

October 21, 2019



National Council of State Housing Agencies

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Bond Markets Update

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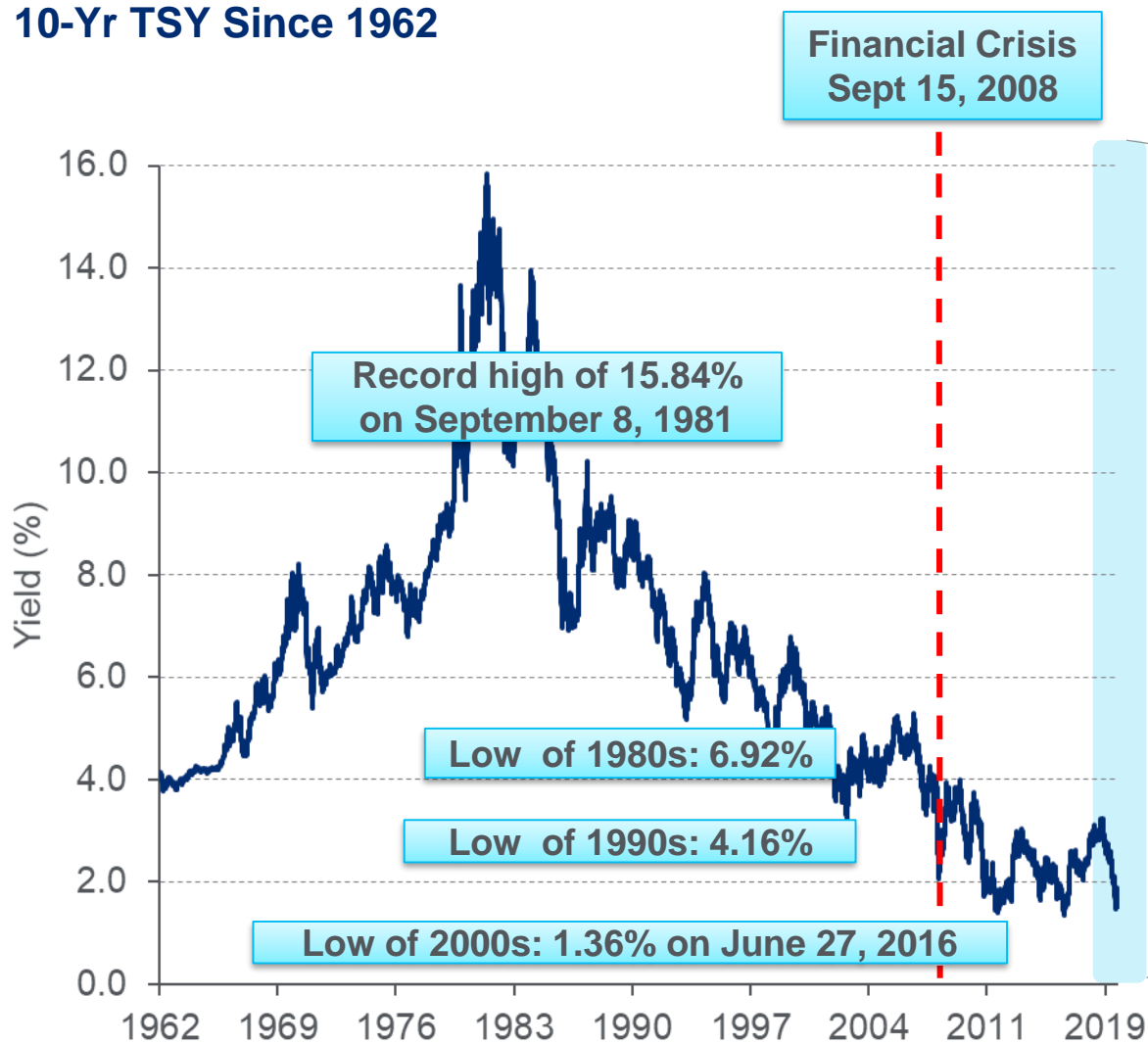
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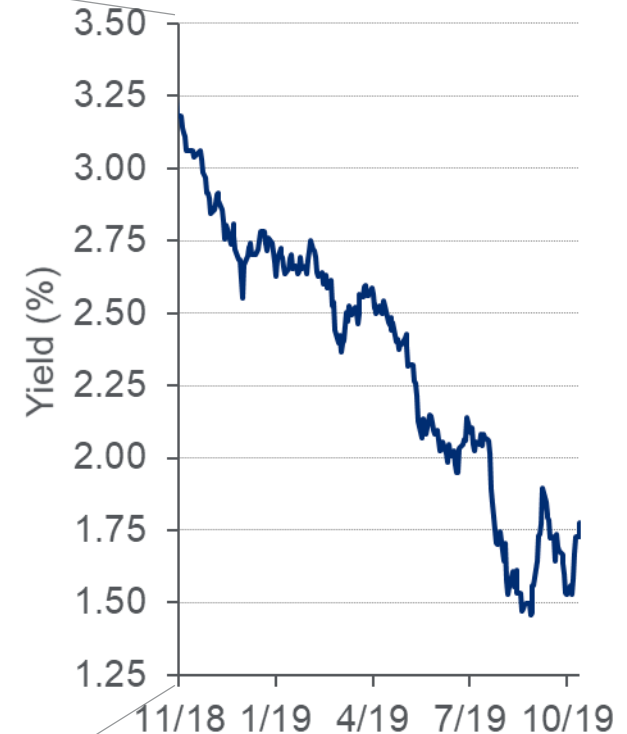
Interest Rate Backdrop – The Rally Continues as
Fed Support is Renewed to Keep Potential
Recession at Bay

