

Municipal Bond Market Update

A Look Back and Forward

B. Craig Elder

Senior Fixed Income Analyst

Baird PWM Equity & Fixed Income Research

Interest Rates – from 3000 BC

Part III. Markets Since the Beginning of Civilisation

Interest Rates

Lending rates in Mesopotamia 3000 BC-600 BC, in Greece and Rome 600 BC-300 AD; Yields on Western government bonds 1150 to date

Decennial high-low bars, linear scale

From c. 3000 BC: use of metals as money by weight in Mesopotamia. Temples as proto-banks: repositories of wealth and lending at interest

Ancient Sumer: Custom of 1 shekel per mina per month = 20%. Rates of 25% also documented (see also India c.2400 BC: Laws of Manu, 24% rate)

Ur: financial centre of Sumer until crash of 1788 BC caused by cancellation of debts under Rim-Sin

Babylon: Code of Hammurabi, 1772 BC. Codified earlier Sumerian custom of 20%. Average rates of 10-25% recorded through Old Babylonian, Assyrian and Neo-Babylonian iterations, until Persian conquest 539 BC, then rates of 40+%

Adoption of Near Eastern financial practices by Greek city states

5th century Greece: spread of coined money and credit; freeing of hoarded capital for productive loans (after Persian Wars, silver discoveries at Laurion)

3rd/4th century Rome: inflation, fiscal crisis

Commercial Revolution of the Middle Ages: easing of prohibitions on usury, rise of banking and state finance in Italy and the Netherlands; evolution of bond markets from census annuities

Dark Ages in the West: Anti-usury laws, e.g. Capitularies of Charlemagne 814 AD

Origins of interest rates:

Natural multiplying of borrowed livestock via reproduction; hence words for interest in ancient languages: Sumerian *mash* = calf, Greek *tokos* = calf, Latin *pecus* = flock, Egyptian *ms* = give birth.

Uruk, "city of sheepfolds", pastoral agricultural economy; had a numerical and writing system for quantifying and recording contracts, and the Mesopotamian calendar system for recording time in lunar months and solar years.

Early rates of interest determined by the standard units of quantity and time, e.g. 1 shekel per mina per month = 20% p.a. in Babylon (Code of Hammurabi), 1 ounce per pound per year = 8.33 % p.a. in Rome (Twelve Tables).

Debt crisis in Archaic Greece: usurious loans, payment in kind, debt servitude; until Solon's reforms, 594 BC

Sulla 88 BC Limit 1000th /mth = 12%

State bankruptcy during Social War 90 BC and civil wars 49-31 BC

Credit crisis 33 AD

Eastern (Byzantine) Empire: Constantine, 325 AD, limit 12.5%; Code of Justinian 528 AD, limit 8%; 850 AD limit raised to 11.5%

373 BC: Defaults by Greek states on loans at Delos

Greece: Temple at Delos From c.500 BC, 10%

Rome: Twelve Tables 443 BC Limit 1 oz/lyear = 8.33%

8% 300-200 BC Athens/Rome

Roman expansion: inflows of silver & gold, falling rates

4% 1 AD Rome

Expansion of coinage under Julius Caesar and Augustus. Reduction under Tiberius: credit crisis in 33 AD

Rome 100 AD 5%

Italian cities c 1150 20% (?)

Venice 1430s 20.00

U.S. 1980s 15.84

England 1700s 9.92

Holland 1570s 8.13

U.S. 1810s 7.64

6.25 1490s Venice

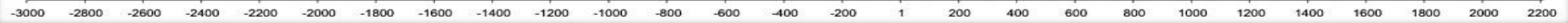
4.88 1340s Venice

3.00 1670s Holland

2.81 1730s England

1.85 1940s U.S.

1.38 2010s U.S.



Fed's Dual Mandate

Support Growth/Suppress Inflation

❖ **Maximum Employment: Grow GDP**

- ❖ Fed's Preferred Target Range is 2.5%-to-3.5%
- ❖ (3.5%) in 2020
 - ❖ Q1-(5.0%) /Q2-(31.4%) /Q3-33.4% /Q4-4.0%
- ❖ 4.8% in 2021
 - ❖ w/Stimulus - +6.50%-to-7.00%
 - ❖ Q1-3.3% /Q2-5.5% /Q3-6.0% /Q4-4.3%

