



For professional investors/qualified investors/qualified clients

Fixed Income ETF Premium & Discounts

Invesco ETF Capital Markets

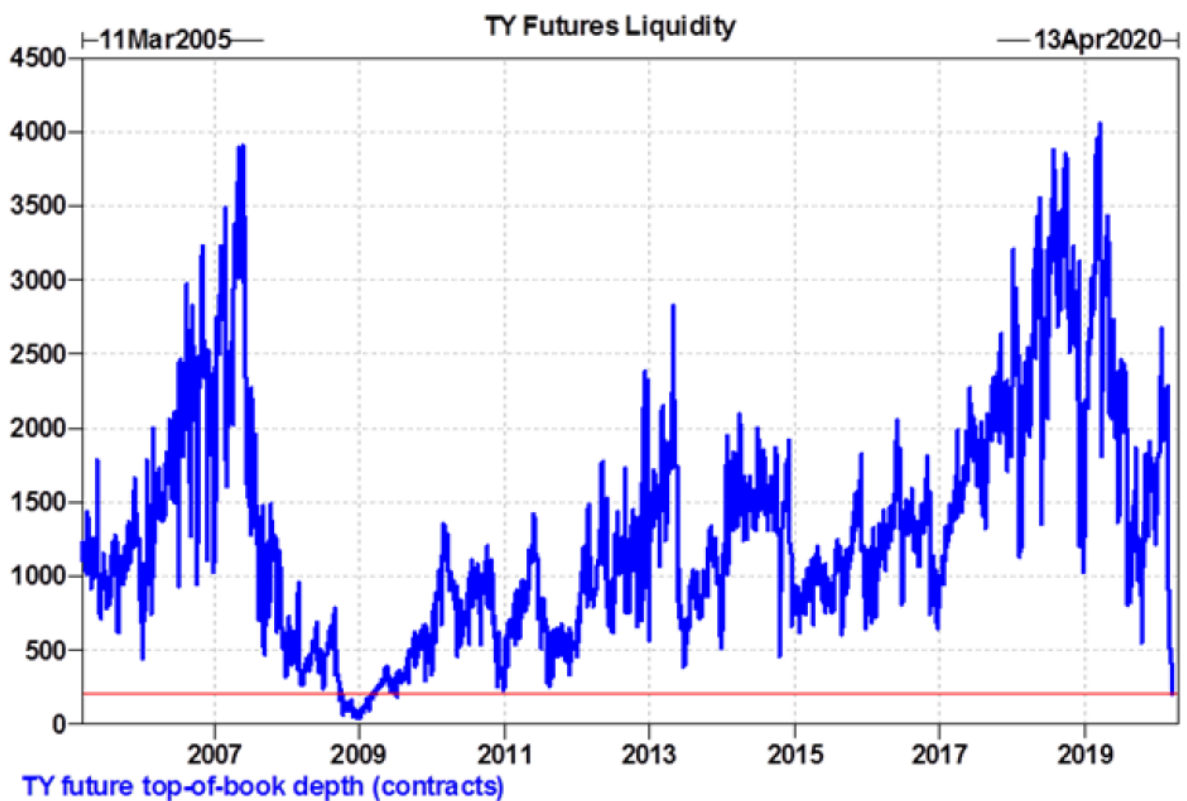
Why do fixed income ETFs trade at premiums and discounts?

It's all about perception. When assessing the premium/discount for an ETF, we compare the ETF's market price to its NAV. The NAV of an ETF represents the value of each share's portion of the fund's underlying assets and cash at the end of the trading day. The key to an accurate assessment of an ETF's premium/discount is the pricing methodology for its NAV. The first point to consider is if the ETF's end-of day NAV is priced from the bid, mid, or offer prices on its underlying portfolio. Typically, fixed income ETFs price their NAVs to the mid or bid of the bonds, but this must be known to appropriately compare two different ETFs. On any given day, if sellers outweigh buyers, one would expect a mid-marked NAV fixed income ETF to trade at a relative discount to a bid marked NAV ETF by a factor of $\frac{1}{2}$ the underlying market bid/ask spread. Note that the underlying market bid/ask spread is not static and will widen/tighten in varying market liquidity conditions.