Interest Rates: 3 Decade Long Rally Continues

10-Yr TSY Since 1962



10-Yr TSY Since Nov. 2018



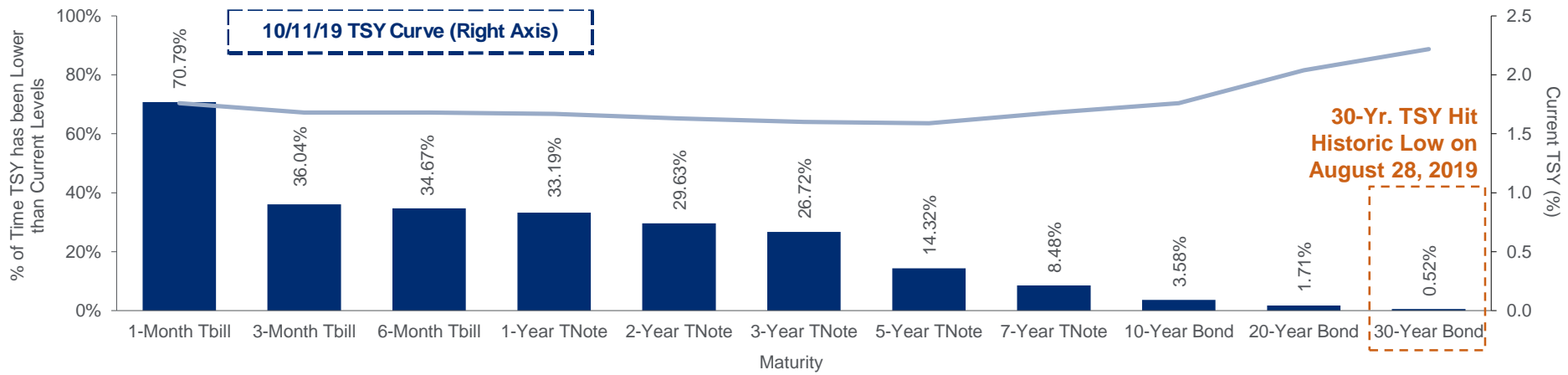
Current Level (10/17/19): 1.76%

- - 90 bps since 1/2/2019
- High of 3.24% on 11/7/18
- Low of 1.47% on 8/28/2019

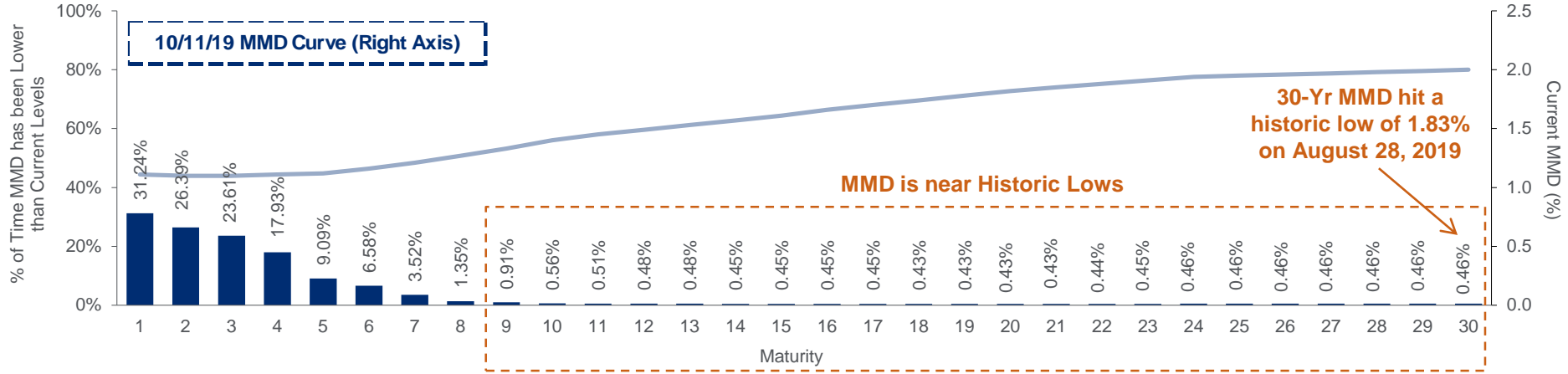
Source: Bloomberg as of October 17, 2019.

Treasury and MMD – Seldom to Almost Never Lower

% of Time TSY has been Lower Since 1986



% of Time MMD has been Lower Since 1986

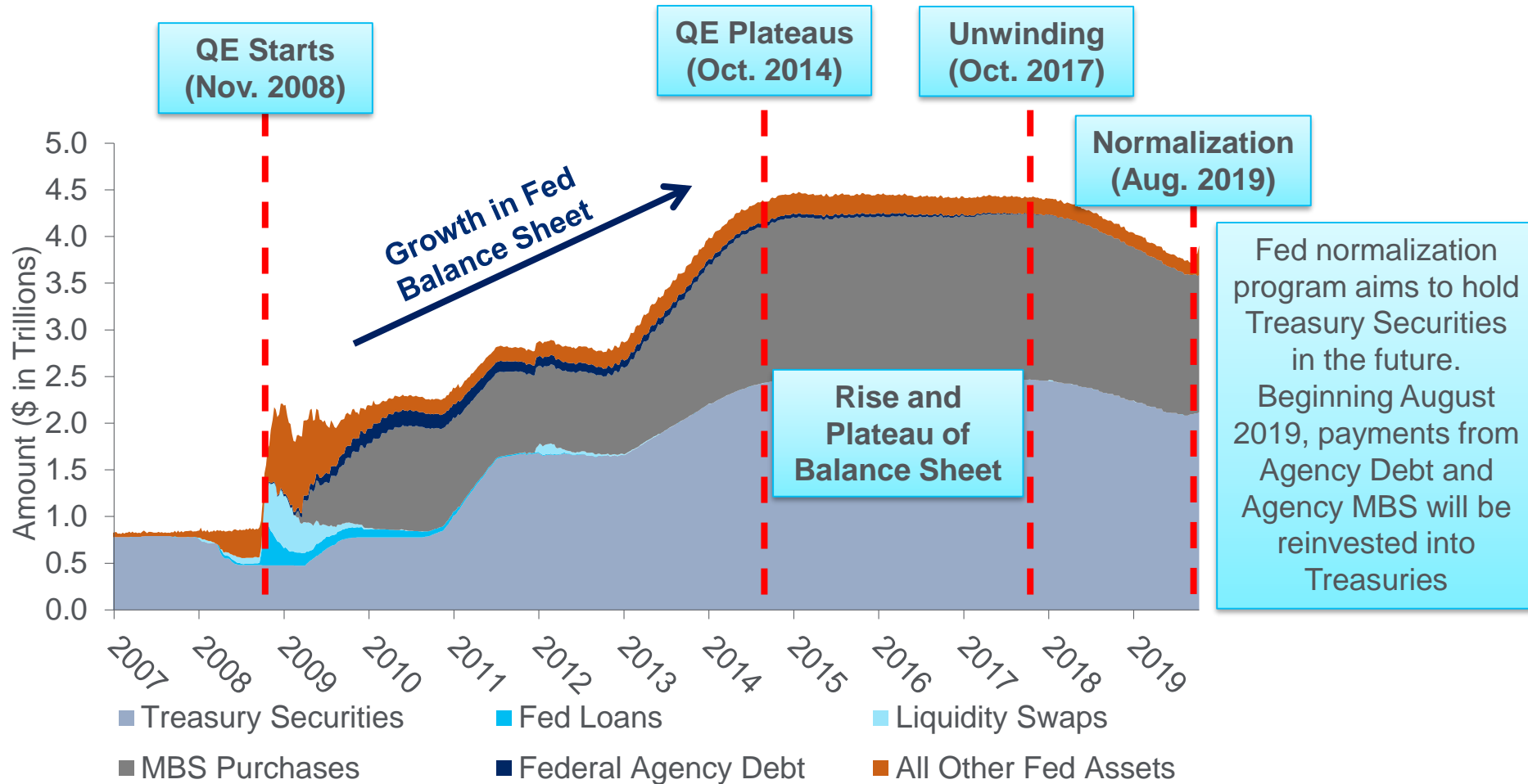


Source: U.S. Treasury Market data as of October 11, 2019.



