

# A source of diversification in US Infrastructure

## US Municipal Bonds for European Insurers

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**Charles Moussier**  
Head of EMEA Insurance Investment Solutions, Invesco  
Charles.Moussier@invesco.com



**Stephanie Larosiliere**  
Head of Municipal Business Strategies & Development, Invesco

### 1. Executive summary

Bond yields remain challenged in the Eurozone and investors continue to face low yields across sectors in the investment-grade universe. With this in mind, the search for higher-yielding fixed income instruments remains strong in Europe. After considering nontraditional sectors such as emerging markets bonds and high-yield bonds, insurers are now looking for additional sources of return and diversification.

**“European insurance companies find infrastructure debt to be an attractive investment.”**

A rising number of European insurance companies find infrastructure debt to be an attractive investment. However, as the European market is in the early stages of development, the investment opportunities are rare. Some types of US municipal bonds could therefore be worth considering for European-based insurers because they typically provide:

- a source of long-dated, high-credit-quality fixed income
- access to US infrastructure debt in a publicly available form (revenue bonds)
- potential for higher yields than equivalently rated public credit, with a demonstrable history of lower default rates and higher recoveries
- a source of diversification within existing credit portfolios
- relative value compared to European corporate bonds, even after hedging costs.

### 2. What are municipal bonds?

Municipal bonds have played a vital role in building the framework of America’s modern infrastructure. They were a major source of financing for canals, roads and railroads during the country’s westward expansion in the 1800s. Today, the proceeds from municipal debt continue to fund a wide range of state and local infrastructure projects, including schools, hospitals, universities, airports, bridges, highways and water and sewer systems.

Municipal bonds are issued by US state and local governments (municipalities), eligible not-for-profit corporations and territories and possessions of the US (for example, Puerto Rico, Guam or American Samoa). When an investor purchases a municipal bond, he or she is lending money to finance myriad public projects.

Traditionally, municipal bond interest payments are exempt from federal income taxes and sometimes state income taxes for domestic investors.

### 3. Potential attractions for foreign investors

For investors who do not pay taxes in the US, these tax features might be considered a drawback rather than advantage, as nominal yields are driven down by those investors who can utilise tax deductions.

This is why foreign investors usually focus on taxable issues, because they trade at a higher yield. Since income from such bonds is taxable in the hands of the investor, taxable municipal bonds offer risk-adjusted yields that are comparable to those available from other taxable entities such as corporate bonds.

The taxable municipal bond market represents over USD 650 billion of the total market size with over 3,000 issuers (approximately 16% of the overall municipal bond market).

Issuers may choose to issue a taxable municipal for a variety of reasons, including access to a broader investor base, the flexible use of proceeds and the fact that the financed activity is not considered tax exempt.

A recent trend is increased municipal issuance using corporate cusips. These are a specific sub-class of municipal bonds that use a corporate cusip identifier. The aim here is to take advantage of the greater liquidity and diverse investor bases that the corporate market offers. Typically, municipal issuers access the corporate bond market to issue longer-dated structures that are attractive to liability-driven investors.

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#### 4. Two types of municipal bonds

In general, municipal bonds fall into one of two categories: general obligation bonds or revenue bonds. The primary distinction between the two is how their principal and interest payments are secured - in other words, the source of revenue that secures the bonds.

General obligation bonds at the state level are secured by the state government's pledge to use all legally available resources to repay the bond.

Examples of issuers of general obligation bonds include states, cities, counties and school districts.

Revenue bonds are secured by a specific source of revenue earmarked exclusively for repayment of the revenue bond. Water and sewer authorities, electric utilities, airports, toll roads, hospitals, universities and other not-for-profit entities typically issue these bonds to finance infrastructure projects.

**"Municipal bonds are worthy of consideration for matching insurers' long-term liabilities."**

#### 5. Favourable liability-matching features

There are many features of typical municipal bonds that make them an instrument worthy of consideration for matching insurers' long-term liabilities. These features include lower default rates, higher recovery rates and predictable long-term income.

The majority of state and local governments are highly rated, whereas corporate credits tend to have lower average ratings (figure 1). Up to 98% of US municipal issuers rated by Moody's are currently rated investment grade. By comparison, only 52% of Global corporate issuers are rated investment grade.

Accordingly, it comes as no surprise that municipal default rates have been exceptionally low, especially when compared with US corporate bonds. The 10-year average cumulative default rate for high-yield corporate bonds is more than three times higher than the high-yield municipal bond default rate (figure 2). This comparison is even more pronounced in the investment-grade universe, where the corporate investment-grade default rate is 23 times higher than the municipal investment-grade default rate.

