August 2018

What are the major influences on Municipal Money Market Yields?

charles SCHWAB Investment Management

Key takeaways

- **While competitive yields are important**, the priorities for the Schwab Municipal Money Funds remain maintaining a stable net asset value (NAV) and sufficient liquidity no matter the interest rate environment
- **Municipal money market fund yields** may at times experience increased volatility
- **Changes in municipal money market fund yields** are primarily influenced by 7-day variable rate demand notes (VRDNs), but also by yields on longer term investments

Kenneth Salinger, CFA
Vice President,
Head of Tax Exempt Strategies

Kevin Shaughnessy, CFA
Senior Portfolio Manager

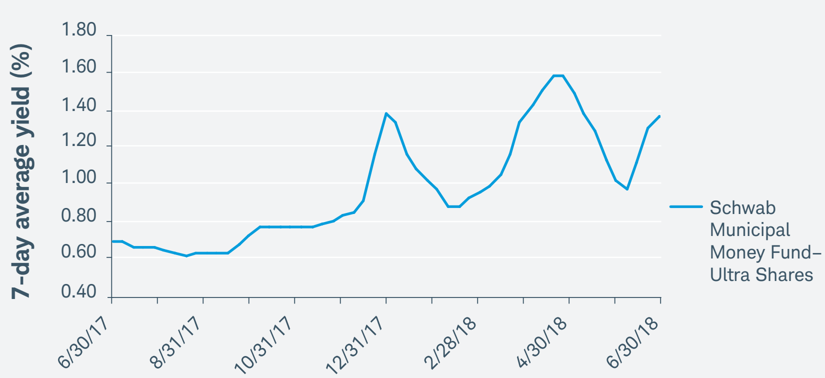
Cameron Ullyatt, CFA
Senior Portfolio Manager

Yields on municipal money market funds (MMMFs) may experience, at times, significant yield volatility. Consider the peaks and valleys illustrated by the net yield for the Schwab Municipal Money Fund™ – Ultra Shares in Exhibit 1 below.

Investors may be wondering: Why do yields on my MMMFs move significantly? To answer that question, let's take a deeper dive into the interplay between yields on the extreme ends of the MMMF yield curve to see how they influence MMMF yields.

Exhibit 1: Municipal yield peaks and valleys

Volatility occurred during the first half of 2018.



Source: Schwabfunds.com. Schwab Municipal Money Fund Seven-day average yield for the previous 12 months as of 6/30/18.

Performance shown represents the annualized fund yield, reflecting applicable waivers and based on the average income paid out over the 7 days ending 6/30/18, assuming interest income was not reinvested. These yields represent past performance, which cannot guarantee future results. Were waivers not reflected, the yields would have been lower. Current performance may be lower or higher than the performance quoted. For more current performance please visit www.schwabfunds.com.

The SIFMA Municipal Swap Index

Across the MMMF industry, the most prevalent investment option is the municipal variable rate demand note (Muni VRDN), which by virtue of its put feature and frequent rate reset, is designed to have a very short effective maturity—usually either 1-day or 7-days. Muni VRDNs, by design, offer price stability, a feature very attractive to MMMFs, the majority of which strive to maintain a stable NAV. Generally speaking, somewhere between 70% and 90% of all MMMF assets are invested in these securities.

Just like the value and movement of the S&P 500® Index is a representation of the U.S. broad equity market, the Securities Industry and Financial Markets Association (SIFMA) is a reflection of the yields available on 7-day Muni VRDNs. Given the widespread use of Muni VRDNs within the MMMF industry, understanding the SIFMA Index is vital to understanding how and why MMMF yields fluctuate.

It all comes down to supply and demand

In any market, supply and demand govern yield movements. For Muni VRDNs, supply and demand patterns come in both long cyclical shifts and in day-to-day varieties.

For example, on the supply side, the existing supply of Muni VRDNs declined steadily from approximately $178 billion at the end of 2015, to just $147 billion in March 2018.

