WILMINGTON TRUST

Quarterly Market Commentary

Municipal Fixed Income

4Q | 2018

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Reversal of Misfortune

"There are good and bad times, but our mood changes more often than our fortune." —Thomas Carlyle

The past year was one of shifting sentiment oscillating between risk on and risk off, and it was decidedly so for domestic fixed income markets. In order to put the most recent quarter into perspective, we think it may be instructive to add historical context. Throughout the first nine months of 2018, robust global growth and concerns over consequent accelerating inflation—and the belief that the Fed would continue to insistently raise its short-term rate target—drove benchmark interest rates and index yields higher as bond market returns suffered.

The S&P Municipal Bond Index ended 2017 drawing a 2.353% yield, and by April 2018 it was sporting 2.798%, a 45 basis point, or bps (0.45%) upswing. In fact, that broad market index delivered negative returns in three of the first four months of the year. While May and June produced consecutive performances of +1.132 and +0.126%, it was insufficient to bring the index's year-to-date total return to dry land. With the close of the first half of 2018, the S&P Municipal Bond Index's trailing 6-month performance stood at –0.021%.

The second half of the year appeared to be well on its way in an apparent follow-through from the first six months, with the index's yield reaching 3.023% by October's close. Then, in the final months of 2018, markets did an about-face. Talk of slowing global growth, along with quickening trade tensions between the U.S. and China, sent interest rates tumbling in a relatively short period of time. On November

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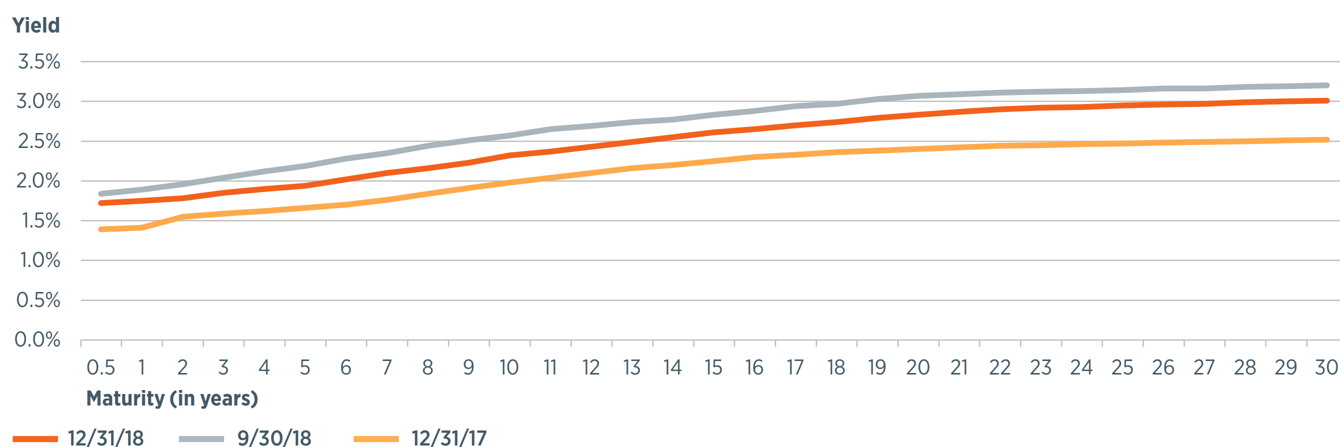
Figure 1
ICE AAA Municipal Yield Curve: Recent trends (period ending December 31, 2018)

Maturity	Current	Previous quarter end	Previous 1 year	Change for the period	
	12/31/18	9/30/18	12/31/17	Δ Quarter	Δ 1 year
6 months	1.720	1.840	1.390	−12	+33
1 year	1.750	1.890	1.410	−14	+34
2 year	1.780	1.960	1.550	−18	+23
3 year	1.850	2.040	1.590	−19	+26
4 year	1.900	2.120	1.620	−22	+28
5 year	1.940	2.190	1.660	−25	+28
7 year	2.100	2.350	1.760	−25	+34
8 year	2.160	2.440	1.840	−28	+32
10 year	2.320	2.570	1.980	−25	+34
15 year	2.610	2.830	2.250	−22	+36
30 year	3.010	3.200	2.520	−19	+49
1yr–30yr slope	1.260	1.310	1.110	−5	+15
2yr–10yr slope	0.540	0.610	0.430	−7	+11
6mo–4yr slope	0.180	0.280	0.230	−10	−5
1yr–8yr slope	0.410	0.550	0.430	−14	−2
3yr–15yr slope	0.760	0.790	0.660	−3	+10

Sources: Wilmington Trust Investment Advisors, ICE Securities Evaluations, Inc., Investortools, Inc. Please see the Disclosures for a description of Slope Analysis.

Figure 2
ICE AAA Municipal Yield Curve (year-over-year comparison)



Sources: Wilmington Trust Investment Advisors, ICE Securities Evaluations, Inc., Investortools, Inc.

8, the benchmark 10-year US Treasury's interest rate hit 3.237%, a level not seen since May 2011. But by December's close, that same security stood at 2.684%, a 55bps drop. With tax-exempt municipal bond yields moving in similar fashion, November and December were strong enough to place performance for the municipal bond market firmly in positive territory for the entire year.

