

# Municipal Fixed Income

## QUARTERLY MARKET COMMENTARY

1Q | 2018

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## Variables are the spice of life

**Robert Collins, CFA**, Head of Municipal Fixed Income

**V**ariable rate demand notes (VRDNs) have provided some spice within the municipal market over the last 18 months. These notes (briefly defined in the highlighted box on the following page), may have long final maturities, but have tender features that provide either daily or weekly liquidity. While we have written some topical commentaries about VRDNs over that time span, these notes continue to deserve comment. VRDNs have certainly provided some seasoning to an otherwise bland realm of the municipal market.

For multiple reasons, both taxable and tax-exempt short-term fixed income vehicles have moved higher, sparking investor interest. Surely we miss a few, but dating back from mid-2016 through the first quarter of 2018, here are some factors influencing short-term rates: money market reform, Federal Reserve tightening, Federal Reserve balance sheet paring, repatriation of corporate profits abroad, and burgeoning T-bill issuance. In March, Wilmington Trust Investment Advisors (WTIA) authored a [blog post](#) on these factors and how they have been pushing LIBOR significantly higher, which directly impacts short-term taxable fixed income.

In this year's first quarter, our tax-exempt market felt the weight of these same influences, and rates offered on daily and weekly VRDNs continued to march higher. As a gauge of the periodic rate resets for VRDNs, we use the Securities Industry & Financial Markets Association's (SIFMA) Municipal Swap Index, which resets weekly. We can see in Figure 1 how this rate index has recently shifted higher. During much of 2017, it was relatively stable, fluctuating between 0.62% and 0.97%, until the end of November. There is often a seasonal impact around year end and this year was no exception. The rate briefly spiked to 1.71% on 12/27/17, only to begin falling back below 1.00% in early February. However, since that time, it has steadily risen, and as of the end of 1Q 2018, posted

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**TAX-EXEMPT VARIABLE RATE DEMAND NOTES (VRDNs):**

VRDNs are short-term securities issued by states, municipalities, or their agencies. While they normally have longer final maturities, the feature that creates the short-term liquidity is a tender option, usually daily or weekly, allowing the note holder to “put” the note back to the issuer for face value. Often, the tender option is secured by a third party—for example, a letter of credit from a national bank.

The interest rate resets in tandem with the tender, either daily or weekly. Interest is usually paid monthly.

VRDNs differ from auction-rate securities in the nature of the liquidity feature. Auction rates require a successful auction in the market to provide their liquidity, while VRDN liquidity is built into the security itself via the tender option and does not depend upon the market.

Although each VRDN sets its rates independently, investors can use the Securities Industry & Financial Market Association’s (SIFMA) Municipal Swap Index as a good gauge of current VRDN reset levels.

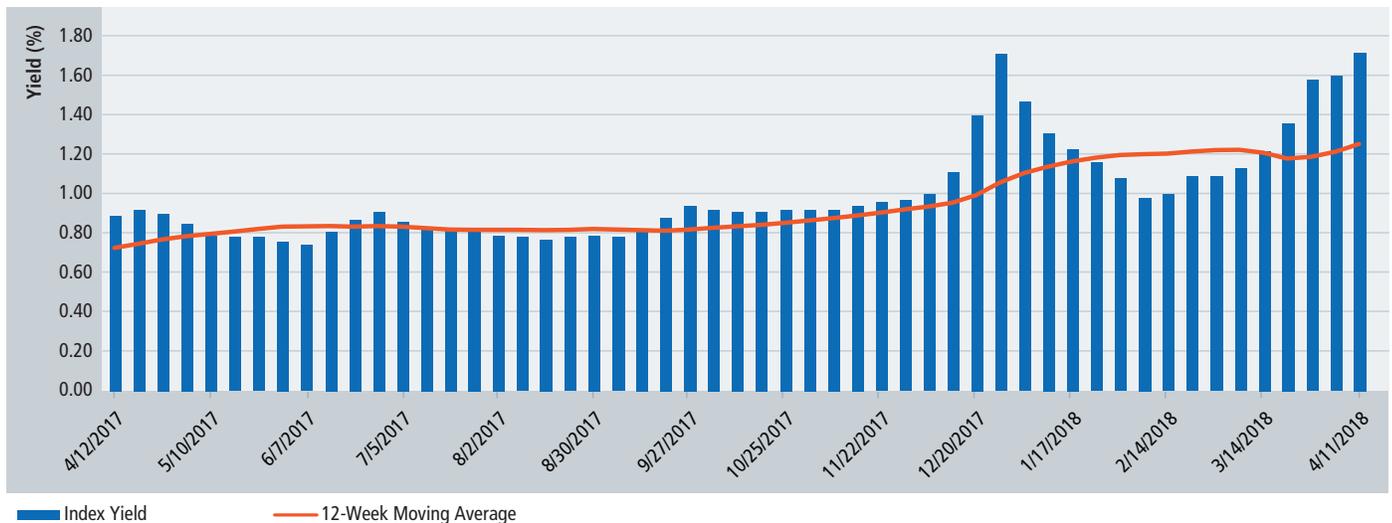
1.58%. Early in April it continued to move higher, and on April 11, that short rate broke through the December 27 high, posting a rate of 1.72%.

