CPIM

CENTER FOR PUBLIC INVESTMENT MANAGEMENT

A PROGRAM BROUGHT TO YOU BY:

JOSH MANDEL

TREASURER OF OHIO

General Session: Current Trends in Public Finance

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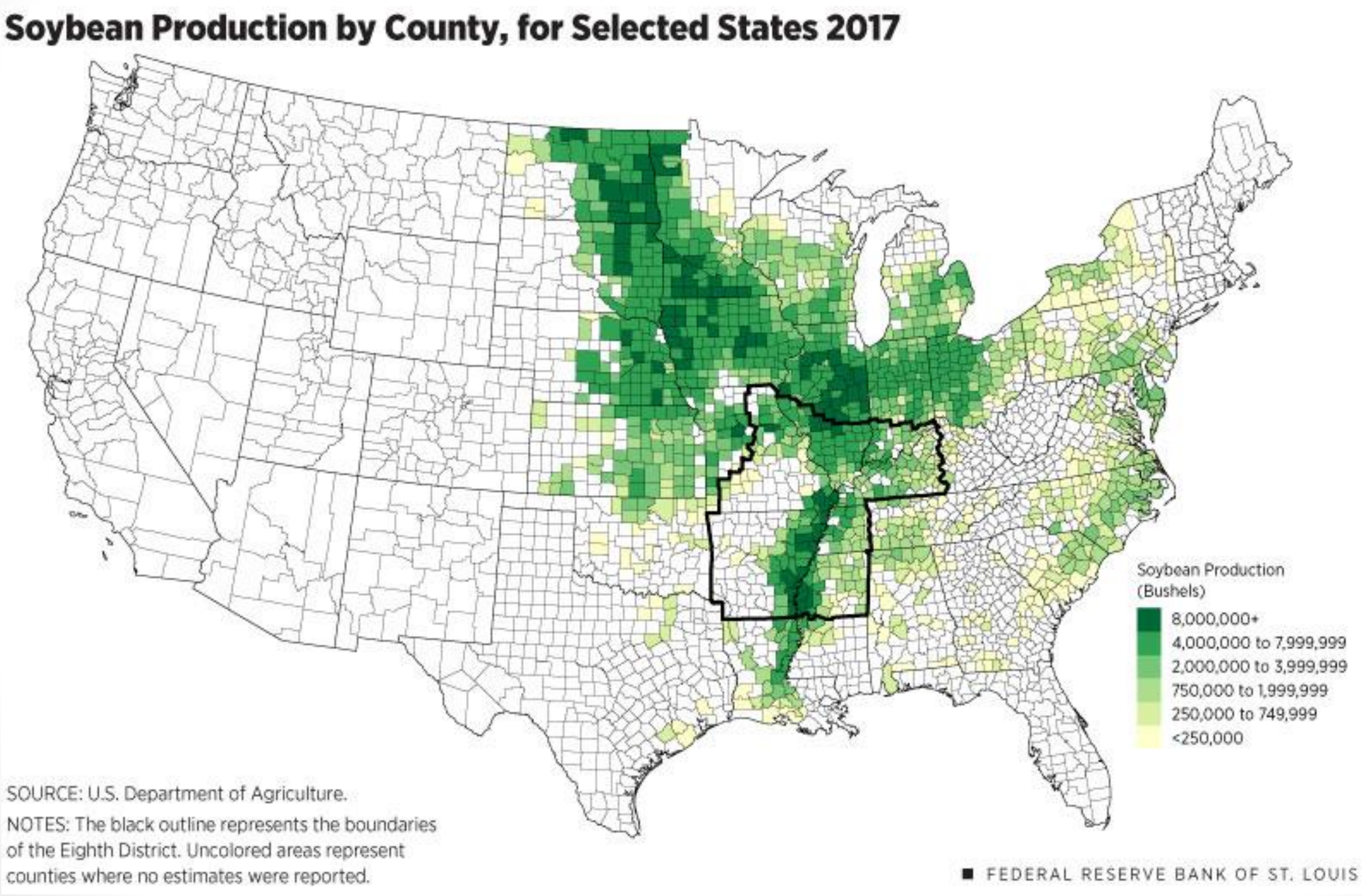
Economy

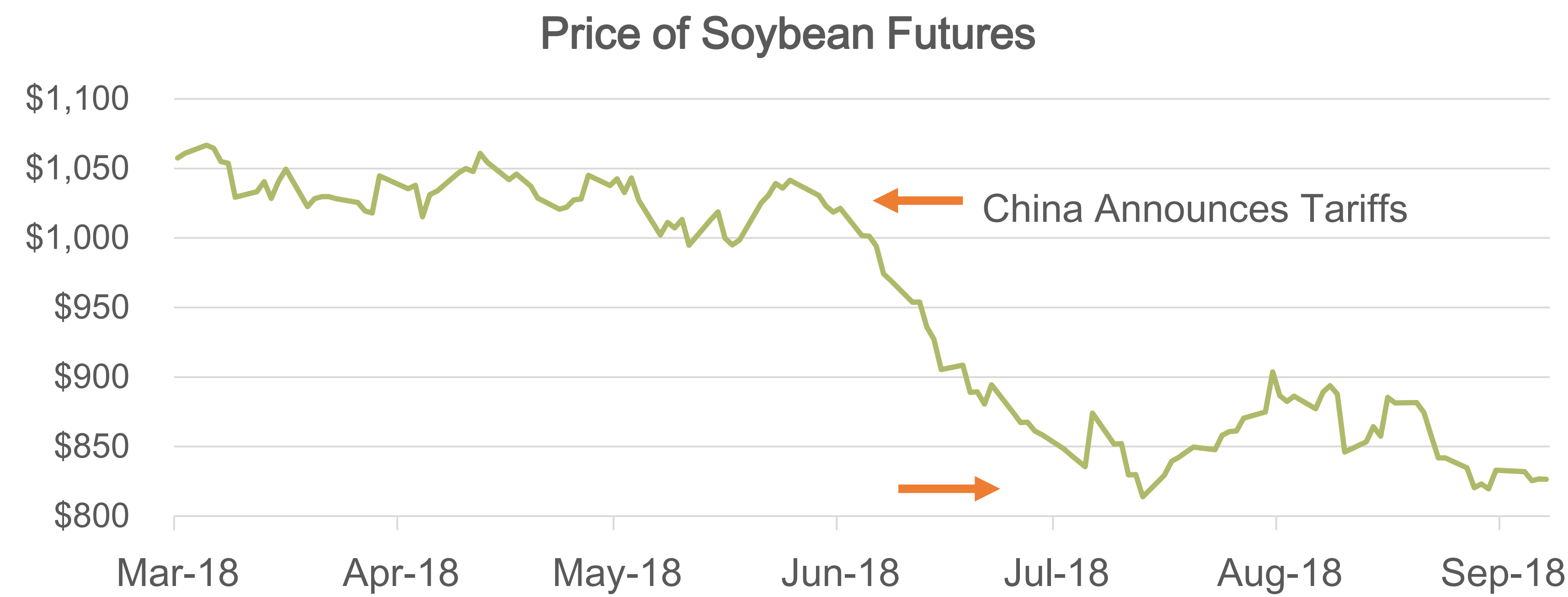
What About the Tariffs

- Until the establishment of the Federal income tax in 1913, tariffs were the greatest source of Federal Revenue (at times comprising 95%).
- U.S. tariffs have been at historical lows and are among the lowest in the world