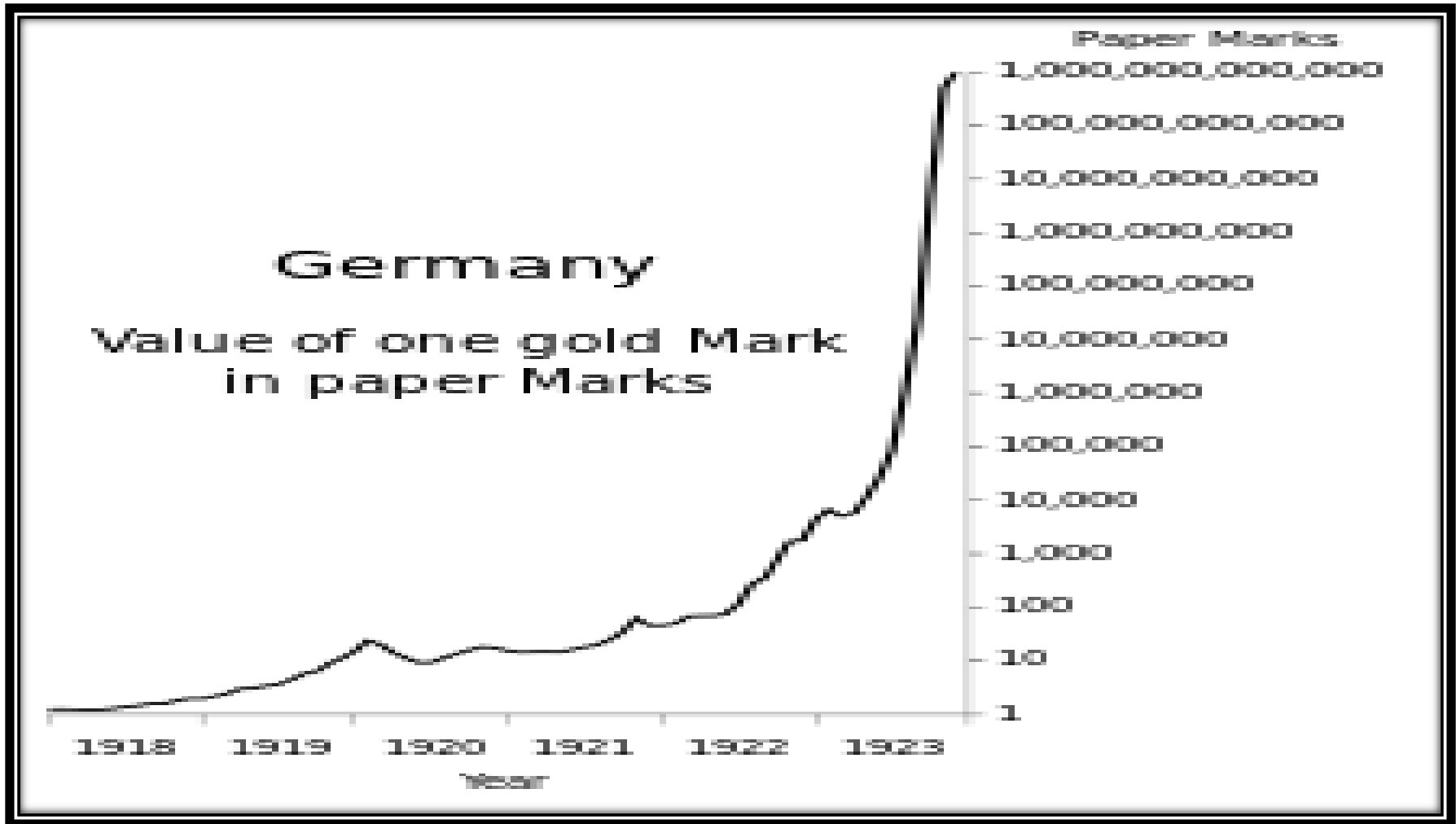
❖ **Fed's Preferred Inflation Measure -PCE Core YoY**

- ❖ Inflation remains below "old" target (2.0%)
- ❖ New target - 2.50%
 - ❖ 1.4% in 2020
 - ❖ Forecasts 1.8% in 2021 / 1.9% in 2022 / 2.0% in 2023
- ❖ Recent bond price move calls forecast into question!

German Inflation – 1918-1923

Source: BEA & Bloomberg

BAIRD



What's the Fed Doing? – Balance Sheet

- ❖ SOMA is \$7.0 Trillion (\$2.1 Trillion in MBS)
- ❖ Fed is buying \$80 billion in Treasuries and \$40 billion in MBS debt each month
- ❖ Could “Term Out” Holdings
 - ❖ WAM is 12.46 years – it could be extended
 - ❖ Most of Longer dated paper is MBS
- ❖ Interest income from portfolio returned to Treasury
 - ❖ \$88.5 billion in FY 2020

President Biden's Stimulus Package

- *\$1.9 Trillion Total Package*
 - *Direct Payments to Individuals*
 - *\$1,400 payment to individuals*
 - *Vaccine & Covid-19 Funds*
 - *Educational Funding*
 - *Enhanced Unemployment Benefits*
 - *5-months*
 - *State & Local Funding*
 - *Direct Aid*

President Biden's Stimulus Package

- *State & Local Funding*
 - *Direct Aid - \$350 billion*
 - *\$195 billion – States*
 - *\$130 billion – Local Governments*
 - *\$20 billion – Native American Tribes*
 - *\$4.5 billion – Territories*
- *State aid formula:*
 - *20% of entire tax revenue collections*
 - *\$500 million base + % of national unemployed workers residing in each state*