Wilmington Trust chief economist Luke Tilley suggests trade will remain a wild card and for rising inflation to level off and GDP growth to slow but remain solid in 2019. He believes the Fed will likely tighten two times this year, with the first hike to occur at the June 19 meeting. While the future path of interest rates is uncertain, we believe municipal market fundamentals are healthy. Still, concerns about underfunded

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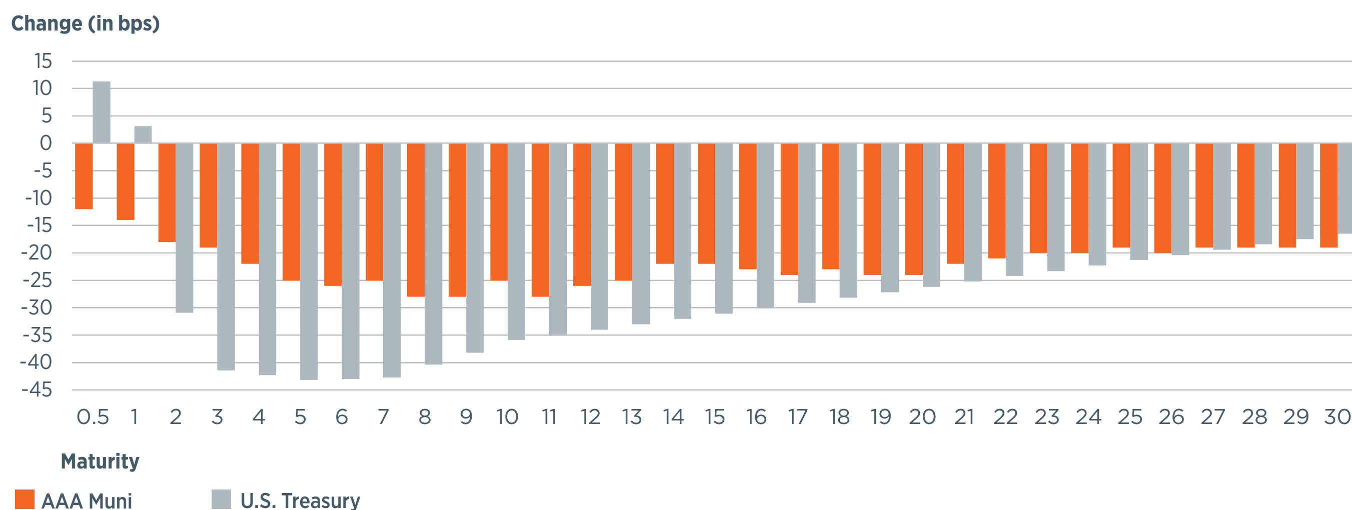
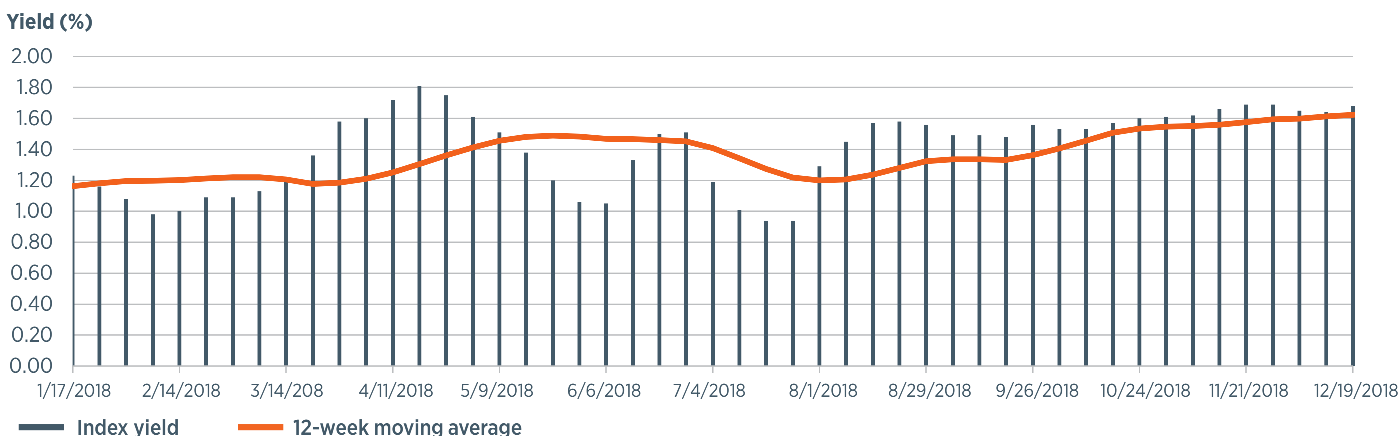
Figure 3
Change in the ICE AAA Municipal and U.S. Treasury yield curves (period ending December 31, 2018; in basis points)



Sources: Wilmington Trust Investment Advisors, ICE Securities Evaluations, Inc., Investortools, Inc.

Figure 4
SIFMA Municipal Swap Index historical yield



Source: Wilmington Trust Investment Advisors, SIFMA. 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. Past performance cannot guarantee future results.

pension liabilities and state and local governments' other post-employment benefits obligations remain squarely on our radar.

Against this backdrop, Wilmington Trust believes the Fed is likely to continue to tighten monetary policy, but at a slower pace and we recommend a slight tactical underweight to investment-grade fixed income assets.