**"Municipal default rates have been exceptionally low, especially when compared with US corporate bonds."**

Figure 2  
**US municipal versus Global corporate issuers' default rates**  
10-year cumulative default rates, average over period 1970-2019

(in %)	Municipal Bonds	Corporate Bonds
Aaa	0.00	0.36
Aa	0.02	0.79
A	0.10	2.11
Baa	1.10	3.58
Ba	3.57	15.40
B	17.49	33.70
Caa-C	25.07	47.89
Investment-Grade	0.10	2.25
Speculative-Grade	7.29	28.68
All Rated	0.16	10.17

Source: Moody's Investor Service, 15 July 2020: US Municipal Bond Defaults and Recoveries, 1970-2019.

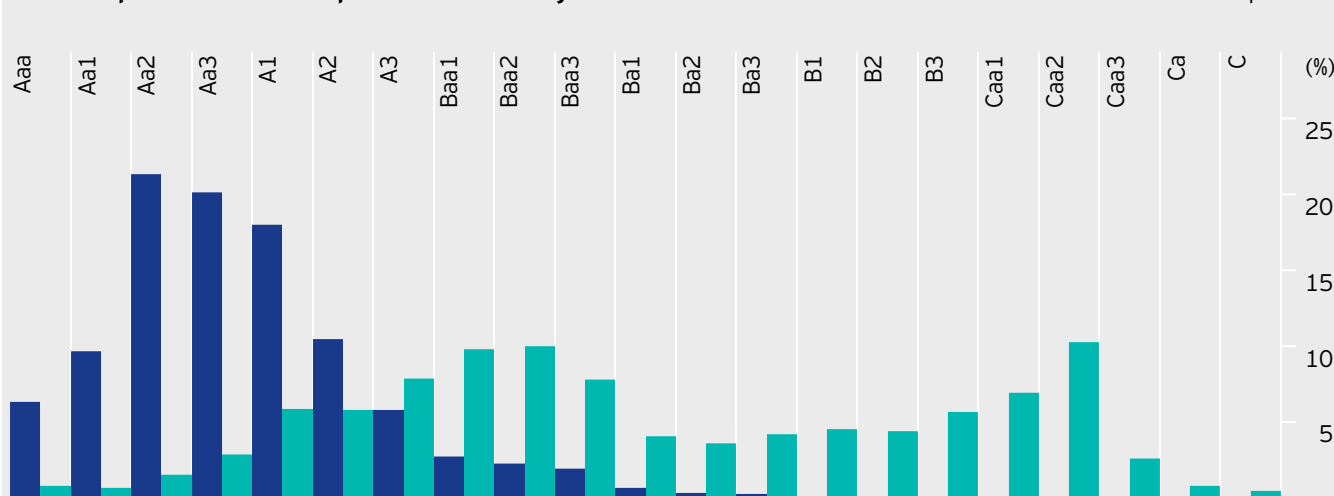
**Past performance is not a guide to future returns.**

In figure 3, classifying outstanding taxable bonds with municipal cusips and corporate cusips (see below), we highlight how the maturity structure of both sets of bonds is tilted towards the long end, with the bias for longer-maturity structures stronger in corporate cusip securities. This demonstrates the availability of longer-maturity bonds to match longer-dated liabilities, e.g. those of life insurers.

Prime examples of such bonds include the California Institute of Technology (13034VAC8), New York and Presbyterian Hospital (649322AE4) and Massachusetts Institute of Technology (575718AF8) bonds, all of which mature in 2116 - that is, in 98 years' time.

In addition, taxable municipal bonds are usually noncallable, which is favourable for liability-matching purposes.