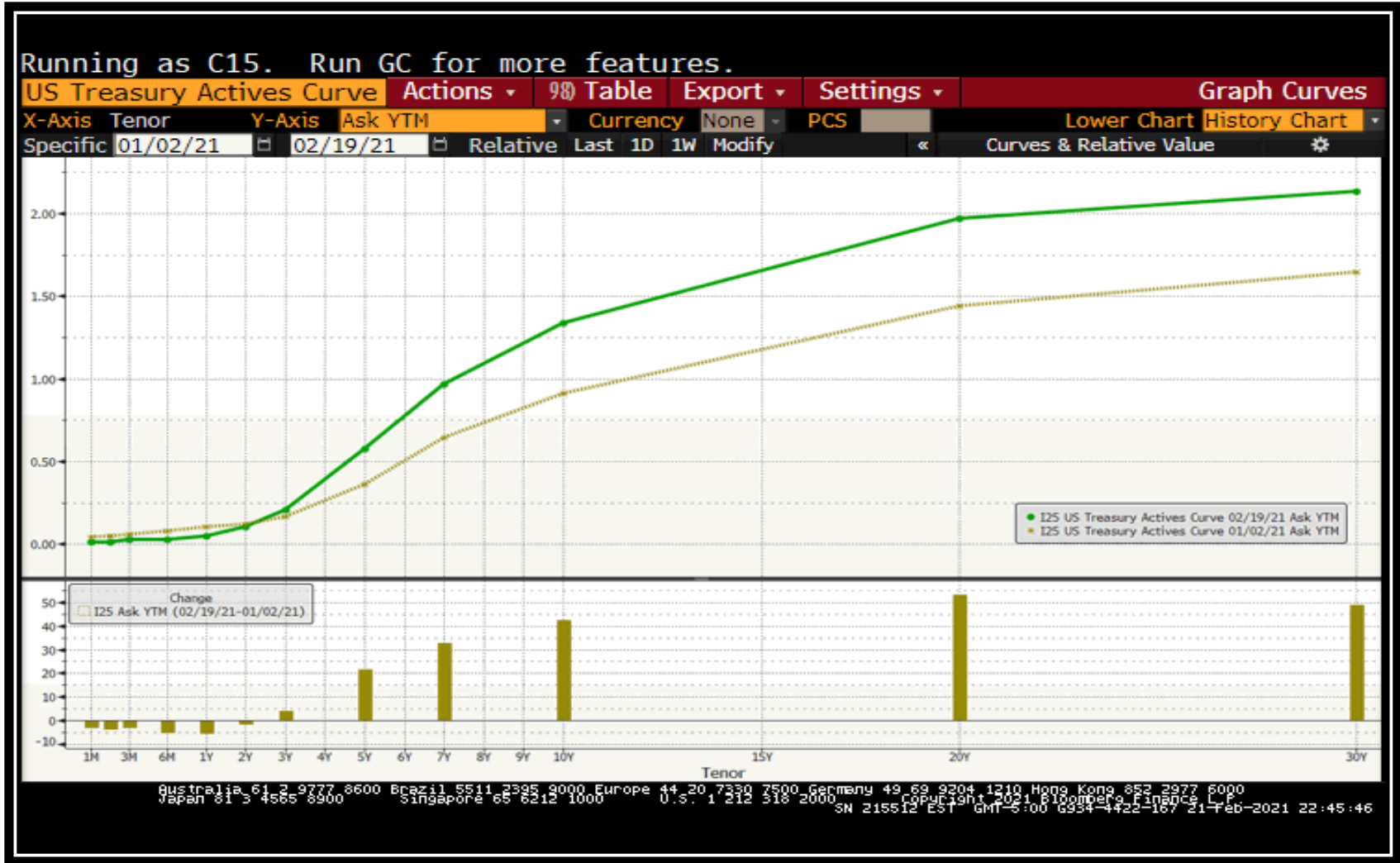
President Biden's Stimulus Package

- *Local aid formula:*
 - *Roughly 17% of all local government tax collections*
 - *Amounts do not include more educational funding or other types of aid that benefit local government*
- *Beneficiaries also include:*
 - *Municipal bond investors*
 - *Reduce downgrades/defaults*
 - *Monoline Bond Insurers*