In a bid-marked NAV ETF, as buyers outweigh sellers on exchange, the ETF price should trade at an expected premium of the full underlying market bid/ask spread. This is because as buyers outweigh sellers, liquidity providers would need to create shares of the ETF and buy bonds at their offer prices to deliver into the portfolio to facilitate said creation. Conversely, as sellers outweigh buyers on exchange in a bid-marked NAV ETF, the ETF price should trade in line with NAV as liquidity providers should be able to redeem the ETF shares, take the bonds they hold and sell them at those bid prices. In theory this should hold true, however in practice, there are times like last few weeks or December of 2018 where we observe these products trading at discounts to NAV. If the NAV price was actionable and market makers could sell bonds 5% higher than the ETF price in the market, why didn't those liquidity providers redeem and arbitrage away the discount to NAV?

To answer this question, we need to examine how these NAV prices are struck. Given the OTC nature of bond markets, it is unlikely there will be a traded price for each bond in the ETF's underlying portfolio every day. In fact, according to a 2018 SEC bond market liquidity study, only 20% of corporate bonds trade on any given day. Thus, in normal market conditions, NAV pricing agents must fair value a significant portion of the Fixed Income ETF portfolio to calculate the daily NAV. If a bond does not have a recent round lot trade, pricing agents may source indications from bond dealers, providing an assessment of the bond's value that day. This can be effective as long as those indications are consistently updated and are in fact actionable prices. In the second week of March 2020, however, we witnessed these fair valued prices dislocate from executable levels. Liquidity dried in the underlying cash bond market, disrupting a wide range of fixed income securities.

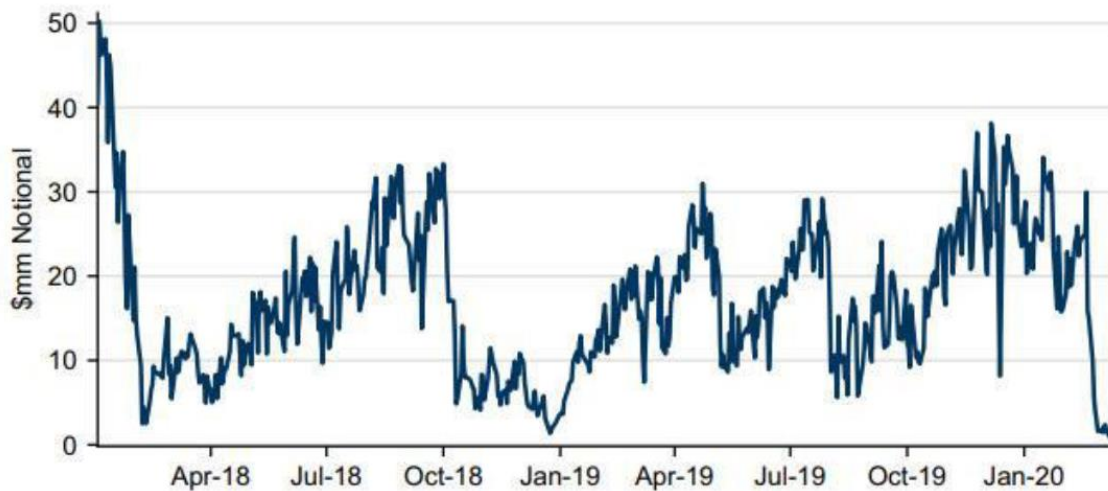
Below are two charts from Goldman Sachs showing the liquidity for treasury futures and S&P 500 futures quantified by the average top of book depth in futures markets. Treasury futures liquidity seemingly evaporated day over day, with market depth reaching levels not seen since the financial crisis. The difference this time however was the pace of change in liquidity conditions, deteriorating over days rather than months. As liquidity dries the velocity of day over day price swings intensify. Our Portfolio Managers noted witnessing day over day price changes in their respective asset classes that they have never seen before.