For investors in higher tax brackets that have specific liquidity requirements or whose risk tolerances for price

volatility are very low, VRDNs offer an alternative to money market funds, CDs, bank deposit rates, T-bills, or other short-term investment solutions. Making a direct comparison among these alternatives requires calculating the taxable equivalent for VRDNs. For example, assuming a 1.50% VRDN and a top tax rate of 37%, we can calculate this security’s taxable equivalent yield to be 2.38%. From a net return perspective only, an investor should be indifferent between a taxable short-term investment earning 2.38% and a tax-exempt VRDN paying 1.50%. A 37% tax on the 2.38% equates to 0.88%, and deducting that from the gross yield of the taxable security nets 1.50%.

Bottom line: the relatively rapid move upward in short-term rates is noteworthy. However, a decision to invest in short-term securities such as VRDNs requires a diligent analysis between investors and their advisors. This includes reviewing overall investment requirements and any and all constraints overlaying those requirements. An attractive rate alone is not a reason to invest. Rather, it is more important to understand how an investment in a particular market or an investment solution fits within the overall portfolio and whether it has the potential to achieve the ultimate goals of the investor.

**FIGURE I**  
**SIFMA Municipal Swap Index historical yield**



Sources: WTIA Municipal Fixed Income, SIFMA

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# 1Q muni market overview

*Stephen Winterstein, Head of Municipal Fixed Income Strategy*

## Yield curve

In 1Q 2018, the bellwether 10-year U.S. Treasury (UST) yield began the period drawing a 2.448% yield, and by late February, that same benchmark security hit its 1Q zenith of 2.951%. From that point forward, it declined rather

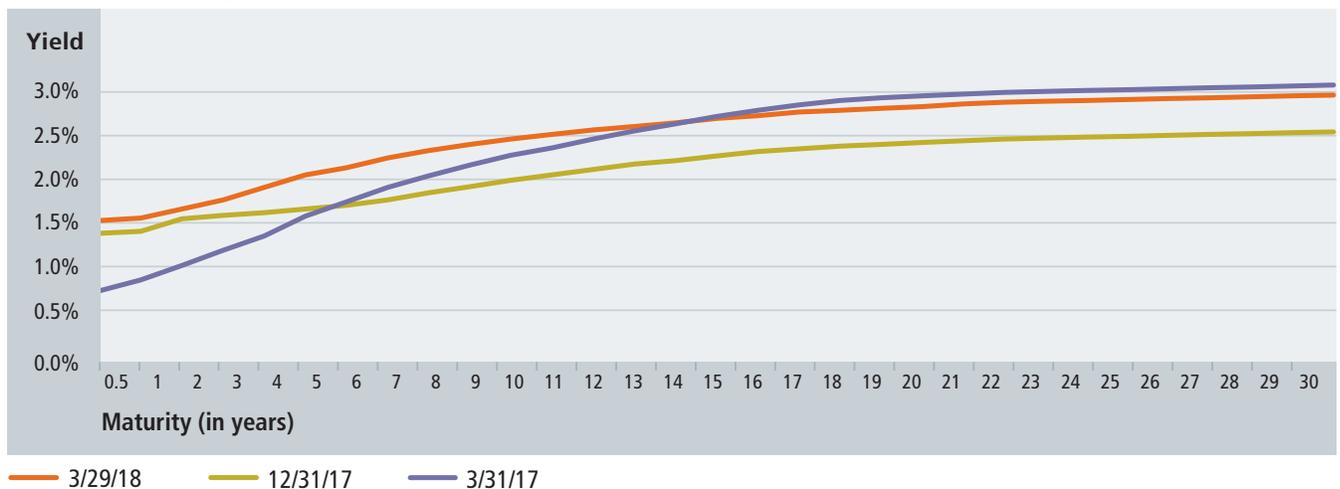
steadily to finish March at 2.740%. Meanwhile, the 2-year UST yield trended higher throughout the quarter, rising to 2.347% on March 20, up from 1.921% at the beginning of the year. Much of the softness at the front of the term structure was likely due, at least in part, to the much-anticipated Fed hikes of its short-term rate target. In fact, the Federal Open Market Committee raised the fed funds target range by 25 basis points, or bps (0.25%), at the March 21 scheduled meeting.