Tariffs – Who are They Affecting



Tariffs – What about Ohio

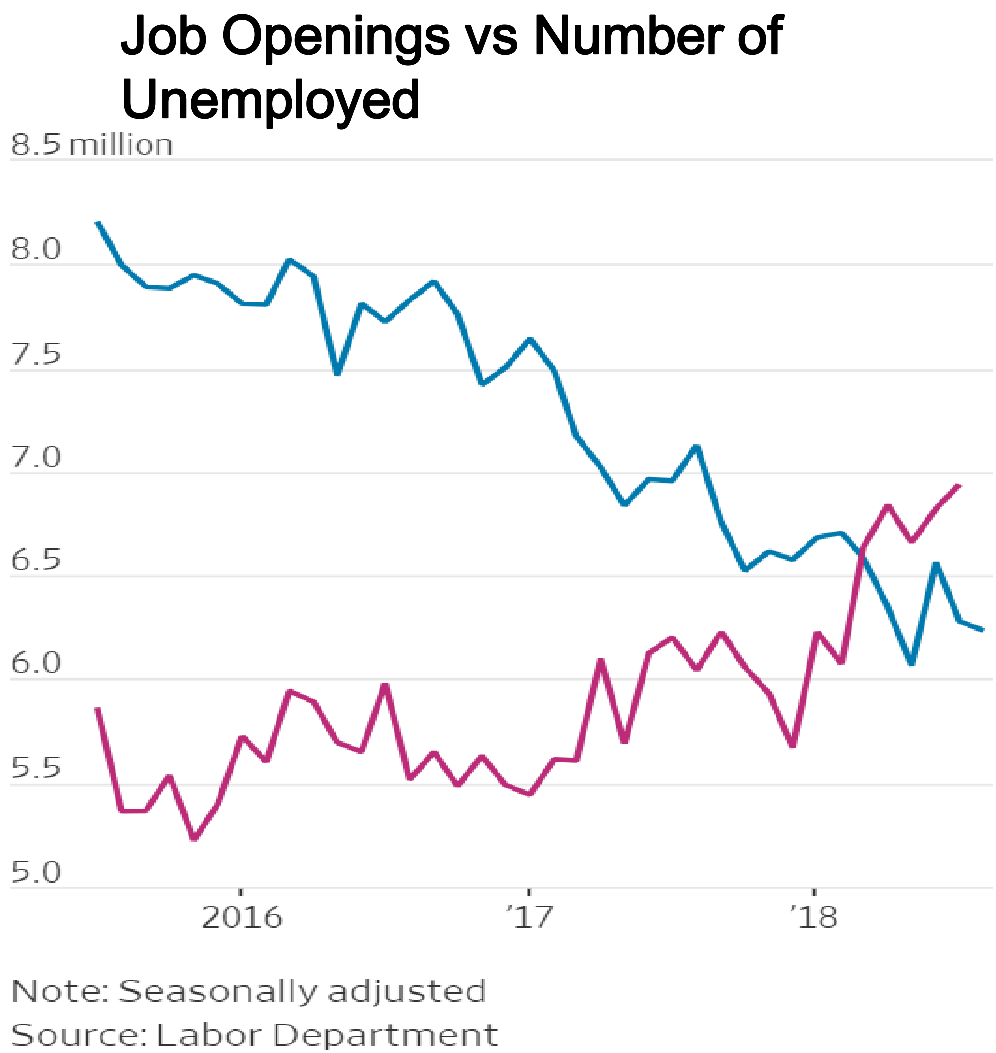


Source: Bloomberg, Data as of 9/17/18

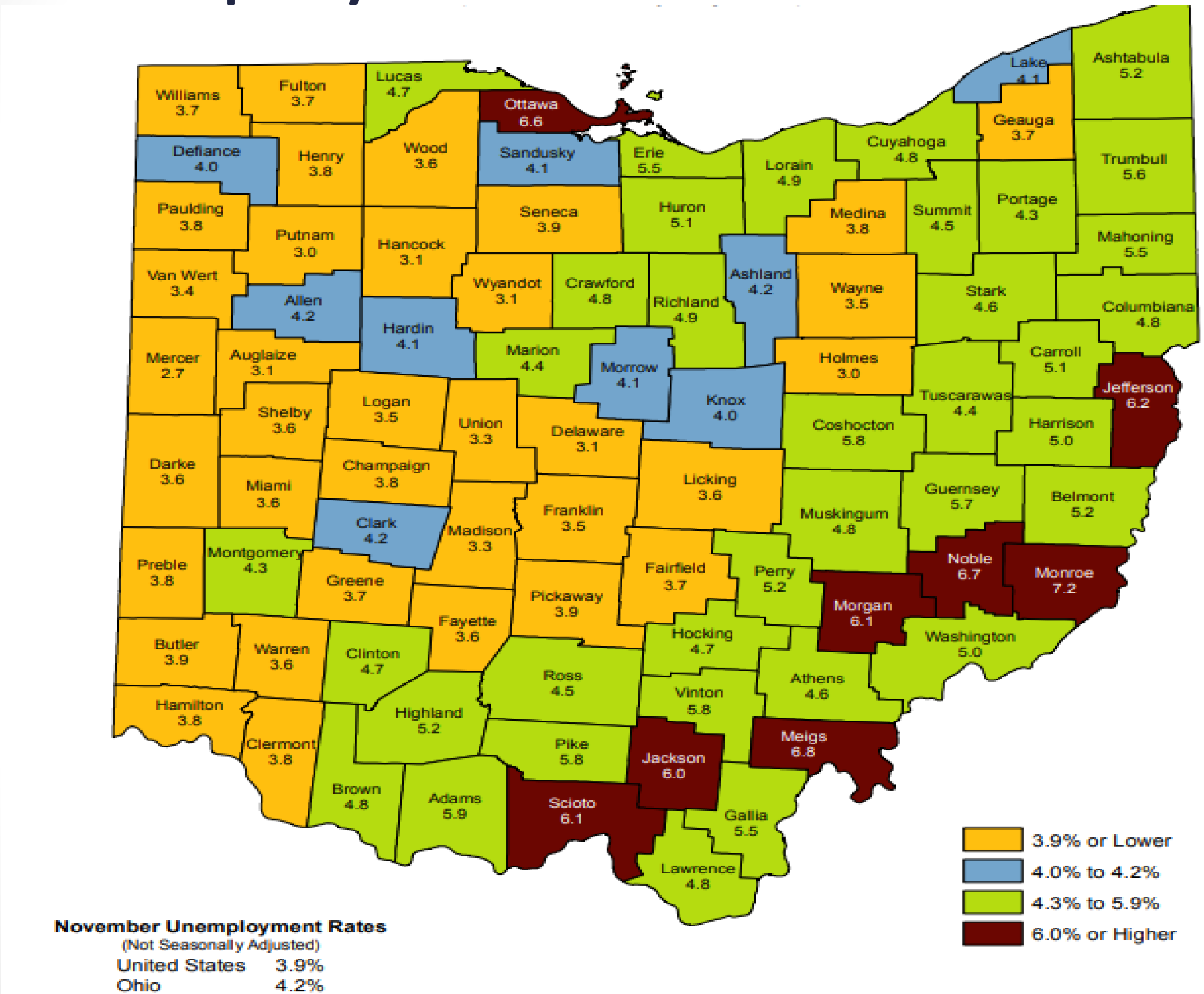
- Soybeans are Ohio's largest agricultural export (31% goes to China), and China has imposed a 25% tariff on U.S. soybeans.
- A recent study by Ohio State University projected a 59% decrease in annual net farm income based on historical trends and yields.[1]
- The USDA has proposed up to $12 billion in aid to U.S. farmers, including $3.6 billion to soybean farmers.

1 https://cfaes.osu.edu/news/articles/soybean-tariff-how-much-could-it-cost-ohio-farmer

Anyone Need a Job?