Yield curve

A risk-off tone overpowered domestic capital markets, as the S&P 500 ended 4Q2018 with a –13.524% 3-month return. Consistent with the sell-off in equities, municipal fixed income saw strong sponsorship across the term structure. The ICE AAA Municipal Yield Curve fell by 12bps at the 6-month spot and by 14 and 18bps at the 1- and 2-year maturities (Figures 1 & 2). The intermediate segment of the yield curve fell by as much as 28bps at the 8-year maturity, the largest drop of any point. While high-grade municipal made a terrific showing over the past three months, UST interest rates outpaced tax-exempt yield to the downside, as illustrated in Figure 3.

Continued

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Figure 5
Key short-term benchmark interest rates (in %)

	Most recent	Previous quarter	Change for the period (in basis points)
	12/26/2018	**9/26/2018**	**Δ 1 Quarter**
SIFMA Municipal Swap Index (federally tax exempt)	1.710%	1.560%	+15
Federally taxable benchmark interest rates & yields			
Overnight LIBOR Fix	2.390%	1.925%	+46
Secured Overnight Financing Rate (SOFR)	2.440%	1.920%	+52
U.S. federal funds effective rate	2.400%	1.930%	+47
1-Week LIBOR Fix	2.419%	2.163%	+26
15-Day commercial paper	2.480%	2.160%	+32
30-Day LIBOR Fix	2.506%	2.242%	+26
30-Day UST bill (bid YTM)	2.422%	2.149%	+27
30-Day commercial paper	2.540%	2.230%	+31

Sources: Wilmington Trust Investment Advisors, SIFMA, Bloomberg L.P. New York Federal Reserve Bank, Intercontinental Exchange, Inc.

Figure 6
SIFMA Municipal Swap Index as a % of key short-term federally taxable benchmark interest rates and yields

	Most recent	Previous quarter	Change for the period (in basis points)
	12/26/2018	**9/26/2018**	**Δ 1 Quarter**
Overnight LIBOR Fix	71.552%	81.028%	–9.477%
Secured Overnight Financing Rate (SOFR)	70.082%	81.250%	–11.168%
U.S. federal funds effective rate	71.250%	80.829%	–9.579%
1-Week LIBOR Fix	70.701%	72.134%	–1.433%
15-Day commercial paper	68.952%	72.222%	–3.271%
30-Day LIBOR Fix	68.246%	69.575%	–1.329%
30-Day UST bill (bid YTM)	70.603%	72.592%	–1.989%
30-Day commercial paper	67.323%	69.955%	–2.632%

Sources: Wilmington Trust Investment Advisors, SIFMA, Bloomberg L.P. New York Federal Reserve Bank, Intercontinental Exchange, Inc.

In particularly volatile periods, U.S. Treasury rates tend to respond more quickly to changing tides, while tax-exempt municipal yields typically take longer to react, usually with less amplitude, and 4Q2018 was no exception. The past 90 days are merely a testimony to the surprising directional changes and movements of interest rates. We counsel investors that the next three months may deliver similar shocks.

The Securities Industry and Financial Markets Association (SIFMA) Municipal Swap Index interest rate closed 2018 at 1.710%, its highest level since April 25 (Figure 4). That tax-exempt index currently stands at 70.082% of the Secured Overnight Financing Rate (SOFR) and 68.246% of the 30-day LIBOR Fix (Figures 5 & 6). Short-term crossover investors will note that 30-day LIBOR Fix edged up by about 26bps higher the last three months. The ratio of SIFMA as a percentage of that benchmark rate moved lower by 1.329 ratios (Figure 6). The largest decline was the SIFMA-to-Overnight LIBOR Fixed ratio, which fell by a full 11.168 ratios.

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Figure 7
Selected S&P Municipal Bond Index totals and averages (as of December 31, 2018)

	Number of holdings	Market value ($B)	Coupon	Yield to worst	Maturity	Maturity (in years)	Priced to date	Priced to date (yrs)	Effective duration
Municipal Bond	191,821	$2,263.59	4.355	2.725	2/5/2031	12.130	2/1/2025	6.088	6.163
S&P Municipal Bond Investment Grade (IG)	183,784	$2,132.73	4.487	2.598	8/24/2030	11.680	10/15/2024	5.789	6.036
S&P Municipal Bond Intermediate	110,013	$1,081.52	4.517	2.500	6/22/2027	8.480	9/7/2024	5.687	5.351
S&P Municipal Bond IG Intermediate	106,362	$1,037.32	4.508	2.442	6/24/2027	8.490	9/7/2024	5.687	5.379
S&P Municipal Bond Short Intermediate	77,856	$762.16	4.564	2.120	3/4/2023	4.180	9/16/2022	3.711	3.366
S&P Municipal Bond IG Short Intermediate	74,723	$723.30	4.541	2.081	3/17/2023	4.220	9/29/2022	3.746	3.406
S&P Municipal Bond Short	45,203	$455.11	4.594	1.933	1/22/2021	2.060	1/5/2021	2.015	1.884
S&P Municipal Bond IG Short	42,922	$423.64	4.548	1.899	1/23/2021	2.070	1/6/2021	2.018	1.889
S&P Municipal Bond High Yield	8,037	$130.87	3.086	4.805	6/6/2038	19.520	12/31/2029	11.000	8.240
S&P Municipal Bond High Yield Ex-Puerto Rico	7,832	$118.74	3.603	4.808	6/24/2038	19.590	7/27/2029	10.570	7.832
S&P Municipal Bond California Index	27,137	$367.48	4.143	2.545	2/14/2032	13.160	2/5/2025	6.098	6.398
S&P Municipal Bond New York Index	12,846	$276.13	4.508	2.591	7/18/2031	12.560	9/13/2024	5.703	5.933
S&P Municipal Bond Puerto Rico Index	267	$14.75	1.271	4.451	7/30/2036	17.450	10/25/2032	13.818	11.000

Sources: Wilmington Trust Investment Advisors, Investortools, Inc., S&P Dow Jones Indices LLC, ICE Securities Evaluations, Inc.
Index calculations by Investortools, Inc. Custom Index Manager.