Post-Crisis Fed Support: Prolonged and Extraordinary

Federal Reserve Balance Sheet

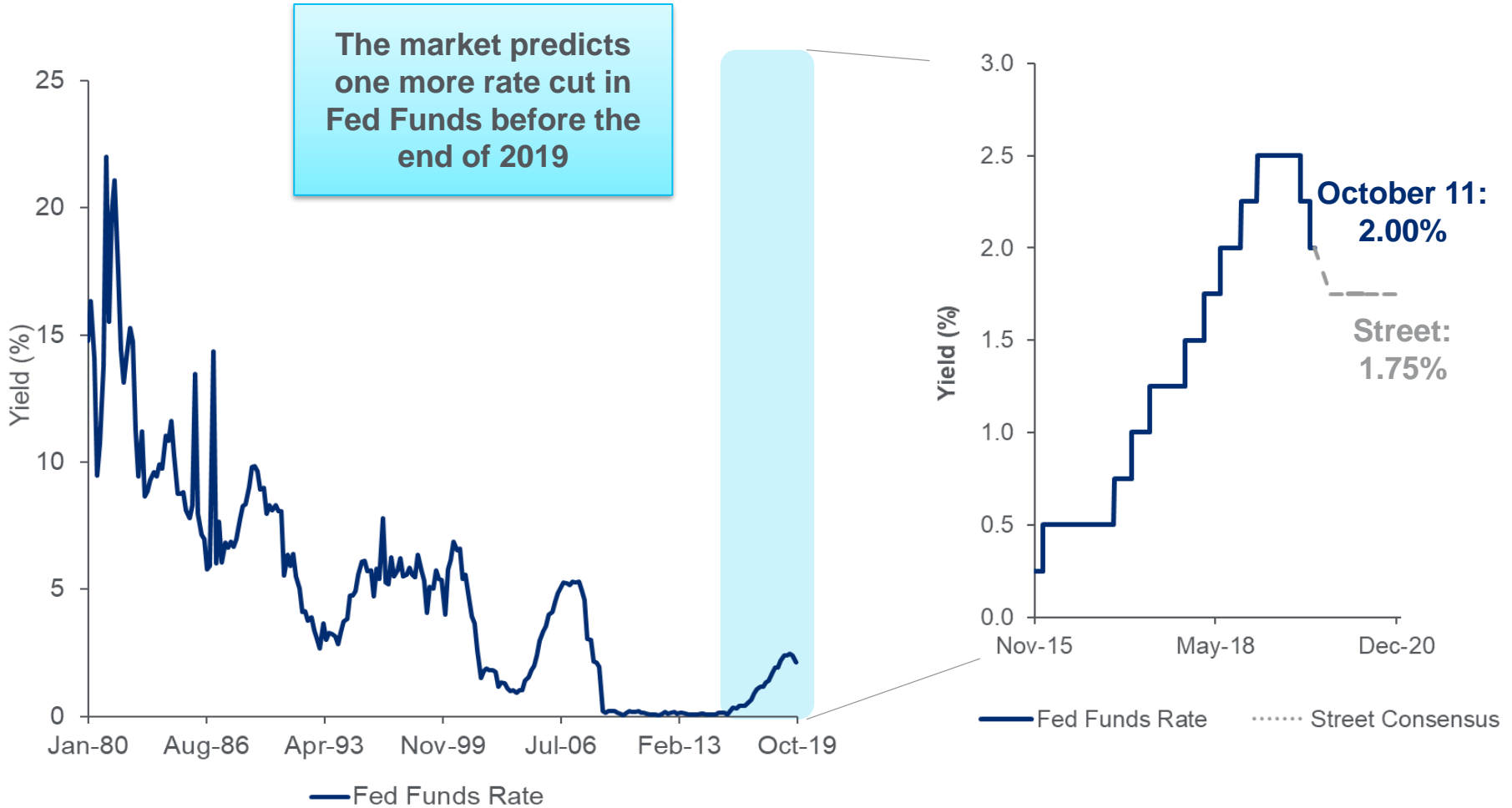


Source: Bloomberg as of October 8, 2019.

Fed Funds Rate – Back Down After Late-Expansion Uptick

Fed Funds Rate Forecast (Upper Limit)

	Current	4Q19	1Q20	2Q20	3Q20	4Q20
Street	2.00%	1.75%	1.75%	1.75%	1.75%	1.75%



Source: Current rates and expectation of Fed hike as of October 11, 2019; Citi forecasts as of September 25, 2019. Bloomberg forecasts as of October 11, 2019.

10-Year Forecast: Not Yet Rock Bottom (How Low Can We Go?)

10-Yr Treasury Yield Forecast

10-Year Treasury	Current	4Q19	1Q20	2Q20	3Q20	4Q20
Citi's Forecast	1.76%	1.75%	1.63%	1.50%	1.38%	1.25%
Street	1.76%	1.70%	1.79%	1.85%	1.90%	2.00%

