Loop Capital Markets

Municipal Strategy Report

A Monthly Analytical Services Division Publication

October 2017

Strange Days at the Fed Not a Problem for Stocks, VIX

These are strange new days at the Fed. Normalization has officially commenced with the Fed reducing reinvestment of a maturing portion of their balance sheet assets each month. One FOMC member, Stanley Fischer, has announced his retirement, just as a new Governor, Randal Quarles, is installed. The recent outbreak of dovish sentiment has been partially quelled, keeping the market on notice that the December rate increase option remains open. Finally, President Trump is moving quickly to select his choice for a new Fed Chair. "Strange days, indeed"

By Chris Mier, CFA | Strategist

This October has ushered in the usual (the annual "Fall Classic"—MLB's playoffs and World Series), the unexpected and horrific (Las Vegas) and the long-anticipated—the Fed's normalization policy starting its execution phase. Throw in the loss of much admired rock performer, Tom Petty, and the ongoing impact of three massive natural disasters, and we having the makings of an October to remember. Who will forget the President's statement that *"We are going to have to wipe that out"* regarding Puerto Rico's debt burden, certainly not current investors! If I ever file for bankruptcy, I know who I am going to call.

> *"Thus, without further modest increases in the federal funds rate over time, there is a risk that the labor market could eventually become overheated, potentially creating an inflationary problem down the road that might be difficult to overcome without triggering a recession. For these reasons, and given that monetary policy affects economic activity and inflation with a substantial lag, it would be imprudent to keep monetary policy on hold until inflation is back to 2 percent."*
>
> **Janet Yellen, Cleveland, September 26**

The Fed's normalization policy will reduce the size of their balance sheet by decreasing reinvestment of the principal payments from maturing Treasury and Agency securities subject to initial caps of $6 billion and $4 billion per month respectively, but increasing in steps at three-month intervals over 12 months until $30 billion and $20 billion are reached per month, respectively. This programmed withdrawal is a welcome retreat from the Fed's unprecedented involvement in financial markets. What was sorely needed in 2010 and 2011 must now go—the training wheels must come off.

The market will be watching carefully as the supply/demand balance in Treasury and Agency securities markets adjust. Normalization by itself might represent a challenge for the market, but this significant monetary policy change is getting

Continued on Page 2

In this Issue

Strange Days at the Fed Not a Problem for Stocks, VIX 1
Economic and Interest Rate Forecast—October 2017 3
Market Review *Data Diffusion | ADS Index* 4
Is the Municipal Credit Cycle Turning? 5
Pennsylvania Walks Financial Tightrope 8
Structural Component Analysis for Pension Plans 10
Public Pension Portfolio Returns Start Strong in FY18 12
Market Review *Historical Monthly Bond Price Changes* 14
Market Review *The Yield Curve* 15
Market Conditions 17
Loop Capital Markets Upcoming Negotiated Calendar 18

Strange Days at the Fed Not a Problem for Stocks, VIX

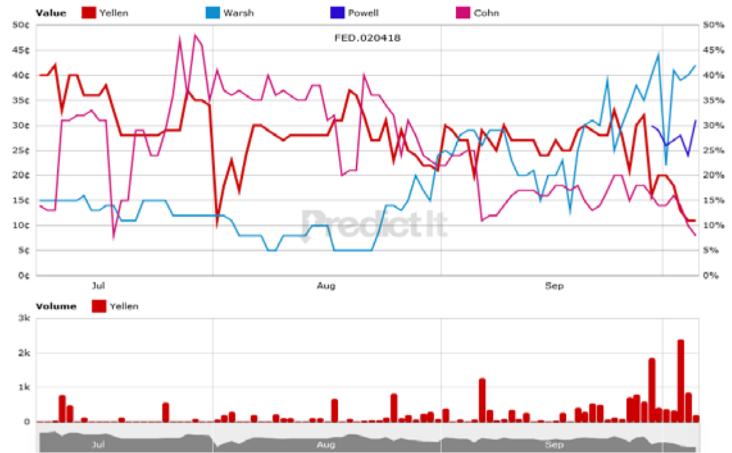
headline competition from a number of other developments.

The first development is the new version of “Operation Twist”. The original operation twist, which dates back to September of 2011, involved the purchase of longer dated bonds and the sale of short maturities. This new Operation Twist involves the sudden movement from Fed dovishness, which prevailed over the latter part of the summer and peaked with the Hurricanes Harvey and Irma, to a more hawkish bent evidenced most recently by Chairman Yellen’s quote in the text box. Ms. Yellen struck an uncharacteristically clear note on the need for the Fed to preserve flexibility to raise the funds rate in December notwithstanding possible continued lack of progress on the inflation front. Her speech *“Inflation, Uncertainty, and Monetary Policy”*, which was delivered at the 59th Annual Meeting of the National Association for Business Economics Conference, reinforced the reassessment underway in the bond market since early September that has resulted in a large increase in the implied probability of Fed action in December and seen the 10-year Treasury yield rise over 30 basis points.

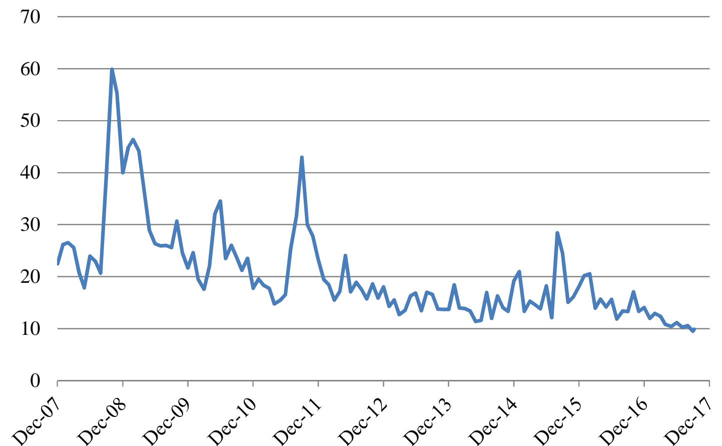
After beating back the temporary insurrection of doves Lael Brainard and Neel Kashkari, Yellen will have to swiftly say her goodbyes to Stanley Fischer, retiring for personal reasons, and put down the welcome mat for newly appointed Governor Randal Quarles, who will be first official vice chairman for supervision, a position created by the 2010 Dodd-Frank reform law, in addition to his chores as a Governor. The confirmation of Quarles, head of investment firm Cynosure Group, was not in doubt. There is no question that Quarles has bona fide qualifications for the newly created spot, although his appointment represents a dramatic shift towards less supervision than when Daniel Tarullo, the former Federal Reserve governor, served unofficially in that capacity. While this may be a case of the fox guarding the henhouse, Quarles is a very capable fox. I expect major US banks to expand their trading in bitcoin.

Meanwhile the parade of candidates for the Fed Chair continues. At least four candidates have been interviewed—Kevin Warsh and Jerome Powell were confirmed interviewees. Other candidates, Glen Hubbard and NEC Head Gary Cohn apparently have not been. Glenn Hubbard, while in possession of a strong resume, is hurt by the “used goods” syndrome. While it’s not a barrier for an aspiring US President to have run for, and lost, his own party’s nomination before ultimately winning the whole shooting match; the same is not always true of posts like the Fed Chair. Hubbard has been discussed before, didn’t get too far, and is not likely to get too far this time either (“Always a bridesmaid, never a bride”). Gary Cohn has been trying to sooth the President’s hurt feelings in the wake of Cohn’s Charlottesville remarks, but not enough time has passed and with a decision from the Administration due in the next couple of weeks, his candidacy may be dead.

Chairman Yellen has done an admirable job and would normally be considered a shoe-in since recent practice has been for a new president to reappoint the Fed Chair of the previous president regardless of party affiliation in order to maintain continuity. President Trump lives to break convention, however, and any new feelings of attachment Trump may have developed for Yellen will pale relative to his need to flout convention. **Predictit**, a “real-money political prediction market… {whose} job is to study the wisdom of the crowd” has Yellen and Cohn fading while Warsh rallies. Powell appears to be a late add.



Financial markets are well aware that the President will be placing his stamp on the Fed with the numerous open positions currently and more anticipated as governors’ terms expire. This, along with all of the other Federal Reserve comings and goings, raise an interesting question: there is plenty enough going on to justify an increase in the VIX, yet the index continues to languish, almost inexplicably, in the eleven months following Trump’s election. A variety of market-worthy events: North Korean theatrics, legislative setbacks, Administration firings by the cartful, NAFTA, immigration, Russian election intervention, modestly rising oil prices and whatever else have collectively failed to boost the VIX. Will it be the changing Fed that finally moves the needle?



Economic and Interest Rate Forecast—October 2017

Factors Supportive of Lower Rates

Hurricanes Harvey and Irma left affected workers unemployed and disrupted hiring, which resulted in 33K nonfarm payroll decrease in September vs. +80K forecast.

Recent hurricanes are expected to shave off 0.6% from Q3 GDP growth.

New and pending home sales dropped more than 3% each in August, while existing home sales declined 1.7%.

Factors Supportive of Higher Rates

As expected, the Fed started unwinding its balance sheet in October, capping its roll off at $6 billion of Treasuries and $4 billion of Mortgage Backed Securities per month through the end of 2017.

A boost to inventories pushed Q2 GDP growth estimate from 3.0% to 3.1%.

Import price index rose 0.3% in August, providing support for Chair Yellen's belief that the recent dip in inflation was transitory.

Philadelphia Fed manufacturing index rose in September to a 3-month high, while Chicago purchasing managers index rose to 65.2, the highest level since 2011.

Auto sales rose at 18.6 million annual pace in September, the highest reading year-to-date, boosted by buyers replacing vehicles that were damaged in Hurricane Harvey.

ISM Manufacturing Index reached a 13-year high in September on strong orders for hurricane rebuilding.