Data as of March 13th, 2020

Exhibit 2: Top-of-book depth has been lower the last few days than it was in late 2018

Daily median E-mini future bid-ask depth (\$mm notional), based on 1-minute intraday snapshots

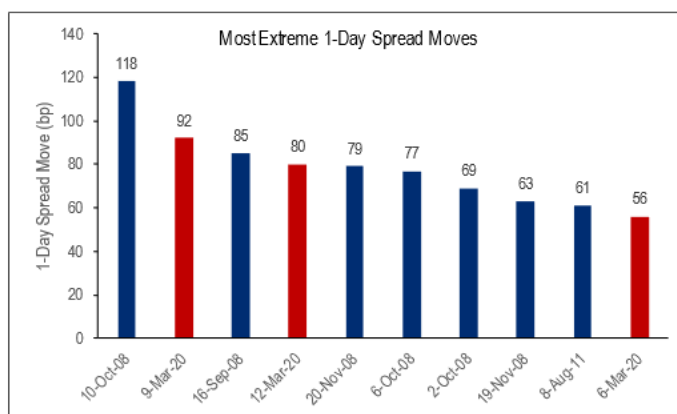


Source: Goldman Sachs Global Investment Research, Reuters

Data as of March 13th, 2020

Attempting to quantify the intensity of these day over day moves, we can look to the price action in High Yield corporates below. Citi noted that last week we saw the largest day over day changes in HY credit spreads since 2008 and that the pace of credit spread widening thus far in March has far exceeded that of the financial crisis.

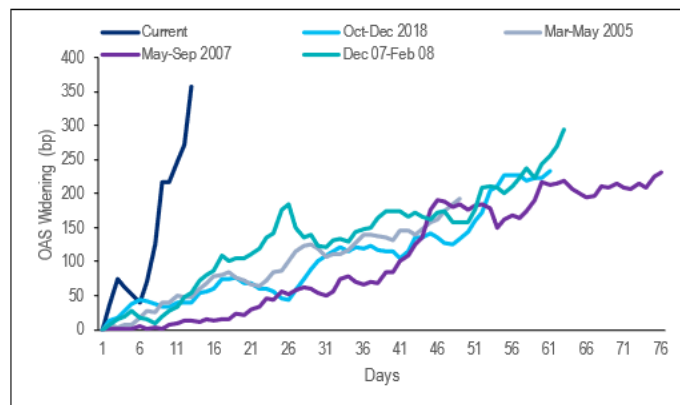
Figure 1. March's Volatility Challenging March 2008's Standard



Source: Citi Research, Bloomberg Barclays Index.

Data as of March 15th, 2020. Most extreme spread moves in 2020 are highlighted in red.

Figure 2. Scale and Scope of March Widening Unprecedented



Source: Citi Research, Bloomberg Barclays Index.

Data as of March 15th, 2020

During these periods of abrupt repricing, dealers can be slow to mark down inventory, and indicative bids can remain above executable prices. Last week, our Portfolio Managers noted it was difficult to discover firm buyers in the OTC cash bond market. As investors headed for the proverbial exits, successfully retrieving a bid in the underlying bonds was a difficult task, let alone transacting. As result, the NAV marks of the bonds inside fixed income ETF portfolios were quite stale in some cases, despite the pricing agents best efforts to fair value these securities.

In these market environments, ETFs become the price discovery vehicle for their underlying markets. Fixed Income ETFs stepped up to fill the void from the lack of continuous price discovery in the underlying bond market. These products displayed firm, actionable, and continuous 2-sided price levels throughout the US equity trading session. The role that these products played must not be understated. Fixed income ETFs allowed investors to transfer risk on and off exchange, alleviating temporary illiquidity in the underlying cash bond market.

This price discovery was observed broadly across the fixed income ETF space, however the magnitude of NAV pricing lag varied between individual asset classes. As result it may be prudent to discuss client questions individually as to provide insights from product specific experts.

Please reach out to the ETF Capital Markets team via the team inbox (etftrading@invesco.com) if any question.

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Data as at March 13th, 2020, unless otherwise stated.

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