FIGURE 2  
ICE AAA municipal yield curve: recent trends (period ending March 29, 2018)

Maturity	Current	Previous quarter-end	Previous 1-year	Change for the period	
	3/29/18	12/29/17	3/31/17	Δ Quarter	Δ 1-year
6 months	1.53	1.39	0.75	+14	+78
1-year	1.56	1.41	0.87	+15	+69
2-year	1.66	1.55	1.03	+11	+63
3-year	1.76	1.59	1.20	+17	+56
4-year	1.90	1.62	1.36	+28	+54
5-year	2.04	1.66	1.58	+38	+46
7-year	2.23	1.76	1.90	+47	+33
8-year	2.31	1.84	2.03	+47	+28
10-year	2.44	1.98	2.26	+46	+18
15-year	2.67	2.25	2.69	+42	-2
30-year	2.93	2.52	3.04	+41	-11
1yr-30yr slope	1.37	1.11	2.17	+26	-80
2yr-10yr slope	0.78	0.43	1.23	+35	-45

Sources: WTIA Municipal Fixed Income, ICE Securities Evaluations, Investortools, Inc.

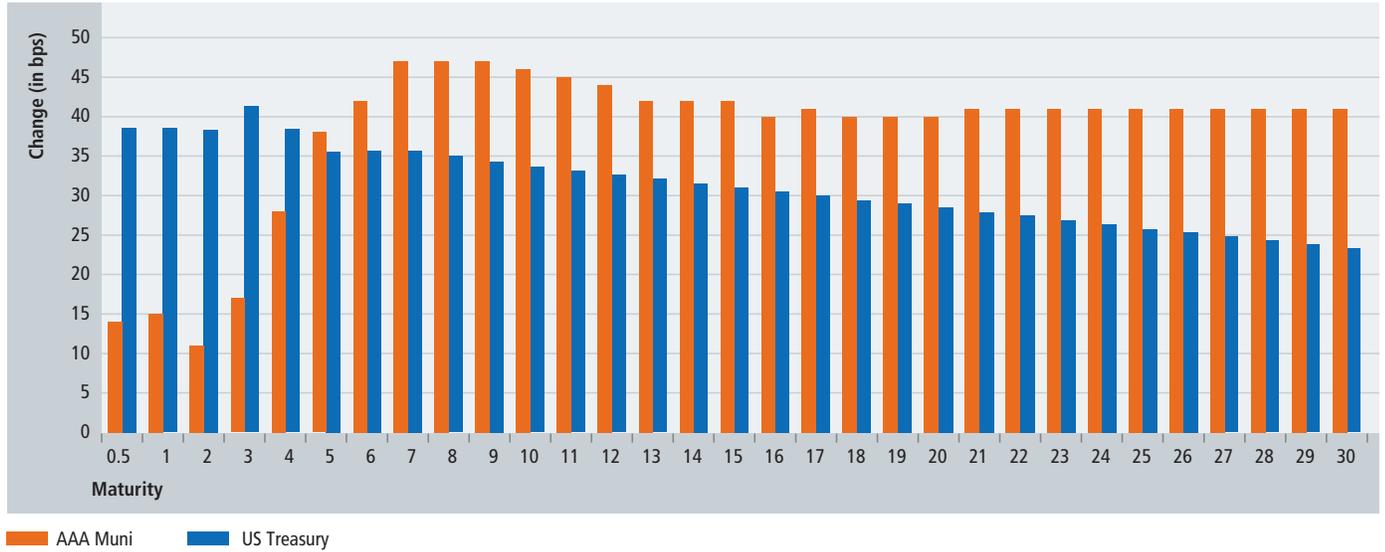
FIGURE 3  
ICE AAA municipal yield curve (year-over-year comparison)



Sources: WTIA Municipal Fixed Income, ICE Securities Evaluations, Investortools, Inc.

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**FIGURE 4**  
**Change in the ICE AAA municipal and U.S. Treasury yield curves (period ending March 29, 2018; in basis points)**



Sources: WTIA Municipal Fixed Income, ICE Securities Evaluations, Inc., Investortools, Inc.

High-grade municipal bond interest rates moved in sympathy with their corresponding USTs, as the ICE AAA Municipal Yield Curve moved higher by 14bps at the 6-month spot and by 15, 11, and 17bps at the 1-, 2-, and 3-year maturities, respectively (Figures 2 and 3). The 5-year leapt by 38bps, even as the 7- and 10-year spots increased by 47 and 46bps, in that order. The 15-year maturity added 42bps to its yield, and the 30-year finished March higher by a full 41bps, drawing a 2.930% yield.

