk by selling accumulated ETF shares in the secondary market. But ETFs that experience primarily selling in these environments, where the redemption mechanism would become the most likely way for a market maker to exit his position, may experience larger discounts.

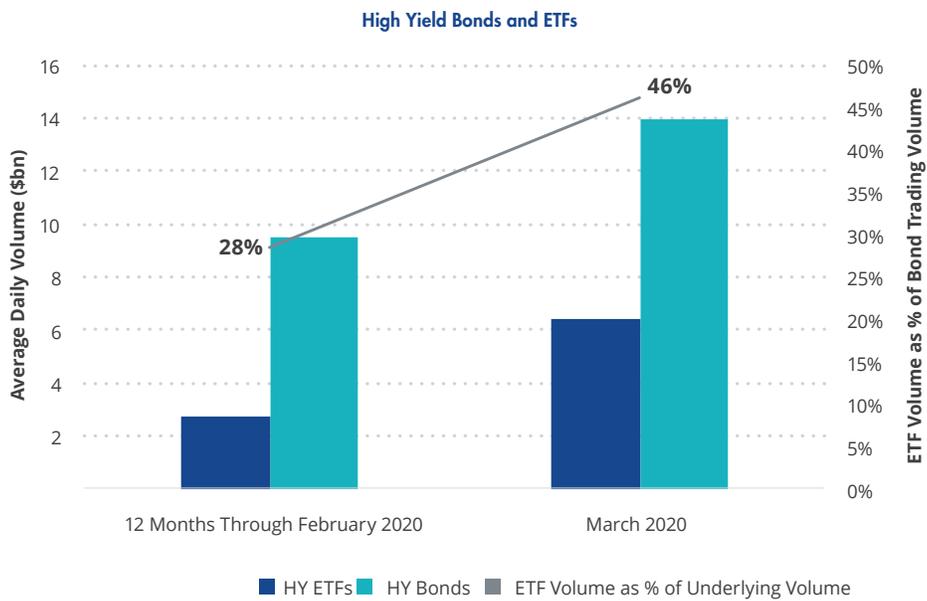
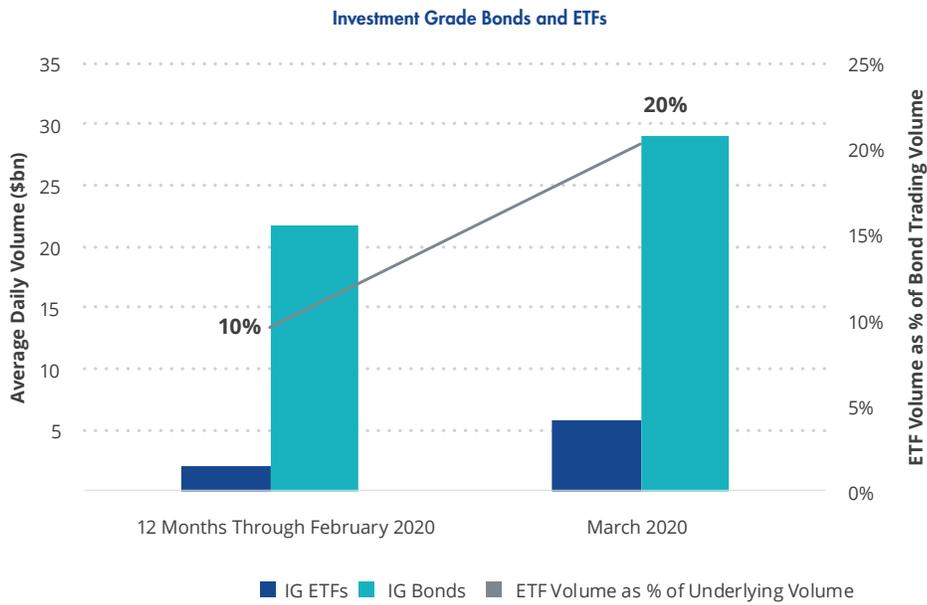
In an environment where there is heavy selling pressure and market stress, discounts to NAV may not reflect a mispricing.

Instead, the secondary market price may reflect a combination of the best estimate of underlying security values and the price of the ETF market maker's risk. NAV may also reflect a best estimate of security valuations, but as a static figure it cannot capture the uncertainty, nor the higher costs for hedging and risk that ETF market makers will factor into the price they make. The NAV may also be slower to react in the most highly volatile periods with very little trading in the secondary market for bonds. In such periods, ETF trading volumes have often tended to actually rise, making the ETFs themselves the leading

mechanism for price discovery for a given asset class. As transactions in the underlying securities increase, it is typical to see the NAV and the ETF market price converge again. In these cases, while the ETF market price may be a leading indicator of the NAV, it may also be more volatile, since the costs associated with holding and trading the underlying securities may change rapidly in such an environment.