Treasury Yield Curve

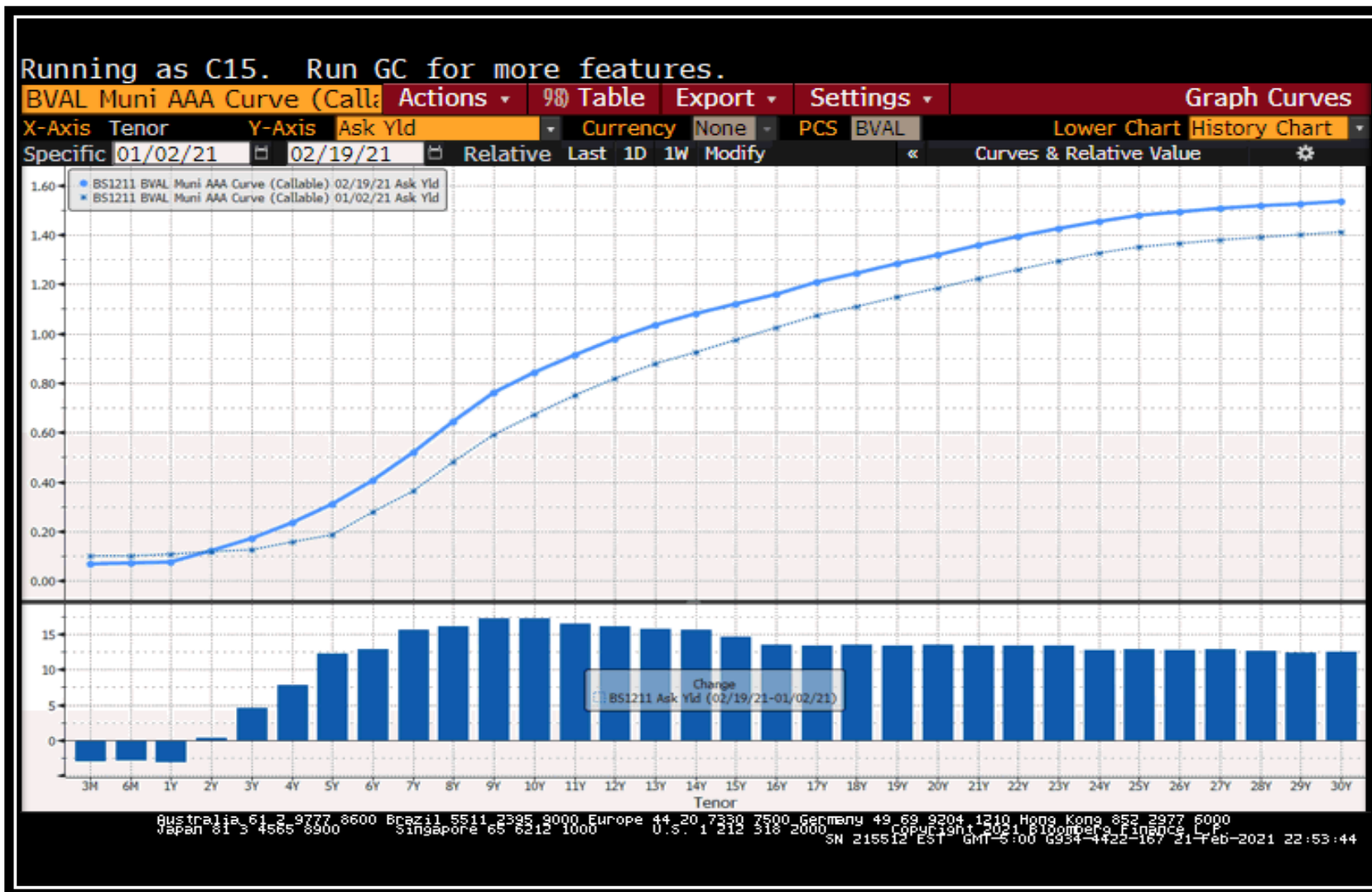


Source: Bloomberg



AAA Municipal Yield Curve

Source: Bloomberg



AAA Municipal vs. Treasury Yield Curve

Source: Bloomberg

Enter all values and hit <GO>.

Municipal Inter-Market Yield History

Curve	Date	Close	Tax (%)
A) GO AAA Callable Yields (BS1211)	02/19/21	Close	0.0
B) US Govt. Treasury Yields (BI550)	02/19/21	Close	0.0

Term	A	B	Spread (+/- BPs)	Spread (%)
	GO-AAAC 2/19/21	Treasury 2/19/21		
1 Yr	0.077	0.086	-1	89.1
2 Yr	0.123	0.112	1	109.2
3 Yr	0.171	0.211	-4	81.3
4 Yr	0.235	0.392	-15	60.1
5 Yr	0.309	0.589	-28	52.4
7 Yr	0.519	0.963	-44	53.9
10 Yr	0.844	1.326	-49	63.6
15 Yr	1.119	1.624	-50	68.9
20 Yr	1.319	1.919	-60	68.7
25 Yr	1.479	2.080	-60	71.1
30 Yr	1.534	2.146	-62	71.5

Muni yields will be grossed up by tax rates.