As both the U.S. government securities and high-grade tax-exempt municipal yields moved upward, the degree to which each curve repositioned varied along the term structure. Figure 4 illustrates that UST interest rate moves were far more dramatic than those of municipals in shorter maturities inside of the 5-year point. For example, the most pronounced absolute difference in yield changes between USTs and municipals occurred at the 3-year spot, with the UST's rate outpacing the municipal's by over 41bps. Moving out the curve, the theme inverted, as high-grade municipal interest rates surpassed those of USTs. As a result of this relative behavior, tax-exempt bonds generally became less attractive vis-à-vis USTs at points along the curve inside of the 5-year spot, and conversely, became more attractive at the 5-year mark and

beyond. Specifically, the 6-month ICE AAA Municipal-to-U.S. Treasury (M/UST) ratio stood at 90.554% on December 29, 2017. With the change of interest rates over the past three months at that maturity, the M/UST quotient rose by 10.908 ratios, coming to rest at 79.646%. Conversely, the 7-year M/UST moved from 75.536% on December 29, to 82.992% at the end of March, a 7.456 ratio decline.

In the previous edition of this publication, we reiterated that cause-effect relationships are extraordinarily difficult to establish in financial markets. We wrote that it is reasonable to suppose that Federal Reserve policy could have been the catalyst for an upward shift in the short portion of the yield curve in 4Q 2017, and that thesis seemed to flow into the first months of 2018.

Nevertheless, we note the incongruity with which UST and municipal yields change across the term structure. Additionally, municipal bond supply and demand as well as deal and security structure are likely responsible for much of this difference.

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**FIGURE 5**  
**Total annual municipal supply** (period ending March 29, 2018)



Sources: WTIA Municipal Fixed Income, The Bond Buyer

### Supply and demand

In order to set the stage for 1Q 2018 municipal supply, it will serve us well to begin with a brief lookback. We remind you that with tax reform congealing by the end of November 2017, issuers and investment bankers were becoming more and more concerned that private activity bonds (PABs) and advance refundings were about to disappear. That is when the deluge of issuance began, and by the end of December, \$62.502 billion in new deals had come to market, an all-time record for monthly issuance (Figure 5). In fact, the second-highest month of volume was \$53.447 billion in October 2016. Moreover, by the final weeks of December, market participants were in a state of collective exhaustion and at \$436.35 billion of new issuance; ultimately, 2017 finished as the second-highest year on record, only 1.901% behind 2016.

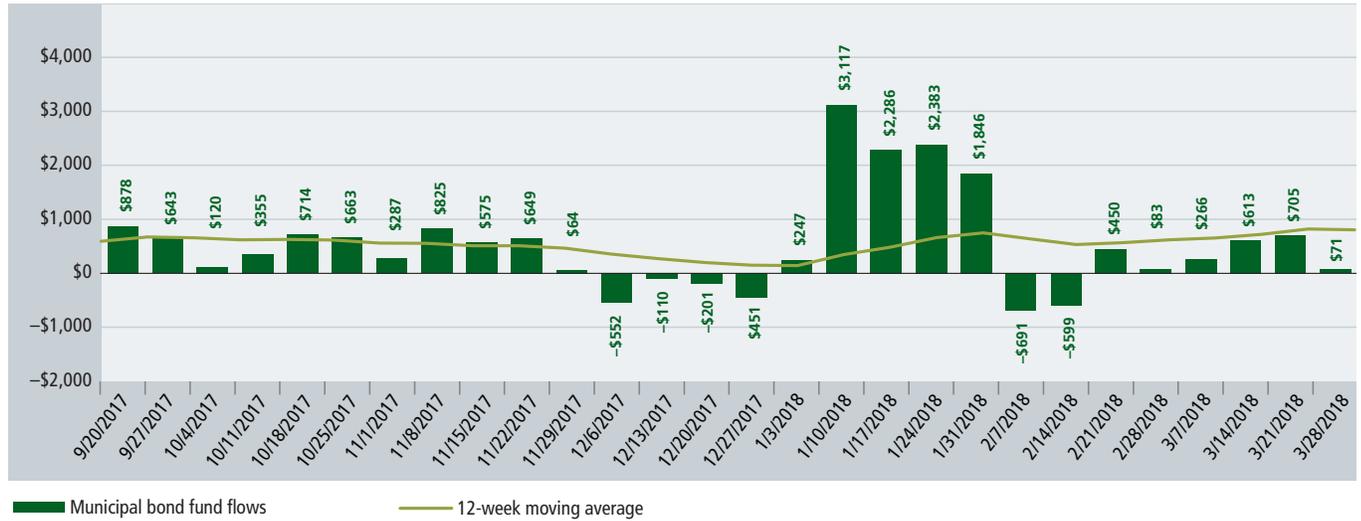
Worth mentioning is that while PABs narrowly escaped the executioner’s axe, advance refundings did not, which alone will have a negative effect on new issuance—advance refunding issuance accounted for roughly 10%–13% of supply in 2017. Nevertheless, year-end fatigue carried on uninterrupted into January, and by month end, the \$20.549 billion in supply stood at only 57% of the prior January’s