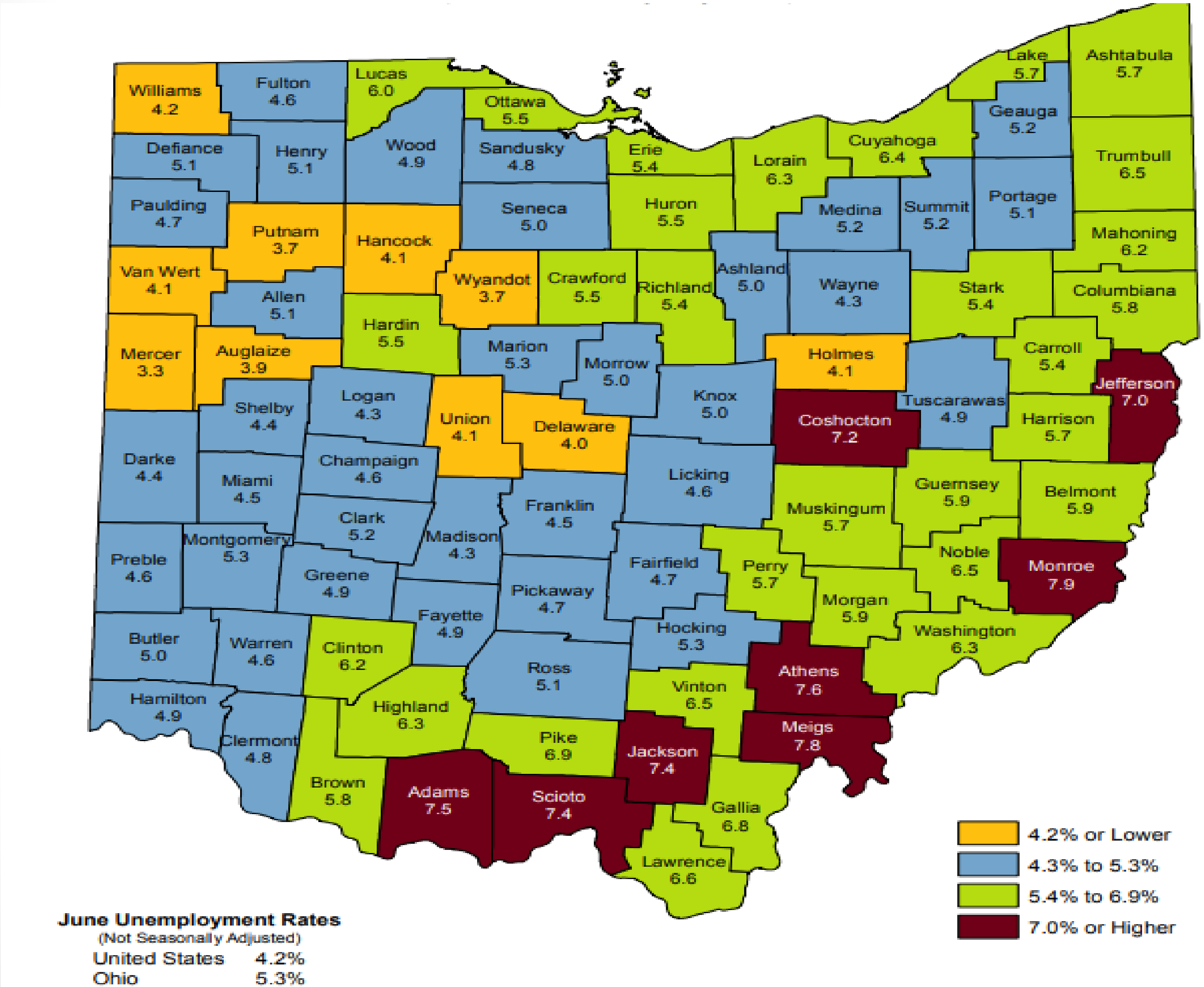


Unemployment – Ohio Nov 2017



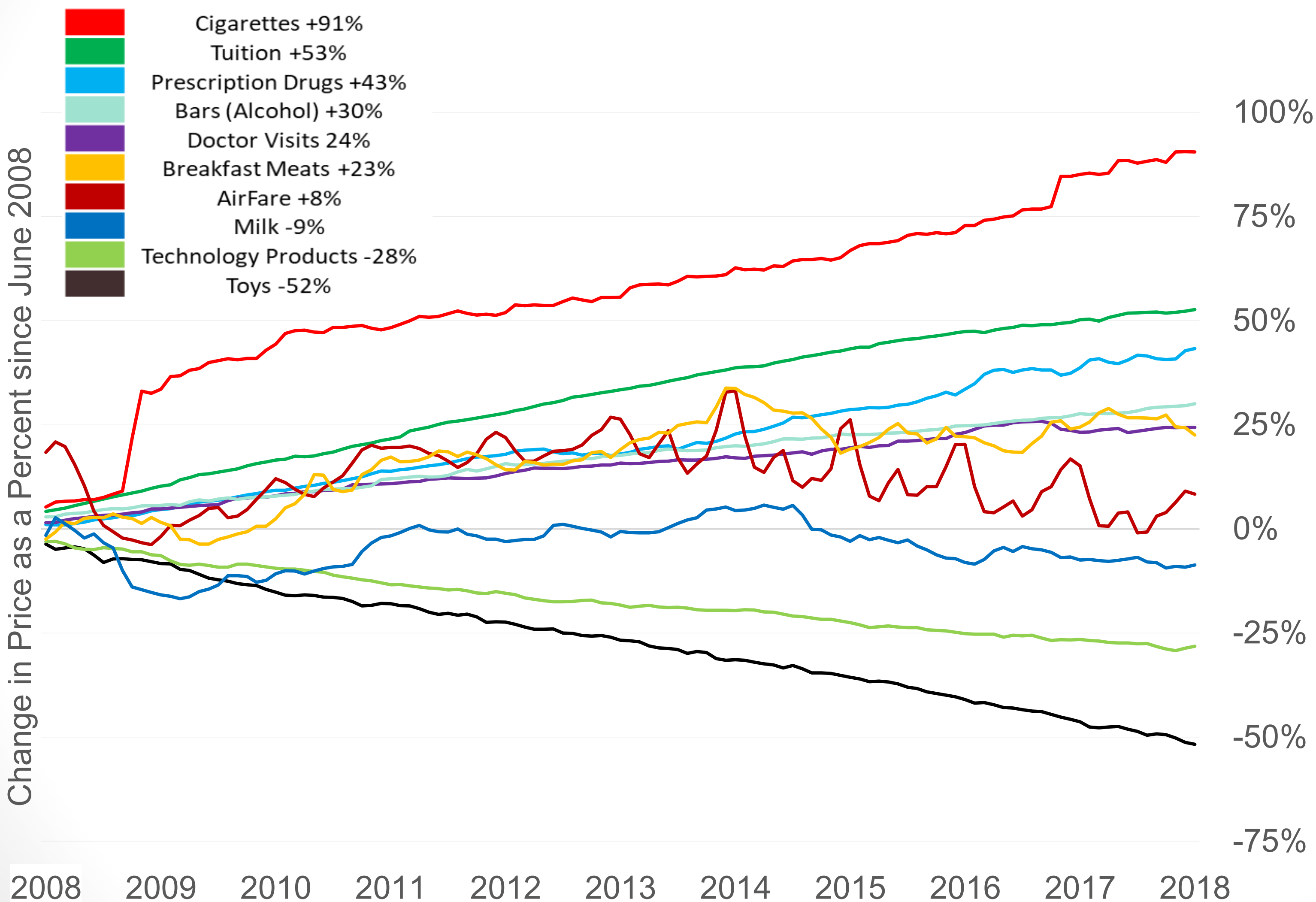
Source: Ohio Department of Job and Family Services: November 2017 – Not seasonally adjusted.

Unemployment – Ohio June 2018



Source: Ohio Department of Job and Family Services: June 2018 – Not seasonally adjusted.

Inflation



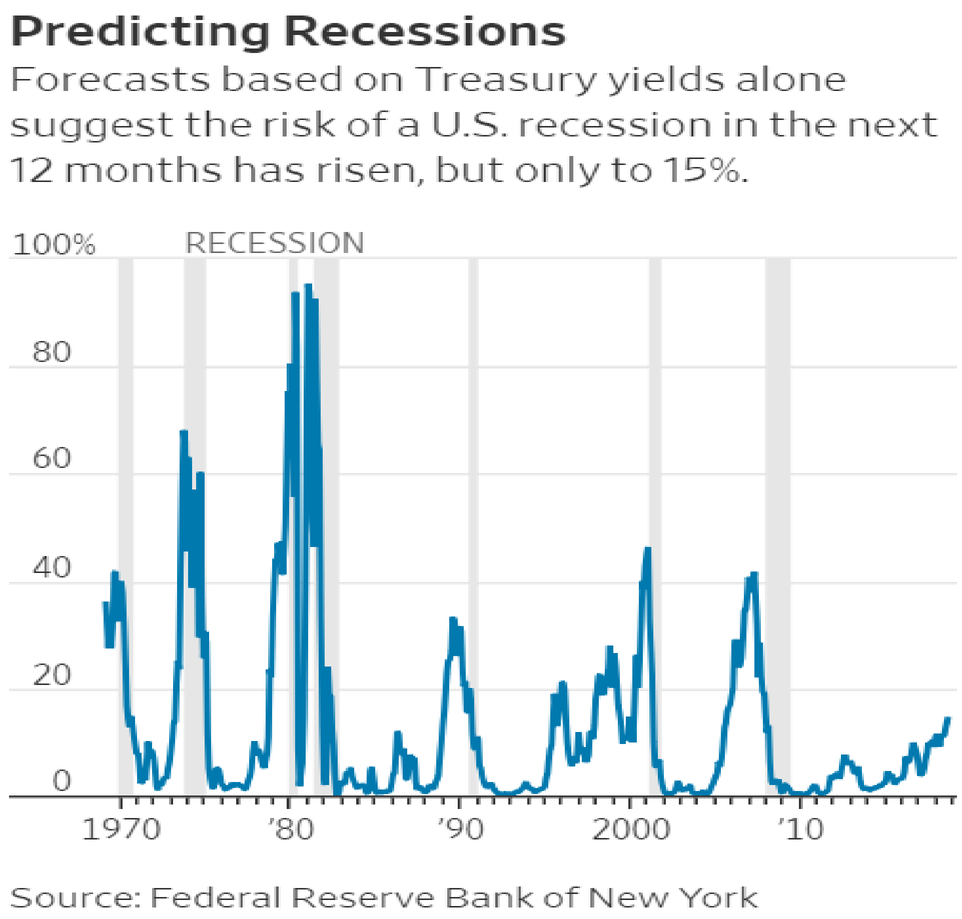
Source: Bloomberg, Data as of 6/30/18

Other Interesting Topics

Interest Rates - Global

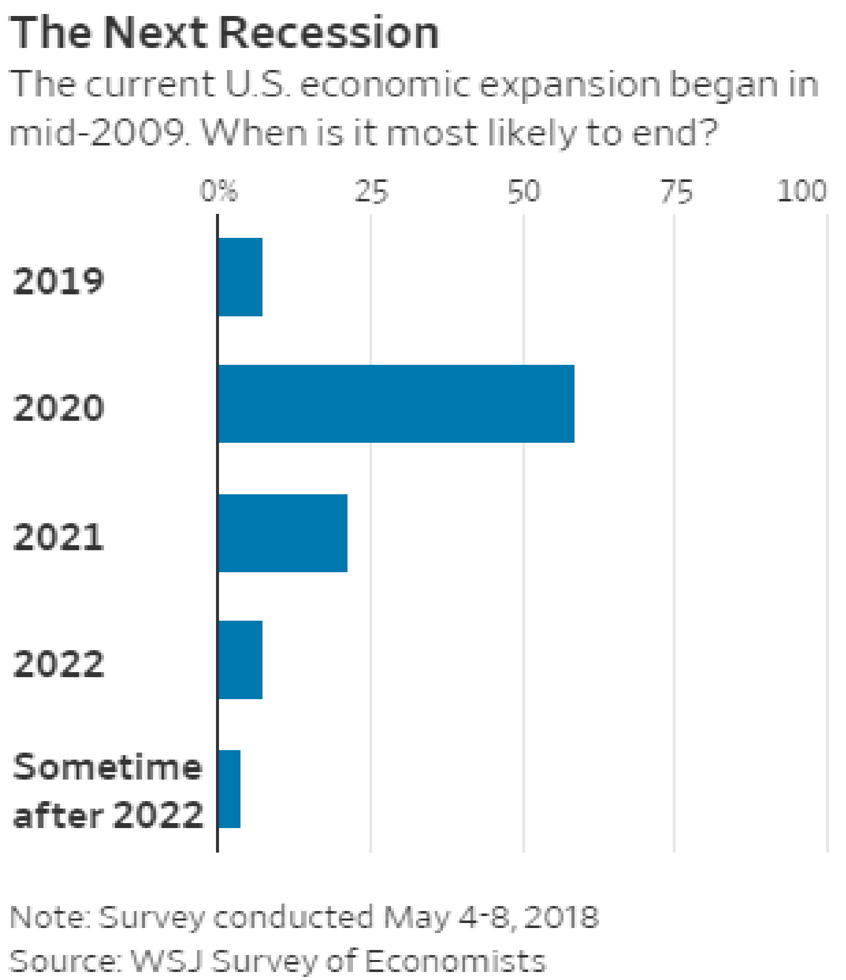
Source: Bloomberg August 2018

Looking Ahead – Signs of the Next Recession



What To Look For: The Next Recession

- Real Estate Values
- Deficit Spending
- Subprime Loans
- Overseas Concerns
- Continued Domestic Growth