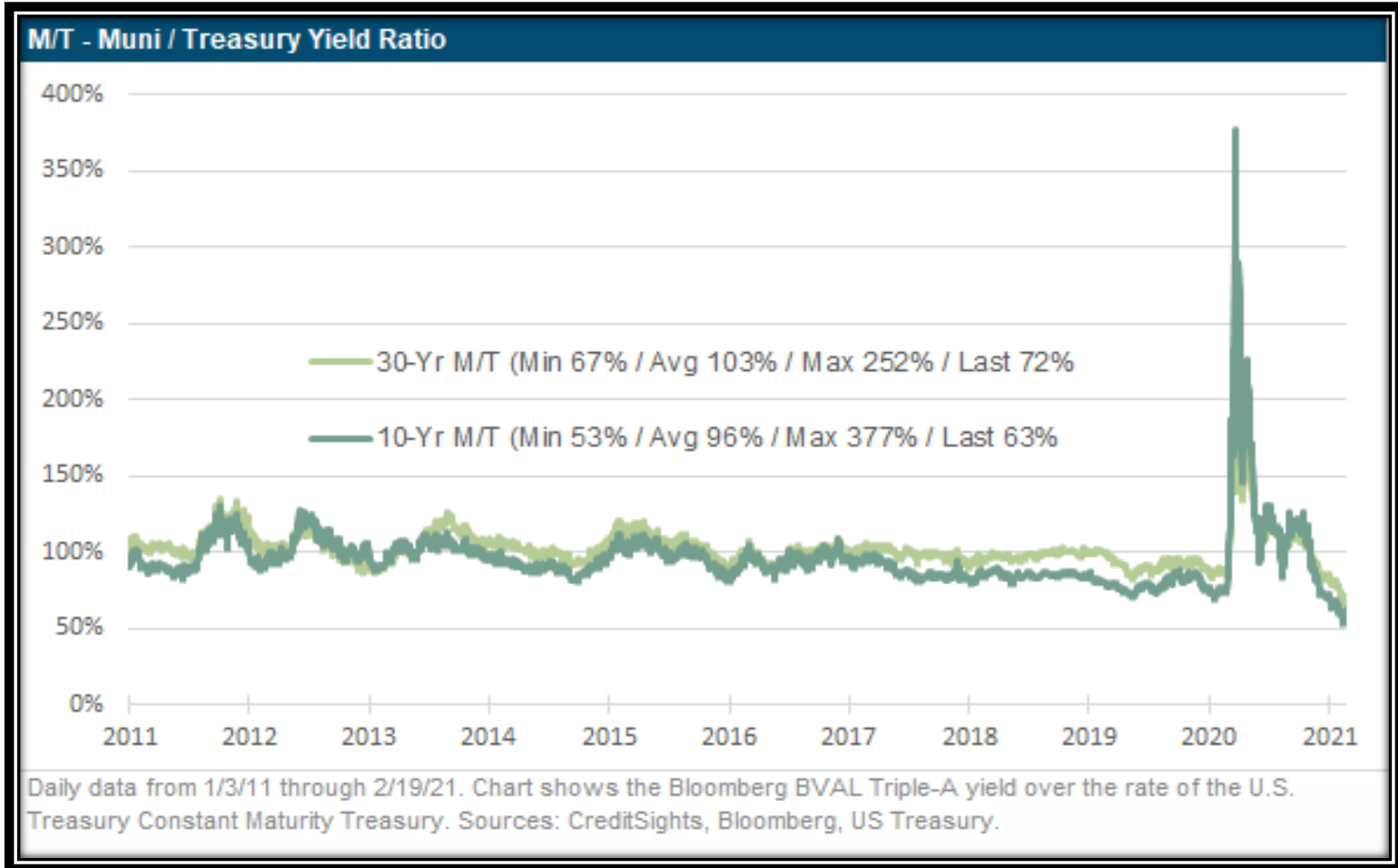
1) Expand Graph

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 4565 8900 Singapore 65 6212 1000 U.S. 1 212 518 2000

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AAA Municipal vs. Treasury Ratio (Historical)

Source: CreditSights



AAA Municipal (TE) vs. Treasury Yield Curve

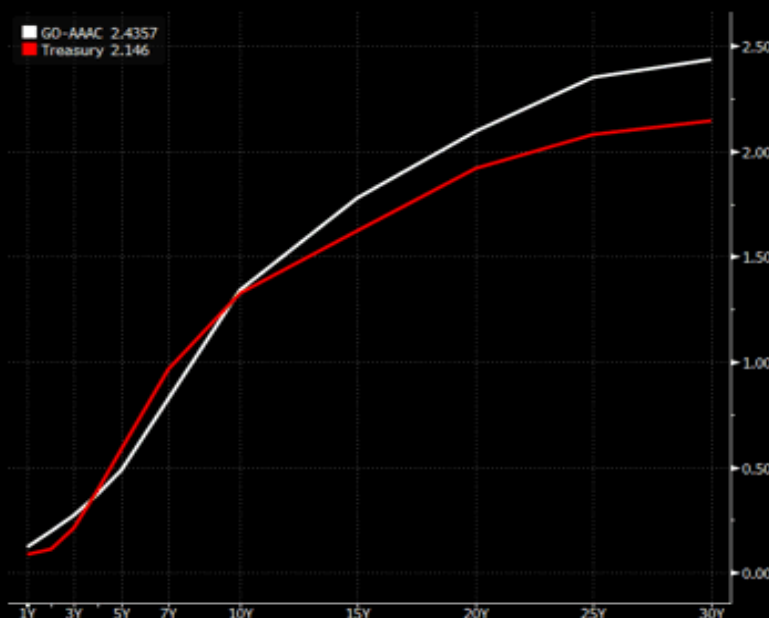
Source: Bloomberg

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Municipal Inter-Market Yield History

Curve	Date	Tax (%)
A) GO AAA Callable Yields (BS1211)	02/19/21	37.0 *G/U
B) US Govt. Treasury Yields (BI550)	02/19/21	0.0

Term	A	B	Spread (+/- BPs)	Spread (%)
	GO-AAAC 2/19/21	Treasury 2/19/21		
1 Yr	0.122	0.086	3	141.5
2 Yr	0.195	0.112	8	173.3
3 Yr	0.272	0.211	6	129.0
4 Yr	0.374	0.392	-2	95.5
5 Yr	0.490	0.589	-10	83.1
7 Yr	0.824	0.963	-14	85.6
10 Yr	1.339	1.326	1	101.0
15 Yr	1.776	1.624	16	109.4
20 Yr	2.093	1.919	17	109.1
25 Yr	2.348	2.080	27	112.9
30 Yr	2.436	2.146	29	113.5