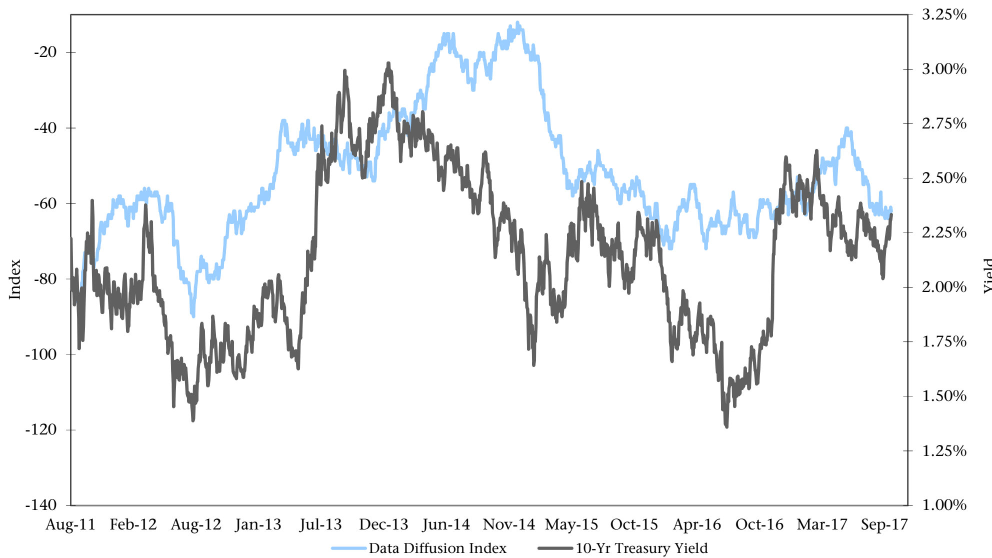
Figure 1 **Economic and Interest Rate Forecast—October 2017**

	1Q'16	2Q'16	3Q'16	4Q'16	1Q'17	2Q'17	3Q'17	4Q'17	1Q'18	2Q'18	3Q'18	4Q'18	Avg'16	Avg'17	Avg'18
Economic Forecasts															
Real GDP	0.6	2.2	2.8	1.8	1.2	3.1	2.1	2.4	2.1	2.7	2.3	2.4	1.5	2.1	2.4
Core PCE Deflator	1.6	1.7	1.8	1.9	1.8	1.5	1.6	1.8	2.0	2.1	2.2	2.1	1.8	1.7	2.1
Unemployment Rate*	4.9	4.9	4.9	4.7	4.7	4.4	4.3	4.2	4.2	4.1	4.0	4.1	4.9	4.4	4.1
Nonfarm Payrolls (chg in 1000s)	588	493	716	443	498	274	505	460	450	430	420	420	2,240	1,737	1,720
S&P 500	1,951	2,075	2,162	2,185	2,327	2,398	2,467	2,530	2,562	2,594	2,626	2,659	2,093	2,430	2,610
Short-Term Interest Rates*															
Fed Funds Target (%)	0.37	0.37	0.40	0.45	0.70	0.95	1.16	1.21	1.41	1.46	1.66	1.69	0.40	1.01	1.56
3-Month LIBOR (%)	0.62	0.64	0.79	0.92	1.07	1.21	1.31	1.31	1.51	1.56	1.74	1.74	0.74	1.23	1.64
7-Day SIFMA (%)	0.08	0.40	0.55	0.66	0.69	0.84	0.82	0.95	1.00	1.10	1.15	1.25	0.42	0.82	1.13
Treasury Interest Rates*															
2-Year Treasury (%)	0.83	0.77	0.72	1.00	1.24	1.29	1.36	1.40	1.59	1.63	1.81	1.84	0.83	1.32	1.72
3-Year Treasury (%)	1.02	0.91	0.84	1.23	1.51	1.47	1.51	1.56	1.75	1.79	1.97	2.00	1.00	1.51	1.88
5-Year Treasury (%)	1.36	1.24	1.12	1.61	1.94	1.81	1.81	1.85	2.03	2.08	2.25	2.28	1.33	1.85	2.16
7-Year Treasury (%)	1.68	1.53	1.39	1.93	2.25	2.07	2.06	2.10	2.23	2.27	2.45	2.48	1.63	2.12	2.36
10-Year Treasury (%)	1.91	1.74	1.56	2.13	2.44	2.26	2.24	2.28	2.46	2.50	2.67	2.70	1.84	2.30	2.58
30-Year Treasury (%)	2.72	2.57	2.28	2.83	3.05	2.90	2.82	2.86	3.03	3.07	3.24	3.27	2.60	2.90	3.15
Municipal Interest Rates*															
30-Year MMD (%)	2.76	2.42	2.15	2.86	3.08	2.86	2.75	2.79	2.94	2.96	3.10	3.11	2.55	2.87	3.03
Muni Yield Curve Slope (%)	2.31	1.85	1.60	2.02	2.21	2.02	1.93	1.82	1.92	1.84	1.93	1.84	1.95	1.99	1.88

P: Preliminary Data
* 3-month average
Source: Loop Capital Markets' Analytical Services Division and Short-Term Desk. Black Text: Actual Blue Text: Forecast as of October 5, 2017

Market Review *Data Diffusion | ADS Index*

Figure 2 **Data Diffusion Index vs. 10-Yr Treasury Yield**

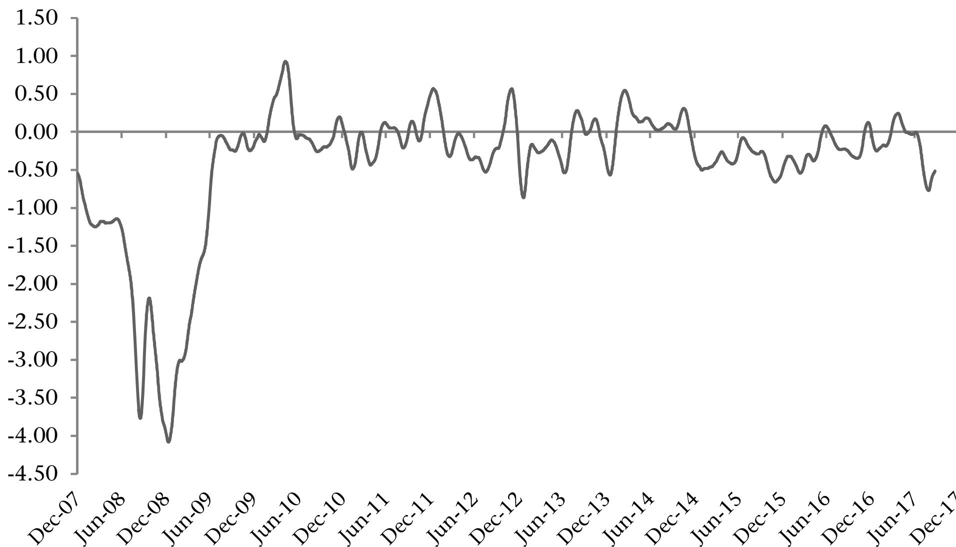


Source: FRED, Loop Capital Markets

As economic releases came weaker than expected in Q3, Treasury yields generally declined before rising again after Fed signaled the beginning of balance sheet normalization.

Data Diffusion Index: We calculate the Data Diffusion Index based on 30 different weekly and monthly economic releases, such as construction spending, capacity utilization and new home sales. If the number came above the consensus estimate (which is positive for economic growth) the index would increase by one, and vice versa. The Treasury yield is expected to track the data diffusion index (the yields would increase as the economy exceeds expectations and vice versa).

Figure 3 **Aruoba-Diebold-Scotti Business Conditions Index (12/31/2007—9/23/2017)**



Source: Federal Reserve Bank of Philadelphia

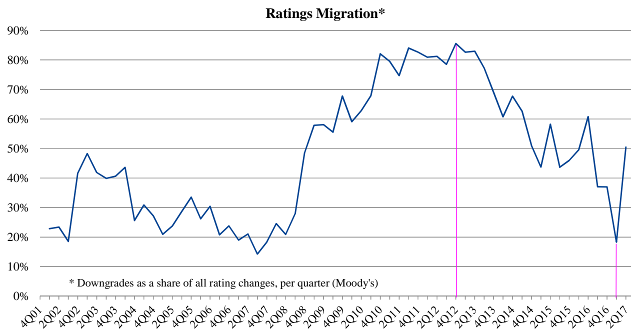
The index dropped in Q3 to the lowest level since January 2013, partially due to the impact of hurricanes on the economy. The comparison is relative to trend growth of about 2%, represented by the flat line.

Reading the ADS Index: The index is designed to track real business conditions at high frequency. Its underlying (seasonally adjusted) economic indicators (weekly initial jobless claims; monthly payroll employment, industrial production, personal income less transfer payments, manufacturing and trade sales; and quarterly real GDP) blend high and low-frequency information and stock and flow data.

Is the Municipal Credit Cycle Turning?

By Rachel Barkley | Vice President

Following the Great Recession, the credit cycle has been on an upswing for the past four years, with downgrades consisting of a decreasing percentage of total ratings revisions from a peak of 84% in 2011Q3 to a low of 18.3% in 2017Q1.[1] More recently, upgrades outpaced downgrades in seven of the nine quarters from 2015Q1-2017Q1.



However, this trend reversed in 2017Q2, with downgrades accounted for 50.5% of all rating actions by Moody's for the quarter. This reversal was also wide-spread, carrying across both tax-supported and revenue-supported sectors.

	2017Q2			2017Q1			
	Downgrades	Total	Downgrades as % of Total	Downgrades	Total	Downgrades as % of Total	% Change Q2-Q1
Tax-Backed							
City	31	68	45.6%	23	135	17.0%	28.6%
County	5	13	38.5%	2	64	3.1%	35.3%
Education	48	94	51.1%	26	132	19.7%	31.4%
Special District	1	9	11.1%	1	26	3.8%	7.3%
State	6	6	100.0%	2	2	100.0%	0.0%
Transportation	0	0	*	0	16	0.0%	*
Water, Sewer, Solid Waste	0	0	*	0	3	0.0%	*
Other Tax-Backed	0	2	0.0%	3	16	18.8%	-18.8%
Not-For-Profit	0	0	*	0	0	*	
Power	0	0	*	0	0	*	
Revenue-Backed							
Health Care	9	13	69.2%	7	10	70.0%	-0.8%
Water, Sewer and Solid Waste	5	16	31.3%	0	11	0.0%	31.3%
Public Power	2	5	40.0%	2	2	100.0%	-60.0%
Transportation	4	11	36.4%	0	6	0.0%	36.4%
Housing	2	8	25.0%	0	4	0.0%	25.0%
Education and Not-for-Profit	26	36	72.2%	6	11	54.5%	17.7%
Other	0	1	0.0%	2	5	40.0%	-40.0%
County	5	8	62.5%	2	7	28.6%	33.9%
City	3	6	50.0%	4	6	66.7%	-16.7%
Special District	0	3	0.0%	3	3	100.0%	-100.0%
State	12	15	80.0%	2	4	50.0%	30.0%
State Revolving Fund	0	0	*	0	0	*	*
Total	**159**	**315**	**50.5%**	**85**	**465**	**18.3%**	**32.2%**

Source: Moody's

Perhaps more concerning, looking at data since 2000, all quarterly changes of this magnitude have been the beginning of a swing in the credit cycle. With this in mind, we now look at some credit indicators that may signal if this shift in ratings will continue going forward.