Investing Today

Investing Today

STAR Ohio

- Been increasing over past few years
- Approximately 2.13%
- Will track future Fed Funds Rates

STAR Ohio PLUS/MMAX/ ICS

- Rates slower to update
  - 2.13% at STAR Plus for balances up to $2.5 million
- Determine if still offers value
- Different rate structures

Local Bank Sweep Accounts

- Rates not increasing as fast
- May be locked into rate
- Work with bank on target balance to cover bank fees

Source: Star Ohio August 9, 2018

Investing Today - Bank Account

Assumptions
Avg Bank Balance = $10,000,000
Earnings Credit = 0.20%
Monthly Fees = $1,000

All cash held at bank	
Value of credit	$1,700
Unused credit	$700
Total interest earnings	**$0**
Minimum balance to offset fees	*$6,000,000*

Move monies to other liquid accounts	
Maintain smaller balance	$2,000,000
Invest in MMF at 2.00%	$8,000,000
Monthly fees	$1,000
Value of credit	$350
Actual monthly fees	$650
Total net interest earnings	**$12,680**
Annualized	$152,160

Investing Today

Traditional Bank CD

- Secured by collateral
- Held at local bank
- Receive collateral statements

CDAR

- Purchased at local bank
- Secured by multiple CD's all under FDIC $250,000 limit
- Receive one statement with all underlying CD's

Brokered CD

- Purchased through broker, work with more than one
- Considered a marketable security
- Price fluctuations
- Need to monitor, no more than $250,000 per FDIC number, including any holdings at STAR Plus, CDAR's, or similar products

Investing Today

Government Agencies

- Ask questions
- Receive multiple quotes, different brokers offer different prices
- Understand cash flows

Callable Bonds

- Slightly higher yields
- Understand call structure
- Reasonable/acceptable percentage of portfolio

Commercial Paper

- Short-term yields can offer value
- Credit analysis must be performed
- Understand your risk tolerance

Liquidity

- No two bonds trade alike
- Understand market risk– price fluctuations

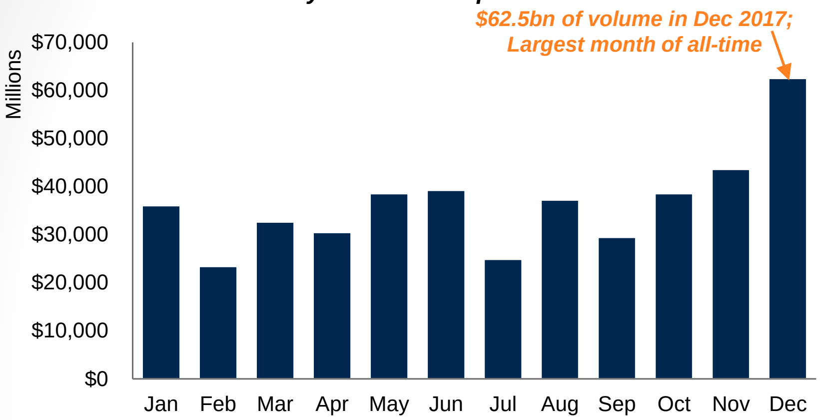
Questions

2017 Year in Review | Municipal Bond Market Characterized by Consistent Buyer Demand

Strong demand in municipal market coupled with modest supply created favorable conditions for issuers

Municipal Bond Issuance

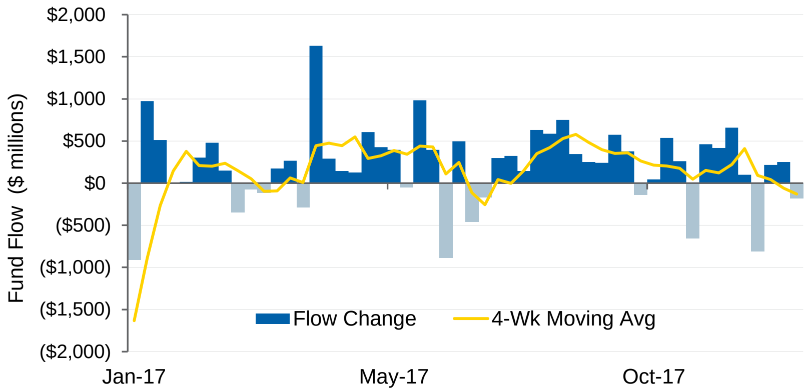
The first two weeks in December ranked #1 and #2 as the heaviest volume weeks in the history of the municipal market



Source: Thomson Reuters SDC Platinum

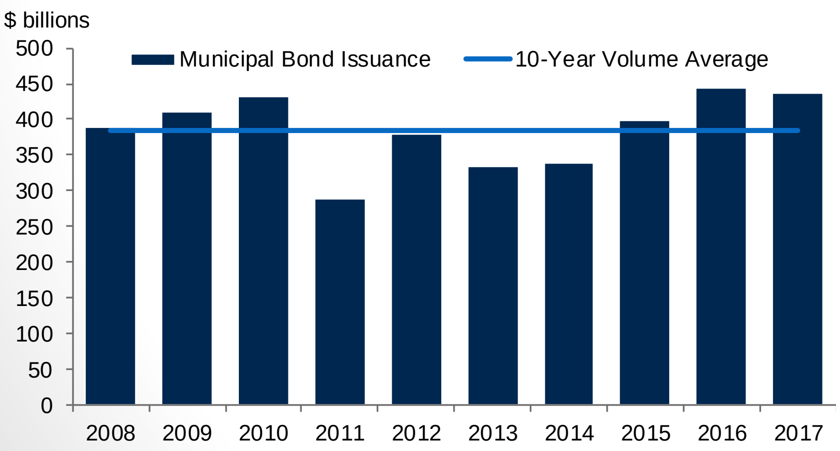
Municipal Bond Fund Flows

Bond funds experienced net inflows in 42 weeks during 2017



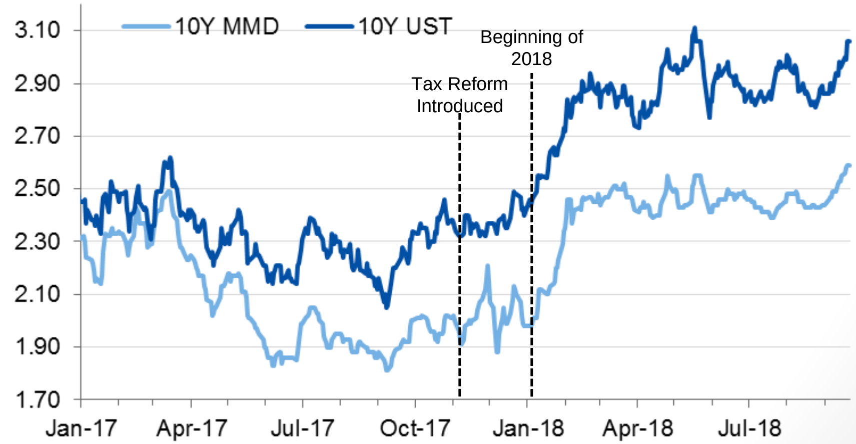
Source: Lipper

Municipal Volume over Last 10 Years



Source: Bond Buyer Decade of Municipal Bond Finance

10 Year MMD and 10 Year UST



Source: Thomson Reuters – The Municipal Market Monitor (TM3), as of September 21, 2018

