

Municipal Bond ETFs During the COVID-19 Crisis: Price versus Net Asset Value

Trading activities efficiently, especially when the liquidity is severely squeezed during a stress period.⁸

Charts 1 and 2 illustrate that on most days before early March 2020, the municipal bond ETFs MUB and VTEB tracked closely with the S&P National AMT-Free Municipal Bond Index, with a daily percentage deviation of between 0.01% and 0.4% for both ETFs.⁹ However, starting on or about March 10, MUB and VTEB persistently diverged from the S&P National AMT-Free Municipal Bond Index and were underpriced for approximately 10 trading days (two weeks) before finally converging again with the index in late March. The daily percentage deviation reached as high as 5.9% for MUB on March 18 and 9.4% for VTEB on March 19.¹⁰

Chart 1. ETF Tracking of S&P National AMT-Free Municipal Bond Index
(Starting Values on December 31, 2019 Set to 100)



APRIL 2020

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Source: MSRB analysis with data obtained from

⁸ This is often referred to as “liquidity mismatch,” which would be more applicable to fixed-income ETF products.

⁹ For this analysis, the starting values of all ETFs and indices were set to 100 on 12/31/19.

¹⁰ ETFs over a long period of time would underperform due to the expenses and transaction costs. However, those costs were not included in this analysis.

Trading in Municipal Bond ETFs During the COVID-19 Crisis: Price versus Net Asset Value¹

Starting in late February 2020, worldwide financial markets experienced unprecedented volatility as a result of the COVID-19 pandemic and the large-scale economic shutdown in many nations, including the United States. Volatility has not simply affected the equity market, where the S&P 500 Index declined nearly 34% only a month after reaching an all-time high in February 2020. Rather, volatility also seeped into the fixed-income markets in March 2020, where there appeared to be massive selling by investors.² Volatility may have also affected the market for fixed-income exchange-traded funds (ETFs), where some of the largest municipal bond ETFs are usually more actively traded than the underlying bonds.³

This market commentary analyzes how municipal bond ETFs performed in March 2020, in the midst of the COVID-19 crisis, by empirically exploring the price movement of the three most frequently traded municipal bond ETFs:⁴ the iShares National Muni Bond ETF (ticker symbol: MUB), the Vanguard Tax-Exempt Bond Index Fund ETF (ticker symbol: VTETB), both of which track the S&P National AMT-Free Municipal Bond Index,⁵ and the VanEck Vector High Yield Municipal Index ETF (ticker symbol: HYD), which seeks to replicate the performance of the Bloomberg Barclays Municipal Custom High Yield Composite Index.⁶

Most ETFs are designed to track a benchmark index closely. The supply, demand and pricing of ETF shares are controlled by a unique creation/redemption process, where the arbitraging activities by authorized participants precipitate the price adjustment for ETFs and/or underlying securities so that ETF prices align with the net asset value (NAV).⁷ ETFs can be traded throughout the day, making them attractive to investors who want to react to market movements in real time. However, close tracking of a portfolio's NAV by a corresponding ETF's price is important, since deviation from the NAV can result in investors purchasing or selling a financial product whose value is different from what investors reasonably believe it to be.⁸ For many fixed-income ETFs, because the underlying securities tend to be less liquid than the ETFs themselves, authorized participants may have a harder time executing

¹ The views expressed in this commentary are those of the author and do not necessarily reflect the views and positions of the MSRB.

² See the MSRB Municipal Market Trading Report (Updated Daily). <http://msrb.org/News-and-Events/COVID-19-Information.aspx>.

³ The illiquid nature of many municipal bonds has been well-documented. See Wu, Simon Z., "Transaction Costs for Customer Trades in the Municipal Bond Market: What is Driving the Decline?" MSRB Research Paper, July 2018. <http://www.msrb.org/~media/Files/Resources/Transaction-Costs-for-Customer-Trades-in-the-Municipal-Bond-Market.ashx>.

⁴ Source: ETFdb.com, <https://etfdb.com/etfdb-category/national-munis/>.

⁵ The daily net asset value of an index is determined by the weighted average of the evaluated price of each individual bond in the index. See <https://us.spindices.com/indices/fixed-income/sp-national-amt-free-municipal-bond-index>.

⁶ The Index is intended to track the overall performance of the U.S. dollar denominated high-yield long-term tax-exempt municipal bond market.