Over the same period of time, demand for Muni VRDNs (as measured by MMMF assets under management) shifted significantly, dropping from $254 billion to just $133 billion*.

Demand for Muni VRDNs is not exclusive to MMMFs. Over the last several years, Muni VRDNs have been an attractive investment alternative for separately managed accounts (SMAs) that invest in municipal securities. Muni VRDNs are also attractive to some municipal bond mutual funds and ETFs, as they seek some level of protection against price volatility in municipal bonds with maturities of between 3 and 7 years.

*Source: Barclays

The SIFMA Index explained

The SIFMA Index is a market index designed to provide a single representative yield for high-grade 7-day Muni VRDNs. The SIFMA Index is computed and reported by Bloomberg under the direction of the SIFMA.

When is the SIFMA Index calculated?

For more than 25 years, the SIFMA Index has been published on Wednesday afternoons, at 3:30pm EST.

How is the SIFMA Index calculated?

The SIFMA Index is the average yield of Muni VRDNs across a wide range of municipal issuers and Wall Street dealers. To be included in the Index, a Muni VRDN must:

- Not be subject to AMT
- Have an outstanding balance of more than $10MM
- Be rated either VMIG1 by Moody's or A-1+ by Standard & Poor's
- Muni VDRNs with yields beyond 1 standard deviation are dropped

How many individual securities are Included in the SIFMA Index?

The market is dynamic and the quantity of securities meeting the above characteristics changes over time. Recently, the Index has generally included between 250 and 350 individual securities. When averaged together, these securities provide a representative yield for thousands of like securities, representing over $100 billion in outstanding par.

Where can I get more information?

Check out the SIFMA website:
www.sifma.org/resources/research/about-the-municipal-swap-index/

Seasonality

Just like shifts in supply and demand occurring over long cycles have an impact on MMMF yield trends over many years, day-to-day swings in supply and demand patterns can alter the yield environment very quickly. Some of these swings are predictable, while others are not.

Some MMMF yield spikes and valleys can be explained by "seasonality." For example, because a disproportionately high amount of municipal bonds are issued with July 1 interest payment dates and maturities, demand for short-term "holding place" investments like Muni VRDNs tends to rise sharply in early July (and also in early January, the opposite semi-annual interest payment date from July), as investors look to make productive use of their interest payments before re-deploying into longer-term investment options. This spike in demand disrupts the supply/demand balance, typically resulting in a drop in MMMF yields during these periods.

An opposite disruption often occurs in April. MMMFs are usually attractive to high-income earners, given their desire for tax-advantaged investment options. The combination of this unique investor base and the high liquidity of MMMFs, results in a disproportionately significant amount of individual income tax payments being drawn from MMMFs. This causes demand to drop sharply and MMMF yields to correspondingly rise. From time to time, MMMF yields ascend to a point where they become competitive with returns available in the taxable market. When this happens, taxable money market funds and other investors who usually have a taxable mandate cross over and bring a new source of demand to reestablish the supply/demand balance.

The below chart shows the SIFMA Index at the beginning and end of April (note the general increase) and the beginning and end of July (note the general decline):

	Apr-1	Apr-30	Jul-1	Jul-30
2018	1.60	1.75	1.51	0.94
2017	0.88	0.90	0.91	0.82
2016	0.39	0.41	0.41	0.44*
2015	0.02	0.11	0.05	0.02
2014	0.06	0.10	0.06	0.06
2013	0.11	0.22	0.06	0.05
2012	0.18	0.25	0.18	0.14

Source: Bloomberg.
*July 2016 was an exception as outflows resulting from Money Market Fund Reform influenced yields more than normal seasonal movements.

Changes to monetary policy

Changes in the federal funds rate, as dictated by the Federal Open Market Committee (FOMC), certainly provide direction to the SIFMA Index, but unlike the taxable money market space where investment yields and FOMC rate actions are undeniably correlated, FOMC policy in the MMMF world is viewed as a guide, not a certainty.