[1] Moody's Investors Services.

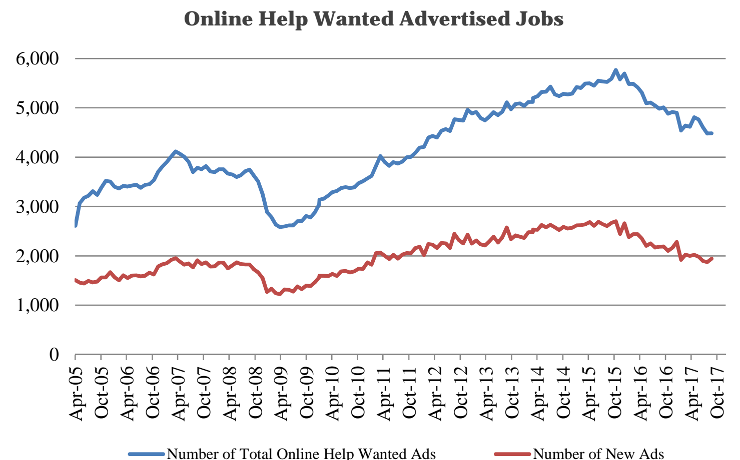
Labor Market

One useful measure of economic strength is the Conference Board's supply/demand ratio, which measures the tightness of the labor market. The metric divides the number of unemployed by the number of total job ads, with lower numbers being indicative of higher job growth. Currently at 1.59, there remains more unemployed than job openings. This is relatively unchanged from its 1.63 level a year prior. Labor market tightness varies significantly by region with the South having just over two unemployed residents per job opening, while the Midwest has 1.67 unemployed persons per opening.

The number of jobs advertised online on a monthly basis has declined from a peak of 5.8 million in November 2015 to 4.5 million for September 2017.[2] On a year-over-year basis, advertised jobs have declined in each of the past 18 months, with September data down 10.1% from the year prior.

From an income perspective, higher wage jobs have fared the worst, with management and business and financial jobs bearing the brunt of the decline in job postings, while lower wage jobs, such as administrative suppport, continue to see some gains.

Florida had the largest decline in jobs posted from the month prior at 4.9%, which likely was impacted by the a combination of Hurricane Irma and the end of the summer tourism season. Virginia (-4.1%) and Arizona (-2.3%) also saw declines on a MoM basis.



Source: The Conference Board

[2] The Conference Board

Revenues and Budget Adjustments

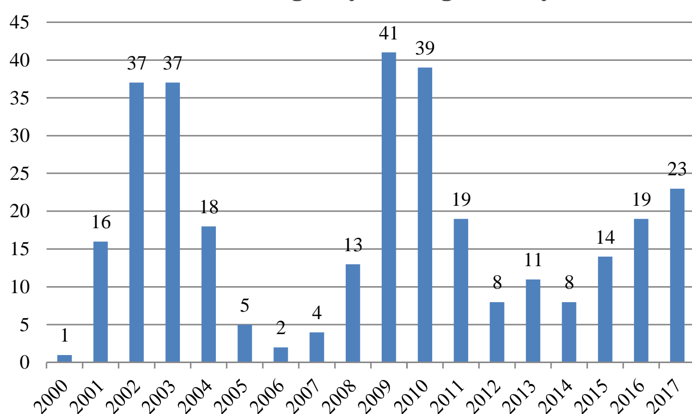
State revenue collections have been regarded as lackluster over the past several years.[3] Quarterly growth for calendar 2016 averaged 0.5%.[4]

2017Q1 growth was stronger at 3.1%, however this appears to be inflated by a shifting of bonus payments from the end of calendar 2016 to the beginning of calendar 2017. Preliminary data for 2017Q2 indicates 2.3% YoY growth. Sales tax growth for the quarter (3.2%) is estimated to outpace personal income tax growth (0.6%), which would benefit states that do not have an income tax. Corporate income tax collections, meanwhile, have decreased for six consecutive quarters.

Areas hit by hurricanes in recent months, including Texas and Florida, will likely see reduced local property tax collections, while sales tax revenues may be bolstered by rebuilding efforts. Vehicles damaged in the storms will also be replaced by many, which has already led to an increase in car and light truck sales for the month of September.[5] Each area's revenue impact will depend on the extent of the damage, the revenue make up and the extent and timing of the recovery.

States have been optimistic regarding revenue growth during the budget process, leading to an increase in states making mid-year budget cuts. Twenty-three states were forced to make mid-year budget cuts in fiscal 2017, totalling $4.9B.[6] This was the largest number of states making mid-year budget cuts since 2010.

Number of States Making Midyear Budget Cuts by Fiscal Year



Source: NASBO

[3]U.S. Bureau of Labor Statistics and Bureau of Economic Analysis
[4] State Revenue Report #108. Rockefeller Institute of Government. September 2017
[5] Hurricane recovery helps boost U.S. September new auto sales. Reuters. October 3, 2017.
[6] Fiscal Survey of States, National State Budget Officers (NASBO) Association. Spring 2017.

Tax Changes

Some states are addressing lagging revenues through tax initiatives, with sixteen states making some degree of tax changes in the fiscal 2018 budget cycle.[7] These have ranged from wide-ranging changes, such as West Virginia, which increased its sales tax rate from 6% to 6.5%, eliminated the sales tax exemption on professional services, created a commercial activities tax and raised the gas tax, to more targeted changes, such as Maine, which eliminated a 3% surcharge on individuals that earn more than $200,000 annually, which had been passed by voters to fund schools. West Virginia's changes are particularly notable as the taxing of professional service activities will help modernize the state's tax structure to reflect the current economy.

While eight states increased their rates, six lowered rates or enacted additional tax credits, such as Maine. With the exception of Indiana, the majority of states enacted tax reductions that were at least partially driven by projected budget gaps. This is particularly true for West Virginia and Oklahoma, which have been hard hit by the downturn in the energy industry. However, many non-energy states also resorted to tax changes due to budget needs. Oregon's tax increases were meant to address the state's projected $1.8B biennial deficit and fund transportation needs.

Two states, Hawaii and Tennesee, implented both increases and decreases in rates.

Looking into next year, North Carolina has passed tax changes for 2019, including reducing the personal income tax rate from 5.499% to 5.25%, raising the standard deduction, and reducing the corporate tax rate from 3% to 2.5%. Tax reductions in the past have often failed to drive additional economic growth, as seen in the recent case of Kansas.

We also note that many states that have been grappling with budget deficits in recent years, including New Mexico and Missouri, have not revised their tax rates. Futher budgetary reductions may prove difficult in future years if budget gaps persist and states remain unwilling to reevaluate their tax levels.

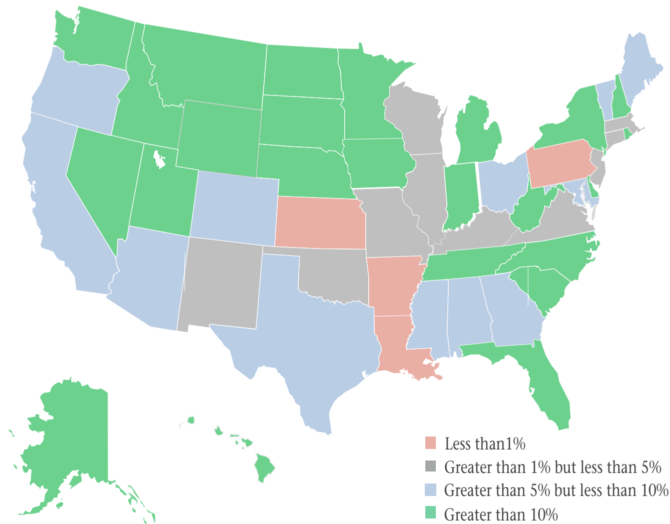
Total General Government Reserves

One positive the states have currently is relatively high reserve levels. Total fund balances at the close of fiscal 2016 totalled $80.8B, equal 10.3% of General Fund expenditures. This however is expected to decrease to $69.4B (8.5% of spending) at the close of fiscal 2017, as 31 states are estimated to have declining reserve

[7] Summaries and Fiscal Year 2018 Proposed & Enacted Budgets. National Association of State Budget Officers. August 2017.

levels for the year.[8] While 34 states are expected to maintain reserve levels at or above 5% of General Fund spending for fiscal 2017, five are expected to have balances below 1% and eight are expected to have balance ranging from 1% to 5%.

State Reserve Levels as % of General Fund Expenditures FY2016



Source: NASBO

Long-Term Obligations

Unfunded pension liabilities have increased 32% from $832.7MM in fiscal 2011 to $1.1B in fiscal 2015.[9]

State debt levels have remained relatively stable, increasing less than 1% annually for the past four years.[10] While pay-go spending has risen, there is evidence that this is due to governments deferring maintenance, which will lead to an increase in capital spending in future years. Gross investment by state and local governments totalled $332.5B for 2017Q2, a 2.9% decrease from the prior quarter.[11] Gross investment unadjusted for inflation as a percentage of nominal gross domestic product (GDP) now stands at 1.7%, down from 2.6% in 2009Q2. If governments had continued investing at 2009 levels, capital spending over the past seven years would have been 27% higher than actual levels.