Looking beyond the 6-month point, last quarter's strength flattened the slope of the ICE AAA Municipal Yield Curve by 5bps, top to bottom. As of Friday's close, the difference between the 1- and 30-year yields stood at 126bps, down from 131bps on September 30 (Figure 1). The ICE AAA Municipal Yield Curve steepened 15bps in 2018.

Market performance

With over 190,000 individual securities and a value of over $2.2 trillion, the S&P Municipal Bond Index is one of the broadest municipal market benchmarks (Figure 7). In point of fact, it represents approximately 59% of the entire $3.8 trillion municipal bond market. With the November and December one-two punch, the S&P Municipal Bond Index served up a powerful +1.520% trailing 3-month total return, bringing the calendar year to a close with performance of +1.356% (Figure 8). The most remarkable aspect of this quick turnaround was that October's -0.656% performance put the index's –0.817% year-to-date performance on a glide path to be the first calendar year with a negative return since 2013, when the S&P Municipal Bond Index produced –2.550%. The reversal was quick, sharp, and welcomed.

Looking at Figure 8, you can see the S&P Municipal Bond Intermediate Index produced a +1.846% return, while the Short Intermediate and Short indices printed +1.395% and +0.917%, respectively. The High Yield Index ended the quarter just under water with a –0.198% return, while making a +5.140% showing for the year. Puerto Rico bonds were clearly a drag on the High Yield Index's 3-month performance, as the High Yield Ex-Puerto Rico Index landed marginally in the black at +0.017%. Finally, while the Puerto Rico Index made a dismal display for 4Q2018, producing –2.024%, that same benchmark turned in a +23.698% total return for the year.

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Figure 8

Selected S&P Municipal Bond Index total returns (period ending December 31, 2018)

	TOTAL RETURNS					ANNUALIZED STANDARD DEVIATION	
	3 month	YTD	1 year	3 year	5 year	3 year	5 year
Municipal Bond	+1.520%	+1.356%	+1.356%	+2.342%	+3.887%	+3.117%	+2.904%
S&P Municipal Bond Investment Grade	+1.631%	+1.125%	+1.125%	+2.151%	+3.704%	+3.121%	+2.885%
S&P Municipal Bond Intermediate	+1.846%	+1.546%	+1.546%	+2.133%	+3.313%	+3.308%	+2.957%
S&P Municipal Bond IG Intermediate	+1.885%	+1.394%	+1.394%	+2.023%	+3.221%	+3.362%	+2.998%
S&P Municipal Bond Short Intermediate	+1.395%	+1.777%	+1.777%	+1.402%	+1.837%	+2.061%	+1.832%
S&P Municipal Bond IG Short Intermediate	+1.420%	+1.685%	+1.685%	+1.348%	+1.790%	+2.090%	+1.858%
S&P Municipal Bond Short	+0.917%	+1.778%	+1.778%	+1.101%	+1.041%	+1.070%	+0.897%
S&P Municipal Bond IG Short	+0.918%	+1.717%	+1.717%	+1.064%	+0.999%	+1.076%	+0.904%
S&P Municipal Bond High Yield	-0.198%	+5.226%	+5.226%	+5.140%	+6.496%	+3.818%	+4.170%
S&P Municipal Bond High Yield Ex-Puerto Rico	+0.017%	+3.258%	+3.258%	+5.820%	+8.178%	+3.985%	+3.708%
S&P Municipal Bond California Index	+1.337%	+1.077%	+1.077%	+2.324%	+4.275%	+3.460%	+3.219%
S&P Municipal Bond New York Index	+1.486%	+0.918%	+0.918%	+2.090%	+3.691%	+3.086%	+2.820%
S&P Municipal Bond Puerto Rico Index	–2.024%	+23.698%	+23.698%	+4.079%	+2.916%	+10.076%	+10.442%

Investing involves risks and you may incur a profit or a loss. Past performance cannot guarantee future results.
Sources: WTIA Municipal Fixed Income, Investortools, Inc., S&P Dow Jones Indices LLC Index calculations by Investortools, Inc. Custom Index Manager.

Supply and demand

We have written about our 2018 supply forecast in past editions of this publication and chronicled week-on-week progress toward our printed estimate in our Municipal Fixed Income Weekly. Then we revised our original assessment at mid-year and continued to report on developments. In the end, the unfolding of history squared nicely with our target range. We began January with a $350 billion guess, and modified it downward to $315 billion at the end of 2Q. As of December's close, the new issuance figure for 2018 stood at $338 billion—mission accomplished (Figure 9).