Exhibit 2 below plots 1-Week LIBOR with its clear "step-up" pattern matching each FOMC rate hike against the SIFMA Index. Note that the SIFMA Index has generally moved in a similar direction, but is also subject to the many complex and diverse forces described above.

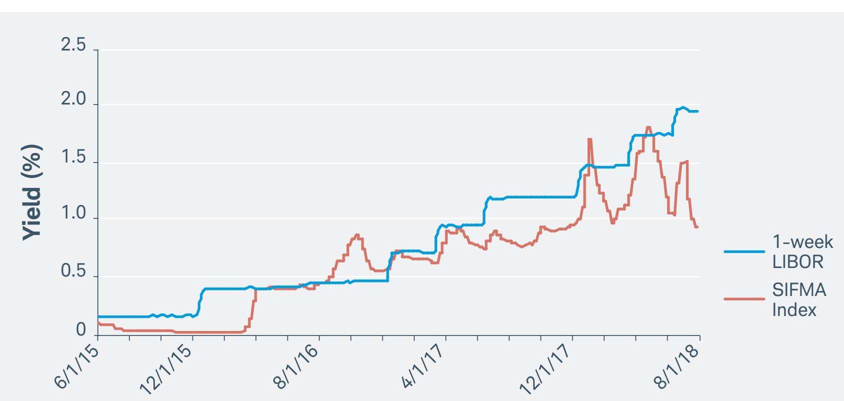


Exhibit 2: 1-Week LIBOR vs SIFMA Index

1-Week LIBOR with its clear "step-up" pattern matches each FOMC rate hike against the SIFMA Index.

Sources: Charles Schwab Investment Management; Bloomberg. 1-Week LIBOR (Bloomberg Ticker: US0001W Index) vs. SIFMA Index (Bloomberg Ticker: MUNIPSA Index).

Other variables can impact the SIFMA Index

While somewhat less common than seasonal shifts and changes in monetary policy, a variety of other factors can also influence yields on Muni VRDNs. These factors can be very difficult to predict. Changes to fiscal policy—principally tax rates—can have a significant effect on the demand for Muni VRDNs, resulting in yield changes. Shifting regulatory landscapes across a variety of sectors can also create supply/demand imbalances resulting in significant yield shifts. Because each situation is governed by different motivations and ramifications, it is difficult to offer a succinct "if this, then that" summary, connecting certain fiscal and regulatory adjustments with a resulting change in yields.

1-year notes

Many MMMFs utilize a "barbell" portfolio construction strategy, where the high concentration of Muni VRDNs maturing within one week at the front end of the yield curve are balanced by an allocation to longer-term holdings positioned in the 1-year space. This strategy is one way to reduce exposure to the SIFMA Index's volatility and can lead to higher overall MMMF yields when the yield curve is positively sloped. Since price risk increases as duration* rises, the allocation to these longer-term holdings is generally small and must be carefully managed. While yields on 1-year notes are certainly influenced by the current federal funds rate and to a degree by some of the same supply and demand dynamics discussed above, they are swayed by the future expectations of monetary policy, more so than by anything else. Although exceptions certainly exist, projections over future FOMC policy changes (looking ahead 6 to 12 months) evolve as new economic data is incrementally incorporated into the market's view of FOMC policy.

Exhibit 3 below contrasts the relatively slow migration of the 1-year rate relative to the sometimes manic pace of change in the SIFMA Index.

*A measure of a portfolio's interest-rate sensitivity—the longer a fund's duration, the more sensitive the portfolio is to shifts in interest rates. Duration is determined by a formula that includes coupon rates and bond maturities.