The data on a turning of the credit cycle for states is mixed. Although revenue growth has been slow and mid-year budget cuts have increased, reserve levels have increased both on a dollar basis and as a percentage of spending. Job opening figures indicates headwinds may be in the future for job gowth, while capital spending may need to increase to offset previously deferred infrastructure maintenance. States are responding to what may be a new normal through a combination of spending constraints and tax initiatives. Going forward, there likely will be increased bifurcation among the states, with the credit cycle turning for some areas.

[8] Fiscal Survey of States, National State Budget Officers (NASBO) Association. Spring 2017.
[9] Pew Charitable Trusts.
[10] Medians - Total State Debt Remains Essentially Flat in 2017. Moody's Investors Service. May 2017.
[11] State and Local Government Delays in Capital Expenditures Push Costs into the Future. Moody's Investors Service. October 2017.

Pennsylvania Walks Financial Tightrope

By Rachel Barkley | Vice President

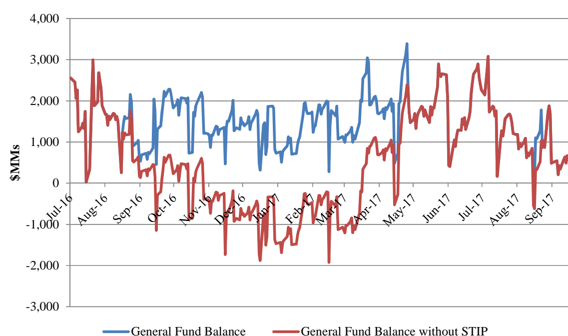
On June 30th, the Legislature passed a $32B expenditure package for fiscal 2018. However, revenues for the year were not agreed upon. The state faces roughly a $2.2B imbalance on its $32B budget. Pennsylvania is one of two states operating without a budget.

The state has a history of late budget adoption, including in fiscal 2016 when it took until March 2016 to end the budget impasse. This was not the only case though, as the state was unable to pass its fiscal 2010 budget until October 6th, while fiscal 2004's budget was not passed until December 23rd.

This July, the Senate approved a revenue plan that relied on $1.3B of borrowing from the tobacco settlement fund and $405MM in tax increases. This would have instituted a 5.7% tax on natural gas utility bills, a 0.5% increase on electric bills and a 1% increase on phone bills. The plan also counted on $200MM from casino expansion, which needed additional legislative approval, $200MM in transfers and additional savings from Medicaid. The plan however was not approved by the House.

The lack of a full budget has put the state under a considerable liquidity constraint. It relied on a $750MM short-term loan in August from the Treasury's Short Term Investment Pool (STIP), which has since been repaid, and transferred $700MM from the motor license fund.[12] In fiscal 2017, the state borrowed from the STIP three times for a total of $2.2B. Last month, the state was unable to pay roughly $1.8B in bills, delaying a $1.2B payment to state managed care providers and a $581MM pension payment. This marks the first time the state has delayed payments to its vendors.[13]

Pennsylvania General Fund Balance



Source: Pennsylvania Treasurer's Office

In September, the Commonwealth Treasurer and Auditor General sent a letter to the Governor and members of the General Assembly detailing the state's inability to meet its current obligations. Moreover, the offices, which must approve all short-term borrowing by the state, would not approve any additional borrowing given the current lack of budget progress.[14] According to the Treasurer's office, the General Fund had a balance of $981.6MM as of September 19th. However, if all pending payments were made, this would drop to -$767.9MM.

Budget negotiations have picked up in recent weeks. The House reconvened in early September after a month and a half break. It passed HB 453, which would provide the General Fund with $2.2B of one-time revenues, detailed below. The largest portion of funding would come from securitizing $1B of tobacco settlement fund payments for a period of up to 10 years.

General Fund Additional Revenues (HB453) in $000s

Tobacco Settlement Fund Monetization	1,000,000
Prior Year Lapsed Appropriations	413,048
Insurance Settlement	249
Drug Manufacturer Settlement	8
Underground Storage Tank Indemnification Fund	100
Gaming Control Board Revenues	50,000
Transfers From:	
Liquor Control Board	235,000
Special Funds	515,500
Air Pollution Control Act	30,409

Source: PA HB453 Fiscal Note

An additional $360MM distribution from the Tobacco Settlement Fund would be used to fund health related services. Partial funding for the state's pension plans for the year would come from unexpended prior year agency operating balances, in the amount of $5.2MM for the State Employees Retirement System (SERS) and $6.8MM for the Public School Employees' Retirement System (PSERS).

Alternately, State Representative DiGirolamo has proposed increasing the personal income tax from 3.07% to 3.32% as well as instituting a 3% natural gas production tax.[15] While this would solve the majority, if not all, of the state's structural budget gap, it was not able to gain traction in the House.

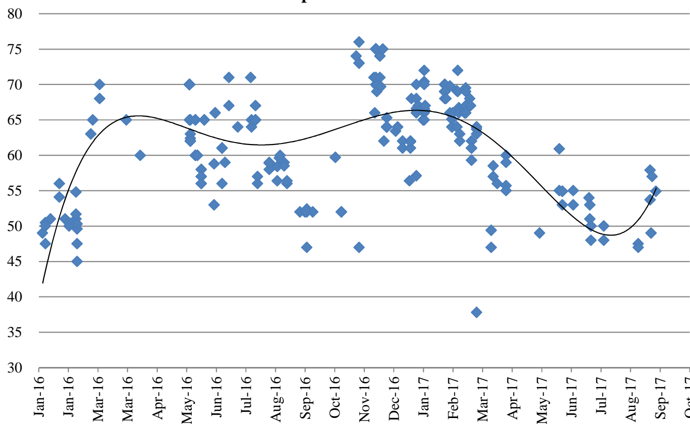
[12] As Pa. budget impasse persists, Wolf warns of dire consequences. Philadelphia Inquirer. August 29, 2017.
[13] Pennsylvania Senate confronts no-tax package in 80-day budget fight. Associated Press. September 18, 2017.
[14] Treasurer Torsella Issues Statement on Short Term Investment Pool Status of General Fund. Pennsylvania Treasurer's Office. September 12, 2017.
[15] Republican lawmaker proposes income tax increase to solve Pennsylvania's budget puzzle. PennLive. September 7, 2017.

The current House plan seems unlikely to pass with Governor Wolf and the Senate opposed to it. Governor Wolf went as far as to call it "irresponsible" for diverting funds from their dedicated uses with fund sweeps.[16]

On October 4th, Governor Wolf put forward a counter plan to securitize profits from the state's liquor system. This would generate roughly $1.25B and would be in place of securitizing the tobacco settlement revenues.

A resolution of the budget that does not move the state towards fiscal balance may lead to credit rating action. The state is currently rated Aa3/A+/AA- by Moody's, S&P and Fitch, respectively. S&P downgraded the state September 20th, citing its structural imbalance and liquidity position as main drivers.[17]

Spreads for state GOs, which had been fallen over the first six months of the year, have increased by 5 to 10 bps in recent weeks, as shown below.



Sources: Eikon, Bloomberg, MMD

Ancillary credits may also be affected by the state's budget standoff. School districts were among the entities most affected by the holdout in fiscal 2016, as they were forced to rely on reserves and short-term borrowing to remain open as state funding, which accounts for an average of 43% of school funding in the state, was not released until the budget was finalized. The Southeastern Pennsylvania Transportation Authority (SEPTA), which provides regional public transportation service to the Philadelphia metro area, has come out against the current plan to shift $357MM from the Public Transit Trust Fund, stating it could lead to a 40% service reduction as well as a 20% fare increase.[18] Meanwhile, for the Pennsylvania Turnpike, Moody's lists increased payments to the state as potential factor that could lead to a downgrade in their most recent rating.[19]

The Senate is in recess until October 16th, when it reconvenes for six days. An additional three days are scheduled in November, beginning the 13th, and six days in December. The House reconvenes on September 25th and is in session through October 25th, before a two week break. Loop will continue to monitor the state's budget situation as negotiations continue.

[16] Gubernatorial candidates have differing views about the 'taxpayers' budget'. PennLive. September 7, 2017.
[17] S&PGR Lowers Pennsylvania GO Rtg To 'A+'; Outlook Stable. S&P Global Ratings. September 20, 2017
[18] SEPTA warns state GOP budget proposal could gut public transit. Philadelphia Inquirer. September 6, 2017.
[19] Moody's assigns A1 to PTC's $373 Million Turnpike Revenue Senior Lien Bonds, Series A of 2017; stable outlook. Moody's Investors Service. September 12, 2017.

Structural Component Analysis for Pension Plans

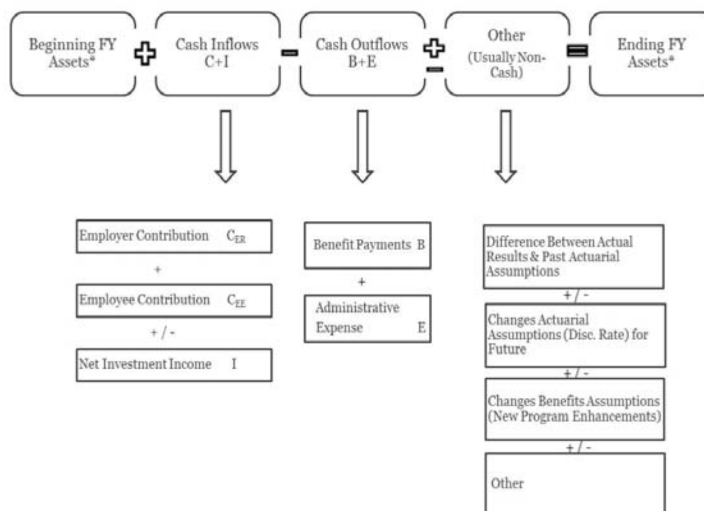
By Maura Murrihy, CFA | Vice President

We have adapted tools used in equity analysis to gauge the particular challenges faced by pensions to meet promises made to plan beneficiaries. For analysts of financial intermediaries in particular, a standard tool is Return on Asset analysis in which all income statement items are expressed as a percentage of assets to isolate changes in profitability and to differentiate business models. Structural Component Analysis for pension plans is a derivation of this methodology. Pension plans can be thought of as manufacturers that have promised products to be delivered way out in the future, in their case streams of cash payments extending decades to compensate current employees and retirees for their past service. Inflows into pension plans are analogous to manufacturers' raw materials and their outflows of benefit payments are their finished products.