We are somewhat perplexed, however. Not so much about supply, but demand. Before turning to our 2019 supply forecast, we want to take a brief look at those demand issues that puzzle us. As we underscored in the prior section, municipal market performance has been robust over the past 11 weeks, delivering a +1.520% total return for the quarter. Nevertheless, 13 of the 14 mid-week Investment Company Institute (ICI) mutual fund flows reports since September 19 have all been negative (Figure 10). Investors have withdrawn a net $11.038 billion from municipal bond funds over that time, leaving the year-to-date net flows at a tepid +$5.446 billion, all in the face of a recently strong municipal market milieu.

What is the source of demand that is supporting the bid and vigorous market performance? One answer could be ETFs. According to the ICI, weekly ETF net issuance has been positive in 11 of the past 14 weeks since September 19. Undoubtedly, those flows explain some of the support, but not

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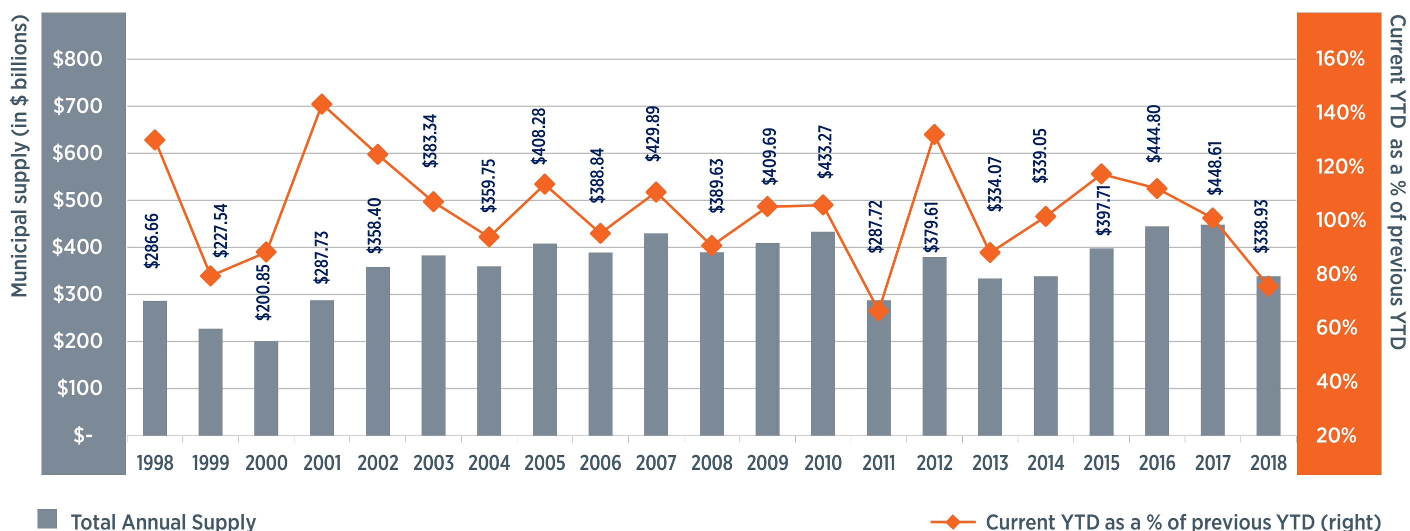
Figure 9

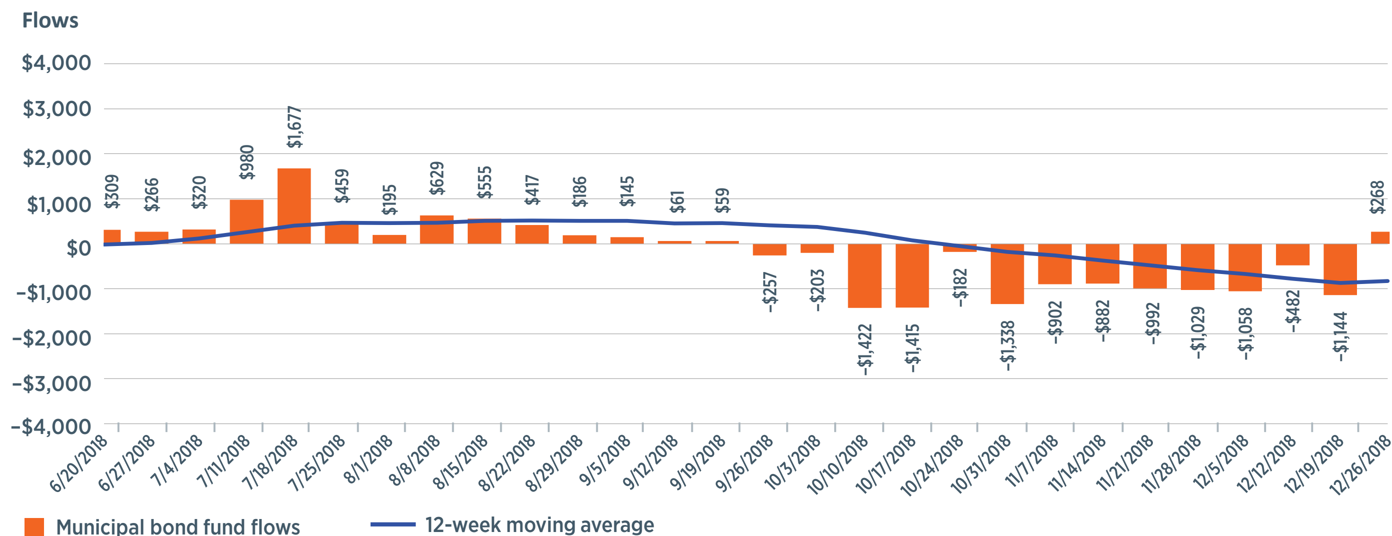
Total annual and year-to-date municipal supply (period ending December 31, 2018)