Figure 1  
**US municipal versus Global corporate issuers' ratings**



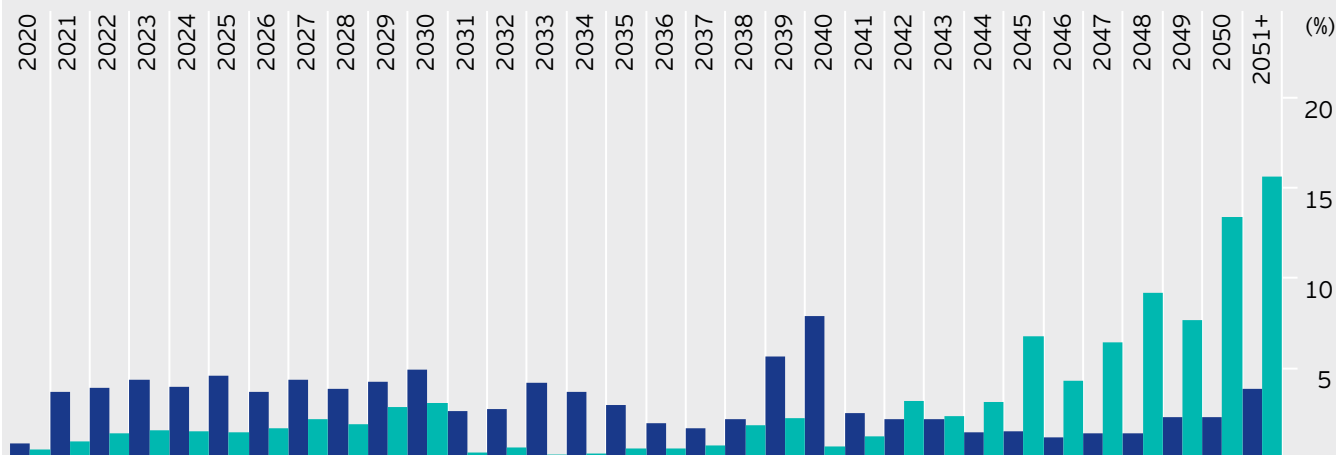
Source: Moody's Investor Service, 15 July 2020: US Municipal Bond Defaults and Recoveries, 1970-2019.

**Past performance is not a guide to future returns.**

Figure 3

**Maturity structure of taxable municipals versus corporate cusip municipals**

■ Taxable municipals  
■ Corporate cusip municipals



Source: Bloomberg, JP Morgan, 22 September 2020. Note: Fixed and zero coupon only. Notes excluded.

**6. Solvency II and infrastructure investments**

Since January 2016 European-based insurers have been subject to Solvency II and its capital requirements. Taking into consideration the market risk module of the standard formula, the capital requirement of a bond or loan is calculated by interest rate, spread, concentration and currency modules.

In simple terms, the spread risk module assigns a capital charge based on the duration, rating (credit quality step) and risk factor of a bond where the risk factor charges depend on the sector. For example, European government bonds have a risk factor of zero - regardless of rating - and therefore do not incur a spread charge. Furthermore, Aaa/Aa covered bonds have a lower risk factor than standard corporate bonds and benefit from a lower capital requirement. In contrast, securitisations have been assigned a high risk factor.

Given the impact of the rating on the calculation of the spread risk charge, the high-quality profile is one important reason why some US municipal bonds are very attractive for insurers regulated under Solvency II. This is especially true for insurers searching for "cheap" sources of duration to match longer-dated liabilities.

Into the bargain, US taxable municipal bonds typically pay higher yields than equivalently rated public credit or corporate bonds. This directly leads to a higher expected capital-adjusted return compared to other types of bonds, even if US taxable municipal bonds are treated as USD corporate bonds under Solvency II (which is a popular approach used by some insurers).

However, it may be possible to gain a more favourable treatment under Solvency II.

Revenue bonds (approximately 70% of overall issuance) are in effect infrastructure debt and are directly linked to revenues from core US infrastructure (universities, hospitals, roads etc.).

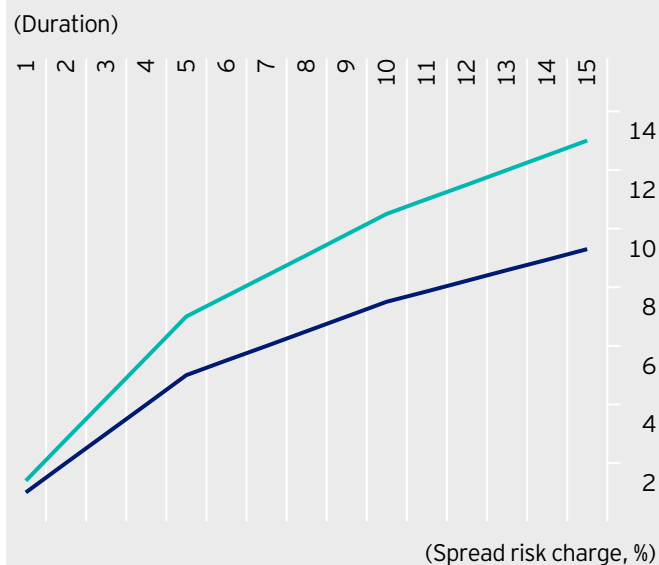
**"It may be possible to gain a more favourable treatment under Solvency II."**

In 2016, EIOPA (European Insurance and Occupational Pensions Authority) updated the spread risk module to include a new set of capital requirements specifically for infrastructure investment (both equity and debt). When compared to similarly rated corporate bonds, the infrastructure debt sector requires approximately 30% less capital to be held by the insurer (figure 4). Identifying municipal bonds meeting the requirements could therefore be favourable.