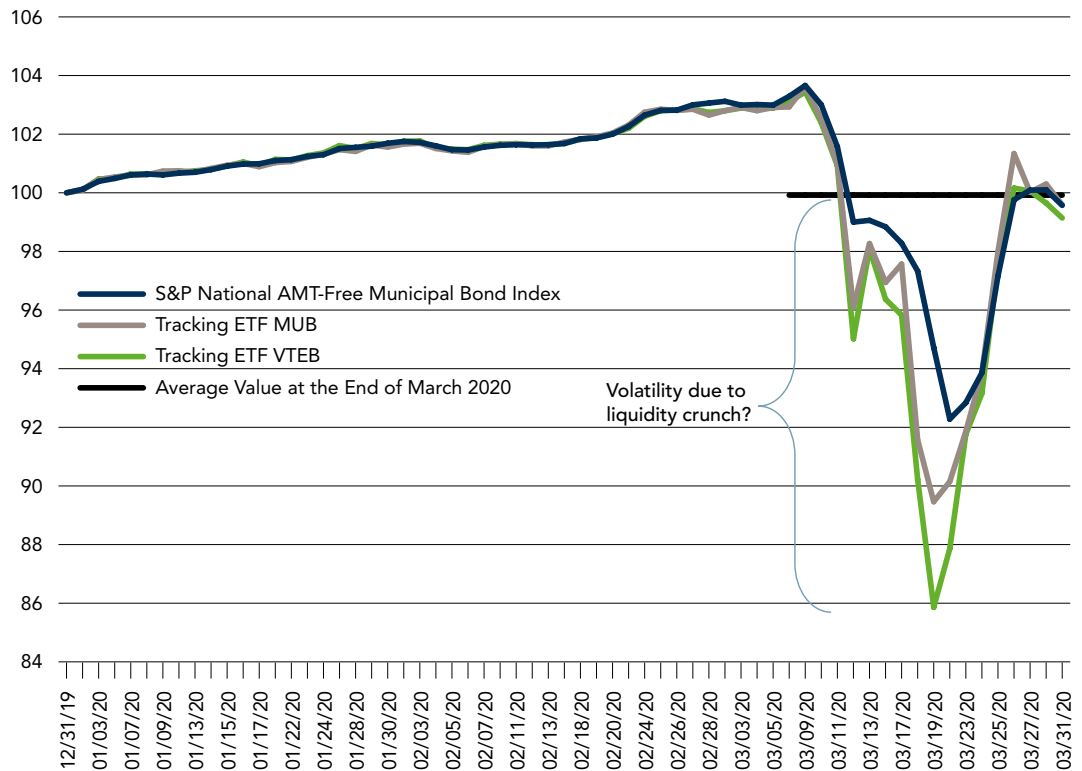
⁷ In the case when there is a price deviation between ETFs and the NAV of their underlying securities, authorized participants create or redeem ETF shares as a way of arbitraging for profit making. See Wu, Simon Z. and Meghan Burns, "Municipal Bond ETFs: Liquidity Impact on Municipal Bond Market," MSRB Research Paper, April 2018. <http://www.msrb.org/~media/Files/Resources/Transaction-Costs-for-Customer-Trades-in-the-Municipal-Bond-Market.ashx>.

⁸ See Wu, Simon Z. and Meghan Burns, "Municipal Bond ETFs: Liquidity Impact on Municipal Bond Market," MSRB Research Paper, April 2018. <http://www.msrb.org/~media/Files/Resources/Transaction-Costs-for-Customer-Trades-in-the-Municipal-Bond-Market.ashx>.

arbitraging activities efficiently, especially when the liquidity is severely squeezed during a stress period.⁹

Charts 1 and 2 illustrate that on most days before early March 2020, the municipal bond ETFs MUB and VTEB tracked closely with the S&P National AMT-Free Municipal Bond Index, with a daily percentage deviation of between 0.01% and 0.4% for both ETFs.¹⁰ However, starting on or about March 10, MUB and VTEB persistently diverged from the S&P National AMT-Free Municipal Bond Index and were underpriced for approximately 10 trading days (two weeks) before finally converging again with the index in late March. The daily percentage deviation reached as high as 5.9% for MUB on March 18 and 9.4% for VTEB on March 19.¹¹