Public pensions have three main inflows: employer contributions (C-ER), employee contributions (C-EE) and net investment income (I). Of the three, net investment income can be considered the most volatile depending on the vagaries of the global markets, followed by employer contributions which depend on the support of politicians elected to uphold previous promises. Employee contributions are the most predicable and stable of inflows, but also the least significant.

Outflows are twofold: monthly benefit payments (B) made to retirees and administrative expense (E) incurred to run the plan. The difference between total inflows and outflows is simply called net inflows. The "Other" category captures adjustments that actuaries make to their estimates of future benefit payouts including salary growth, retirement ages, mortality, and probability of disability. The discount rate they select to value future obligations is the most important determinant of a pension plan's health. At the end of the year, remaining assets are tallied after these inflows and outflows. We measure inflows and outflows relative to beginning assets which are set at 100% and then can compare individual plans and groups of similarly situated plans by asset size, funded ratio levels or inflow or outflow categories. We use it to examine relationships between well-funded or improving plans and those with deteriorating fundamentals beneath the surface.

The methodology can be a useful map to understand the evolution of funded ratio history for pensions. We analyzed 74 state plans with assets greater than $1 billion for 2016. We measured each inflow and outflow category relative to beginning assets. There is a clear linear mapping between the factors' rankings and corresponding funded ratios in almost every case. The relationships were particularly strong for employer contributions (C-ER) and benefit payments (B) and found that state plans with low C-ERs and very low B payouts had consistently higher funded ratios, indicators that those plans are not under intense pressure to alter their structural compositions of inflows.



For example, Florida Retirement System (FRS) is a strong plan relative to others in the US. Historically, FRS had shown very strong funded ratios well exceeding 100% until the Great Recession occurred. In 2009, the funded ratio (GASB #25) fell from 105.6% to 87.9%; it has seen slight erosion since that juncture.

Note the chart below features two sets of funded ratios: one stated on outdated GASB#25 or "actuarial" basis and another using the newly adapted GASB #67-68 accounting methodologies, reflecting the mandated absence of formerly used market-smoothing valuation practices. We look at both sets of ratios because there will be a permanent "break" in the series, and because pensions are not required restate history. FRS' funded ratio (GASB #67-68) fell meaningfully from 96.1% and 92.0% in FYs 2014 and 2015 to 84.9% by June 2016.

Some states have chosen to address funded level deterioration with added employer contributions. However, the State of Florida had diminished its Employer Contribution rate (C-ER) from a peak level of 3.3% of beginning assets in 2010 and 2011 to a subsequent low of 1.2-1.3% in 2012-2013. At the time, this was offset by a corresponding increase in the Employee Contribution rate (C-EE) of 0.6-0.7%. The C-ER rate now has been steady at 1.7%-1.8% (2014-2016) and its C-EE ratio has leveled at 0.5%, still low rates of inflows relative to much more challenged plans. FRS' funded ratio

makes it almost a top quartile plan with low relative (first quartile) C-ER rates but higher relative BP rates (just a hair above the median).

2016 Median Large State Plan Rankings

		Percentage of Beginning Assets											
		Start	(C-ER +	C-EE +	I) =	Inflows	(B +	E) =	Net Ins +	Other =	Finish		
		Beg. Assets	Employer Contri- butions	Employee Contri- butions	Net Inv. Income	Gross Inflows	Benefit Payments	Admini- strative Expense	Net Inflows	Other	Ending % Begin. Assets	Ending Actuarial Funded Ratio	Change Actuarial Funded Ratio
Individual Factor Ranks	Quartile												
1st Quartile Median	1	100.0%	1.7%	0.6%	2.2%	3.4%	-5.0%	0.0%	2.1%	0.1%	101.7%		
2nd Quartile Median	2	100.0%	3.0%	1.2%	1.2%	5.3%	-6.8%	-0.1%	-1.2%	0.0%	99.1%		
3rd Quartile Median	3	100.0%	3.9%	1.7%	0.4%	6.9%	-8.7%	-0.1%	-2.6%	0.0%	97.2%		
4th Quartile Median	4	100.0%	6.5%	2.8%	-0.6%	10.1%	-12.6%	-0.1%	-5.0%	-0.5%	94.6%		
Total Median		100.0%	3.4%	1.5%	1.0%	6.5%	-7.3%	-0.1%	-2.0%	0.0%	97.9%		
Funded Ratio by Factor	Quartile												
1st Quartile Median	1		85.4%	82.3%	78.3%	78.6%	86.9%	82.7%	84.8%	65.1%	84.8%	89.1%	-2.3%
2nd Quartile Median	2		74.7%	73.9%	70.9%	81.8%	76.7%	68.4%	67.9%	68.4%	68.3%	74.1%	-3.7%
3rd Quartile Median	3		66.7%	67.9%	69.2%	66.7%	61.6%	68.3%	67.1%	70.0%	67.1%	62.4%	-5.0%
4th Quartile Median	4		58.6%	59.8%	56.2%	57.7%	46.3%	58.8%	60.5%	69.1%	60.8%	43.7%	-8.8%
Total Median			68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	-4.2%

** 74 State Plans with June Fiscal Years > $1 Billion. Loop Capital Database. Medians do not add across.

Florida Retirement System Structural Component Analysis 2002-2016

		Percentage of Beginning Assets														
		Start	(C-ER +	C-EE +	I) =	Inflows	(B +	E) =	Net Ins +	Other =	Finish					
FY	Beginning Assets (MM)	Beginning Assets	Employer Contri- butions	Employee Contri- butions	Net Inv. Income	Gross Inflows	Benefit Payments	Admini- strative Expense	Net Inflows	Other	Ending % Begin. Assets	Ending Assets (MM)	Ending Actuarial Funded Ratio	Ending GASB Funded Ratio	Change Actuarial Funded Ratio	Change GASB Funded Ratio
2002	97,279	100.0%	1.8%	0.0%	-8.1%	-6.2%	-3.2%	0.0%	-9.4%	0.0%	90.6%	88,142	115.0%		-3.0%	
2003	88,142	100.0%	2.1%	0.0%	3.1%	5.1%	-4.9%	0.0%	0.2%	0.0%	100.2%	88,349	114.2%		-0.8%	
2004	88,349	100.0%	2.2%	0.1%	16.7%	18.9%	-4.7%	0.0%	14.2%	0.0%	114.2%	100,934	112.1%		-2.1%	
2005	100,934	100.0%	2.2%	0.0%	10.2%	12.4%	-5.2%	0.0%	7.2%	0.0%	107.2%	108,206	107.3%		-4.8%	
2006	108,206	100.0%	2.2%	0.0%	10.6%	12.8%	-5.2%	0.0%	7.6%	-0.1%	107.5%	116,340	105.6%		-1.8%	
2007	116,340	100.0%	2.6%	0.0%	18.3%	21.0%	-5.5%	0.0%	15.5%	0.0%	115.5%	134,315	105.7%		0.1%	
2008	134,315	100.0%	2.4%	0.1%	-4.7%	-2.2%	-5.1%	0.0%	-7.3%	0.0%	92.7%	124,467	105.4%		-0.3%	
2009	124,467	100.0%	2.6%	0.1%	-19.9%	-17.1%	-5.3%	0.0%	-22.5%	0.0%	77.5%	96,503	87.9%		-17.5%	
2010	96,503	100.0%	3.3%	0.0%	15.2%	18.6%	-7.5%	0.0%	11.1%	0.0%	111.1%	107,180	88.0%		0.1%	
2011	107,180	100.0%	3.3%	0.0%	22.6%	25.9%	-7.8%	0.0%	18.1%	0.0%	118.1%	126,580	86.9%		-1.1%	
2012	126,580	100.0%	1.2%	0.6%	-0.1%	1.8%	-7.0%	0.0%	-5.2%	0.0%	94.8%	119,981	86.4%		-0.6%	
2013	119,981	100.0%	1.3%	0.7%	13.6%	15.6%	-7.6%	0.0%	8.1%	0.0%	108.1%	129,672	85.4%		-0.9%	
2014	129,672	100.0%	1.8%	0.5%	17.6%	19.9%	-6.8%	0.0%	13.1%	2.6%*	115.7%	150,014	86.6%	96.1%	1.1%	
2015	150,014	100.0%	1.7%	0.5%	3.5%	5.6%	-6.6%	0.0%	-1.0%	0.0%	99.0%	148,454	86.5%	92.0%	-0.1%	-4.1%
2016	**148,454**	**100.0%**	**1.7%**	**0.5%**	**0.6%**	**2.7%**	**-7.2%**	**0.0%**	**-4.5%**	**0.0%**	**95.5%**	**141,781**	**85.4%**	**84.9%**	**-1.1%**	**-7.1%**

* Net position adjusted for the removal of the DROP liability post GASB 67. Source: Public Plan Database and Loop Capital.

Public Pension Portfolio Returns Start Strong in FY18

By Ivan Gulich | Senior Vice President

In an effort to provide muni analysts with timely data required to properly evaluate public pensions, we have created a model that forecasts portfolio returns on a quarterly and fiscal year bases.

Our dataset consists of 80 large state pension plans.[20] These plans account for 82% of aggregate state pension plan liabilities. Asset classes for these plans include domestic and international equities and fixed income instruments, real estate, alternative investments, cash and short term instruments and other.

The following are total returns for indices that we have selected to represent respective asset classes.

