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Municipal Versus Treasury Bonds: The Relationship

Seeking Value in Municipal Credit Spread

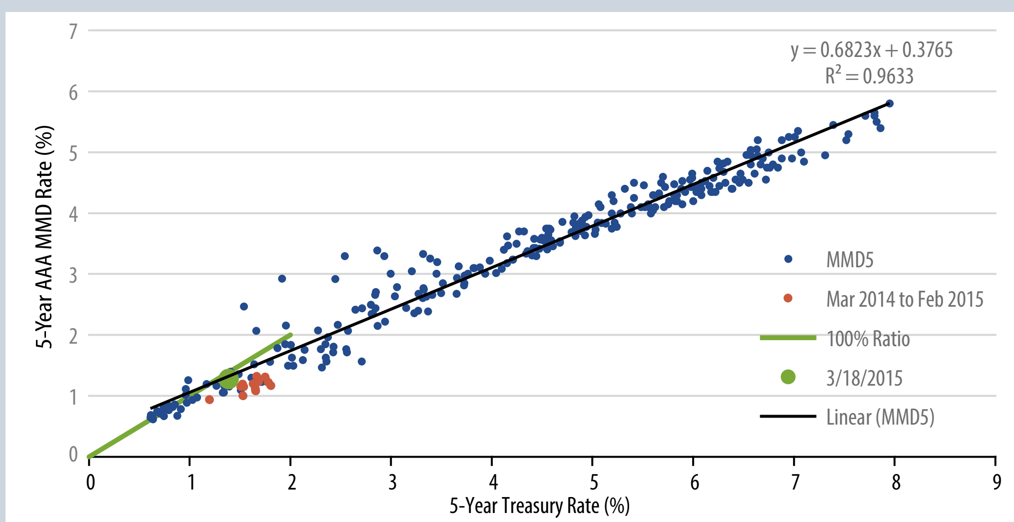
The Municipal Desk continues to find value for the crossover investor in municipal credit spread. This note uses the historical relationship between AAA municipal and Treasury rates (the "Relationship") to interpret current market levels.

- As of March 18, 2015, the ratios of AAA municipal yields to Treasury yields are currently 92%, 106% and 114% for the 5-, 10- and 30-year maturity points, respectively. Ratios exceeding 100% strongly suggest value, especially for those investors that can benefit from tax-exempt income.
- Ratios greater than 100% are predicted by a long-term linear regression model when Treasury yields are unusually low.
- Municipal bonds may provide protection from rising rates because they exhibit long-term betas to Treasury bonds ranging from 68% (for the 5-year maturity) to 60% (for the 30-year maturity).
- Closer analysis reveals evidence of positive convexity in the Relationship at low rate levels. Historical data suggests that municipal yields diverge from the long-term linear model when rates are very low and cluster around the 100% ratio line. The historical relationship suggests that municipal bonds will appreciate with a beta of 1.0 if Treasury rates decline, but will revert to lower betas if Treasury rates rise.

Risk, Risk Premium and Valuation

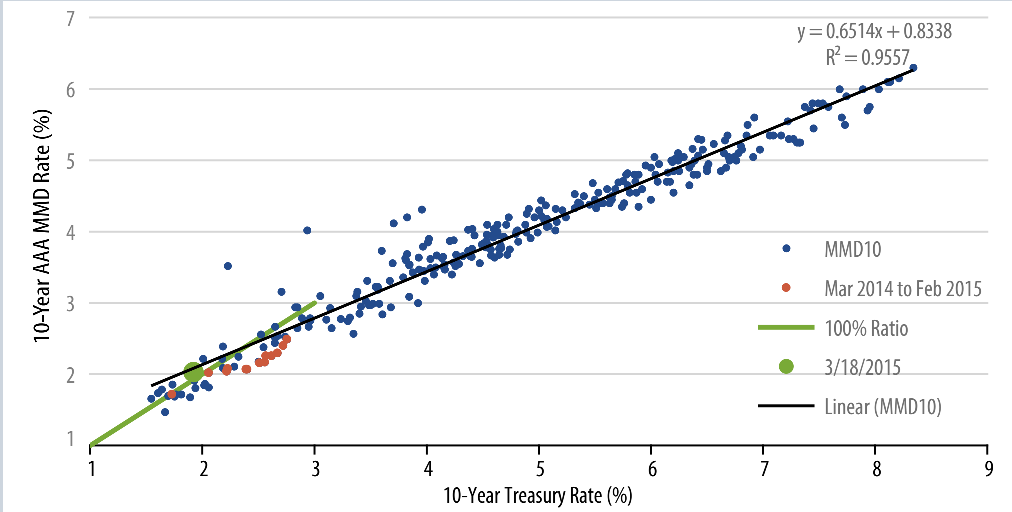
Linear regression provides important information about the municipal market. The graphs below show scatter analyses of municipal and Treasury yields for three maturity points.