Sources: WTIA Municipal Fixed Income, *The Bond Buyer.*

Figure 10

Estimated weekly municipal bond mutual fund flows, trailing 6 months



Sources: Wilmington Trust Investment Advisors, Inc., Investment Company Institute.

all of it. We are unaware of a comprehensive and authoritative data source for separately managed account (SMA) flows. Anecdotally, we believe demand from individual investors and institutional investors in the form of SMAs stays firm, which could explain the apparent slack. Nevertheless, we are baffled by negative mutual fund flows, and expect the tide to reverse should the market remain firm.

Turning to our 2019 supply forecast, we consider several issues. First, while state and local governments are still stable, looming underfunded pension issues may repress the political will to borrow. On the other hand, the need to maintain, improve, and expand infrastructure is omnipresent, and unlikely to abate over the next year. These two countervailing forces may serve to offset one another, leaving the desire and need to issue debt untouched from last year. If we consider the current level and drift of interest rates, some may believe the economic cycle is approaching a near-term crest, and borrowing costs may stay flat or even edge slightly lower. If

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that sentiment materializes and endures, we could see issuers take a wait-and-see posture.

Finally, with midterm elections bringing control of the House to Democrats, Richard Neal (D-MA) will serve as chair of the House Ways and Means Committee. Unlike outgoing chair Kevin Brady, Neal is considered by most to be a friend of the municipal bond market. We remind readers that the negotiations and penning of the Tax Cuts and Jobs Act of 2017 sparked fears of an unchecked attack on the tax-exemption of municipal bonds in general, or private activity bonds in specific, and resulted in a deluge of issuance in December of that same year. As a result, fatigue characterized the first months of 2018, and resulted in 1Q new issuance of only $65.72 billion. A recurrence of such an episode doesn't appear likely for 2019, so we expect 1Q2019 supply to exceed that of the same period in 2018. After making allowances for all these factors, we think supply should come in at roughly $375 billion for 2019.

Core narrative

The tax-exempt municipal market seems on solid footing as credit quality remains reasonably healthy. We continue to pay close attention to underfunded pension liabilities and other state and local obligations but note that certain issuers are taking measures to address these challenges. While the strength in the municipal market may be temporary and yields may rise, a slowing economic growth rate may allow interest rate movements to be relatively well behaved. While we continue to be constructive on domestic fixed income markets in the long term, we believe there are other asset classes that may provide more opportunity. Therefore, we have a moderate near-term tactical underweight in investment-grade municipal bonds.

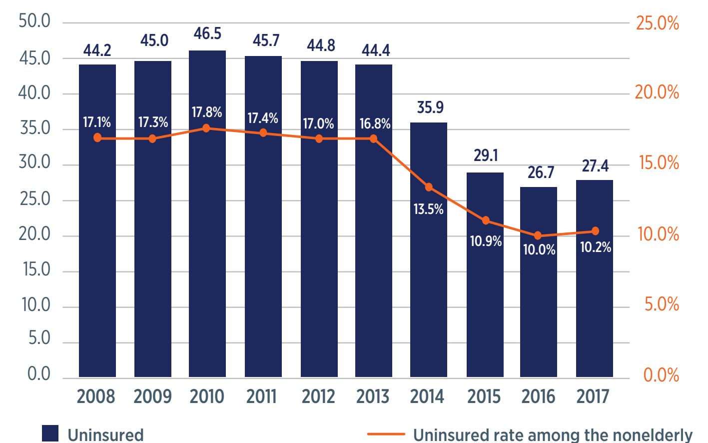
Robert Tice
Research Analyst

The ACA likely headed back to Supreme Court

In December 2018, U.S. District Judge Reed O'Conner in the U.S. District Court for Northern Texas ruled that the health insurance mandate under the Affordable Care Act (the ACA) is unconstitutional and the rest of the law is invalid, raising a new debate on the future of the ACA. While the ruling creates uncertainty for the health care sector, we believe most or all of the ACA will be preserved either through the courts or the political process.

Over eight million people in the U.S. currently receive subsidies through the ACA and it has considerably reduced the rate of uninsured people since it was established.[1] The Kaiser Family Foundation, a nonpartisan organization, published its research regarding health care coverage (Figure 1). It represents the reduction in the uninsured rate. When the major provisions of the ACA were implemented in 2014, the uninsured rate began to drop dramatically and continued to decline to a historical low by 2016.

Figure 1
Number of uninsured and uninsured rate among the nonelderly population, 2008-2017



Includes nonelderly individuals ages 0 to 64.
Source: Kaiser Family Foundation analysis of 2008-2017 American Community Survey (ACS), 1-Year Estimates.