\$36.005 billion. While February 2018 lagged the same month in the prior year, the deficit narrowed such that 2018 year-to-date supply ended at 69% for the same period in 2017. By the close of 1Q 2018, new issuance stood at \$65.772 billion versus \$91.981 billion for the same period last year.

From the outset, our municipal supply estimate for all of 2018 was \$350 billion, a 20% decline from 2017, and we currently stand by that forecast. To be sure, however, we were quite concerned in the first weeks of January that the glacial pace at which deals were coming to market would leave our forecast entirely too sunny. We are encouraged that volume began to accelerate in February and March, and we are now approaching somewhat of a comfort zone with our estimate. Importantly, we believe the new issuance supply dearth has had a slightly positive contribution in an otherwise negative-performing market.

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**FIGURE 6**  
**Estimated weekly municipal bond mutual fund flows, trailing six months (\$ millions)**



Sources: WTIA Municipal Fixed Income, Investment Company Institute

Turning to demand, the Investment Company Institute (ICI) recorded \$10.777 billion of net flows into municipal bond funds for 1Q 2018 (Figure 6). We have repeatedly underscored on these pages that we believe the evidence suggests retail investors tend to react to recent market performance by adding or withdrawing capital from municipal bond funds, and thus far in 2018, the S&P Municipal Bond Index has served up a disappointing -0.923%. That same broad market benchmark delivered a +0.948% total return for December 2017, so the subsequent 1-month surge of inflows was not at all surprising. Nevertheless, from the beginning, the municipal market dealt two consecutive months of discouraging performance, and although March saw an upturn, consequent mutual fund flows turned negative, and then only slightly positive over the final eight weeks of the quarter.

**Market performance**

Like the closing months of 2017, the tax-exempt municipal market was mixed, but overall had a rough go of it during the first quarter, as yields generally moved higher across the entire term structure. With a 6.274-year effective duration, the S&P Municipal Bond Index suffered at the hand of the curve’s rise, as seen by its 1Q -0.923% performance. That same broad market benchmark printed a +2.530% trailing 1-year total return. In point of fact, with the largest moves occurring in the 7- to 15-year segment of the curve, the S&P Municipal Bond Intermediate Index fared the worst of all the indices on which we report (Figures 7 and 8).

The Short Intermediate Index has a term structure of 1 to 7.999 years, while the Short Index has a range of 6 months to 3.999 years. As a large spike in the yield curve occurred in the 3- to 8-year segment, the Short Intermediate Index’s performance landed in the red and delivered -0.332% for the quarter. On the other hand, the more muted upward shift at shorter maturities paved the way for the Short Index to deliver a +0.239% total return. Even so, both the Short Intermediate and Short Indices finished March with positive trailing 1-year performance of +0.687% and +0.522%, in that order.

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**FIGURE 7**
**Selected S&P municipal bond index totals and averages** (period ending March 29, 2018)

	Number of holdings	Market value (\$B)	Coupon	Yield-to-worst	Maturity	Maturity (in years)	Priced to date	Priced to date (yrs)	Effective duration
<b>S&amp;P Municipal Bond</b>	185,942	\$2,210.04	4.375	2.658	3/9/2030	11.980	4/2/2024	6.013	6.274
<b>S&amp;P Municipal Bond Investment Grade</b>	178,347	\$2,084.01	4.509	2.530	9/21/2029	11.510	1/12/2024	5.790	6.192
<b>S&amp;P Municipal Bond Intermediate</b>	107,513	\$1,060.19	4.520	2.520	8/13/2026	8.390	2/8/2024	5.864	5.654
<b>S&amp;P Municipal Bond Short Intermediate</b>	76,386	\$763.84	4.602	2.099	4/29/2022	4.090	12/18/2021	3.724	3.385
<b>S&amp;P Municipal Bond Short</b>	42,102	\$441.78	4.652	1.836	5/8/2020	2.110	4/30/2020	2.088	1.938
<b>S&amp;P Municipal Bond High Yield</b>	7,595	\$126.03	3.072	4.787	11/19/2037	19.690	12/5/2027	9.687	7.622
<b>S&amp;P Municipal Bond High Yield Ex-Puerto Rico</b>	7,383	\$115.10	3.606	4.664	12/12/2037	19.750	4/6/2027	9.020	7.118
<b>S&amp;P Municipal Bond California Index</b>	26,563	\$366.20	4.144	2.475	1/15/2031	12.830	3/10/2024	5.948	6.492
<b>S&amp;P Municipal Bond New York Index</b>	12,640	\$267.50	4.550	2.500	12/9/2030	12.720	11/26/2023	5.661	6.157
<b>S&amp;P Municipal Bond Puerto Rico Index</b>	288	\$13.73	1.301	5.576	7/1/2035	17.450	5/6/2033	15.103	11.445