Performance of Asset Classes in Q1 FY18 and FY17

#	Asset Classes	Benchmark	Bloomberg Tickers	Total Return Q1 FY'18	Annualized	FY'17
1	US Equity--Broad	Russell 3000	RAY	4.6%	19.6%	18.5%
2	US Large Caps	S&P 500	SPTR	4.5%	19.2%	17.9%
3	Global Equity	MSCI ACWI	MXWD	5.3%	23.0%	19.4%
4	US Treasury	S&P U.S. Treas. Bond Index	SPBDUSBT	0.3%	1.3%	-1.9%
5	US Treasury Bills	Money Market Funds	VMMXX	0.3%	1.1%	0.7%
6	US IG Corporates	S&P IG Corp. Bond Index	SPUSCIG	1.2%	5.1%	1.7%
7	Global Corp. Ex-US	S&P Int. Corp. Bond Index	SPBDICBT	4.0%	17.0%	3.7%
8	Hedge Funds	Hedge Fund Index	HFRXGL	1.8%	7.5%	6.0%
9	Commodities	CRY Commodity Index	CRYTR	5.0%	21.7%	-8.7%
10	U.S. REIT	Bloomberg REIT Index	REIT	1.1%	4.6%	0.2%
11	U.S. Private Equity	Private Equity Index	PRIVEXD	4.9%	21.2%	36.8%

Source: Bloomberg

Equities and private equity continued their outsized gains in the first quarter of new fiscal year. U.S. fixed income instruments remained a drag on portfolio performance, but international corporate bonds rallied due to improved global economic outlook and supply-demand imbalance. Hedge fund managers once again failed to deliver market-beating returns, while commodities, which generally represent a small portion of plan portfolios, appreciated.

Using these inputs and plan portfolio allocations, we have estimated returns net of fees for major pension funds in Q1 FY18.

#	Plan	Net Returns Q1 FY18 Estimated	Q1 FY18 Annualized	FY17 Actual	FY17 Estimated
1	Alaska PERS	3.36%	14.14%		14.64%
2	Alaska Teachers	3.36%	14.13%		14.62%
3	Arizona Public Safety Personnel	3.02%	12.66%		14.40%
4	Arizona SRS	3.29%	13.85%		13.57%
5	Arkansas PERS	3.48%	14.67%		14.38%
6	California PERF	2.91%	12.18%	11.20%	11.59%
7	California Teachers	3.32%	13.96%	13.40%	13.84%
8	Connecticut SERS	3.19%	13.40%	14.34%	12.75%
9	DC Police & Fire	3.16%	13.27%		12.17%
10	DC Teachers	3.16%	13.27%		12.17%
11	Delaware State Employees	2.73%	11.36%		11.26%
12	Florida RS	3.37%	14.17%	13.77%	13.93%
13	Georgia ERS	3.25%	13.65%		12.55%
14	Georgia Teachers	3.48%	14.65%		12.86%
15	Idaho PERS	3.23%	13.58%	12.40%	12.61%
16	Illinois SERS	3.13%	13.11%		13.05%
17	Illinois Teachers	2.86%	11.94%	12.30%	11.97%
18	Illinois Universities	3.32%	13.96%		13.25%
19	Indiana PERF	2.52%	10.45%	7.98%	11.09%
20	Indiana Teachers	2.52%	10.45%	7.98%	11.09%
21	Iowa PERS	2.78%	11.59%	11.70%	10.69%
22	Iowa Municipal Fire and Police	3.05%	12.75%		11.74%
23	Kansas PERS	3.12%	13.07%		12.16%
24	Kentucky ERS	2.92%	12.20%	12.09%	11.86%
25	Kentucky Teachers	3.52%	14.85%	15.07%	14.21%
26	Louisiana SERS	3.37%	14.18%	15.50%	14.07%
27	Louisiana Teachers	3.17%	13.28%	15.93%	12.83%
28	Maine State and Teacher	3.07%	12.85%		12.58%
29	Maryland PERS	2.98%	12.48%	10.02%	12.58%
30	Maryland Teachers	2.98%	12.48%	10.02%	12.58%
31	Massachusetts SRS	3.10%	12.99%	12.80%	13.06%
32	Massachusetts Teachers	3.10%	12.99%	12.80%	13.06%
33	Michigan Public Schools ERS	3.03%	12.69%	12.90%	12.68%
34	Michigan SERS	3.07%	12.84%		12.80%
35	Minnesota GERF	3.26%	13.69%	15.10%	13.01%
36	Minnesota State Employees	3.26%	13.69%	15.10%	13.01%
37	Minnesota Teachers	3.26%	13.69%	15.10%	13.01%
38	Minnesota Police and Fire Ret. Fund	3.26%	13.69%	15.10%	13.01%
39	Mississippi PERS	3.45%	14.51%	14.66%	13.95%
40	Missouri DOT and Highway Patrol	2.71%	11.27%		11.99%
41	Missouri State Employees	2.40%	9.96%		11.49%
42	Montana PERS	3.14%	13.17%		12.80%
43	Montana Teachers	3.14%	13.18%		12.82%
44	Nebraska Schools	3.30%	13.87%		12.64%
45	New Hampshire Retirement System	3.19%	13.36%		13.02%
46	New Jersey PERS	3.28%	13.79%	13.07%	13.94%
47	New Jersey Police & Fire	3.33%	14.01%	13.07%	14.15%
48	New Jersey Teachers	3.26%	13.71%	13.07%	13.87%
49	New Mexico PERA	3.25%	13.65%	11.13%	12.59%
50	New Mexico Educational	3.57%	15.05%		15.04%
51	New York State Teachers	3.21%	13.48%		13.15%
52	NY State & Local ERS	3.19%	13.40%	11.42%	11.37%
53	NY State & Local Police & Fire	3.19%	13.40%	11.42%	11.37%
54	North Carolina Local Government	3.24%	13.58%	10.60%	12.10%
55	North Carolina Teachers & State Emp.	3.24%	13.58%	10.60%	12.10%
56	North Dakota PERS	3.35%	14.08%	12.96%	13.32%
57	North Dakota Teachers	3.39%	14.27%	12.96%	13.41%
58	Ohio School Employees	3.00%	12.55%		13.44%
59	Ohio Teachers	3.35%	14.10%	13.99%	14.14%
60	Oklahoma PERS	3.38%	14.24%	12.65%	12.55%
61	Oklahoma Teachers	3.34%	14.04%	15.00%	13.47%
62	Oklahoma Police Pension System	3.11%	13.03%	11.14%	12.67%
63	Oregon PERS	2.90%	12.09%	11.92%	12.46%
64	Pennsylvania School Employees	2.79%	11.63%		12.35%
65	Rhode Island ERS	3.04%	12.74%	11.62%	12.71%

[20] Public Plans Database

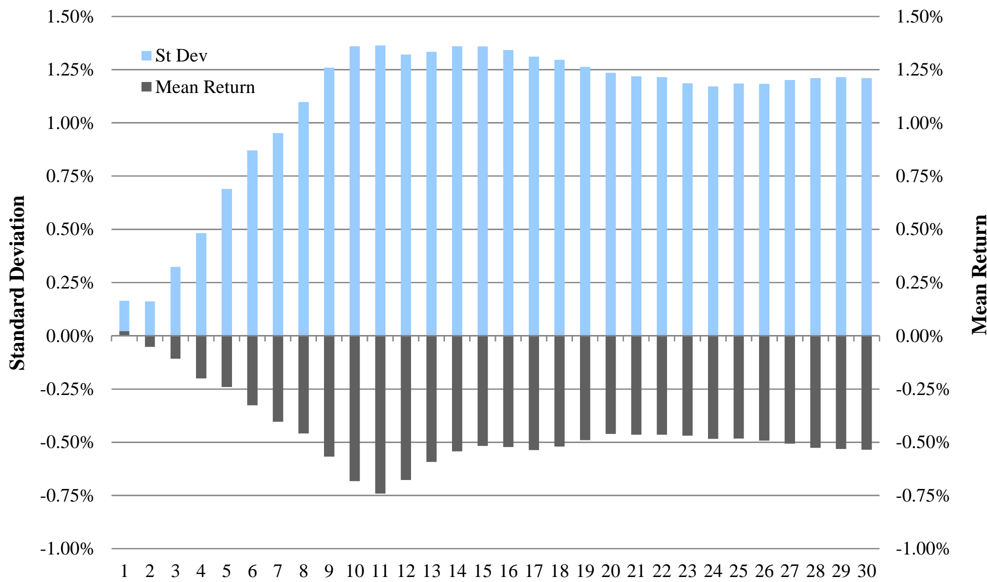
#	Plan	Net Returns			
		Q1 FY18		FY17	
		Estimated	Annualized	Actual	Estimated
66	South Carolina Police	2.55%	10.60%		9.88%
67	South Carolina RS	2.55%	10.60%	11.90%	9.89%
68	South Dakota RS	3.20%	13.43%	13.81%	9.65%
69	Texas ERS	3.08%	12.89%	12.40%	12.63%
70	Texas LECOS	3.08%	12.89%		12.63%
71	Texas Teachers	3.26%	13.71%	12.90%	12.73%
72	Vermont State Employees	3.24%	13.59%		12.71%
73	Vermont Teachers	3.21%	13.48%		12.72%
74	Virginia Retirement System	2.86%	11.92%	12.10%	12.24%
75	Washington LEOFF Plan 2	2.96%	12.38%		12.81%
76	Washington PERS 2/3	2.96%	12.38%		12.81%
77	Washington School Empl. Plan 2/3	2.96%	12.38%		12.81%
78	Washington Teachers Plan 2/3	2.96%	12.38%		12.81%
79	West Virginia PERS	3.47%	14.61%		14.76%
80	West Virginia Teachers	3.44%	14.48%		14.60%

These are rough estimates generated using index returns and uniform assumptions with respect to asset allocation, not detailed calculations based on analysis of actual pension portfolios. So far, FY17 actual returns were off by 1.1%, on average, compared to our estimates.

Pension plan assets have continued to appreciate in Q1 FY18 at about 13% annual pace, as was the case in FY17. We estimate that, all else equal, solid gains in the past quarter would boost asset sufficiency ratio for an average pension plan by about 1 percentage point in FY18.

Market Review *Historical Monthly Bond Price Changes*

Figure 4 **Muni Benchmark Callable Scale — Average Bond Price Changes (October)**



Sources: Loop Capital

We show historical bond price changes for each point on the muni benchmark callable curve during the month of October for the last 16 years.

The returns in October were mostly negative, with bond prices declining, on average, 0.45% across the curve.