Chart 1. ETF Tracking of S&P National AMT-Free Municipal Bond Index
(Starting Values on December 31, 2019 Set to 100)



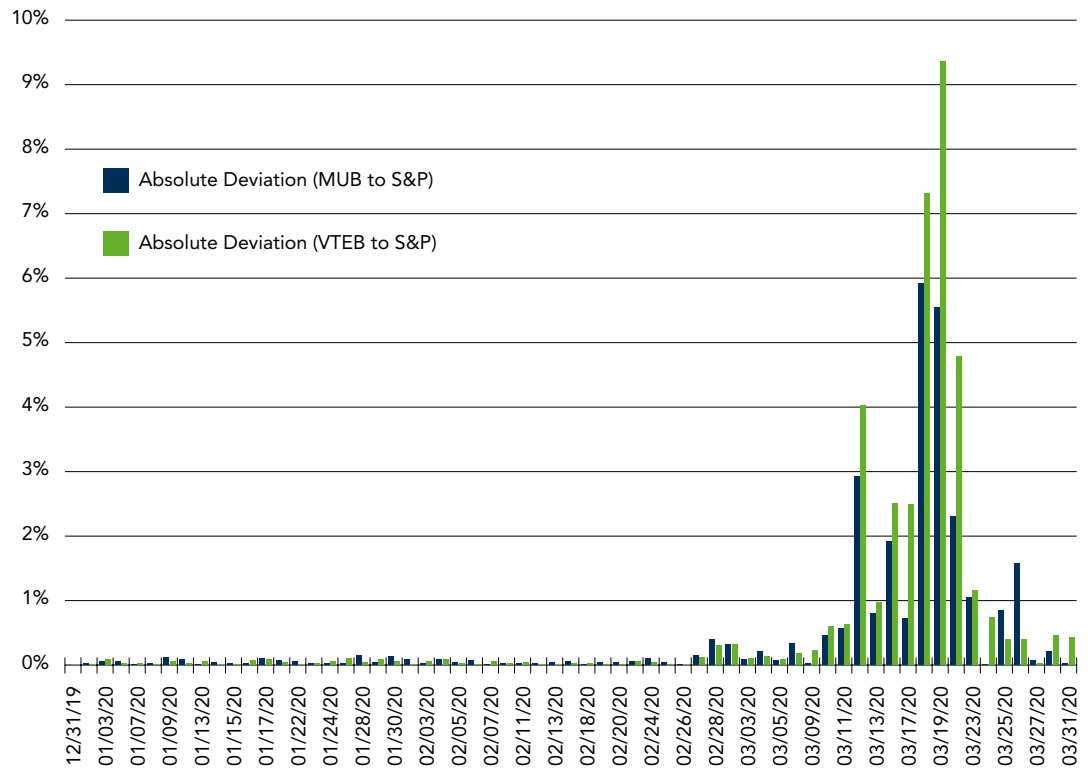
Source: MSRB analysis with data obtained from Bloomberg.

⁹ This is often referred to as “liquidity mismatch,” which would negatively affect the price-tracking ability of those fixed-income ETF products.

¹⁰ For this analysis, the starting values of all ETFs and indices were set to 100 at the end of 2019.

¹¹ ETFs over a long period of time would underperform the benchmark indices because of the fund management expenses and transaction costs. However, those factors should not impact the performance in a brief three-month period in this analysis.