Tax Cuts and Jobs Act of 2017

- The Tax Cuts and Job Act of 2017 eliminates the use of tax-exempt bonds for purposes of advance refunding outstanding tax-exempt bonds
  - The elimination of advance refundings is projected to reduce annual tax-exempt issuance by 20-25%. Private Activity Bonds (PABs) were preserved under the Act but may potentially be a target again in 2018 as revenue raising becomes a priority in any budget discussions
- December issuance set an all-time monthly record with over $60 billion of tax-exempt issuance brought to market
  - Much of December issuance was advance refunding transactions to close by the December 31 deadline
- Wall Street forecasts for tax-exempt debt issuance in 2018 call for significantly lower yearly total with RBCCM projecting just $285 billion, a nearly 35% decline from 2017's total of $432 billion
- The reduction in the corporate tax rate to 21% will likely impact certain key investors (primarily banks and insurance companies) appetite for holding tax-exempt debt
  - The extent of the impact on their future purchases of tax-exempt debt is yet to be determined
  - On the positive side, the minor reduction in the maximum individual tax rate to 37% is not expected to lessen demand from individual investors for tax-exempt debt
- **While the overall impact of the Tax Cuts and Job Act of 2017 on the municipal market overall is yet to be determined, the combination of significantly lower debt issuance combined with the expected strong demand from individual investors should allow the municipal market to perform well in the new environment**
- The Federal Reserve interest rate tightening program that began in December 2015 has resulted in five hikes to date but relatively little change in long-term interest rates
  - Most Wall Street forecasts include 3 to 4 additional hikes in 2018 as the Fed aims to approach a 3.00% long-term target for the Fed Funds Rate
  - Additionally the Fed is still in the early stages of the reversal of its quantitative easing program that resulted in the huge build up of its balance sheet
  - The unwind that began in 2017 is increasing from $10 billion to $20 billion a month in 2018
  - The Tax Cuts and Job Act of 2017 is certainly expected to be a further stimulus for the economy with some forecasters predicting 3.5-4.0% GDP growth
  - The combination of the strong economy, record setting equity markets, continued Fed tightening through rate hikes and deleveraging its balance sheet and the expected stimulus from the Tax Bill could all potentially put pressure on the still very low levels of long-term interest rates

Source: Bond Buyer

Summary of Major Tax Reform Provisions and Effect on Municipal Buyers

Issue/Affected Party	2018 Tax Plan
Individuals	▪ Adjusts individual income tax rates and thresholds, creating six rates of 10%, 12%, 24%, 32%, 35% and 37% ▪ Increases the standard deduction to $12,000 / $18,000 / $24,000 ▪ $10,000 cap on property tax and state and local income taxes (SALT) paid deduction
Corporations	▪ Lowers the corporate income tax rate to 21%
Property and Casualty Insurance Companies	▪ Replaces the fixed 15% *reduction in the reserves* deduction with a fixed 26.25% *reduction in the reserves* deduction – Keeps it consistent with current law by adjusting the rate proportionately to the decrease in the corporate tax rate ▪ The proration rule imposes a partial tax on tax-exempt interest earned by P&Cs, and the change in the bill would increase that tax relative to P&Cs general tax rate

Issue/Affected Party	2018 Tax Plan
Private Activity Bonds	▪ Permitted
Advance Refundings	▪ Prohibits tax-exempt advance refundings
Alternative Minimum Tax	▪ Corporate AMT is eliminated ▪ Individual AMT exemption amount is raised from $84,500 to $109,400 (married filing jointly) ▪ The exemption amount phase-out will be increased to $1,000,000
Tax Credit Bonds	▪ All rules for issuance of tax credit bonds repealed
Professional Sports Facilities Bonds	▪ Permitted

Source: taxfoundation.org, KPMG Tax News Flash Report, Sullivan & Cromwell LLP U.S. Tax Reform: Insurance Company Provisions Report, and Forbes.

Economic Update

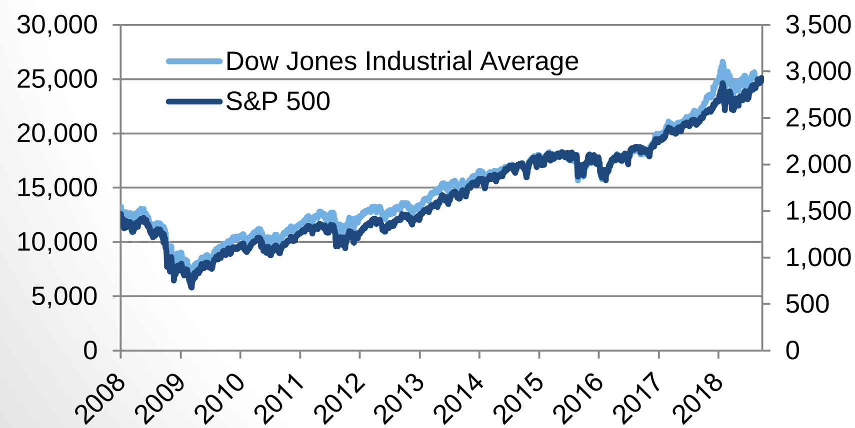
Bond Buyer 20 GO Bond Index Since 1961

% of Time in Each Range Since 1961

Yield Range	
Less than 3.50%	10.10%
3.50% - 4.00%	10.43%
4.01% - 4.50%	10.80%
4.51% - 5.00%	10.07%
5.01% - 5.50%	14.03%
5.51% - 6.00%	9.77%
6.01% - 6.50%	7.57%
6.51% - 7.00%	6.90%
7.01% - 7.50%	6.23%
7.51% - 8.00%	3.67%
Greater than 8.00%	10.43%
Total	**100.00%**

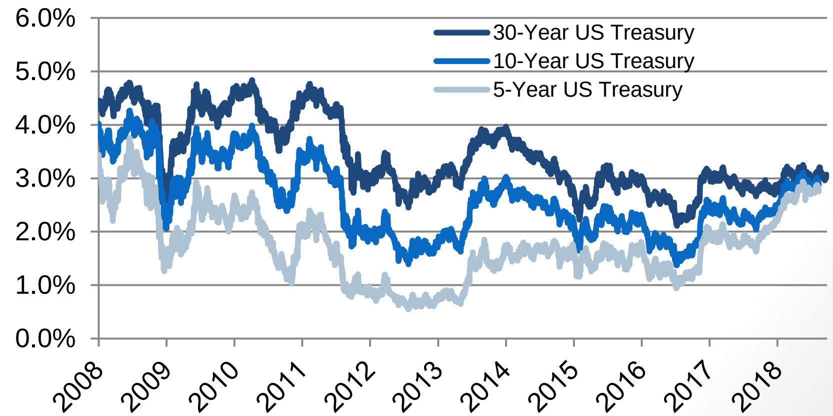
Source: Bloomberg as of September 20, 2018. Weekly yields and indexes released by the Bond Buyer. Updated every Thursday at approximately 6:00pm EST. 20 Bond General Obligation Yield with 20 year maturity, rated Aa2 by Moody's Arithmetic Average of 20 bonds' yield to maturity

U.S. Equity Market



Source: Bloomberg

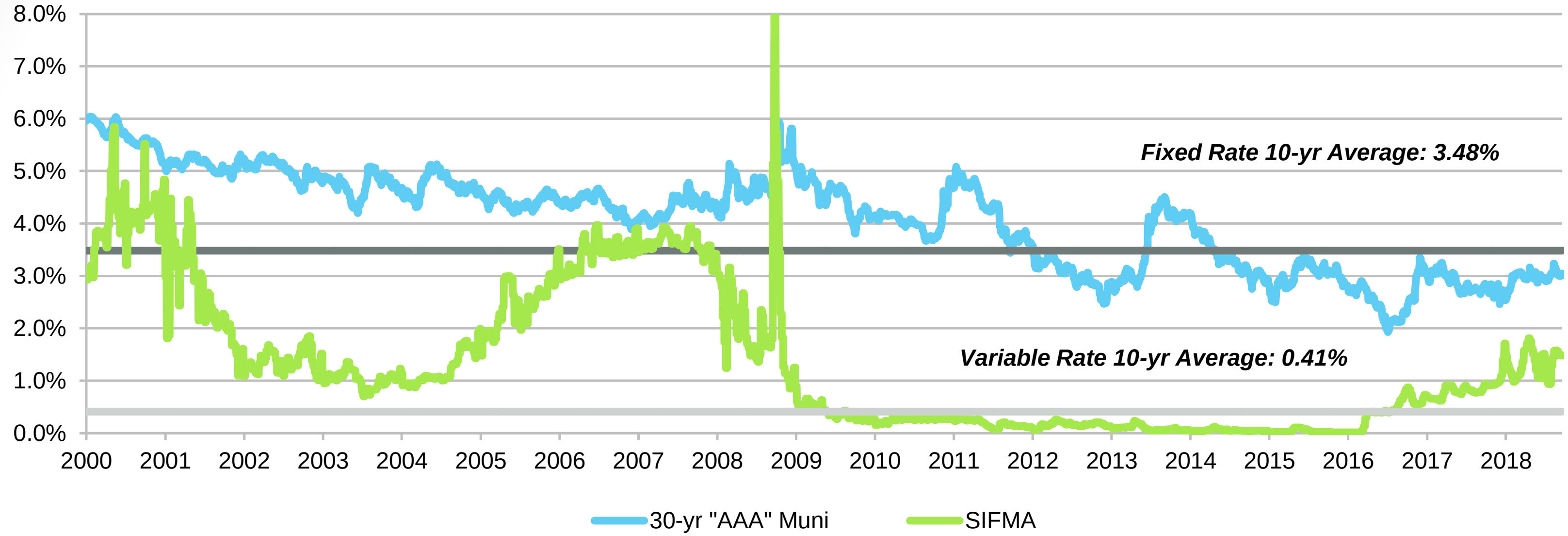
U.S. Treasury Rates



Source: Thomson Reuters

Current Capital Market Conditions | Tax-Exempt Marketplace

Long-Term View: Short-Term and 30-Year Tax-Exempt Yields Since 2000…



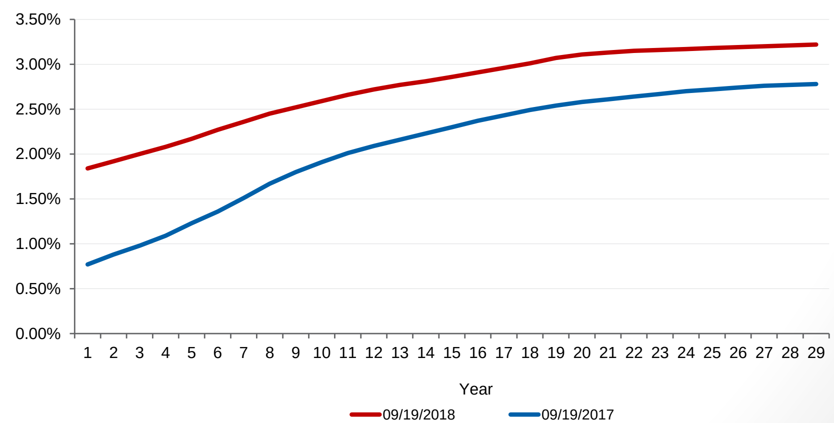
Source: Thomson Reuters – The Municipal Market Monitor (TM3), Bloomberg