Figure 5 **Muni Benchmark Callable Scale — Average Bond Price Changes (October)**

AAA MMD - MONTHLY PRICE CHANGE

Maturity	5	10	15	20	25	30
Oct-01	0.40%	1.26%	1.17%	1.00%	0.93%	1.00%
Oct-02	-1.06%	-2.57%	-2.23%	-2.37%	-2.14%	-2.21%
Oct-03	-1.11%	-1.66%	-1.49%	-0.86%	-0.78%	-0.70%
Oct-04	0.22%	0.56%	0.80%	0.87%	0.63%	0.63%
Oct-05	-0.79%	-1.50%	-1.34%	-1.25%	-1.17%	-1.17%
Oct-06	0.09%	0.32%	0.40%	0.48%	0.71%	0.79%
Oct-07	0.13%	0.00%	0.24%	0.24%	0.39%	0.32%
Oct-08	-0.40%	-0.86%	1.10%	0.62%	-0.16%	-0.85%
Oct-09	-1.25%	-3.65%	-3.23%	-2.75%	-2.74%	-2.81%
Oct-10	-0.14%	-1.05%	-1.68%	-1.51%	-1.27%	-1.26%
Oct-11	-1.08%	-1.37%	-1.04%	-0.88%	-1.42%	-1.58%
Oct-12	-0.23%	-0.16%	-0.24%	-0.16%	0.08%	0.24%
Oct-13	1.18%	0.81%	0.64%	0.32%	0.64%	0.64%
Oct-14	0.23%	0.82%	0.81%	1.06%	0.81%	0.65%
Oct-15	0.45%	-0.08%	-0.16%	-0.16%	-0.24%	-0.24%
Oct-16	-0.50%	-1.79%	-2.02%	-2.01%	-2.01%	-2.01%
Mean	-0.24%	-0.68%	-0.52%	-0.46%	-0.48%	-0.54%
St Dev	0.69%	1.36%	1.36%	1.24%	1.18%	1.21%

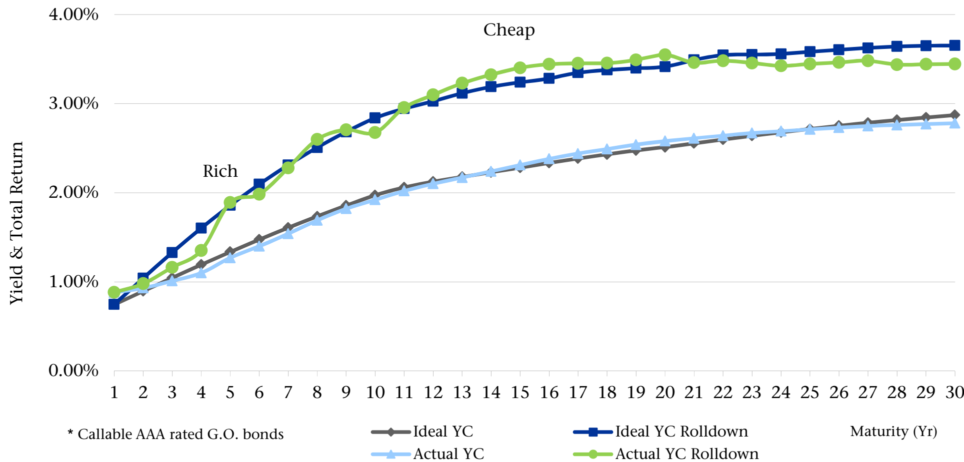
Source: Loop Capital

The 11-yr point has the lowest expected return.

The 10 to 16-year range was most volatile, with standard deviation of monthly bond price changes of 1.35%.

Market Review *The Yield Curve*

Figure 6 **1-Year Forward Roll-down—Muni Benchmark Curve* (September 26, 2017)**

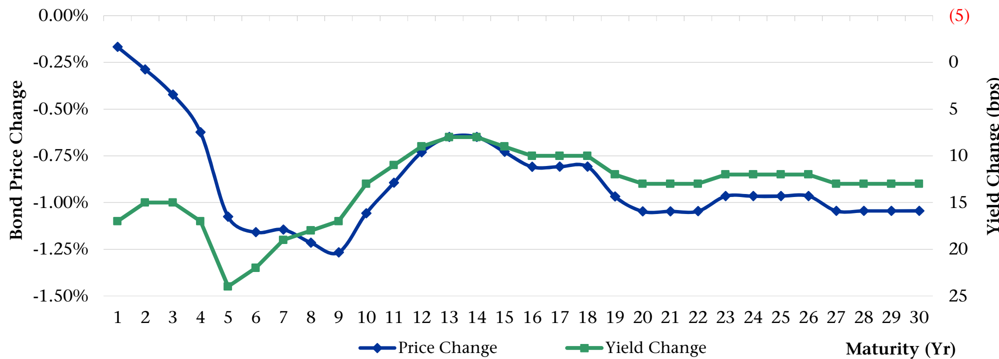


Source: Loop Capital | *Callable AAA-rated G.O. bonds

The yield curve shows rich (3 to 4-yr, 10-yr, 23+ yr) and cheap (13 to 20-yr) points on the AAA MMD curve, based on one year holding period returns and assuming no change in the yield curve. 20-yr maturity offers the highest expected total return.

Actual returns will depend on the level and shape of the yield curve a year from now.

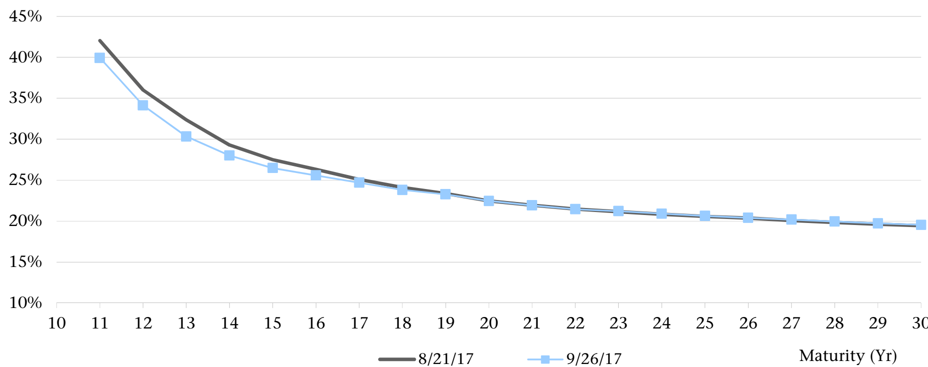
Figure 7 **Monthly Price Change — AAA GO Bonds* (9/1/17 — 10/2/17)**



Source: Loop Capital | *Price Change Only

Bond prices slumped in September, as yields rose 17 to 24 bps in the 4 to 9 year range and 13 bps on the long end of the curve.

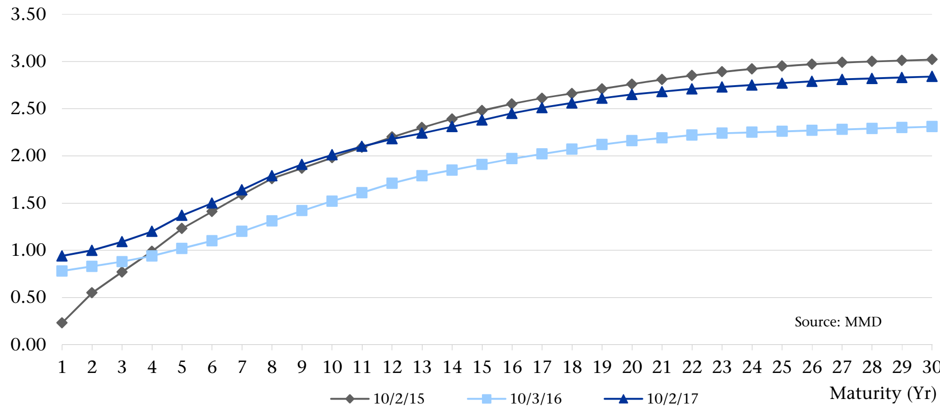
Figure 8 **Implied Municipal Volatilities**



Source: Loop Capital | *10-year call

Implied volatilities declined moderately in the 11 to 15 year range, but remained essentially unchanged on the long end of the curve over a five week period ending on September 26.

Figure 9 **Current vs. Historical Municipal Yield Curves (%)**

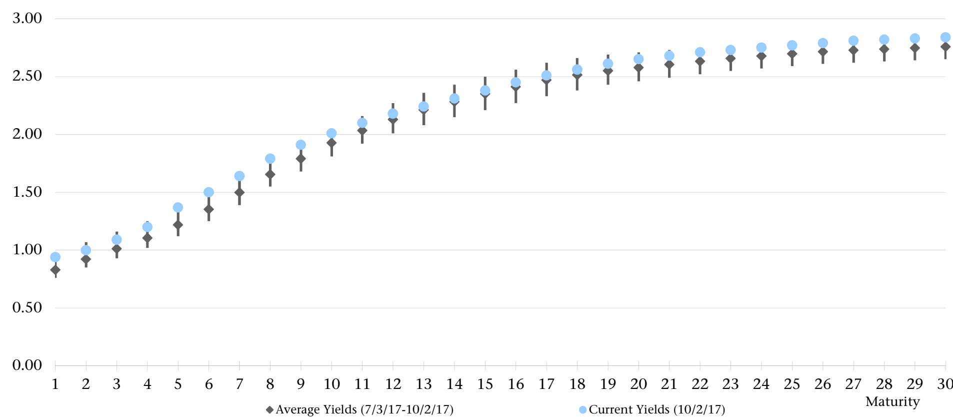


Source: MMD

Yields are about 50 bps higher, on average, than they were in October 2016.

The curve has flattened by about 90 points over the last 2 years.