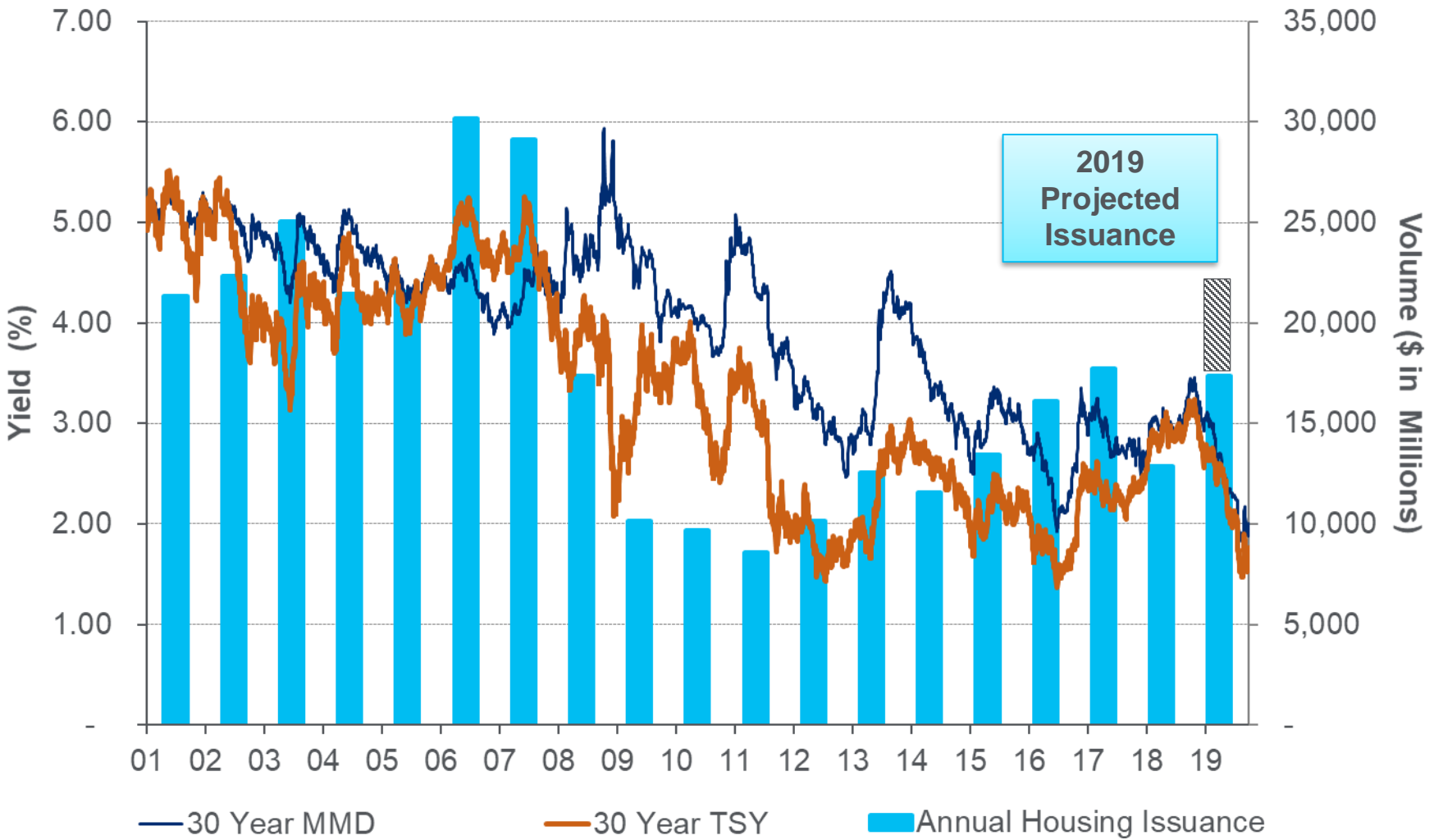


Source: Current rates and expectation of Fed hike as of October 11, 2019; Citi forecasts as of September 25, 2019. Bloomberg forecasts as of October 11, 2019.

Focus on the Municipal Housing Bond Markets – “Relationships” Matter

HFAs & MRBs: Post Crisis Competition Difficulties

Housing Issuance, 30-Year MMD, and 10-Year TSY



Source: Bloomberg and SDC as of October 14, 2016. 2019 housing supply estimate based off of 2019YTD with a pro rata projection of supply through the end of the year.



Three Key Factors that Impact MRB Financing Competitiveness

Ratio: MMD / Treasury

- Relationship of tax-exempt to taxable yields
- Tax-exempt yields are measured using MMD Index
- Ratios are a vehicle for capturing the general benefit of tax-exemption
 - Higher ratio = less benefit of tax exemption

MRB TE Spread: MMD + ___ bps

- Relationship (difference in bps) between tax-exempt yields for housing bonds (Mortgage Revenue Bonds or MRBs) and MMD Index
 - $MMD + \text{Spread} = \text{MRB Yield}$
- Spread varies with maturities and market conditions

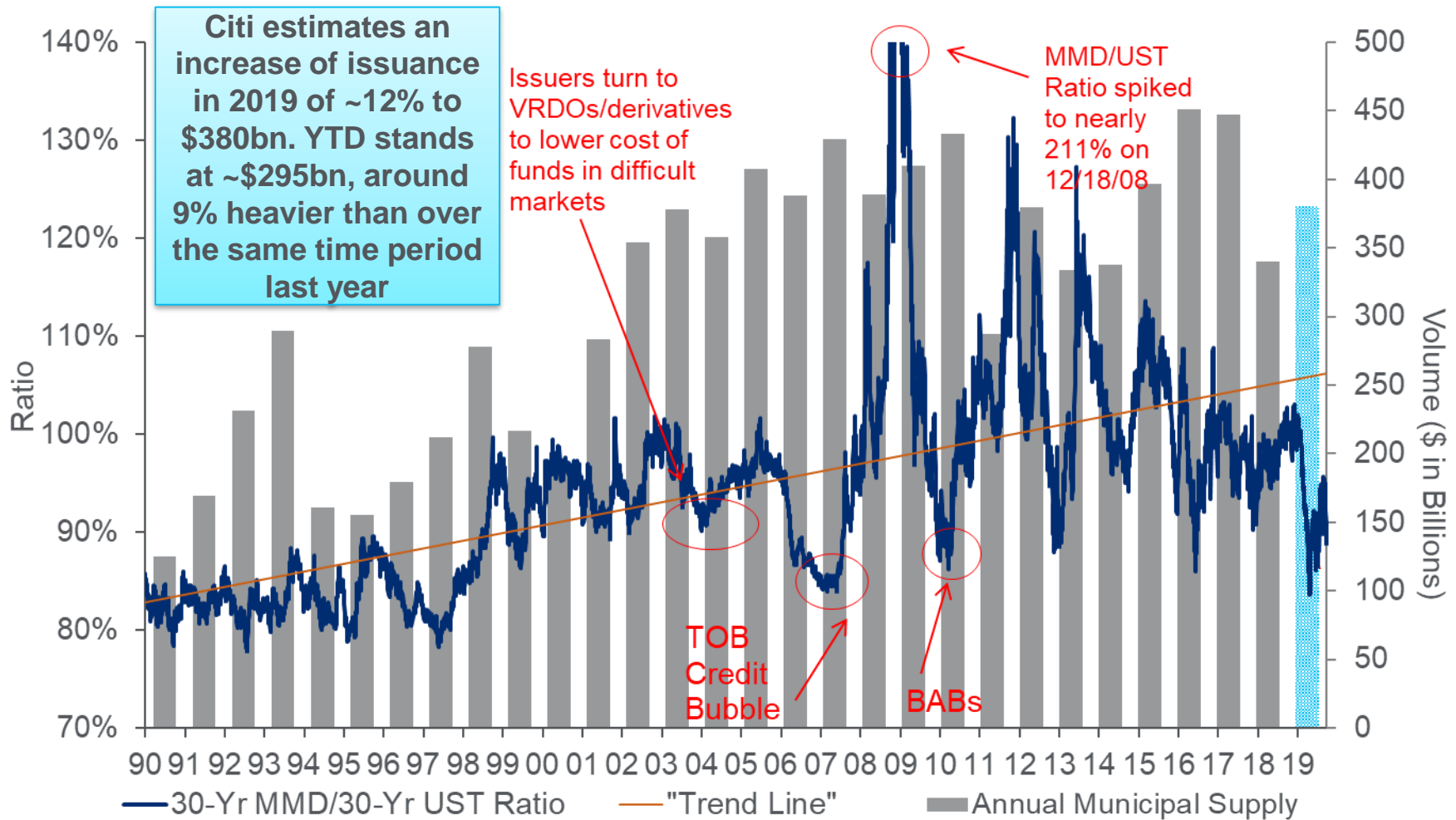
Shape of the Yield Curve(s): 2s to 10s (MRB Curve)