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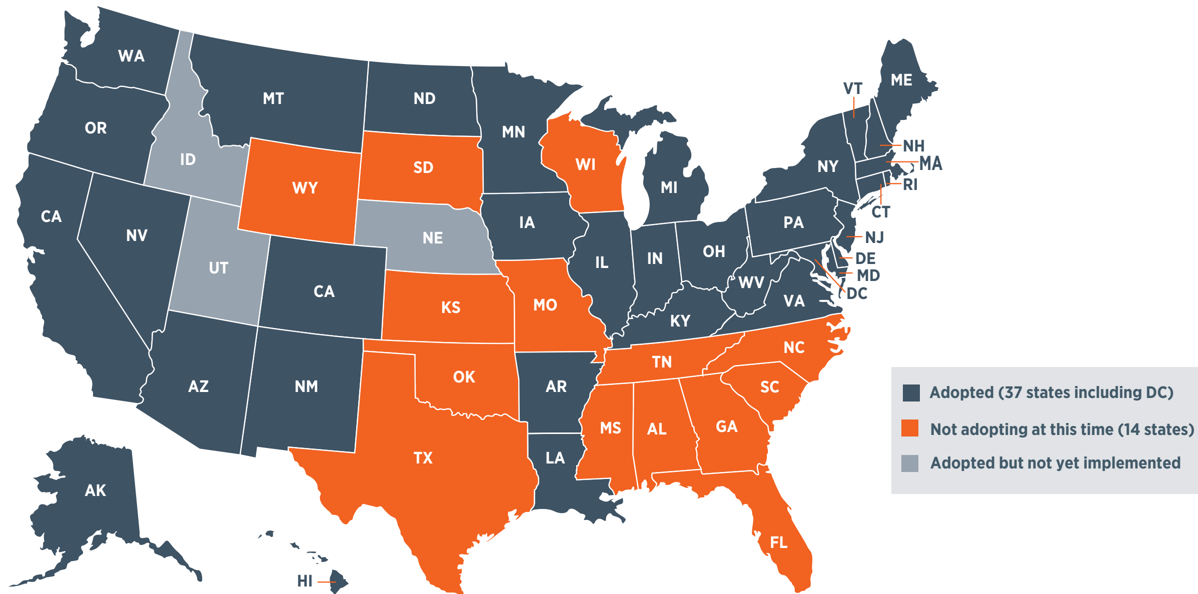
Figure 2
Status of State Medicaid expansion decisions



Current status for each state is based on KFF tracking and analysis of state activity.
Source: "Status of State Action on the Medicaid Expansion Decision," KFF State Health Facts, updated January 23. 2019.

The ACA was passed in 2010 under the Obama administration and mandated that all individuals were required to have health insurance or assume a tax penalty. Judge O'Conner's ruling that the ACA is unconstitutional was the result of a lawsuit filed by Texas and 19 others states seeking to undo the ACA.[1,2] The Tax Cuts and Jobs Act signed in December 2017 by President Donald Trump eliminates the individual mandate financial penalty. The basis for Judge O'Conner's ruling rests on the claim that since the penalty is no longer enforced, the entire ACA is unconstitutional due to the fact that the individual mandate is not severable from the rest of the law. This ruling is expected to be appealed, and all provisions and present coverage remain in place for the time being.

The appeals process will start with the U.S. Court of Appeals for the Fifth Circuit and if the ruling is upheld at that level, the appeal will go to the U.S. Supreme Court. The survival of the ACA will most likely be determined based on whether the individual mandate is indeed non-severable from the array of provisions that make up the total law.[3] If upheld in its entirety, the recent ruling is expected to significantly reduce the number of people with Medicaid coverage and could have detrimental effects for hospitals and health care systems across the country. Since 2014, more states have expanded Medicaid coverage and the total number of expansion states including the District of Columbia has now reached 37. Health care providers in states that expanded Medicaid would be most affected if Judge O'Conner's ruling is upheld.

As Fitch Ratings stated, "Any reduction in the ACA, either through repeal, piecemeal legislative efforts or legal challenges to its constitutionality, is detrimental for the U.S. not-for-profit healthcare sector, particularly in those states that have or are expanding Medicaid."[4] Providing health care services for millions of people who will lose Medicaid coverage could cause a rise in bad debt for health care providers.[4] This in turn would create lower operating margins in these hospitals from an increase in uncompensated care costs and charity cases.

As we await the outcome of the appeal process, there are multiple factors to consider. The ACA has survived other challenges, even up to the U.S. Supreme Court in both 2012 and 2015, and we expect it to survive this challenge as well. However, until it is decided, the present case will produce uncertainty, since an adverse Supreme Court decision could

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significantly impact financial reimbursement to health care systems for services rendered. Millions of Americans could lose health care coverage which in turn could increase bad debt for hospital systems nationwide. Many health care issuers are already preparing for industry headwinds by carefully managing their balance sheets to prepare for an expected decline in cash flow growth for 2019. However, even if the ACA is found unconstitutional, we expect that the political process would replace or preserve at least some of the ACA provisions that are politically popular. Each health care provider's ability to acclimate to these uncertainties will remain a crucial element regarding its ability to maintain stable credit quality.

Although these changes could increase credit risks within the sector, we believe some investment opportunities will fare better than others, largely based on the hospital's or health care system's level of Medicaid reliance and balance sheet strength. Through careful analysis, it is possible to identify those entities expected to maintain a stable financial platform, despite the constantly changing challenges they face. Wilmington Trust continues to favor health care organizations whose management teams exhibit the ability to adapt to a rapidly changing and competitive market. Larger systems are generally better positioned to meet the rising competition and evolving challenges in this sector. By and large, these systems benefit from a diversified revenue stream, greater negotiating power with insurers, and economies of scale to weather the storm of this transforming sector. Additionally, we favor providers with a leading market share and a high percentage of commercial payors, while avoiding certain inner city and rural hospitals that are reliant on Medicaid, unless they are linked to a larger health care system.