Figure 4

**A-rated municipal bonds versus A-rated corporate bonds**

■ A-rated municipal bond  
■ A-rated corporate bond



Source: Official Journal of the European Union, data as at 30 September 2019.

EIOPA defines a qualifying infrastructure entity as one "which is not permitted to perform any other function than owning, financing, developing or operating infrastructure assets". These assets must be "physical structures or facilities, systems and networks that provide or support essential public services"<sup>1</sup>, such as toll roads and water treatment plants. Furthermore, the asset needs to have "predictable" cash flows<sup>2</sup>. Bonds should be investment-grade<sup>3</sup> and the insurer should be able to demonstrate the ability to hold these assets to maturity<sup>4</sup>. Given these criteria, certain US taxable revenue-backed bonds may meet the requirements and be an appropriate investment for European insurance companies.

Many revenue bonds may meet the infrastructure debt requirements under Solvency II and therefore receive a reduction in the spread risk charge.

Given that municipal bonds are issued in USD, it is obvious that European investors have to bear additional risk or decide to hedge the inherent foreign currency exposure.

In the standard formula for calculating the Solvency Capital Requirement (SCR), the regulator specifies the capital required for currency exposures and prescribes that, for each currency, the upside or downside impact on the insurer's asset-liability value should be calculated, with a standard stress scenario of 25% fluctuation in the currency.<sup>5</sup> This results in an additional 25% charge for USD currency risk, if the exposure is not hedged back to the insurer's local currency (for example, EUR, GBP).

## 7. Municipal taxable model portfolio<sup>6</sup>

We calibrated a portfolio of taxable municipal bonds in the context of insurance liabilities. This portfolio compares favourably against equivalent corporate bond portfolios in different currencies (figure 5). The characteristics of this municipal bonds portfolio are listed below:

- 100% taxable municipal bonds
- focus on revenue bonds backed by infrastructure projects
- investment-grade municipal bonds only
- buy-and-hold approach based on sound credit research and risk management
- focus on A and Aaa ratings
- duration of 10-12 years with minimal dispersion
- hedging of currency risk and interest rate risk through fixed/ fixed cross-currency swap

Assuming an investment of USD 100 million, constructing a model portfolio leads to the portfolio characteristics shown in figure 5.

With above 80% of the market rated investment grade and with maturities typically exceeding 20 years, municipal bonds represent a potential instrument to manage long-duration life insurance liabilities. In the context of relatively low yields, municipal bonds can offer better yield than investments in high-grade corporate bonds for lower capital requirements and lower economic risk in the context of buy-and-hold strategies.

In addition, if some of the portfolio holdings qualify for favourable treatment under Solvency II, the expected capital-adjusted return can be further enhanced.

Figure 5

### Model portfolio: US IG municipal bond portfolio versus IG corporate bond portfolio

	US IG municipal bond portfolio	US IG corporate bond portfolio	EUR IG corporate bond portfolio	GBP IG corporate bond portfolio
Average coupon	4.04%	4.90%	1.65%	3.69
Effective duration	11.7	10	10.5	10
Book yield (local currency)	2.32%	2.11%	0.65%	1.57%
Book yield (in EUR)	1.37%	1.11%	0.65%	-
Book yield (in GBP)	2.05%	1.71%	-	1.57%
Average credit quality	AA-/A+	A-	A-	A-
Number of issuers	40	50	50	50

Source: Invesco, data as at 10 September 2020. For illustrative purposes only.