- Relationship (difference in bps) between short maturity and long maturity yields
- Municipal yield curves always have some slope
 - Contrasts with the Treasury yield curve, which may be flat or even inverted
- Typical tax-exempt bond funding cost is driven by longer maturities
- Conventional mortgage market is typically funded based on the shorter expected average life of the loan

Tax-Exempt to Taxable Relationship – Ratios

The Long Term Municipal Trend – Supply Up, Ratios Down

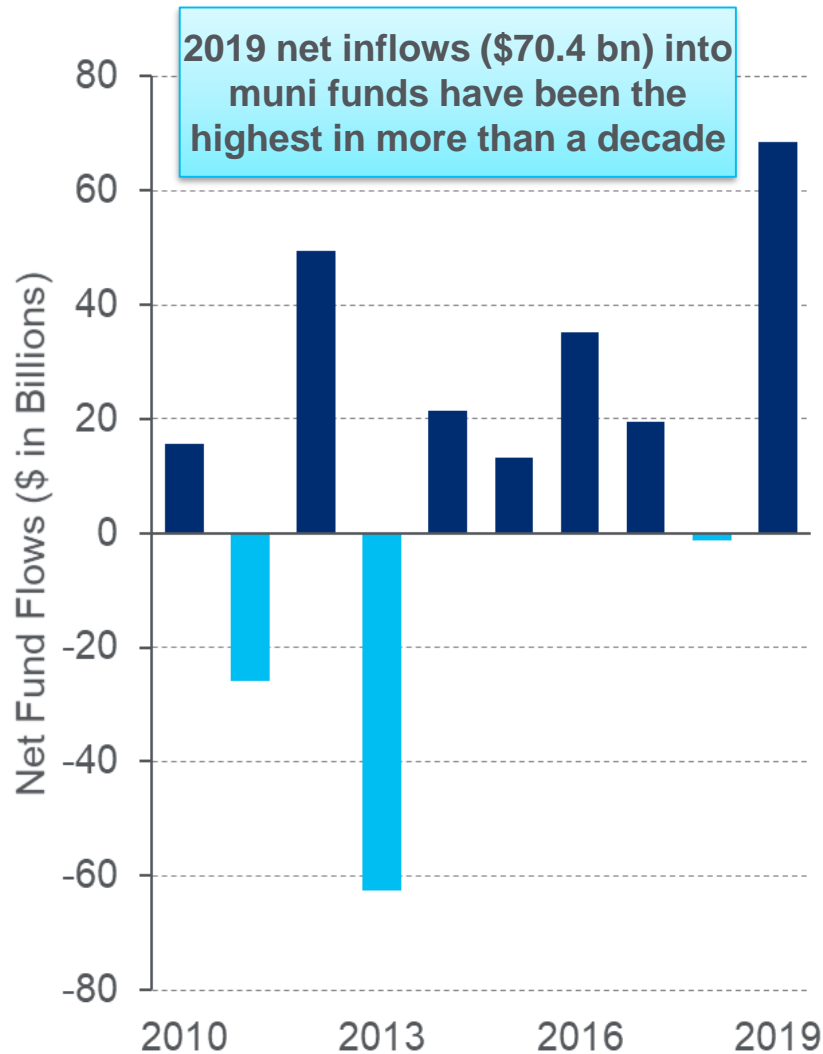
Annual Municipal Supply (\$B) and 30-Yr MMD/TSY Ratio



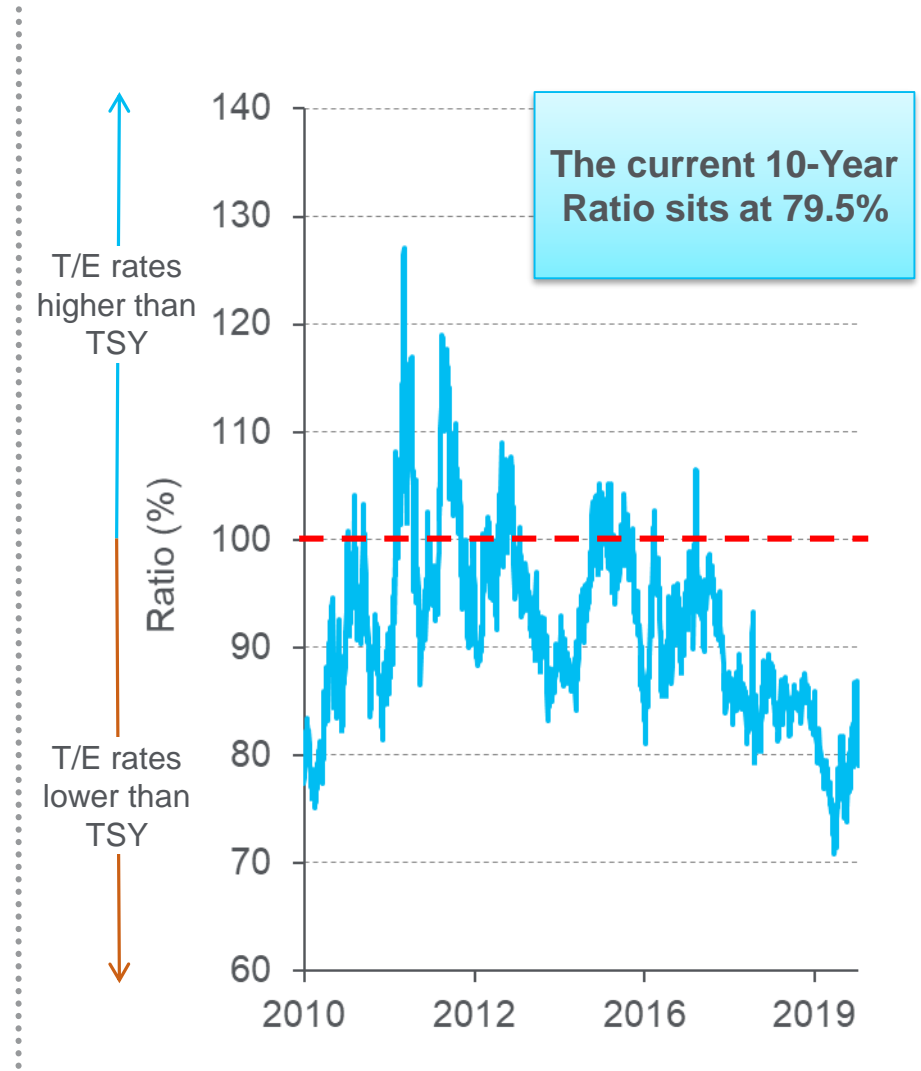
Source: SDC, includes private placements, excludes notes. 2019 supply estimate based off of 2019YTD with a pro rata projection of supply through the end of the year.