Sources: WTIA Municipal Fixed Income, Investortools, Inc., S&P Dow Jones Indices LLC  
Index calculations by Investortools, Inc. Custom Index Manager

Interestingly, because of its extraordinarily low duration, the S&P Municipal Bond Short Index has never generated a negative trailing 1-year return. Actually, since the inception of the S&P Municipal Bond Indices in January 1999, the Short Index's worst trailing 12-month performance was +0.182%. Moreover, of the 226 rolling 6-month returns since inception, only 13 produced negative results, with the worst being -0.738%.

Finally, the California and New York indices closed the past three months with -1.017% and -1.057%, while Puerto Rico delivered a remarkable +9.093%. Even as California ended the year with a 1-year trailing return of +2.934%, the commonwealth's trailing 12-month -8.940 performance still reflects a portion of its 2017 thrashing of -18.435%.

### Core narrative

The municipal bond market began 2018 on firm footing despite the negative performance in recent months. Concerns about the long-range effects of the elimination of advance refundings continue to persist, and the complexion of option and coupon structures in new deals may continue to evolve—especially if we enter an accelerating interest rate cycle, when issuers could well find themselves without a viable refinancing tool.

The upward curve shift over 1Q 2018 highlights the importance of understanding the prospective performance of various strategies under a variety of interest rate scenarios and time horizons. We continue to advise investors to reevaluate their risk tolerance and return requirements to identify the interest rate risk exposure that best fits their own unique circumstances.

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FIGURE 8

**Selected S&P municipal bond index total returns** (period ending March 29, 2018)

	TOTAL RETURNS					VOLATILITY		
	3-month	YTD	1-year	3-year	5-year	5-year	Yield-to-worst	Effective duration
<b>S&amp;P Municipal Bond</b>	-0.923%	-0.923%	+2.530%	+2.335%	+2.764%	3.509%	2.658%	6.274
<b>S&amp;P Municipal Bond Investment Grade</b>	-1.055%	-1.055%	+2.464%	+2.196%	+2.642%	3.451%	2.530%	6.192
<b>S&amp;P Municipal Bond Intermediate</b>	-1.091%	-1.091%	+1.956%	+2.007%	+2.439%	3.339%	2.520%	5.654
<b>S&amp;P Municipal Bond Short Intermediate</b>	-0.332%	-0.332%	+0.687%	+1.140%	+1.412%	1.923%	2.099%	3.385
<b>S&amp;P Municipal Bond Short</b>	+0.239%	+0.239%	+0.522%	+0.794%	+0.852%	0.848%	1.836%	1.938
<b>S&amp;P Municipal Bond High Yield</b>	+1.293%	+1.293%	+3.877%	+4.373%	+4.389%	5.237%	4.787%	7.622
<b>S&amp;P Municipal Bond High Yield Ex-Puerto Rico</b>	+0.430%	+0.430%	+7.542%	+6.484%	+6.504%	4.801%	4.664%	7.118
<b>S&amp;P Municipal Bond California Index</b>	-1.017%	-1.017%	+2.934%	+2.550%	+3.302%	3.830%	2.475%	6.492
<b>S&amp;P Municipal Bond New York Index</b>	-1.057%	-1.057%	+2.274%	+2.296%	+2.766%	3.350%	2.500%	6.157
<b>S&amp;P Municipal Bond Puerto Rico Index</b>	+9.093%	+9.093%	-8.940%	-2.227%	-4.187%	11.590%	5.576%	11.445

Investing involves risks and you may incur a profit or a loss. Past performance is no guarantee of future results.

Sources: WTIA Municipal Fixed Income, Investortools, Inc., S&P Dow Jones Indices LLC  
Index calculations by Investortools, Inc. Custom Index Manager

## DISCLOSURES

**The S&P Municipal Bond Index** is a broad, market value-weighted index that seeks to measure the performance of the U.S. municipal bond market. It tracks fixed-rate bonds exempt from federal income tax, though they may be subject to the alternative minimum tax (AMT), with par outstanding of at least \$2 million. The index includes bonds of all quality ratings—from AAA to non-rated, including defaulted bonds—and from all sectors of the bond market. The S&P Municipal Bond Index constituents undergo a monthly review and rebalancing.

