
Discussion of “State Government Debt Structure”

Paper by Oliver Giesecke, Hoover

Discussion by Daniel Bergstresser, Brandeis

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Upshot

- Very nice paper on an important topic. I encourage you to read it and am grateful for the opportunity to discuss it.

Summary

- What is the “structure” of state borrowing? By structure Giesecke mostly means maturity profile.
- How does this structure change with market and economic conditions?
- Giesecke trains vision and language models to extract debt information from state government ACFRs:
 - Maturity of debt,
 - What type of entity has issued this debt.
- Debt data from state ACFRs linked to bond-level data to get credit spreads.

Summary

From page 105 of 2024 MA ACFR

At June 30, 2024, debt service requirements to maturity for principal and interest are as follows (amounts in thousands):

Fiscal Year Ended June 30	Governmental Activities								Business - Type Activities					
	Excluding MSBA Debt				MSBA Debt									
	Public Offering Debt		Direct Placement Debt		Dedicated Sales Tax Bonds			Total Governmental Activities		Special Obligation UI Bonds		Revenue Obligation		
	Principal	Interest	Principal	Interest	Principal	Interest	Interest subsidies (1)	Principal	Interest net of Interest subsidies	Principal	Interest	Principal	Interest	
2025	\$ 1,230,367	\$ 1,439,231	\$ —	\$ 3,000	\$ 177,625	\$ 205,885	\$ (22,833)	\$ 1,407,992	\$ 1,625,283	\$ 396,605	\$ 63,606	\$ 248,791	\$ 194,544	
2026	1,346,616	1,391,629	—	3,000	183,865	201,861	(22,833)	1,530,481	1,573,657	217,870	52,003	195,411	186,425	
2027	1,315,916	1,328,068	10,000	2,950	346,225	197,445	(22,833)	1,672,141	1,505,630	216,660	44,042	201,379	178,344	
2028	1,191,219	1,266,632	10,000	2,650	208,115	184,520	(15,047)	1,409,334	1,438,755	215,125	36,112	217,474	172,473	
2029	1,294,344	1,211,331	10,000	2,350	335,420	175,512	(11,767)	1,639,764	1,377,426	212,275	28,123	268,055	155,463	
2030 - 2034	6,069,591	5,142,393	50,000	7,250	1,084,565	767,992	(38,722)	7,204,156	5,878,913	571,990	39,324	1,099,287	636,274	
2035 - 2039	5,605,755	3,820,922	20,000	800	1,444,145	504,984	(18,004)	7,069,900	4,308,702	—	—	1,172,851	413,231	
2040 - 2044	5,636,280	2,586,396	—	—	1,064,540	238,300	(545)	6,700,820	2,824,151	—	—	800,087	203,657	
2045 - 2049	5,032,420	1,412,284	—	—	548,720	69,256	—	5,581,140	1,481,540	—	—	370,269	86,524	
2050 - 2054	3,539,250	399,885	—	—	51,725	2,416	—	3,590,975	402,301	—	—	195,845	21,045	
Total long - term debt ..	32,261,758	19,998,771	100,000	22,000	5,444,945	2,548,171	(152,584)	37,806,703	22,416,358	1,830,525	263,210	4,769,449	2,247,980	
Less: current portion	(1,230,367)	(1,439,231)	—	(3,000)	(177,625)	(205,885)	22,833	(1,407,992)	(1,625,283)	(396,605)	(63,606)	(248,791)	(194,544)	
Long - term debt	<u>\$31,031,391</u>	<u>\$18,559,540</u>	<u>\$100,000</u>	<u>\$19,000</u>	<u>\$5,267,320</u>	<u>\$2,342,286</u>	<u>\$(129,751)</u>	<u>\$36,398,711</u>	<u>\$20,791,075</u>	<u>\$1,433,920</u>	<u>\$199,604</u>	<u>\$4,520,658</u>	<u>\$2,053,436</u>	

(1) FY21 interest subsidies reflect announced sequestration reductions. There may be sequestration reductions in future years as well.

Summary

- Hypotheses:
 - Relationship between X (choose from below) and debt maturity structure:
 - Issuer financial strength
 - Macroeconomic conditions
 - Yield curve
 - Issuance by other categories of issuers (testing the “fill the gap” hypothesis)
 - Credit ratings
 - TCJA SALT deduction limitations

Stepping back a bit

- Our federal government borrows to cover operating deficits, the so maturity structure of borrowing is not defined by the purpose. The US Treasury has an advisory group that opines on the tradeoffs involved in the maturity structure decision.

Stepping back a bit

- With state borrowing, the debt is used to finance infrastructure, so one useful starting point is the life span of the infrastructure being financed.
- This aligns, in a generational sense, the timing of infrastructure use with the payment timing. Some issuers are explicit that asset life span is a default for the maturity structure of the debt.
- If the debt is backed by a revenue pledge, it is natural to align the timing of the pledged cash flows with the timing of debt service requirements.
- States also use “anticipation notes” of different flavors (“tax anticipation notes”, “grant anticipation notes”), this is short-term borrowing in anticipation of future cash inflows.



MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

Debt Issuance and Management Policy

June 2024

1) Purpose for Policy and Debt; Use of Debt Proceeds

The purpose of this policy is to establish a framework for the issuance and effective management of debt of

Stepping back a bit

The MBTA will institute such controls as recommended by its independent auditor and other best practices deemed appropriate by the Chief Administrator, the Chief Financial Officer and Treasurer, including on advice from the financial advisor, investment advisor and bond counsel.

7) Debt Structure

Maturities of new money debt generally will be based on the useful life of the assets being financed. Principal will be amortized to take into account short- and long-term needs and debt capacity. . The use of capitalized interest (borrowing to pay a portion of the interest) will be limited depending on budgetary needs, market conditions, and applicable federal tax law. Call features will be evaluated by considering the relative value of future financing flexibility and the market's perception of any premium associated with a call.

Credit enhancement or insurance will only be used when the present value of anticipated savings (i.e., reduced interest expense) are expected to exceed the cost of the enhancement.

“Maturities of new money debt generally will be based on the useful life of the assets being financed.”

My comments, 1: Put results into context

- It would be useful for Giesecke to compare first moments from his process with what a researcher might have inferred based on more widely-used data sources.
- A different scholar might have done this analysis starting with the Mergent data, which provides reasonably comprehensive coverage of municipal bonds.
- Are there states where the debt amounts, composition estimates, or maturity structures that Giesecke estimates are very different from what one might have inferred from the Mergent data?

My comments, 1: Put results into context

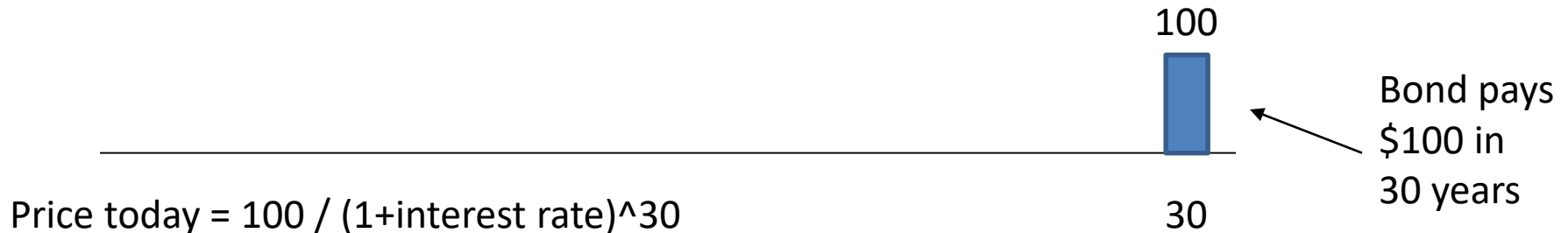
- Giesecke says that his data-harvesting process delivers a $> 99\%$ success rate, but
 - It would be worth knowing what the failures look like,
 - It would be worth knowing where his results look accurate and tell you something new relative to what we might think we already know.

My comments, 2: underlying drivers

- The relationship between financial conditions and debt maturity profile is interesting.
- If the default is to align debt repayment profile with the life of the projects being financed, does this result reflect changes over the cycle in what types of projects are being financed?
- Is the use of “anticipation notes” a cyclical phenomenon?

My comments, 3: maturity and duration

- Maturity is the final date of a bond's payments
- Duration has many different meanings, most prominently the interest rate sensitivity of the value of a bond or bond portfolio.



- If a state borrows using floating-rate debt, the maturity might be 30 years but the duration could be very low. Your interest payments will fluctuate with market interest rates. If a state constantly rolled over short-term borrowing its interest payments would also fluctuate with market rates.

My comments, 3: maturity and duration

- A 30-year bond that paid a fixed interest rate would have a lot of duration; a 30-year floating rate bond could have a very low duration.
- A decade ago MA considered issuing more unhedged floating-rate debt, in order to better align the interest-rate sensitivity of its debt service with the interest-rate sensitivity of tax receipts.
- The upshot of that analysis: all risk exposures were totally dominated by the effect of pension assets and liabilities.

My comments, 3: maturity and duration

- Dwelling on call options for a moment. Most municipal bonds are callable, meaning that the issuer has the right to retire bonds prior to maturity. A callable bond will have a lower duration than an equivalent non-callable bond, and its likely lifespan will be lower.
- Giesecke does very good work adjusting spreads for these call options. Callability will also affect bond duration, callable bonds will have shorter duration, and the effect of the callability will depend on yields and coupon structures.

Overall

- I am very optimistic about this research program and am delighted to read and discuss this paper.
- I would endorse getting a little more granular in combing through how this data harvesting process tells a researcher things that are different from what researchers might have inferred from existing data sources.
- I would endorse incorporating the fact that municipal borrowing has more of a natural default maturity profile than other types of borrowing.