Municipal Bonds – Strong Interest / Improved Ratios

Net Fund Flows Have Swelled...



...And Ratios have Decreased



Source: Bloomberg and Municipal Market Analytics. Net Fund Flows as of October 9, 2019. Treasuries and MMD as of October 11, 2019.

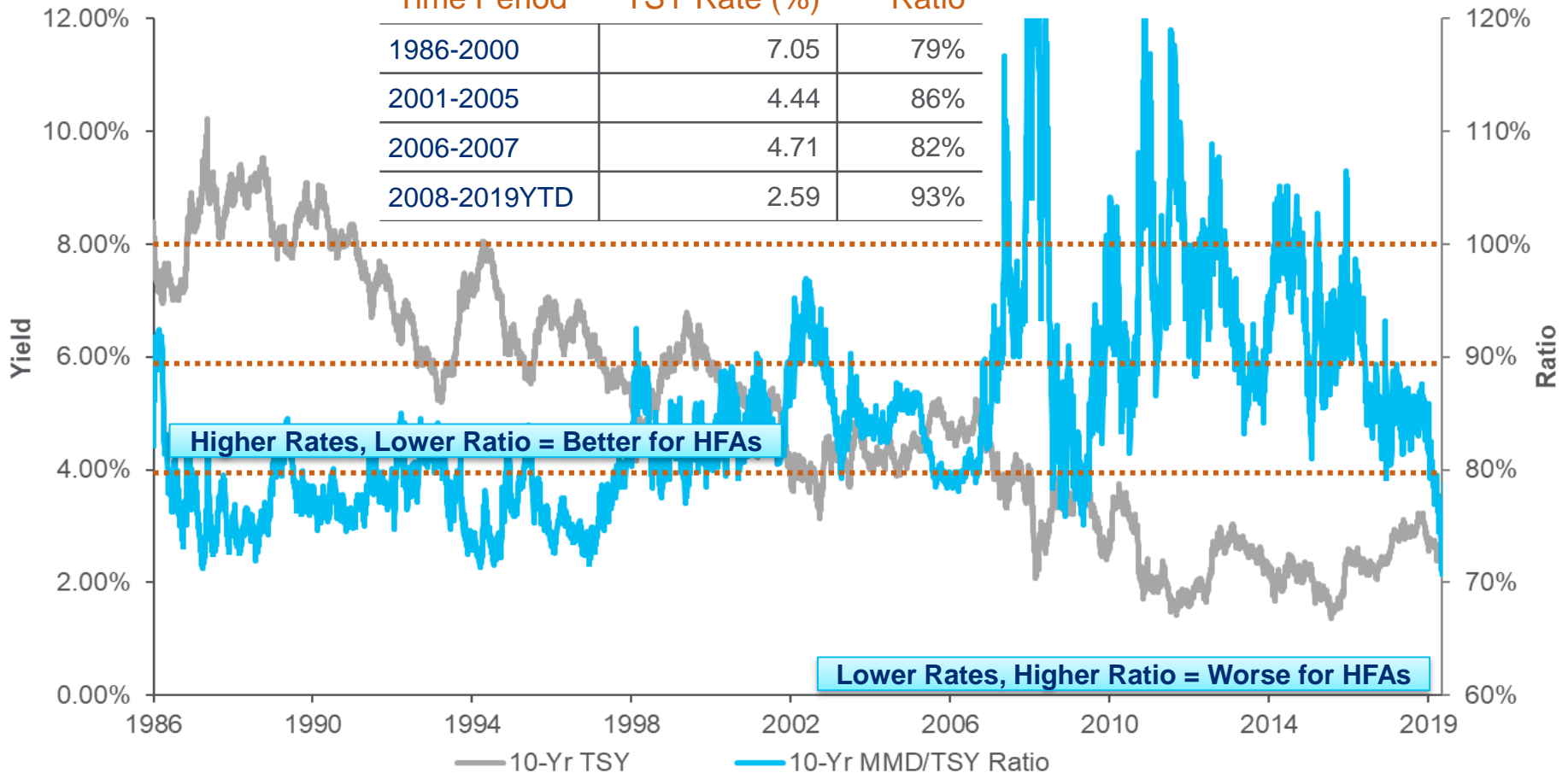
Correspondence of Ratios to Absolute Interest Rates

Low rates often affect HFA's funding advantage relative to the conventional market. This is shown in the graph below: pre-2000 rates/ratios were favorable, the advantage was restored with higher rates in 2006-07, but post-Crisis it largely evaporated.

10-Yr TSY and 10-Yr MMD/TSY Ratio

Average 10-Yr Rate and Ratio

Time Period	TSY Rate (%)	Ratio
1986-2000	7.05	79%
2001-2005	4.44	86%
2006-2007	4.71	82%
2008-2019YTD	2.59	93%