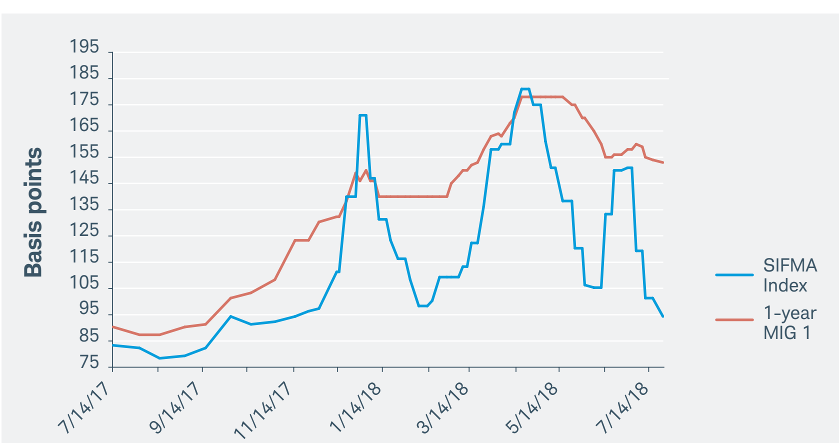


Exhibit 3: The two ends of the MMMF yield curve

1-year rate moves relatively slow compared to the SIFMA Index.

Bloomberg; The Municipal Market Monitor (TM3). SIFMA Index vs. 1-year MIG 1 which is the representative yield for 1-year national notes that are not state specific. 1 basis point equal 0.01%

Pulling it all together

While MMMFs invest the majority of their assets in Muni VRDNs, most also allocate a portion of assets to investments which are "further out on the curve"—whether to 1-year notes or to intermediate-term options between 1-week and 1-year. The mix of these investments is dynamic, as MMMF portfolio managers navigate different interest rate environments and variances in both short- and long-term supply and demand patterns. When FOMC rate hikes are likely, higher concentrations in Muni VRDNs may result in greater yield volatility for MMMFs. Likewise, when the FOMC is more inclined to reduce rates, a larger concentration in investments further out on the yield curve may lead to a tempering between the highs and the lows of MMMF yields.

While the mix between Muni VRDNs and longer-term investments changes over time, the Schwab Municipal Money Funds place priority on a stable NAV and sufficient liquidity to meet shareholder redemptions. Every asset allocation decision is made with these factors at the forefront.

Investors should consider carefully information contained in the prospectus, or, if available, the summary prospectus, including investment objectives, risks, charges, and expenses. You can request a prospectus by visiting schwabfunds.com/prospectus. Please read the prospectuses carefully before investing.

You could lose money by investing in a money market fund. Because the share price of the fund will fluctuate, when you sell your shares they may be worth more or less than what you originally paid for them. The fund may impose a fee upon the sale of your shares or may temporarily suspend your ability to sell shares if the fund's liquidity falls below required minimums because of market conditions or other factors. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time.

Income from municipal securities may be subject to the Alternative Minimum Tax (AMT), and capital appreciation from discounted bonds may be subject to state or local taxes. Capital gains are not exempt from federal income tax.

The opinions expressed are not intended to serve as investment advice, a recommendation, offer, or solicitation to buy or sell any securities, or recommendation regarding specific investment strategies. Information and data provided have been obtained from sources deemed reliable, but are not guaranteed. Charles Schwab Investment Management makes no representation about the accuracy of the information contained herein, or its appropriateness for any given situation.

Some of the statements in this document may be forward looking and contain certain risks and uncertainties.

Examples provided are for illustrative purposes only and not intended to be reflective of results you can expect to achieve.

The views expressed are those of the authors and are subject to change without notice based on economic, market, and other conditions. Past performance is no guarantee of future results.

Charles Schwab Investment Management, Inc. (CSIM), the investment advisor for Schwab Funds, and Charles Schwab & Co., Inc. (Schwab), Member SIPC, the distributor for Schwab Funds, are separate but affiliated companies and subsidiaries of The Charles Schwab Corporation.

charles SCHWAB Investment Management

For more insights, visit us at schwabfunds.com