Exhibit 1
5-Year Treasury vs. 5-Year Municipal Bonds (MMD*), April 1991 to February 2015



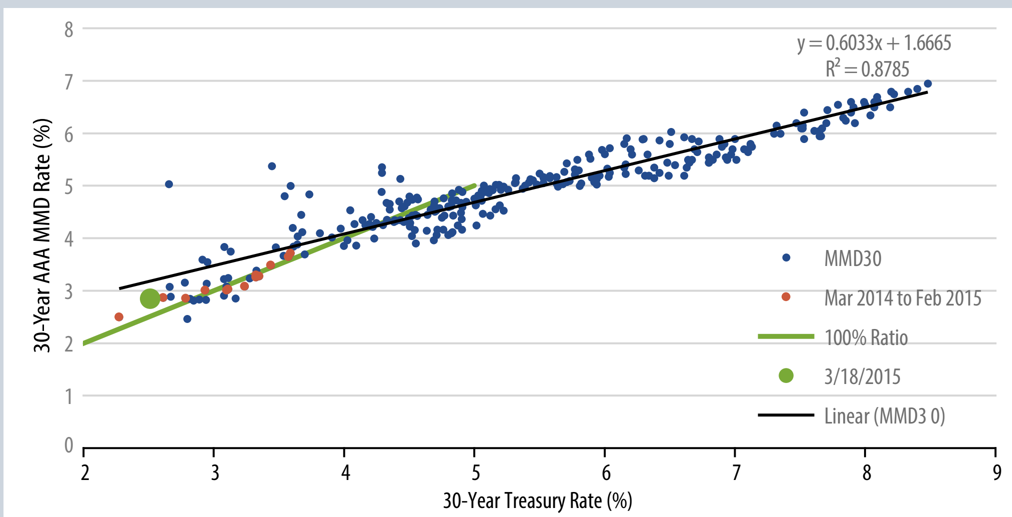
Source: Bloomberg, Thomson Reuters, Western Asset. As of 18 Mar 15 **Municipal Market Data*

Exhibit 2
10-Year Treasury vs. 10-Year MMD, April 1991 to February 2015



Source: Bloomberg, Thomson Reuters, Western Asset. As of 18 Mar 15

Exhibit 3
30-Year Treasury vs. 30-Year MMD, April 1991 to February 2015



Source: Bloomberg, Thomson Reuters, Western Asset. As of 18 Mar 15

The table below summarizes the regression results for the 5-, 10- and 30-year maturities. Recall that the beta coefficient represents proportional change in municipal yield given a change in Treasury rates, and the constant coefficient is a municipal risk premium earned by the investor.

Exhibit 4
AAA MMD Regressed on to Treasury Rates

Maturity	Beta	Constant	R-Sq
5-Year	0.682	0.377	0.96
10-Year	0.651	0.834	0.96
30-Year	0.603	1.667	0.88

Source: Bloomberg, Thomson Reuters, Western Asset. As of 18 Mar 15

This table suggests that, given the right entry level, municipal bonds could provide protection from rate increases while earning a stable risk premium.

The regression model also provides a rich/cheap model to evaluate municipal yields in terms of Treasury yields. Using levels from March 18, 2015, we find that the 5- and 10-year municipal yields are 4 and 6 basis points (bps) rich, respectively. The 30-year point is 35 bps rich according to the linear model, yet has a ratio of 114% and a positive spread of 34 bps over Treasury yields.

Exhibit 5
Regression Model for March 18, 2015

	Treasury	Predicted	AAA MMD	Err	Err Z-Score	Ratio	Spread
5-Year	1.389	1.324	1.28	-0.044	-0.10	92	-0.109
10-Year	1.921	2.085	2.03	-0.055	-0.23	106	0.109
30-Year	2.511	3.181	2.85	-0.331	-1.00	114	0.339

Source: Bloomberg, Thomson Reuters, Western Asset. As of 18 Mar 15

Low Rates

One of the recurring questions regarding municipals is whether ratios should or do increase when rates decrease. The studies above indicate that ratios have increased in low rate environments, and recent history has provided us an opportunity to observe detailed behavior at the extremes of low rates. In particular, if municipal yields continue to track the regression line, then sufficiently low rates will lead to ratios that exceed 100%. The graphs above include the 100% ratio line shown in green, and, when Treasury rates are low, the data points cluster around the green line segments (albeit with errors). It appears that the market resists ratios above 100%, and the long-term regression relationship is broken at extremely low rates.

This represents a type of positive convexity. Near the point of intersection of the green and black lines on the graph, history suggests that municipals will lag Treasury bonds with a beta of 0.60 (for the 30-year point) if rates increase, but will keep pace with Treasury bonds if rates decrease.