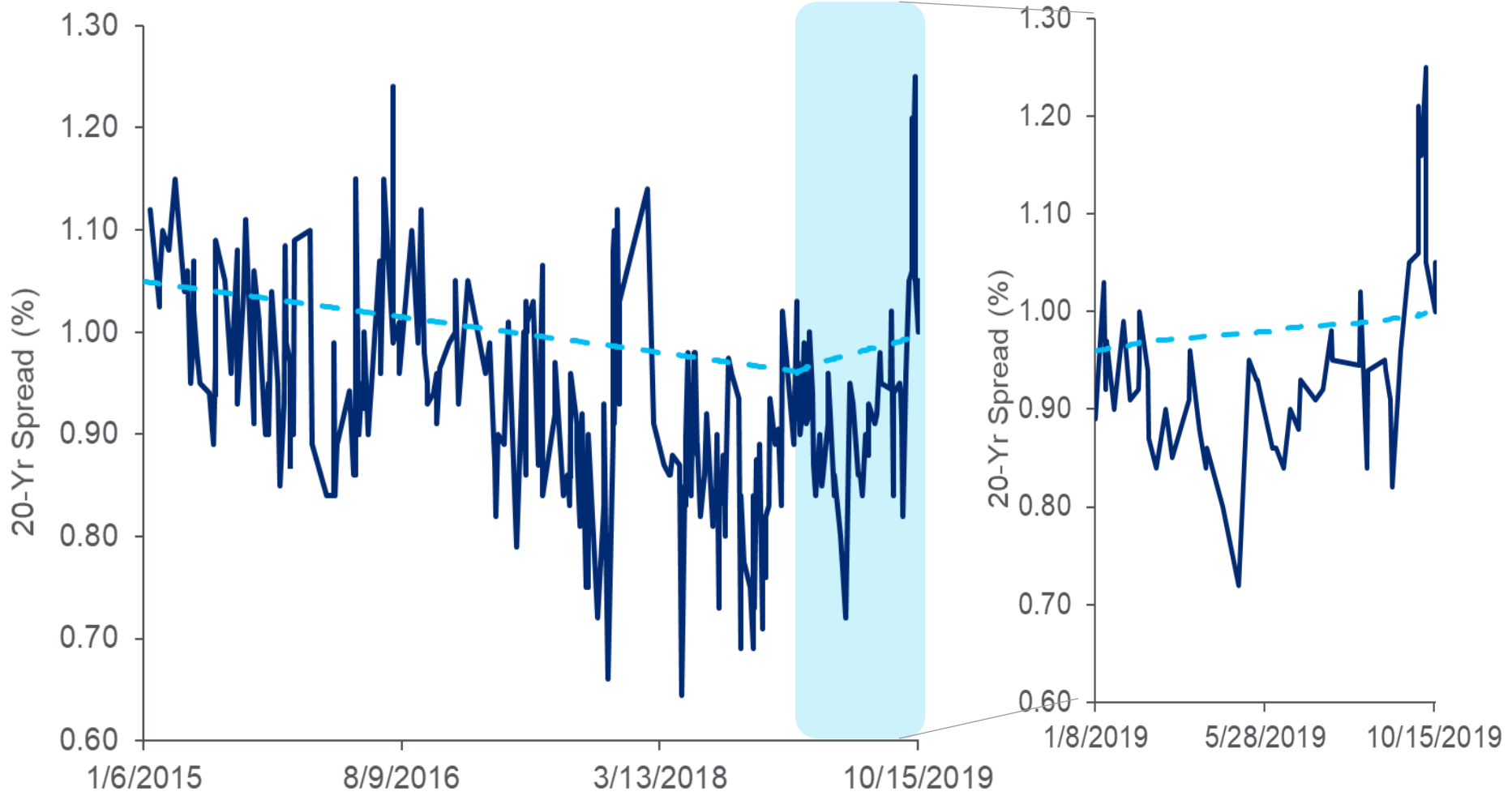


Source: TM3 and Bloomberg as of October 11, 2019.

The 'Cost of *Housing*' – Spreads to MMD

Spreads Generally Trending Lower (Narrowing)... Until August

20-Year Non-AMT Housing Spreads Since 2015



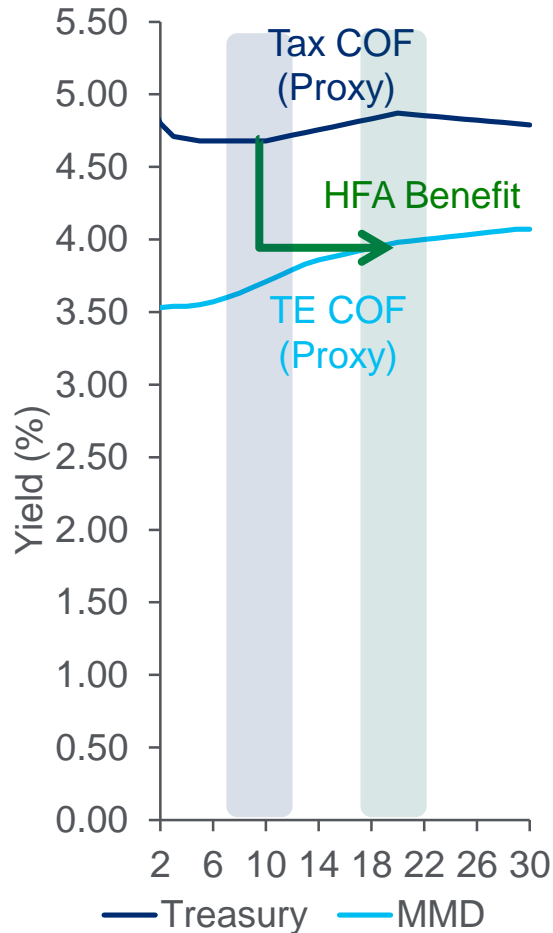
Source: TM3 and SDC as of October 15, 2019.



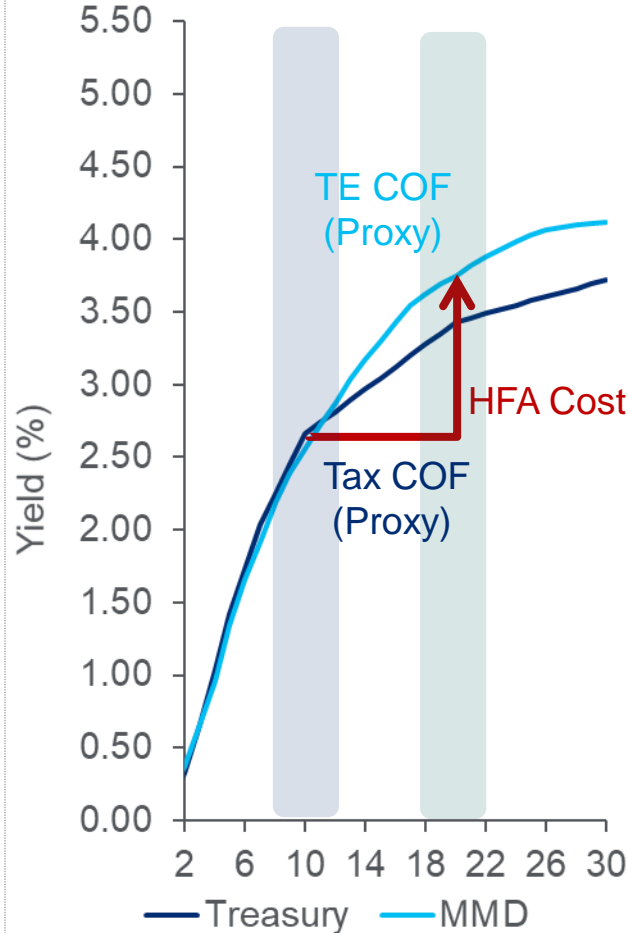
The Value of the Yield Curve – Its Steepness, Absolute and Relative

Flatter Yield Curve is Generally Good for HFAs

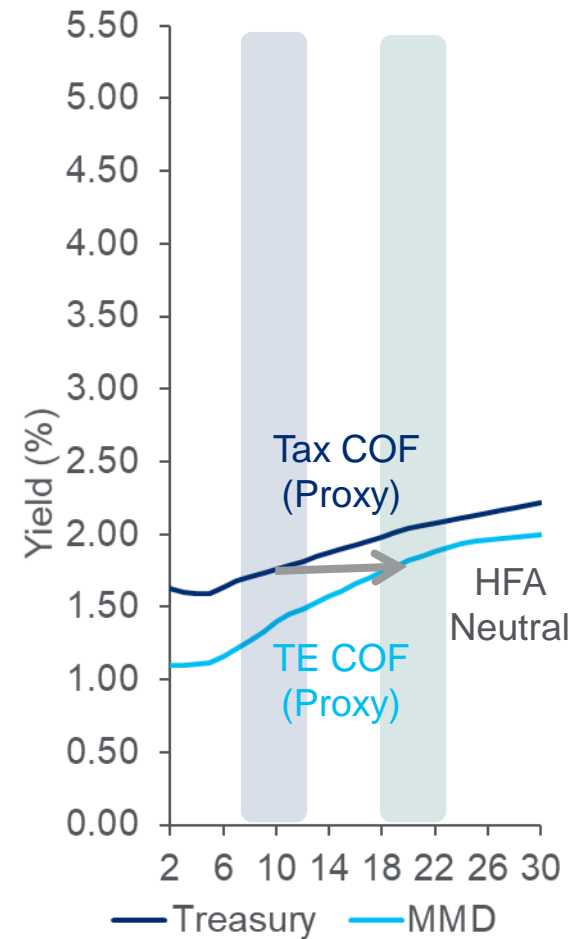
Flat Yield Curve (1/2/2007)