Understanding the way that redemptions are handled by mutual funds compared to ETFs is critical in understanding the relative merits and drawbacks of each structure. When faced with redemption requests, mutual fund managers can choose which securities to liquidate in order to satisfy the request. They often will sell the most liquid securities, since these are not only the easiest to sell but also incur the lowest trading costs to do so. The less liquid remaining securities continue to be valued at NAV. If redemptions continue, these too will need to be sold. If the valuations used to determine NAV are indeed lagging the true market value, realized values from these liquidations may be far below the values provided by third party pricing providers, and more will need to be sold in order to satisfy redemptions at NAV. The more illiquid and less frequently traded the securities are, the more acute this problem is.

There are several features of ETFs that significantly reduces the potential for fire sales. Most importantly, ETF investors who sell their shares in these environments do so at ETF market prices, which already reflect the realizable market values of the underlying bonds. Second, the secondary layer of liquidity provided by the ETF wrapper means that not all trading results in primary market (creation or redemption) activity. Historically, only a small portion of trading volume results in primary market activity, and that portion tends to decrease in periods of market volatility. Further, the volume of ETF trading tends to increase in periods of market stress relative to trading in the underlying bonds. This was true during the recent volatility experienced in March 2020. There was a general increase in trading volume across bonds and ETFs, but a much greater increase among ETFs. This is an indication of the enhanced liquidity that ETFs provided during a time in which liquidity in the underlying bonds became more scarce.



Source: VanEck as of 5/31/2020.

If there is heavy net selling that does result in redemptions, the market maker will receive a basket of underlying securities that is either a pro-rata slice of the portfolio or a sample of the portfolio that represents the overall risk and return characteristics of the portfolio. The redemption basket will not be a selection of only the most liquid securities because the ETF's portfolio manager must, by mandate, continue to seek to track the performance of its benchmark. For the most part, portfolio managers do not historically have to trade because of primary market activity. However, portfolio managers do have flexibility to select the bonds that are included and in the case of many fixed income ETFs in a way that may help to achieve efficient execution of redemptions.

Does NAV pricing make mutual funds better?

Given the apparent stability of the NAV relative to an ETF's market price during market stress, and the fact that mutual fund investors can transact at NAV, many investors may conclude that the mutual fund is a superior structure. Although the mutual fund structure may satisfy the needs of many investors and may be better suited for certain asset classes and investment strategies, we believe that choosing mutual funds over ETFs because of the premium/discount potential is misguided.

As described herein, ETF market prices better reflect the market's real-time assessment of not only the portfolio's value but also trading costs. ETFs provide not only a valuable price discovery tool for the overall marketplace, but also provide investors with real time executable pricing on their investment. In times of market stress, a discount to NAV may represent the price of immediate liquidity in an uncertain market. ETFs provide the benefits of price transparency and liquidity in stressed conditions, which is when these benefits have the greatest value. For investors who do not need to transact in stressed markets, NAVs and market prices generally converge as market volatility dies down. This can be driven both by narrowing bid-offers and decreasing costs of liquidity, which can increase the market price, or as underlying security values provided by pricing vendors adjust downwards to reflect actual transactions taking place, which would decrease the NAV.

Further, the distribution of costs may be a concern for mutual fund investors. As described previously, the costs associated with redemptions are borne by remaining shareholders, while transacting shareholder receive NAV. This means that investors who are trading in periods of market stress are potentially having their trading costs subsidized by long-term shareholders. This may provide an incentive to be the first to redeem in such a situation, potentially further exacerbating this effect. For funds that invest in fixed income or other less liquid asset classes, this poses a very significant risk for remaining shareholders, since NAV prices of the underlying securities may dislocate from their executable market prices in times of stress.

At the same time, those who choose to invest in the same fund during times of market stress may be overpaying relative to the market value of the underlying assets.

The ETF structure has several inherent benefits to investors:

1. The trading of the ETF shares provides a second layer of liquidity that allows investors to transact throughout the day
2. The structure provides transparency to both the exposure and cost

Mutual funds do not provide the same level of liquidity and transparency, but can certainly satisfy the needs of long-term investors who do not need to trade intraday nor seek to invest in less liquid asset classes, if they are comfortable with the distribution of costs or relative lack of transparency. We believe both structures can be suitable for long-term investors, but that ETFs can also be especially suitable for investors seeking liquidity, trading opportunities, tactical exposure, or hedging tools. All investment vehicles, whether ETF or mutual fund, as well as separately managed accounts, hedge funds or closed-end funds, have inherent benefits and drawbacks. Investors should understand the relative advantages and disadvantages that each structure provides, so they can choose the vehicle best suited to their needs and the investment strategy.

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