ENDNOTES

[1] KFF, "The Uninsured and the ACA: A Primer," January 2019.

[2] Moody's Investor Services, "Likely Appeal of Judge's Ruling on Healthcare Law Means No Immediate Credit Effect for State, Hospitals, or Insurers," December 17, 2018.

[3] Credit Sights, "Healthcare: Affordable Care Act Whacked," December 18, 2018.

[4] Fitch Ratings, "ACA Repeal Would be Negative for Non-Profit Health Providers," December 17, 2018.

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.

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 Rulemaking Board. The Index excludes reset rates falling outside +/- 1 standard deviation (i.e., ignores the

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Annualized returns and volatility (as of December 31, 2018)

	ANNUALIZED RETURNS				ANNUALIZED STANDARD DEVIATION		
	1 year	3 year	5 year	10 year	3 year	5 year	10 year
Municipal Bond	+1.356%	+2.342%	+3.887%	+5.107%	+3.117%	+2.904%	+3.950%
S&P Municipal Bond Investment Grade	+1.125%	+2.151%	+3.704%	+4.876%	+3.121%	+2.885%	+3.897%
S&P Municipal Bond Intermediate	+1.546%	+2.133%	+3.313%	+4.469%	+3.308%	+2.957%	+3.651%
S&P Municipal Bond IG Intermediate	+1.394%	+2.023%	+3.221%	N/A	+3.362%	+2.998%	N/A
S&P Municipal Bond Short Intermediate	+1.777%	+1.402%	+1.837%	+2.805%	+2.061%	+1.832%	+2.073%
S&P Municipal Bond IG Short Intermediate	+1.685%	+1.348%	+1.790%	N/A	+2.090%	+1.858%	N/A
S&P Municipal Bond Short	+1.778%	+1.101%	+1.041%	+1.701%	+1.070%	+0.897%	+0.951%
S&P Municipal Bond IG Short	+1.717%	+1.064%	+0.999%	N/A	+1.076%	+0.904%	N/A
S&P Municipal Bond High Yield	+5.226%	+5.140%	+6.496%	+9.534%	+3.818%	+4.170%	+6.324%
S&P Municipal Bond High Yield Ex-Puerto Rico	+3.258%	+5.820%	+8.178%	N/A	+3.985%	+3.708%	N/A
S&P Municipal Bond California Index	+1.077%	+2.324%	+4.275%	+5.569%	+3.460%	+3.219%	+4.525%
S&P Municipal Bond New York Index	+0.918%	+2.090%	+3.691%	+4.849%	+3.086%	+2.820%	+3.681%
S&P Municipal Bond Puerto Rico Index	+23.698%	+4.079%	+2.916%	+2.780%	+10.076%	+10.442%	+9.838%

Investing involves risks and you may incur a profit or a loss. Past performance cannot guarantee future results.
Sources: WTIA Municipal Fixed Income, S&P Dow Jones Indices, LLC.

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.

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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SOFR

The SOFR is the Secured Overnight Financing Rate, and is calculated as a volume-weighted median of transaction-level tri-party repo data collected from the Bank of New York Mellon (BNYM) as well as GCF Repo transaction data and data on bilateral Treasury repo transactions cleared through FICC's DVP service, which are obtained from DTCC Solutions LLC, an affiliate of the Depository Trust & Clearing Corporation. Each business day, the New York Fed publishes the SOFR on the New York Fed website at approximately 8:00 a.m and will reflect data for the prior business day.

LIBOR Fix

London - Interbank Offered Rate - ICE Benchmark Administration Fixing for US Dollar. The fixing is conducted each day at 11am & released at 11.45am (London time). The rate is an average derived from the quotations provided by the banks determined by the ICE Benchmark Administration. The top and bottom quartile is eliminated and an average of the remaining quotations calculated to arrive at fixing. The fixing is rounded up to 5 decimal places where the sixth digit is five or more. ICE Libor day count follows normal market convention: 365 days for GBP, 360 days for the other currencies and for value two business days after the fixing. Please note that for the overnight rate, the value date is on the same day as the fixing date, with the maturity date falling the next business day in both centres.

US Federal Funds Effective Rate

A target interest rate set by the central bank in its efforts to influence short-term interest rates as part of its monetary policy strategy. Data is released by the NY Federal Reserve each day at approximately 9:00 a.m. EST for the prior business day. Until March 1, 2016, the daily effective federal funds rate was calculated by the New York Fed as a volume-weighted mean of overnight rates on trades arranged by major brokers. As of March 1, 2016, the New York Fed is reporting the daily volume-weighted median value of trades provided by the brokers. All rates are subject to revision by the New York Fed.

Commercial Paper

These yields are composites of offered levels for A1/P1/F1 rated US Commercial Paper programs. They include Commercial Paper programs issued by US firms, excluding all programs which are asset-backed or LOC backed. Rates are received from broker/dealers and updated daily each morning. The rates are quoted on a discount (ACT/360) basis.

Source: The New York Federal Reserve Bank, Bloomberg L.P., Intercontinental Exchange, Inc.

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