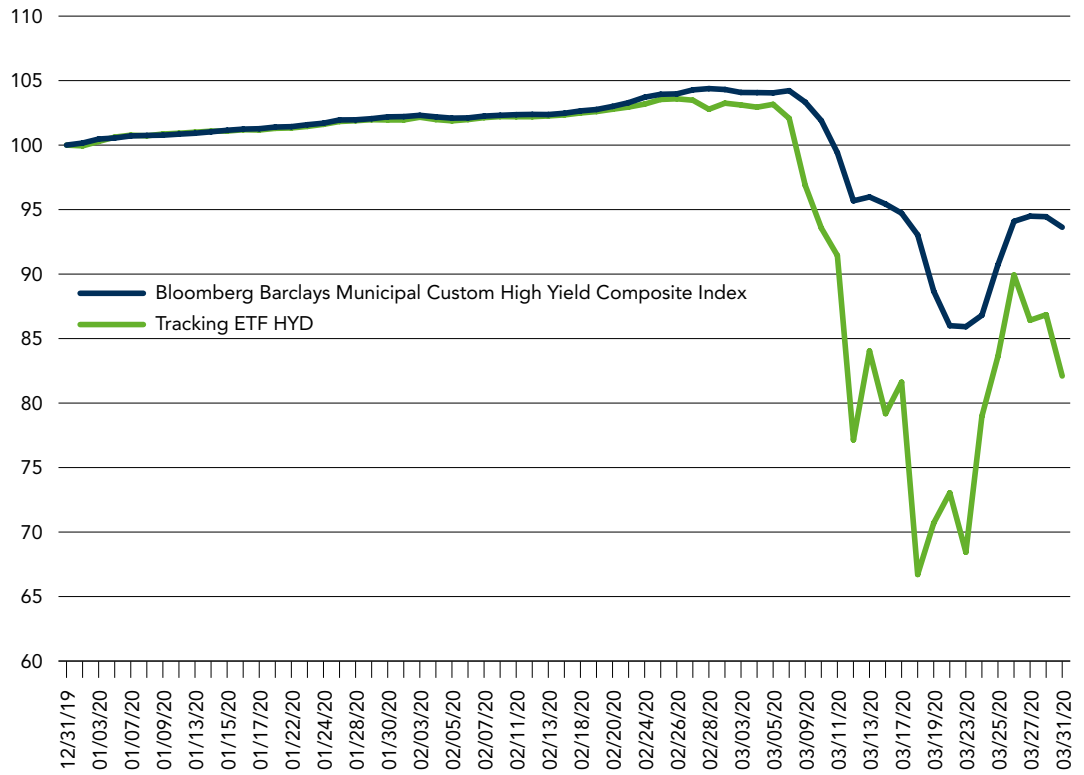
Chart 2. Absolute Percentage Deviation Between Tracking ETFs and S&P National AMT-Free Municipal Bond Index
(Starting Values on December 31, 2019 Set to 100)



Source: MSRB analysis with data obtained from Bloomberg.

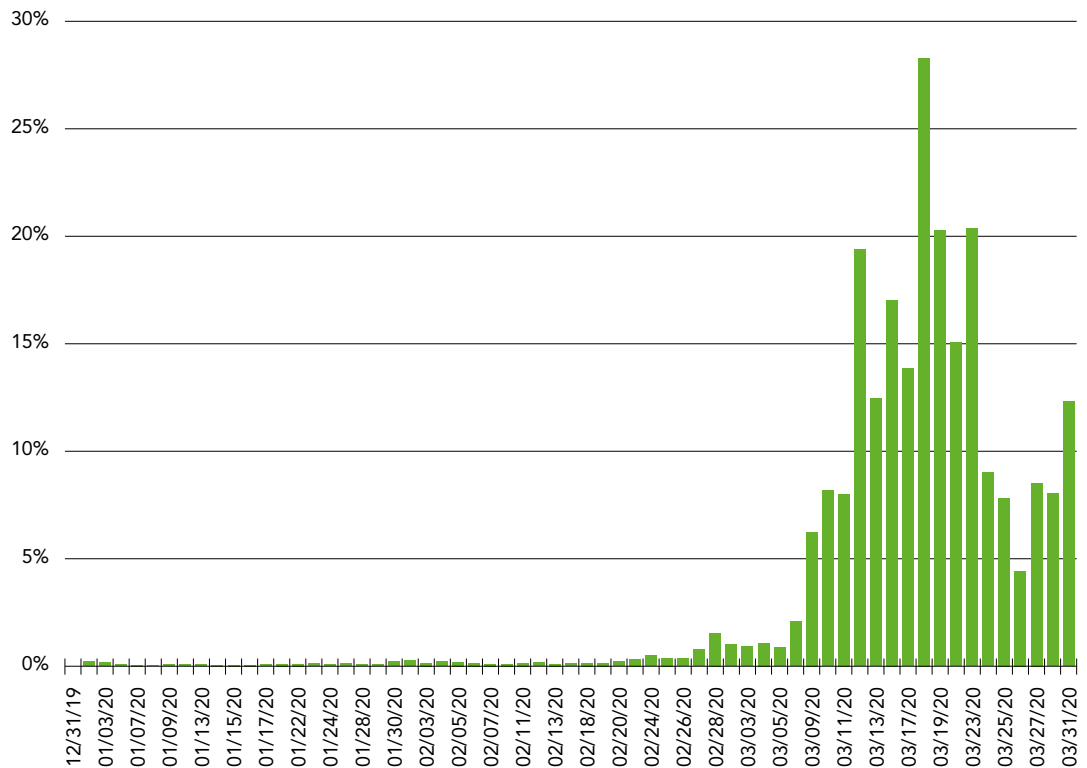
The price divergence was even more severe for HYD, the ETF replicating the Bloomberg Barclays Municipal Custom High Yield Composite Index. As Charts 3 and 4 show, the percentage deviation between HYD and its benchmark was negligible until late February 2020. However, in March HYD started to trade at a significant discount to its benchmark, and the gap grew precipitously over the next few weeks, peaking with a discount of 28.3% on March 18. Unlike the two ETFs tracking the S&P National AMT-Free Municipal Bond Index, HYD never entirely closed the gap with its benchmark index and was still trading at a significant discount at the end of March 2020.