## 8. Appendix: Basic requirements for Solvency II for taxable municipal revenue bonds

Factor	Requirement	Comment on revenue bonds
Nature of issuer	The bond should be related to an investment in an infrastructure project entity. <sup>7</sup>	Separate authority or agency or LLC <sup>8</sup> owning a specific project.
Stressable cash flows	The infrastructure project entity can meet its financial obligations under sustained stresses that are relevant for the risk of the project. <sup>9</sup>	Usually given for revenue bond sectors transportation, airports/ports, power and water/sewer.
Predictability of cash flows	The cash flows that the infrastructure project entity generates for debt providers and equity investors are predictable (e.g. the level of output is contractually fixed). <sup>10</sup>	Usually sufficiently predictable due to low demand risk or availability based, take-or-pay contract or regulated.
Regulatory & Contractual Protections	The infrastructure assets and infrastructure project entity are governed by a contractual framework that provides debt providers with a high degree of protection. <sup>11</sup>	Trust indenture protections usually meet the requirements.
Ability to hold until maturity	Where investments are in bonds or loans, the insurance or reinsurance undertaking can demonstrate to the supervisor that it is able to hold the investment to maturity. <sup>12</sup>	The investor is assumed to be able to hold the bond to maturity (e.g. life insurer).
Credit Rating	The criteria for exposures that are assigned a reduced risk factor shall be the assignment of a credit quality step between 0 and 3. <sup>13</sup>	Bonds under consideration are assumed to have a credit rating of at least BBB given the structure of the municipal bond market.

Source: EIOPA, 31 May 2018.

### Investment risks

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

Municipal securities are subject to the risk that legislative or economic conditions could affect an issuer's ability to make payments of principal and/or interest.

All fixed income securities are subject to two types of risk: credit risk and interest rate risk. Credit risk refers to the possibility that the issuer of a security will be unable to make interest payments and/ or repay the principal on its debt. Interest rate risk refers to the risk that bond prices generally fall as interest rates rise and vice versa.

Municipal bonds are issued by state and local government agencies to finance public projects and services. They typically pay interest that is a tax in their state of issuance. Because of their tax benefits, municipal bonds usually offer lower pre-tax yields than similar taxable bonds.

### Notes

- <sup>1</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 1 55 (a) and (b)
- <sup>2</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)(b)
- <sup>3</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 180 (12)(d)
- <sup>4</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)(d)
- <sup>5</sup> Commission Delegated Regulation (EU) 2015/35 of 10 October 2014, Article 188
- <sup>6</sup> For discussion purposes only. Terms and characteristics are subject to change.
- <sup>7</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)
- <sup>8</sup> Limited Liability Company
- <sup>9</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)(a)
- <sup>10</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)(b)
- <sup>11</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)(c)
- <sup>12</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 164a (1)(d)
- <sup>13</sup> Commission Delegated Regulation (EU) 2016/467 of 30 September 2015, Article 180 (12)(d)

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## About the authors



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### **Charles Moussier**

Head of EMEA Insurance Investment Solutions, Invesco

Based in Paris, Charles Moussier is Head of EMEA Insurance Investment Solutions. He joined Invesco to reinforce the Global Insurance Solutions division within Invesco.

Charles has a broad insurance and investment banking background. He studied engineering, he holds a Business Administration Diploma and a Master in Insurance and Finance and qualified as an actuary. In his last role he developed the financial institutions advisory business for Natixis CIB. He was Deputy Head of Global Investment Solutions for the AXA Group. Before that, he was co-head of the Insurance & Pension funds solutions team for Crédit Agricole CIB in Paris, Head of Investments and ALM for AXA RE in Paris, Equity derivatives trader assistant for BNPP Americas in New York (USA) and Securitization credit analyst for IXIS Capital Markets in Paris. Charles started his career as scientific coordinator for Airbus Space in 2001 on the Mars express mission.



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### **Stephanie Larosiliere**

Head of Municipal Business Strategies & Development, Invesco

Stephanie Larosiliere is the Senior Client Portfolio Manager and Head of Business Strategies & Development for the Invesco Municipal Bond team. She works with the fund management team, acting as its representative with clients and other intermediaries. Her responsibilities include working with sales staff and clients to provide insight on the municipal fixed income market and the investment strategies utilised by the team. She is also responsible for the ongoing product development and marketing of municipal bond products.

Stephanie joined Invesco in 2011 as a Senior Product Manager supporting the municipal and convertible businesses. She previously served as a vice president of the Goldman Sachs Asset Management fixed income product management team, where she was responsible for portfolio analysis, product development, client retention and marketing. Prior to joining Goldman Sachs in 2008, she worked as an institutional product management associate for Brown Brothers Harriman. She began her career in the industry in 2003 as a risk management analyst with JPMorgan Chase, where she was responsible for performing daily value-at-risk analysis and monthly stress-risk tests on the bank's credit portfolio.

Stephanie earned a BBA in finance and investments from Baruch College - The City University of New York (CUNY).



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