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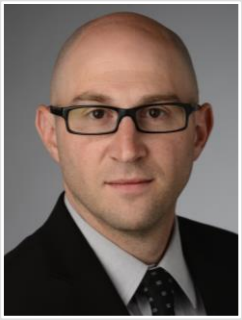

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University and Hospital Municipal Bonds: Taxable Supply Continues at a Solid Clip

The Build America Bond (or "BAB") program signed into law on February 17, 2009 broadened the investor base for municipal credit to a global audience. Despite the closing of the BAB program at the end of 2010, the changing economics facing higher education and not-for-profit healthcare have been a catalyst for sustained issuance in these taxable municipal bond sectors. This trend should continue to offer investors opportunities to diversify credit portfolios and augment performance. In this paper, we explore:

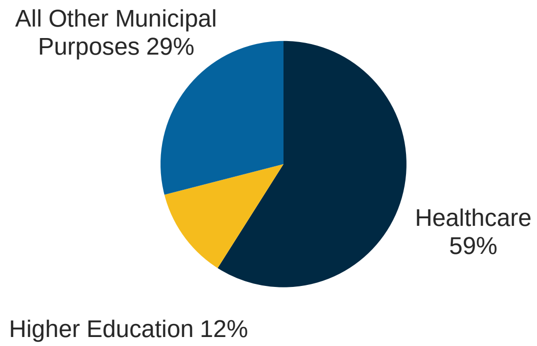
- *The incentives for universities and hospitals to issue taxable debt instead of tax-exempt debt;*
- *The rationale for taxable issuance to continue in these sectors; and*
- *The advantages of diversification into municipal credit for taxable debt investors.*

BROADENING INVESTOR BASE

The municipal bond market is an increasingly important vehicle for infrastructure finance within the United States. This market has been, and continues to be, primarily a vehicle for U.S. investors seeking modest credit risk with preferential tax treatment, characteristics that have historically made municipal credit a retail-based investment.

However, the broadening of the investor base during the BAB program to institutional U.S. and international investors remains relevant to the expansion of taxable bond issuance in two large sectors of the social infrastructure continuum—universities and hospitals.

2018 CREDIT INDEX-ELIGIBLE MUNICIPAL ISSUANCE



Source: Bloomberg, PGIM Fixed Income as of December 31, 2018

Looking at the universe of taxable municipal debt issued in 2018, healthcare and higher education accounted for 71% of the $16.6 billion of aggregate credit index-eligible municipal bond issuance for the year, according to Bloomberg.

TAX EXEMPTION REQUIRES SIGNIFICANT REGULATORY COMPLIANCE…

It may not be necessarily intuitive as to why an entity that can issue tax-exempt (and therefore cheaper) debt would choose to issue taxable debt and pay a higher cost of capital. When considering this cost, one must additionally weigh the opportunity cost of the use-restrictions that accompany tax-exempt debt.

The ability of municipal debt to be tax-free is constrained by various tests established under the U.S. Internal Revenue Code ("Tax Code"). The Tax Code limits how facilities financed with tax-exempt debt can benefit certain users, among many other provisions. For example, if more than 10% of a bond's proceeds finance a project managed by a private entity, or if the federal government or a private entity repay the debt financing a project, such a structure would violate the Tax Code and any interest on that debt would be subject to taxation.

…ILLUSTRATING A DYNAMIC CAPITAL FINANCING PARADIGM

Below are several examples that highlight when healthcare and higher education issuers may elect to issue taxable over tax-exempt debt.

In 2010, Pfizer launched its Centers for Therapeutic Innovation (CTI), which is comprised of stakeholders across the university and hospital spectrum, including Columbia University Medical Center, Johns Hopkins University, New York University, Washington University (St. Louis), and the University of Southern California, among others.

Washington University is just one example of an institution that chose to sell U.S. credit index-eligible taxable debt in 2017 to facilitate optimizing its capital costs related to its medical school. Participating in CTI provided Washington University with needed funding for both direct and indirect research. Absent this relationship, funding would have had to come from either internally-generated resources or from private or governmental research grants, which are a finite resource. Washington University's decision to issue taxable debt illustrates the significance of having flexibility in deploying capital. Given that we do not see either of these challenges moderating in the near-to-intermediate term, material taxable issuance by universities and hospitals is expected to continue.

Another example is Memorial Sloan Kettering Cancer Center's (MSKCC) decision to sell $400 million in taxable, unsecured debt to finance, in part, its expansion into New Jersey in late 2012. To access governmental conduits to issue tax-exempt debt, however, the use of proceeds must clearly be defined and satisfy regulatory hurdles, which is often a time-consuming affair. Rather than wait months for regulatory matters to be resolved or reduce its balance sheet resources to move forward with its capital plan, MSKCC chose instead to issue U.S. corporate index-eligible taxable debt to finance its capital plan.

Looking prospectively, it is entirely rational to expect taxable issuance in the higher education and healthcare sectors will continue to grow as these entities seek to augment operational flexibility and further develop strategic initiatives that are often incongruent with the regulatory requirements of tax-exempt debt issuance.