Chart 3. ETF Tracking of Bloomberg Barclays Municipal Custom High Yield Composite Index
 (Starting Values on December 31, 2019 Set to 100)



Source: MSRB analysis with data obtained from Bloomberg.

Chart 4. Absolute Percentage Deviation Between Tracking ETF and Bloomberg Barclays Municipal Custom High Yield Composite Index (Starting Values on December 31, 2019 Set to 100)



Source: MSRB analysis with data obtained from Bloomberg.

The price divergence was potentially caused by a liquidity crunch that would have made executing the arbitraging activities to swiftly narrow the pricing gap challenging. Authorized participants would likely have been discouraged from, or less effective in, arbitraging if they had difficulties in selling the bonds they received for ETF share redemption. The liquidity crisis was apparently more severe for high-yield municipal bonds than for investment-grade municipal bonds, as evidenced by the disparity in the tracking errors of their representative ETFs. Even for the ETFs tracking the same investment-grade benchmark index, the S&P National AMT-Free Municipal Bond Index, performance was uneven, with one ETF performing better than the other. The announcement by the Federal Reserve Bank on March 20, 2020 that it would begin open market support for the municipal bond market, coupled with increased purchases of municipal bonds by market participants, likely prevented further deterioration and prompted a narrowing of the pricing gap at the end of March 2020.

To be clear, the large divergence of price movement was not unique to the municipal bond market, as the corporate bond market also experienced a similar magnitude of price deviation between its most frequently traded ETF, the iShares iBoxx USD Investment Grade Corporate Bond ETF (ticker symbol: LQD), and its benchmark, the iBoxx USD Investment Grade Corporate Bond Index. Table 1 compares the largest daily deviation during March 2020 between the most frequently traded municipal bond ETF and corporate bond ETF, and shows that the largest daily deviation was similar in magnitude, with both MUB and LQD trading at a discount of more than 5% to their respective benchmark index.

Table 1. Comparison of Deviation — Municipal Bond ETF (MUB) and Corporate Bond ETF (LQD)
(Starting Values on December 31, 2019 Set to 100)

	Municipal Bond ETF (MUB)	Corporate Bond ETF (LQD)
Largest Daily Deviation in March 2020	5.9%	5.3%

Source: MSRB analysis with data obtained from Bloomberg.

While there may be contending schools of thought on why fixed-income ETFs traded at large discounts during the volatile period, market illiquidity appears to have impacted the ETF tracking mechanism, leading to a significant price divergence between the fixed-income ETFs and the benchmark indices. Investors who sold those products during the two weeks in March 2020 were likely disadvantaged because the prices at which they were sold were lower than the NAV of the underlying securities. In particular, the degree of price divergence between ETFs and benchmark indices seems to be related to the liquidity of underlying bonds in the indices, where an illiquid portfolio such as the high-yield municipal bond portfolio exhibited a much larger divergence than the more liquid investment-grade municipal bond portfolio. Investors should consider the liquidity of underlying securities when buying and selling an ETF during a market stress period and understand where the ETF price is relative to its NAV.

The MSRB cautions that this analysis is preliminary and only reflects trading activities for a relatively short period of time during which there was unprecedented volatility in the municipal securities market. In addition, the behavior of fixed-income ETFs may differ during other market stress periods, and the MSRB intends to further explore how fixed-income ETFs track indices during these volatile periods.

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