**The S&P Municipal Bond Investment Grade Index** consists of bonds in the S&P Municipal Bond Index that are rated at least BBB- by Standard & Poor's, Baa3 by Moody's, or BBB- by Fitch Ratings. For the avoidance of doubt, the lowest rating is used in determining if a bond is eligible for the Index. S&P Dow Jones Indices looks at the long term rating, either insured or uninsured, and the underlying rating for index inclusion. All bonds must also have a minimum maturity of

three years and a maximum maturity of up to, but not including, fifteen years, as measured from the rebalancing date.

**The S&P Municipal Bond Intermediate Index** consists of bonds in the S&P Municipal Bond Index with a minimum maturity of three years and a maximum maturity of up to, but not including, 15 years, as measured from the rebalancing date.

**The S&P Municipal Bond Short Intermediate Index** consists of bonds in the S&P Municipal Bond Index with a minimum maturity of one year and a maximum maturity of up to, but not including, eight years, as measured from the rebalancing date.

**The S&P Municipal Bond Short Index** consists of bonds in the S&P Municipal Bond Index with a minimum maturity of six months and a maximum maturity of up to, but not including, four years, as measured from the rebalancing date.

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FIGURE 9

**Annualized returns and volatility** (period ending March 29, 2018)

	ANNUALIZED RETURNS				ANNUALIZED STANDARD DEVIATION		
	1-year	3-year	5-year	10-year	3-year annualized standard deviation	5-year annualized standard deviation	10-year annualized standard deviation
S&P Municipal Bond	+2.530%	+2.335%	+2.764%	+4.421%	2.987%	3.509%	4.349%
S&P Municipal Bond Investment Grade	+2.464%	+2.196%	+2.642%	+4.327%	2.978%	3.451%	4.275%
S&P Municipal Bond Intermediate	+1.956%	+2.007%	+2.439%	+4.265%	3.173%	3.339%	3.873%
S&P Municipal Bond Short Intermediate	+0.687%	+1.140%	+1.412%	+2.872%	1.936%	1.923%	2.238%
S&P Municipal Bond Short	+0.522%	+0.794%	+0.852%	+1.819%	0.977%	0.848%	1.091%
S&P Municipal Bond High Yield	+3.877%	+4.373%	+4.389%	+5.886%	4.295%	5.237%	8.342%
S&P Municipal Bond High Yield Ex-Puerto Rico	+7.542%	+6.484%	+6.504%	N/A	3.848%	4.801%	N/A
S&P Municipal Bond California Index	+2.934%	+2.550%	+3.302%	+4.859%	3.321%	3.830%	4.891%
S&P Municipal Bond New York Index	+2.274%	+2.296%	+2.766%	+4.322%	2.949%	3.350%	4.077%
S&P Municipal Bond Puerto Rico Index	-8.940%	-2.227%	-4.187%	+0.378%	11.332%	11.590%	9.916%

Investing involves risks and you may incur a profit or a loss. Past performance is no guarantee of future results.

Sources: WTIA Municipal Fixed Income, S&amp;P Dow Jones Indices, LLC

**The S&P Municipal Bond High-Yield Index** consists of bonds in the S&P Municipal Bond Index that are not rated or whose ratings are less than or equal to BB+ by Standard & Poor's, Ba1 by Moody's, or BB+ by Fitch Ratings. Bonds that are prerefunded or escrowed to maturity are not included in this index. The lowest long-term underlying rating, either insured or uninsured, is used in determining if a bond is eligible for the Index.

**The state level municipal bond sub-indices** consists of bonds in the S&P Municipal Bond Index that have been issued by municipalities or municipal authorities within the respective states, the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands. States and municipalities may have issues across the duration and quality spectrums or may be more concentrated to certain sub-indices, such as in the S&P Investment Grade or High Yield bond indices.

**The S&P Municipal Bond Puerto Rico Index** consists of bonds in the S&P Municipal Bond Index issued by the Commonwealth of Puerto Rico, and municipalities and municipal authorities within the Commonwealth. Individually these entities may have issues across the duration and quality spectra; however, as a general matter they have been increasingly concentrated in the S&P High Yield Bond Index.