Long Term Yields Below 10-year Average

- 30-year "AAA" MMD currently **3.04%**
  - 111bps off all-time low of 1.93%
  - 44bps below 10-year average of 3.48%
  - 30-year Tsy Yield currently 3.05%
  - Muni-to-Tsy ratio at 99.67% as Treasuries have outperformed municipals recently
- SIFMA Index currently **148bps**
  - 10-year average is 0.41%

Source: Thomson Reuters – The Municipal Market Monitor (TM3), Bloomberg
Current yields as of September 21, 2018

Municipal GO "AAA" MMD Yield Curve YOY



Source: Thomson Reuters – The Municipal Market Monitor (TM3)

Industry-Wide Estimates Projecting Municipal Issuance Will Drop Significantly Due to Tax Reform

Recent market developments should make tax-exempt bonds attractive to investors

- The Tax and Job Cut's elimination of Advance Refunding Bonds will diminish supply of new tax-exempt bonds
- Decreased supply should make bonds trade at lower ratios to taxable bonds
- Increased economic activity and the Fed's policies may guide rates higher; municipal bonds tend to price at lower ratios in rising rate environments

2018 Municipal Issuance Year to Date September 24, 2018

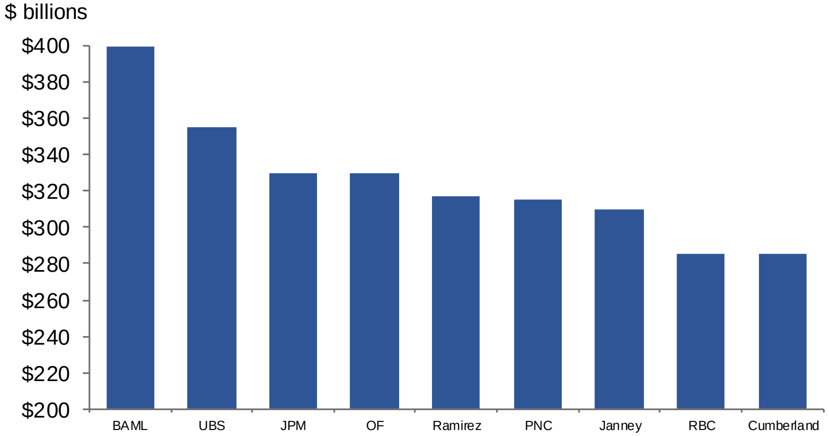
- 2018 Volume: $238bn, down 13% year-over-year
- 2017 New-Issue Volume: $410bn, down 4.3% from $428bn in 2016

Average Weekly Supply:

- 2018: $6.1bn
- 2017: $7.9bn
- 2016: $8.2bn

Sources: Bloomberg, Thomson Reuters, TM3, and RBCCM.

2018 Projected Municipal Issuance



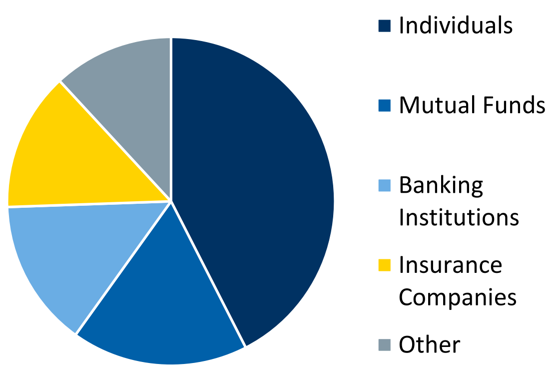
Source: Bond Buyer, "Muni analysts divided on volume forecast for 2018" , January 3, 2018

With the passage of tax reform, we generally expect new issue purchases by major asset classes to be impacted as follows:

- Individual and Professional Retail – **increased** demand
- Mutual Funds – **increased** demand
- Banking institutions – a general **reduction** in overall demand with highest impact at the shorter-end and among the highest credit grades
- Property and casualty insurers- a general **reduction** in overall demand with the highest impact at the shorter end among the highest credit grades

Source: RBC Capital Markets

Q4 2017 Holders of U.S. Municipal Securities ($billion)



Source: Thompson Reuters SDC

Current Capital Market Conditions | Week of September 24, 2018

All eyes are on the Federal Reserve this week, as a rate hike at Wednesday's meeting is fully priced into the market.

Market Commentary

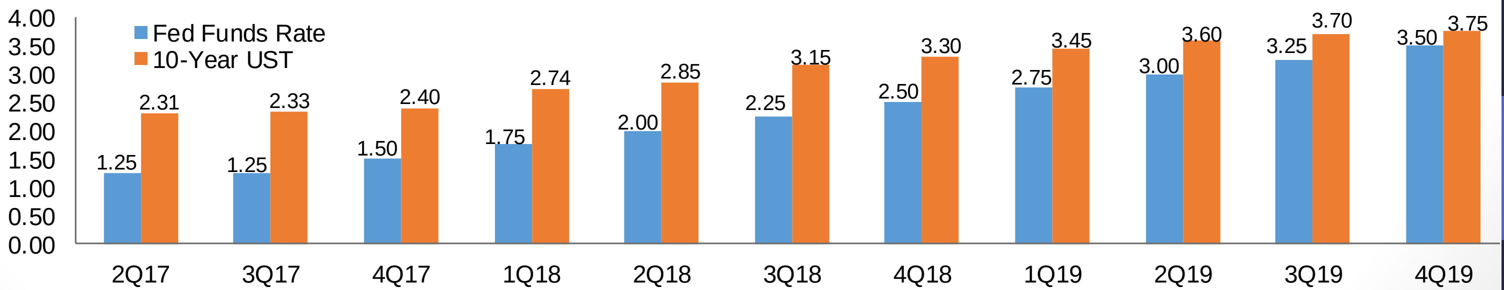
- Market participants will pay close attention to the FOMC's assessment of inflation, growth, and forward guidance.
- Fed funds futures are pricing in a 73% chance of a fourth rate hike at the December 19th FOMC meeting.
- Trade tensions escalate, with China threatening to walk away from talks with the US unless threats of additional tariffs stop.
- Equities shrugged off trade concerns, as the SPX closed at a new high on Thursday, and the DJIA followed suit on Friday.
- Treasury auctions this week total $106bn, including $37bn 2s Monday, $38bn 5s Tuesday, and $31bn 7sThursday.
- Thursday's data includes the third reading of second-quarter GDP, which is expected to show 4.2% annualized growth.
- The yield on the 10yr note is the highest since May, as economic growth propels equities higher at the expense of Treasuries.
- Pressure in the rates market continues to push muni yields higher; MMD showed mixed performance vs. USTs last week.
- Municipal supply totaled $7.7bn last week and is expected to shave $3bn this week, as issuers look to avoid the FOMC.
- Bond funds reported $141mm of net inflows into the municipal market last week; high-yield continues to attract the most cash.

Source: *RBC Capital Markets*

RBCCM Interest Rate Forecast

Forecasting Flattening Yield Curve

	Actual					Forecast					
Period	**2Q17**	**3Q17**	**4Q17**	**1Q18**	**2Q18**	**3Q18**	**4Q18**	**1Q19**	**2Q19**	**3Q19**	**4Q19**
Fed Funds Rate	1.25	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50
2-Year UST	1.38	1.47	1.89	2.27	2.52	2.65	2.80	3.00	3.25	3.40	3.55
5-Year UST	1.89	1.92	2.20	2.56	2.73	2.95	3.10	3.25	3.45	3.55	3.65
10-Year UST	2.31	2.33	2.40	2.74	2.85	3.15	3.30	3.45	3.60	3.70	3.75
30-Year UST	2.84	2.86	2.74	2.97	2.98	3.35	3.50	3.65	3.75	3.80	3.85
Spread (30-yr to 2-yr)	**146**	**139**	**85**	**70**	**46**	**70**	**70**	**65**	**50**	**40**	**30**



Source:
RBC, September 24, 2018

http://www.rbc.com/economics/economic-data/index.html

Cash Market Alternatives

Taxable Bonds
- Use taxable bonds to advance refund tax-exempt bonds with an escrow to the call date
- Negative arbitrage in the escrow is a factor just like tax-exempt advance refundings
- Issue taxable bonds with a call to allow for future tax-exempt refundings

Forward Delivery Bonds
- Bonds are sold today with a delayed delivery period
- Forward premium estimated at 7 to 8 basis points per month
- Works best for bonds with call dates within a year; could go as long as 2 years