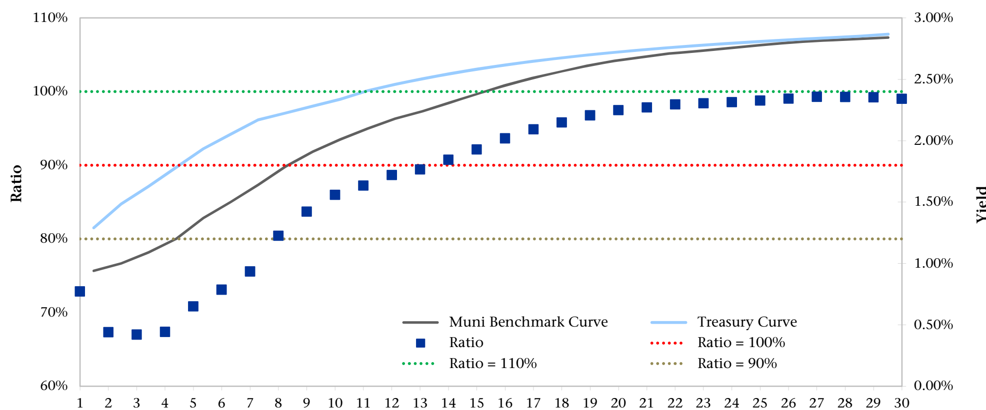
Figure 10 **3-Month Average Benchmark Muni Curve Yield**



Source: MMD

Muni yields are close to, or at their highest levels in 3 months on the front and long ends of the curve. It should be noted that yield ranges are unusually narrow, 24 bps on average.

Figure 11 **Muni and Treasury Yield Curves and Ratios**



Source: MMD, Eikon

The ratio curve has largely returned to the familiar upward sloping shape.

The ratios are close to 100% on the long end of the curve.

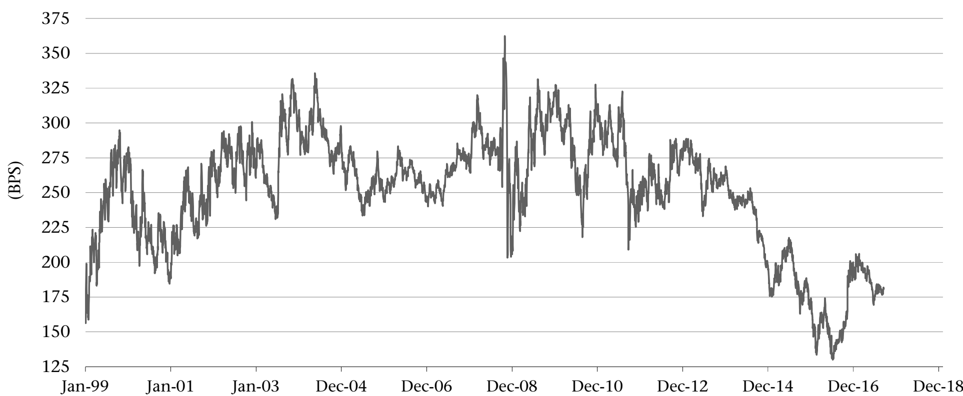
Market Conditions

Figure 12 **2 to 30-Yr Muni Spread (bps)**

Source: Federal Reserve

The slope of the curve increased 11 bps in Q3 and appears to be range-bound.

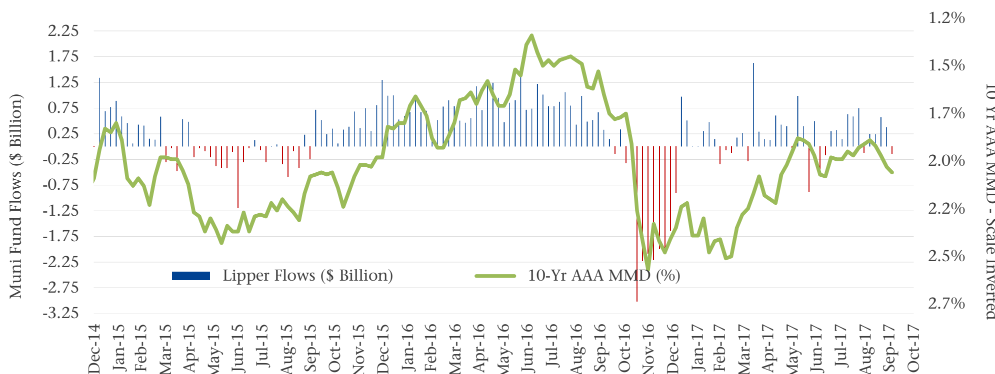
Figure 13 **Inflation Expectations**



Source: FRED

Fed's five-year forward breakeven inflation rate, derived from TIPS and regular Treasury yields, has stabilized around 1.75% lately.

Figure 14 **Lipper Weekly Municipal Mutual Fund Flows ($ Billion)**

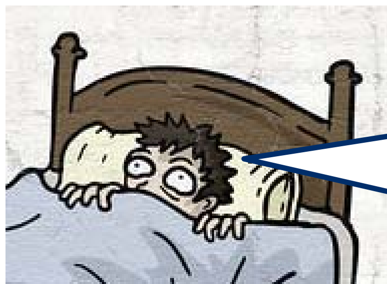


Source: Lipper

Lipper muni fund flows turned negative this week for the first time since late August. The 4-week Lipper average is positive $236MM.

Loop Capital Markets Upcoming Negotiated Calendar

Date	Par Amount ($ mil)	Issue	Loop Capital's Role
10/10/17	105.5	State of New York Mortgage Agency Homeowner Mrtg. Rev. Bonds, AMT, Non-AMT	Co-Manager
10/12/17	2,569.5	North Texas Tollway Authority System Revenue and Refunding Bonds Series 2017	Co-Manager
10/13/17	1,000.0	New York City Transitional Finance Authority Building Aid Revenue Bonds	Co-Manager



Analytical Services Division

Loop Capital Markets' Analytical Services Division (ASD), established in 2002, publishes a variety of reports that provide clients with relevant and timely information about the bond market and investor demand. The ASD is one of the largest analytics groups dedicated to investment banking, providing analytics and commentary on the economy, monetary policy, and a variety of public finance issues.

Chris Mier, CFA, Managing Director
312.356.5840 | christopher.mier@loopcapital.com

Ivan Gulich, CFA, Senior Vice President
312.913.2204 | ivan.gulich@loopcapital.com

Rachel Barkley, Vice President
312.913.2297 | rachel.barkley@loopcapital.com

Maura Murrihy, CFA, Vice President
312.913.2236 | maura.murrihy@loopcapital.com

Vania Petkova, Vice President
312.913.2229 | vania.petkova@loopcapital.com

Loop Capital, founded in 1997, is a highly client-focused investment bank, brokerage and advisory firm that provides capital solutions for corporate, governmental and institutional entities across the globe.

Loop Capital Markets and its affiliates serve clients in corporate and public finance, financial advisory services, taxable, tax-exempt and global equity sales and trading, analytical services, and financial consulting services.

Headquartered in Chicago, the firm has over 180 professionals in 22 offices across the country. Find more information at www.loopcapital.com.

Loop Capital® is a registered trademark of Loop Capital Holdings, LLC. Securities and investment banking services are offered through Loop Capital Markets LLC. Loop Capital Markets LLC is a registered broker-dealer and a member of the Financial Industry Regulatory Authority (FINRA), the Municipal Securities Rulemaking Board (MSRB) and the Securities Investor Protection Corporation (SIPC). Swap related services are offered through Loop Capital Strategies, LLC. Loop Capital Strategies is an Introducing Broker registered with the Commodity Futures Trading Commission (CFTC) and member of the National Futures Association (NFA). Loop Capital prepared this product for informational purposes only. This product and the information herein (collectively "Information") is not a research report and it should not be construed as such. The Information has been gathered from sources believed to be reliable, but is not guaranteed and is not a complete summary of all available data. Any historical price(s) or value(s) are also only as of the date indicated and from any source that may be noted. Loop Capital is under no obligation to update opinions or other information. Any opinions expressed by Loop Capital represent our present opinions as of the date of this Information and are subject to change without further notice. The Information, including proposed terms and conditions, are indicative and for discussion purposes only. Finalized terms and conditions of any transaction or engagement are subject to further discussion and negotiation and will be evidenced by a formal agreement. Any reproduction, redistribution or transmission of the Information, in whole or in part, without the prior written permission of Loop Capital is prohibited. Except as required to comply with applicable law or regulation, Loop Capital makes no warranty whatsoever (including but not limited to, warranties as to quality, accuracy, performance, timeliness, continued availability or completeness) as to the Information contained herein. This product may not be posted to a website without prior approval by Loop Analytical Services Division. The Information contained is not an offer to buy or sell or a solicitation of an offer to buy or sell any security or instrument or to participate in any trading strategy. Loop Capital does not provide accounting, tax or legal advice; however, you should be aware that any proposed indicative transaction could have accounting, tax, legal or other implications that should be discussed with your advisors and or counsel. The Information should not be relied upon for the maintenance of your books and records or for any tax, accounting, legal or other purposes. Subject to applicable law, you may disclose any aspects of any potential transaction or structure described herein that are necessary to support U.S. federal income tax benefits. The fact that Loop Capital has made the Information or other information available to you constitutes neither a recommendation that you enter into or maintain a particular transaction or position nor a representation that any transaction is suitable or appropriate for you. Transactions involving derivative or other products may involve significant risk and you should not enter into any transaction unless you fully understand the risks and have independently determined that such transaction is appropriate for you. Loop Capital shall have no liability, contingent or otherwise, to you or to any third parties, or any responsibility whatsoever, for the correctness, quality, accuracy, timeliness, pricing, reliability, performance or completeness of the Information, data or formulae provided herein or for any other aspect of the performance of the Information. In no event will Loop Capital be liable for any damages (including special, indirect, incidental or consequential damages) which may be incurred or experienced on account of your use of the information provided herein or this website, even if Loop Capital has been advised or the possibility of such damages. Loop Capital will have no responsibility to inform you of any difficulties experienced by Loop Capital or any third parties with respect to the use of the Information or to take any action in connection therewith. Loop Capital and its affiliates, officers, directors, and employees, including persons involved in the preparation of this website, may from time to time have "long" or "short" positions in and buy or sell, the securities, derivatives (including options) or other financial products thereof, of entities mentioned herein. In addition, Loop Capital and/or its affiliates may have served as manager or co-manager of an offering of securities by any such entity. Further information may be obtained upon request. Unless otherwise agreed in writing between you and Loop Capital, Loop Capital is acting solely as a principal/underwriter in an arm's length commercial transaction in which Loop Capital has financial and other interests that differ from yours. Loop Capital is not acting as a municipal advisor, financial advisor or fiduciary and the information provided should not be construed as "advice" within the meaning of Section 15B of the Securities Exchange Act of 1934.