**The Securities Industry and Financial Markets Association Municipal (SIFMA) Swap Index** is designed to reflect activity in high-grade, weekly-reset Variable Rate Demand Notes (VRDN). It represents the average reset rate of qualifying VRDNs, subject to exclusions to ensure diversity of market participants and exclusion of outlier events that may skew an equal weighted index. In order for an issue to qualify for inclusion in the index a VRDN must have an outstanding amount over \$10 million, reset weekly, pay interest monthly, have the highest short-term rating from S&P or Moody's, and may not be subject to the Alternative Minimum Tax. Beginning 2014, VRDNs also must be reported to the Municipal Securities

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*Rulemaking Board. The Index excludes reset rates falling outside +/- 1 standard deviation (i.e., ignores the top 16.7% and bottom 16.7%) of reported rates and can include only one quote per issuer through a given remarketing agent, and each agent is limited to no more than 15% of the number of securities in the index. Designed and overseen by SIFMA, the Index is calculated and published by Bloomberg.*

*Indices are not available for direct investment. Investment in a security or strategy designed to replicate the performance of an index will incur expenses, such as management fees and transaction costs, which would reduce returns.*

**Slope analysis:** *The slope of the yield curve measures the rate gap between two points in the yield curve representing shorter- and longer-term yields. A low slope indicates a flat yield curve, where shorter- and longer-term rates are close to each other. The slope increases as the yield curve steepens, due to rising long rates and/or falling short rates, reflecting the higher gap between the yields of shorter and longer maturity bonds. In our slope analysis, we plot the trailing 40-day moving average of the slopes of the short v. long bond (1–30 year) and the intermediate range (2–10 year). We also plot +/- 2 standard deviation of the 40 trailing daily slopes—the trio are commonly referred to as Bollinger bands—to offer context to the moving average in light of the overall volatility of changes in the slope. Together, this is intended to indicate current steepness of the yield curve relative to recent trends.*

**Horizon & scenario analysis** *is intended to provide a sense of possible return outcomes, using indices with distinct durations, assuming given changes in yield over a given period. This exercise applies parallel shifts in the yield curve to the interest rate sensitivity of bonds of various maturities, reflected by their average effective duration, to project price impacts and assess the effect of interest rate changes on total return expectations. Effective duration is an estimate of the price change in a security given a change in market yield. For example, a bond with a duration of four years implies that for a 0.25% (25bps) increase in market yield, the value of the bond would be expected to change -1% — and similarly for the reverse. The effective duration is thus applied in the projection to the various maturity points along the yield curve. While the yield curve can shift in a broad variety of ways (e.g., steepening), we limit our movements to parallel shifts. That is, each maturity on the curve is shifted by the same amount. Expected impacts to total return are provided, as well as three components: price return, yield return, and roll return. Price change is most directly impacted by the yield shift. Meanwhile, yield return gradually reflects the effect of higher or lower market rates as proceeds are reinvested. The roll component reflects bonds' changing outstanding maturities, and corresponding shift down the yield curve (i.e., toward maturity), and is presumed to remain constant across scenarios—contributing if the yield curve is upward sloping (i.e., “normal”) and detracting if the*

*curve is downward sloping. This material is intended to illustrate potential total return effects across a range of yield environments and investment horizons and, further, to demonstrate the risks of investing in various ranges along the yield curve, commonly represented by the effective duration measure.*

*Municipal bonds typically provide a lower yield than comparable taxable bonds in consideration of the tax-advantaged status of the interest payments from these bonds, which are exempt from federal taxes and may be exempt from applicable state and/or local taxes in the states and/or municipalities where they were issued. Capital gains do not share this tax advantaged status. Investments in municipal securities may not be appropriate for all investors, particularly those who do not stand to benefit from the tax status of the investment. The Alternative Minimum Tax may negate some or all of the tax benefits available through municipal securities.*

**Quality ratings** *are used to evaluate the likelihood of default by a bond issuer. Independent rating agencies, such as Standard & Poor's and Moody's Investors Service, analyze the financial strength of each bond's issuer. Moody's ratings range from Aaa (highest quality) to C (lowest quality). Bonds rated Baa3 and better are considered “Investment Grade.” Bonds rated Ba1 and below are “Below Investment Grade” (also “High Yield” or “Speculative”). Similarly, Standard & Poor's ratings range from AAA to D. Bonds rated BBB- and better are considered “Investment Grade” and bonds rated BB+ and below are “Below Investment Grade.”*

**All investments carry some degree of risk.** *This report uses return volatility, as measured by standard deviation, as a proxy for risk. Volatility serves as a collective, quantitative estimate of risks present to varying degrees in the respective asset classes (e.g., liquidity, credit and default risks). Certain types of risk may be underrepresented by this measure. Investors should develop a thorough understanding of the risks of any investment prior to committing funds.*

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