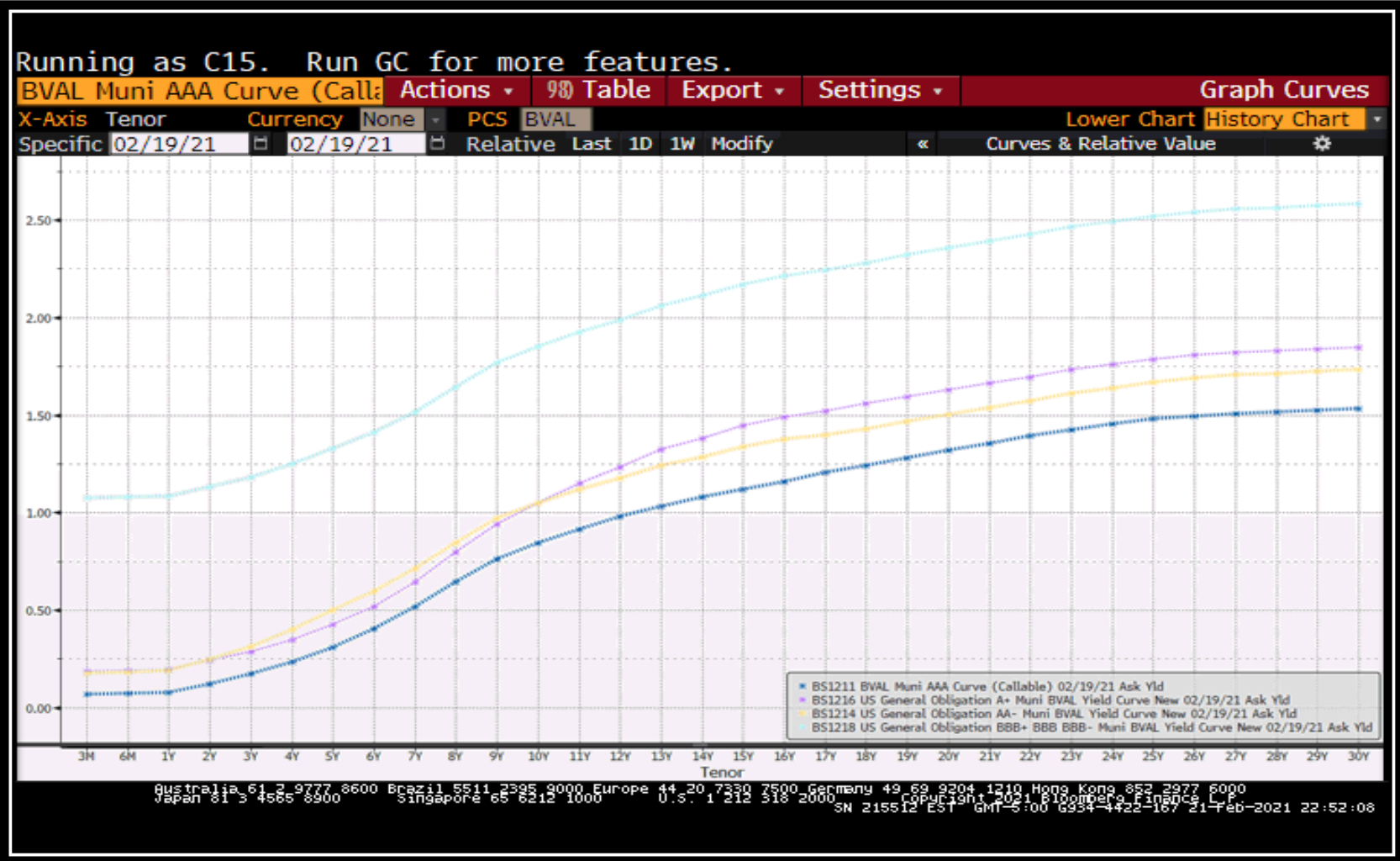
Muni yields will be grossed up by tax rates.

1) Expand Graph

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Japan 81 3 4565 8900 Singapore 65 6212 1000 U.S. 1 212 516 2000
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Municipal Yield Curves by Ratings