Steep Yield Curve (10/1/2013)



Current Yield Curve (10/11/2019)

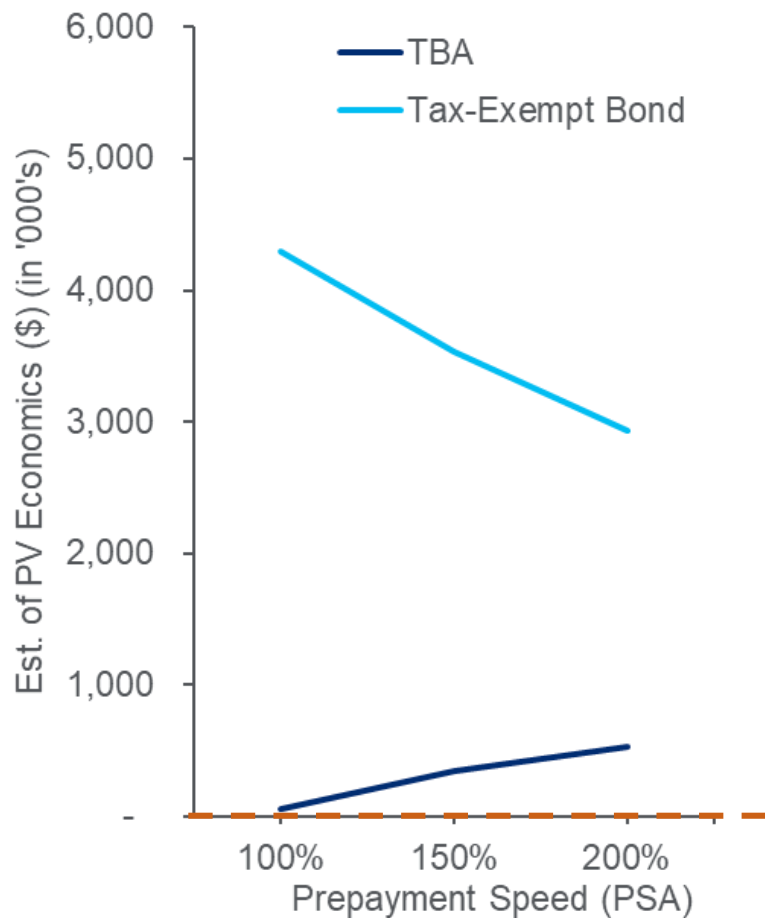


Source: TM3 and SDC as of October 11, 2019.

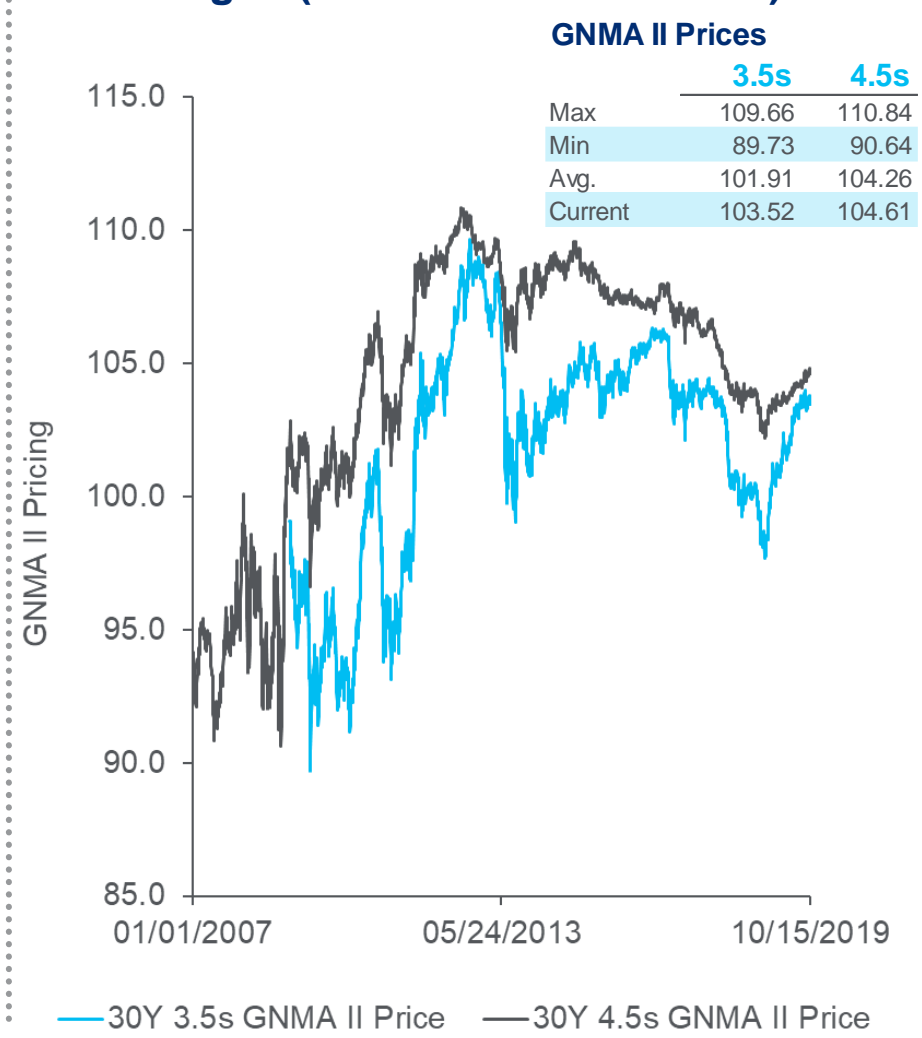
Bonds (PV Residual, On Balance Sheet) Versus (MBS) Sales / Current Income (and Revenue)

Bond Economics (Profit) Continue to Outperform MBS Sales

Bond Sales Generate More Expected Profit (Pay-On-Sale 5 pts. DPA Loan w/ 4.13% Rate on First Loan)¹



GNMA II Prices – Up from Loans, Down From Highs (Prices Since Jan. 2007)²



1. Assumes \$100 mm bond financing & 5 Pts. of DPA (Pay-On-Sale) with 15% Loss. For illustrative purposes only. Actual results will vary. Full Spread = "FS". 2. Bloomberg as of October 15, 2019.



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