HIGH CREDIT QUALITY AND MUTED EVENT RISK

Not surprisingly, many of the institutions pursuing such strategic initiatives have ample balance sheets and established market positions, which drive relatively high-quality credit ratings. This is an important reason why these two sectors—healthcare and higher education—accounted for approximately 71% of credit index-eligible taxable municipal bond issuance in 2018. Within that universe, the majority of issuers were of higher credit quality, as is shown below.

Credit Index-Eligible Taxable Municipal Credit Quality[1]

	AA Range	A Range	BBB Range	Lower/NR
Healthcare	30%	50%	18%	2%
Higher Education	20%	67%	7%	6%

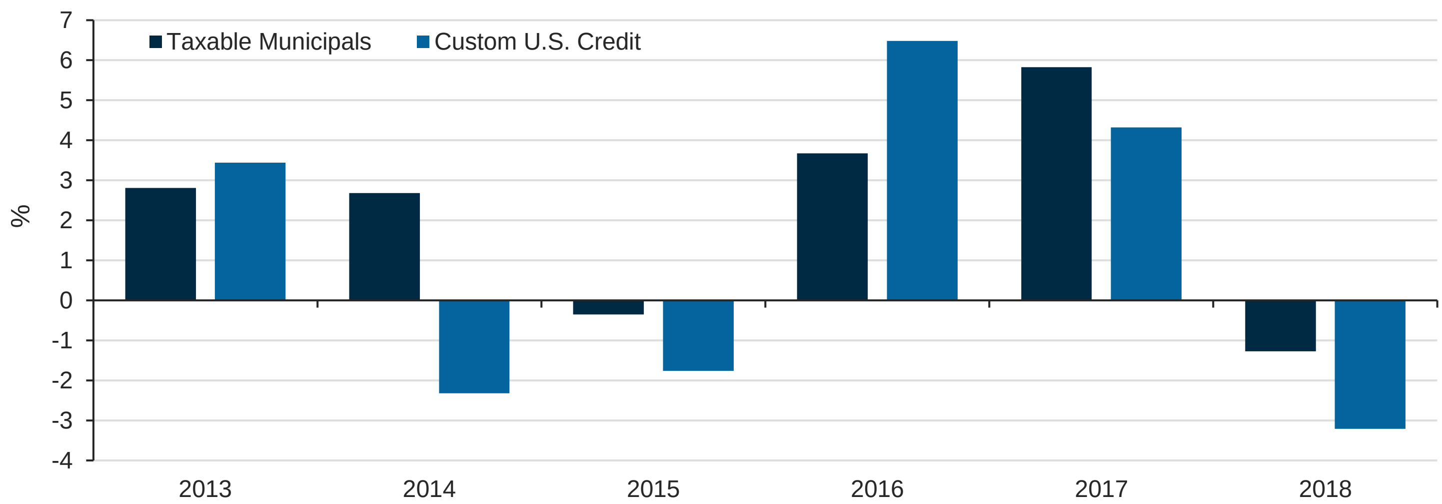
[1] Sources: Bloomberg and PGIM Fixed Income as of December 31, 2018.

The strong credit quality of these institutions, combined with the superior default experience of the municipal asset class in general, can offer fixed income investors meaningful credit stability. According to Moody's Investor Service Municipal Defaults and Recoveries 2017, the aggregate cumulative 10-year default rate from 1970 to 2017 for Aa-rated municipal bonds is just 0.02%, which compares favorably to global corporate bonds at 0.81% over the same period.

Lastly, we believe taxable municipal debt can provide advantages to an investment grade fixed income portfolio. As the chart below illustrates, taxable municipals have exhibited an attractive excess return profile relative to comparably-rated U.S. corporate bonds with a similar duration profile. The impact of the lower beta is particularly notable in difficult risk environments. Observationally, this outperformance is likely explained by a reduced correlation to cyclical downturns, and, in conjunction with a lower historical default experience, can offer investors an important source of stability and performance diversity.

TAXABLE MUNICIPALS: HIGHER-QUALITY LONG DURATION WITH LOWER BETA IN DOWN MARKETS*

Annual Excess Returns



Past performance is not a guarantee or a reliable indicator of future results. Please see the Notice for important disclosures. *The value of investments can go down as well as up. Sources of returns: Bloomberg and PGIM Fixed Income as of December 31, 2018.*

** For illustrative purposes only. Represents the annual excess returns over similar-maturity U.S. Treasuries of a proprietary taxable municipal index comprised of both credit index-eligible and non-credit index-eligible bonds vs. a custom Bloomberg Barclays U.S. Credit Index comprised of different maturity and rating buckets to match the taxable municipal index's option adjusted spread duration and credit ratings. An investment cannot be made into an index.*

CONCLUSION

In sum, we expect taxable municipal issuance in the healthcare and higher education sectors to remain an active investment opportunity for investors seeking high-quality, long-duration investments with the added benefits of sector and credit diversification.

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Source(s) of data (unless otherwise noted): PGIM Fixed Income as of March 2019.

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