Source: Bloomberg



Market Returns



Source: CreditSights

Annual Relative Total Return Ranking - USD Markets															
2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
S&P 500 15.8%	US Govt 9.1%	US Govt 14.0%	High Yield 57.5%	High Yield 15.2%	Munis 11.2%	EM Sov 18.3%	S&P 500 32.4%	S&P 500 13.7%	Munis 3.6%	High Yield 17.5%	S&P 500 22.3%	Munis 1.0%	S&P 500 31.5%	S&P 500 18.4%	S&P 500 4.2%
High Yield 11.8%	Mtges 7.0%	Mtges 8.3%	Loans 52.5%	S&P 500 15.1%	US Govt 9.8%	S&P 500 16.0%	High Yield 7.4%	Munis 9.8%	Mtges 1.5%	S&P 500 12.0%	EM Sov 10.0%	Mtges 1.0%	High Yield 14.4%	High Grade 9.8%	Loans 1.8%
EM Sov 10.6%	EM Sov 6.4%	Munis -4.0%	EM Sov 27.2%	EM Sov 12.5%	EM Sov 8.2%	High Yield 15.6%	Loans 5.4%	High Grade 7.5%	S&P 500 1.4%	Loans 10.4%	High Yield 7.5%	US Govt 0.8%	EM Sov 14.3%	US Govt 8.2%	High Yield 1.3%
Loans 6.9%	S&P 500 5.6%	High Grade -6.8%	S&P 500 26.4%	Loans 10.4%	High Grade 7.5%	High Grade 10.4%	Mtges -1.4%	EM Sov 7.3%	US Govt 0.8%	EM Sov 9.5%	High Grade 6.5%	Loans 0.6%	High Grade 14.2%	High Yield 6.2%	Munis 0.3%
Mtges 5.3%	High Grade 4.6%	EM Sov -10.2%	High Grade 19.8%	High Grade 9.5%	Mtges 6.1%	Loans 9.8%	High Grade -1.5%	Mtges 6.1%	EM Sov 0.6%	High Grade 6.0%	Munis 5.4%	High Grade -2.2%	Loans 8.7%	Munis 5.3%	Mtges -0.2%
Munis 5.0%	Munis 3.3%	High Yield -26.4%	Munis 14.5%	US Govt 5.9%	High Yield 4.4%	Munis 7.3%	Munis -2.9%	US Govt 6.0%	Loans 0.1%	Mtges 1.7%	Loans 4.6%	High Yield -2.3%	Munis 7.7%	EM Sov 4.8%	EM Sov -2.2%
High Grade 4.4%	High Yield 2.2%	Loans -29.3%	Mtges 5.8%	Mtges 5.7%	S&P 500 2.1%	Mtges 2.6%	US Govt -3.3%	High Yield 2.5%	High Grade -0.6%	US Govt 1.1%	Mtges 2.4%	S&P 500 -4.4%	US Govt 7.0%	Mtges 4.1%	High Grade -2.3%
US Govt 3.1%	Loans 2.0%	S&P 500 -37.0%	US Govt -3.7%	Munis 2.3%	Loans 1.5%	US Govt 2.2%	EM Sov -5.8%	Loans 1.8%	High Yield -4.6%	Munis 0.4%	US Govt 2.4%	EM Sov -4.6%	Mtges 6.5%	Loans 3.5%	US Govt -2.7%

Source: CreditSights, BoFA/ML, S&P/PLSTA, Bloomberg
EM Sov is US EM Sovereign BBB & lower index
YTD calculated as of Feb 19, 2021

Market Returns

Source: CreditSights

Comparative Total Returns										
Feb 19, 2021	Short-Term Cumulative Returns						Annualized Returns			
	YTD	WTD	1Mo	3Mo	6Mo	1yr	2yr	3yr	5yr	10yr
US										
Treasury	-2.65%	-0.84%	-1.60%	-2.82%	-3.50%	2.88%	5.85%	5.13%	2.65%	3.26%
High Grade Corp.	-2.26%	-0.67%	-1.38%	-1.22%	0.26%	4.47%	9.28%	7.06%	6.06%	5.39%
High Yield Corp.	1.34%	-0.05%	0.85%	4.07%	7.68%	6.27%	7.94%	6.48%	9.41%	6.41%
Leveraged Loans	1.77%	0.13%	0.42%	3.78%	7.09%	4.53%	5.27%	4.45%	6.12%	4.46%
Municipals	0.26%	-0.77%	0.16%	1.12%	1.76%	3.53%	6.01%	5.24%	3.70%	4.83%
Convertibles	12.14%	-0.44%	5.71%	25.71%	39.29%	59.32%	39.38%	28.47%	25.27%	14.86%
Preferreds	-1.79%	-0.63%	-0.71%	-0.12%	2.23%	3.59%	7.69%	6.59%	6.17%	6.38%
Mortgage Markets										
Mortgage Master	-0.20%	-0.17%	-0.17%	0.04%	-0.05%	2.99%	4.71%	4.43%	2.75%	3.04%
US Equity Market										
S&P 500	4.22%	-0.68%	2.98%	9.47%	16.68%	17.43%	20.76%	14.81%	17.55%	13.56%

Source: CreditSights, BoAML, S&P/LSTA, Bloomberg

Treasury= GOQ0, HG = C0A0, HY= H0A0, LL = SPBDPL, Muni = U0A0, Convert = V0S0, Pref= P0P1, Mortgages = M0A0, S&P 500 = SPX

Municipal Bond Issuance



Source: SIFMA

- Q3 - \$3.922.7 Trillion (\$50,136.0 Trillion)
- Forecast - \$502 billion in 2021 – down 1.7%
 - Long-term - \$452 billion – down 3.2%
 - Short-term - \$50.0 billion – up 13.9%
- Taxable Municipal Issuance
 - \$145.0 billion – 2021
 - \$142.2 billion - last year

Municipal Bond Ownership



Source: Federal Reserve

Individuals	\$1,910.0	45.20%
Funds	\$1,121.9	26.85%
Banks	\$524.9	12.42%
Insurance Companies	\$510.2	12.07%
Others	\$158.6	3.76%
Total	\$4,225.7	100.0%

Municipal Bond Ownership

Source:

- ❖ Fear of higher tax rates
 - ❖ Somebody needs to pay for these massive stimulus plans
 - ❖ Thought is that we will see a return to the top bracket to 39.6% (Over \$400,000)
 - ❖ 2022?
 - ❖ Question is how far down the income scale will be impacted?
- ❖ Tend to buy in their locale
 - ❖ State/Municipality
 - ❖ Known to them
 - ❖ Reduce their state income taxes as well