Tender and Current Refunding
- Issuer buys back its bonds through public notice with a premium to entice investors
- Proceeds of a current refunding are used for the tender prices
- Can also use a CP program or internal liquidity to fund tender

Other Alternatives
- Cinderella Bonds
- Swap-Based Alternatives

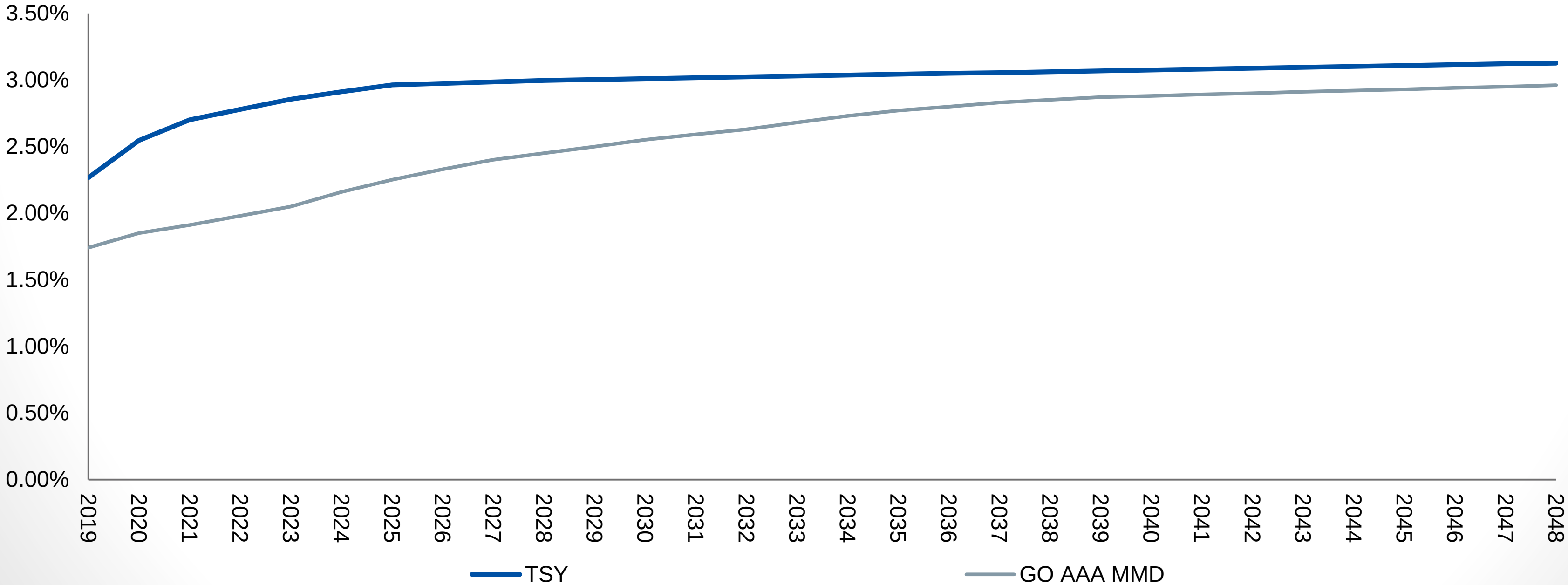
Advance Refundings with Taxable Bonds

Taxable bonds can be used to advance refund bonds with an escrow to the call date

Mechanics

- Long-term taxable bonds can be issued which are not subject to the yield restriction and arbitrage rebate rules accompanying tax-exempt bonds
  - Negative arbitrage in the escrow would still be a factor, just like in tax-exempt advance refundings
- Short-term taxable bonds can be issued which mature or are callable not earlier than 90 days before the call date of the refunded bonds
  - Once the these bonds are callable or mature, they can be refunded (or remarketed) at market tax-exempt interest rates
- Shape of the US Treasury yield curve is a factor in determining the economic viability of this structure
  - The current yield curve is relatively flat, providing a potential for substantial PV debt service savings
- Taxable yields are almost always higher than tax-exempt yields, especially on the short and intermediate parts of the yield curve, potentially reducing the savings compared to those realized in a tax-exempt advance refunding

US Treasury and MMD Yield Curves



Source: Thomson Reuters – The Municipal Market Monitor (TM3), as of August 13, 2018

Forward Delivery Bonds

Bonds are sold today with a long delivery period in the future

Mechanics

- Forward refunding is accomplished by entering into a bond purchase agreement or rate lock agreement with a bond purchaser for the purchase of tax exempt bonds to be issued not earlier than 90 days before the refunded bonds' call date
    - Due to credit and settlement risk, 12-18 months is typically the maximum forward period
- Forward premium is estimated at 7 to 8 basis points per month, but this eliminates future market risk on the refunding bonds
    - This forward premium, however, is an additional cost over current market yields for current delivery bonds
- This structure is best suited for bonds that have a call date within one year of entering into the rate lock agreement

Forward Delivery Timeline

Today — **Approval and Documentation** — **9/1/2018** — **Forward Period** — **6/1/2019**

1 **Today**

Begin refunding transaction and draft purchase/rate agreement

2 **Price Refunding Bonds**

Issue forward refunding bonds and sign documents (including purchase/rate agreement)

3 **Settlement**

Delivery of Funds / Refunding Bonds

Source: RBC Capital Markets

Tender and Current Refunding

Issuer buys back its bonds through public notice with a premium to entice investors

Mechanics

- An issuer can institute a tender offer to current holders of its outstanding bonds that are not currently callable
- To make the offer, the issuer must
  - Identify current bondholders
  - Determine a tender premium, or a mechanism for doing so (i.e., a modified auction)
  - Issue new tax-exempt bonds to fund the tender purchase
    - These bonds would be considered current refunding bonds and therefore their interest would be tax-exempt
- A tender process can last 3 to 5 weeks (or longer) and its success is not guaranteed
  - The market price of the bond, the tender premium, and the yield of the new issue would all be factors in determining the economics of the tender refunding

Illustrative Tender Example

- $50mm of 5% coupon bonds maturing in 2029 with a 2019 call date
- Current market price determined to be 103.509
- Tender premium of X
- Tender Price is 103.509 + X
- Cost of escrow is $50mm * (103.509 + X)
- Cost of escrow must be compared to remaining debt service payments (on a PV basis) to determine economic feasibility of a tender offer

Source: RBC Capital Markets

Taxable Build America Bonds Refunding Update

- The American Recovery and Reinvestment Act allowed state and local governments to issue taxable Build America Bonds ("BAB") that would receive federal subsidies to offset a portion (35%) of their interest cost
  - However, the subsidy is subject to sequestration reduction, i.e. the FY 2018 sequestration rate of 6.6% reduces the effective BAB interest rate subsidy to 32.69%
- The District can execute a tax-exempt advance refunding of the outstanding BABs to generate savings and eliminate exposure to federal sequestration
  - *While the Tax Cut and Jobs Act eliminates the advance refunding of outstanding tax-exempt bonds, it does not eliminate the ability to advance refund a taxable bond (when the original purpose of the bonds would qualify for tax-exempt financing)*
  - As long as the subsidy is "turned off," Treasury Department Associate Tax Legislative Counsel, John Cross, does not believe that this will trigger any tax issues; guidance from the Treasury is expected soon

Refunding Considerations:

- **Base Case – Future Current Refunding:** The District can wait until the call date to refund the BABs
  - This is the baseline scenario to use in the evaluation of alternative scenarios
- **Alternative I – Advance Refunding Today:** Assuming the preliminary conclusion on advance refunding BABs, the District could execute a tax-exempt advance refunding
  - The BAB subsidy payments *are not expected* to remain in effect once the BABs are legally defeased

Source: RBC Capital Markets

Short Call Option Considerations

- The passage of the Tax Cuts and Jobs Act eliminated the ability to advance refund tax exempt bonds
  - An advance refunding is defined as a refunding issue that closes greater than 90 days in advance of the stated call date of a bond issue
  - Tax exempt municipal issuers were permitted one advance refunding over the life of a bond issue
- A logical market adaptation could be the use of call options shorter than the typical 10 year call option
- RBC served on a number of Ohio local government transactions with shorter than typical call options in 2017
- Two of these transactions that would be of note are:
  - Revere LSD (Summit County), Ohio (Rated Aa1) – On March 29, 2017 RBC senior managed a $59.7 million bond issue with a 5 year call option (5/1/22)
  - Winton Woods CSD (Hamilton County), Ohio – On May 16, 2017 RBC sole managed a $51.7 million bond issue with a 5 year call option (5/1/22)
- Both transactions received substantial interest from investors (on average 5x to 8x oversubscribed) and the callable portions of the transitions were completed at spreads substantially **below the AAA yield curve**
- Some examples of major investors of long dated bonds with short call options have included:
  - Vanguard
  - Boston Company
  - Eaton Vance TABS
  - Franklin Funds
  - State Farm

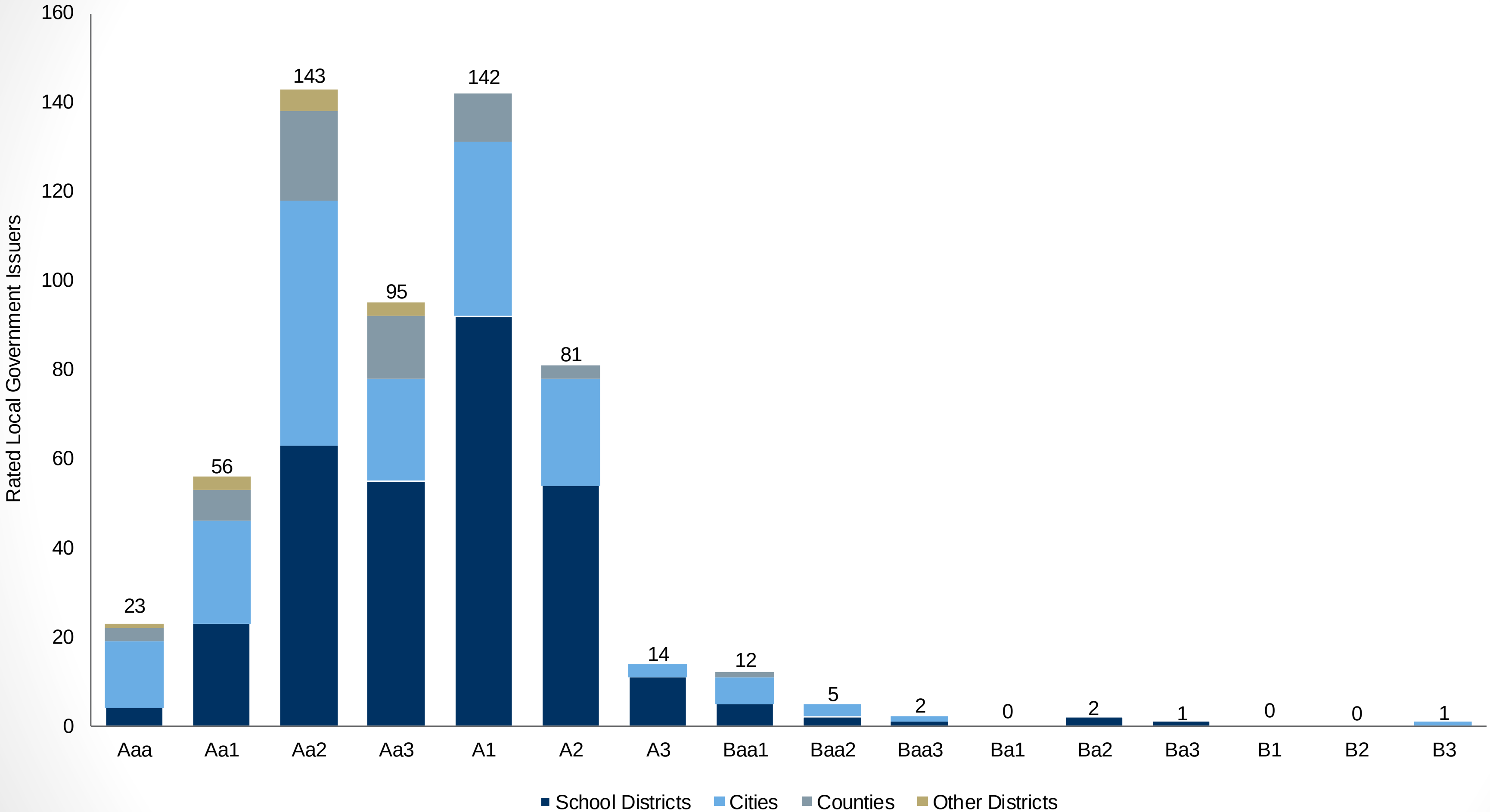
Source: RBC Capital Markets

Ohio Ratings Update

- Moody's: Maintains 577 underlying ratings on counties, cities and school districts in Ohio
  - Columbus and Cincinnati metropolitan areas are key drivers to state's overall economic growth and recovery since 1990, accelerating greatly after recessionary and recovery period from 2010
  - Tax implications:
    - Approximately 66% of those Ohio local governments pass tax increases in May 2017
    - Ohio county sales tax grow revenue but at a slowing rate compared to 2015 and 2016 rates with elimination of Medicaid MCO tax
    - School districts continue to rely on levy elections to grow revenue in September 2017 due to a decade of declining state aid for 75% of districts statewide
- S&P : Maintains 239 underlying ratings on counties, cities and school districts in Ohio
  - "stable in recent years" with "moderate tax revenue growth and good financial management" allowing "governments to build and maintain strong budgetary reserves"
  - "Despite cuts to state-shared revenue in recent years, most local governments in Ohio have addressed these cuts without credit deterioration. Overall, S&P Global Ratings has taken more positive than negative rating actions during the past few years."
  - The loss of sales tax revenue from Medicaid managed care services is the biggest risk for Ohio counties in the next few years.
  - Cities with weaker economies remain most vulnerable to credit pressure in light of lower state-shared revenue.
  - The recently approved state biennium budget holds funding relatively flat for most school districts.

Sources: Moody's Ohio based research publications in May, June, September, 2017 and September 2018
"Medians and Credit Factors: Ohio Local Government and School Districts" S&P September 19, 2017

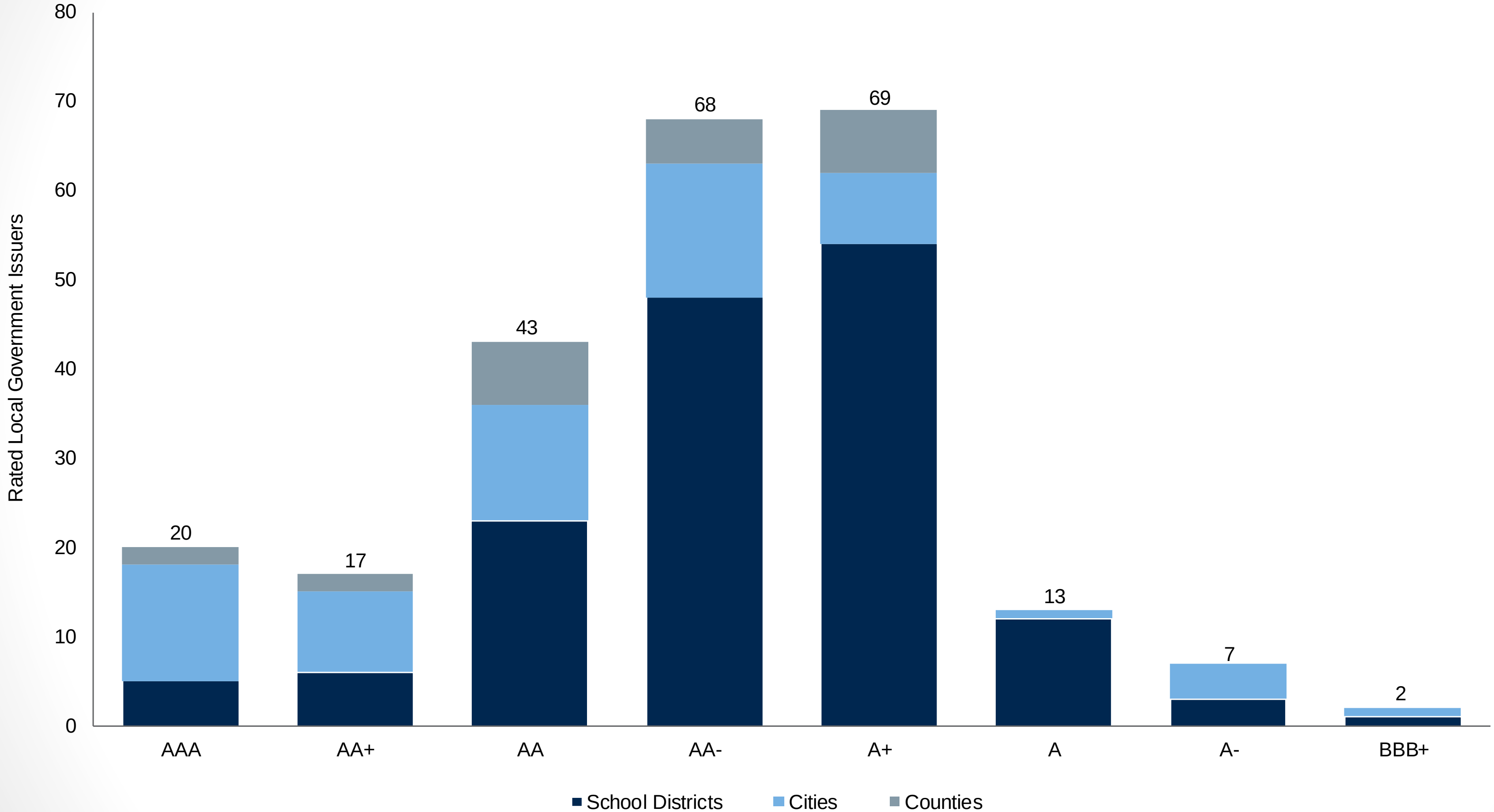
Moody's Ohio Local Government Credit Rating Distribution



- Moody's currently rates 577 local governments in the state of Ohio, with the majority of local government issuers (50%) receiving either a Aa2 (25%) or A1 (25%) rating

Source: Moody's Investors Service, May 2018

S&P's Ohio Local Government Credit Rating Distribution



- S&P currently rates 239 local governments in the state of Ohio, with the majority of local government issuers (29%) receiving an A+ rating

Source: S&P Global Ratings, May 2018

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