State GO Ratings

Source: Bloomberg

US States Information														
State GO Bond Rating					State Income Tax Rates									
Name	Moody	S&P	Fitch	KBRA	Name	Moody	S&P	Fitch	KBRA	Name	Moody	S&P	Fitch	KBRA
Alabama	Aa1	AA	AA+		Kentucky					Ohio	Aa1	AA+	AA+	
Alaska	Aa3	AA-	A+		Louisiana	Aa3	AA-	AA-		Oklahoma	Aa2	AA		
Arizona					Maine	Aa2	AA			Oregon	Aa1	AA+	AA+	
Arkansas	Aa1	AA			Maryland	Aaa	AAA	AAA		Pennsylvania	Aa3	A+	AA-	
California	Aa2	AA-	AA		Massachusetts	Aa1	AA	AA+		Puerto Rico	Ca	D	D	
Colorado					Michigan	Aa1	AA	AA		Rhode Island	Aa2	AA	AA	
Connecticut	A1	A	A+	AA-	Minnesota	Aa1	AAA	AAA		South Carolina	Aaa	AA+	AAA	
District of Co...	Aaa	AA+	AA+		Mississippi	Aa2	AA	AA		South Dakota				
Delaware	Aaa	AAA	AAA	AAA	Missouri	Aaa	AAA	AAA		Tennessee	Aaa	AAA	AAA	
Florida	Aaa	AAA	AAA		Montana	Aa1	AA	AA+		Texas	Aaa	AAA	AAA	AAA
Georgia	Aaa	AAA	AAA		Nebraska					Utah	Aaa	AAA	AAA	
Guam		BB-			Nevada	Aa1	AA+	AA+		Vermont	Aa1	AA+	AA+	
Hawaii	Aa2	AA+	AA		New Hampshi...	Aa1	AA	AA+		Virgin Islands				
Idaho					New Jersey	A3	BBB+	A-	A	Virginia	Aaa	AAA	AAA	
Illinois	Baa3	BBB-	BBB-		New Mexico	Aa2	AA			Washington	Aaa	AA+	AA+	
Indiana					New York	Aa2	AA+	AA+	AA+	West Virginia	Aa2	AA-	AA	
Iowa					North Carolina	Aaa	AAA	AAA		Wisconsin	Aa1	AA	AA+	AA+
Kansas					North Dakota					Wyoming				

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States



Source: S&P

- *S&P Began Year w/Negative Outlook for States*
 - *Federal Policy Changes*
 - *Vaccination Progress*
 - *Structural Budget Balances*
 - *Uneven Economic Recovery*
 - *Medicaid Utilization*
 - *Pensions and OPEB*
 - *Event Risks*
 - *Extreme Winter Conditions – Nationwide but especially in the South*
 - *Infrastructure*

Biden's Stimulus

- *Ratings should show some stability:*
 - *S&P had 11 states on negative outlook*
 - *1.3 million state & local government jobs were lost from February – November 2020*
- *Amounts do not include more educational funding or other types of aid that benefit local government*
- *Beneficiaries also include:*
 - *Municipal bond investors*
 - *Reduce downgrades/defaults*
 - *Monoline Bond Insurers*

Source: KBRA/Strategas

- **States Revenue Losses Not as Bad as 1st Thought**
 - *Est Decline in state revenue in **May** 2020:*
 - *FY 2020 – (\$185 billion)/(7.0%)*
 - *FY 2021/2022 – (\$580 billion)/(11.0%)*
 - *Est Decline in state revenue in **October** 2020:*
 - *FY 2020 – (\$22 billion)/(0.8%)*
 - *FY 2021/2022 – (\$305 billion)/(5.8%)*
 - *Differences:*
 - *FY 2020 +\$163 billion/+6.2%*
 - *FY 2021/2022 +\$275 billion/+5.2%*
- *Y/Y Change in State Tax Collections*
 - *IT- +1.0% / NIT – (4.0%)*

What's to Come?

- **ESG:**
 - *Currently most of the focus is on Corporations*
 - *We expect to see more emphasis on Governments*
 - *Driven by Investors – Large Funds Especially*
 - *Climate*
 - *Green Bond Issuance (\$18 Billion/4.1%)*
 - *2020 – 3.4% (10 issuers account for 50% of issuance)*
 - *2013 – 0.03%*
 - *Sustainable Issuance (\$30 Billion)*
 - *2020 – 5.8%*
 - *2019 – 3.2%*

What's to Come?

- *Governance Structure*
 - *Chair/CEO Separation*
 - *Board/Sr. Management Diversity*
- *Social*
 - *Diversity/Inclusion*
 - *Race/Gender/Orientation*
 - *Equal Pay/Promotion Opportunities*
- *Increased Taxable Municipal issuance*
- *Taxation of All municipal bond interest(?)*
- *Simpson/Bowels in 2010*



Disclaimers

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Past performance is not a guarantee of future results.

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Sources:

- Bloomberg
- Bloomberg Barclays Indices
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- U.S. Census Bureau
- CreditSights
- Department of Labor
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- S&P
- SIFMA
- Strategas