

# Savings Lost: The High Cost of Early Refinancing

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BROOKINGS

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# Topic: Advance Refunding with Taxable Bonds

- Use of tax-exempt bonds for advance refunding outlawed in 2017
- Hundreds of 'taxable' advance refundings between 2018 and 2021
- *With hindsight*, how did these taxable refundings perform relative to refunding with tax-exempt bonds on the call date?
- Methodology of 'counterfactual' analysis
- Case study: Massachusetts School Building Authority
- Results for selected transactions
- Policy implications

# Ten Largest Taxable Advance Refundings Totaled Almost \$7BN

Top Ten Largest Taxable Advance Refundings (January 1, 2018 – January 1, 2021)					
	Issuer	Description	Series	Size (\$MM)	Issue Date
1	State of California	GO Refunding Bonds	Series 2018	1,200.00	04/25/18
2	NYS Thruway Authority	General Revenue Bonds	Series M	857.63	10/30/19
3	Broward County, Florida	Airport System Revenue Refunding Bonds	Series 2019 C	719.94	11/21/19
4	Massachusetts School Building Authority	Subordinate Dedicated Sales Tax Bonds	2019 Series B	715.42	11/20/19
5	San Diego Community College District	GO Refunding Bonds	2019 Series A & B	693.44	10/16/19
6	San Francisco City/County Public Utility Commission	Water Revenue Bonds	2019 Subseries A, B and C	656.96	01/09/20
7	NYS Dorm Authority	Facilities Revenue Bonds	Series 2019B	560.80	12/03/19
8	Houston City, Texas	Utility Revenue Refunding Bonds	Series 2019C	539.14	09/17/19
9	Arizona Transportation Board	Highway Revenue Refunding Bonds	Series 2020	510.28	02/12/20
10	Ohio Turnpike & Infrastructure Authority	Senior and Junior Lien Revenue Refunding Bonds	Series 2020A	472.47	02/13/20
			<b>Total</b>	<b>6,926.08</b>	

# Methodological Nuances

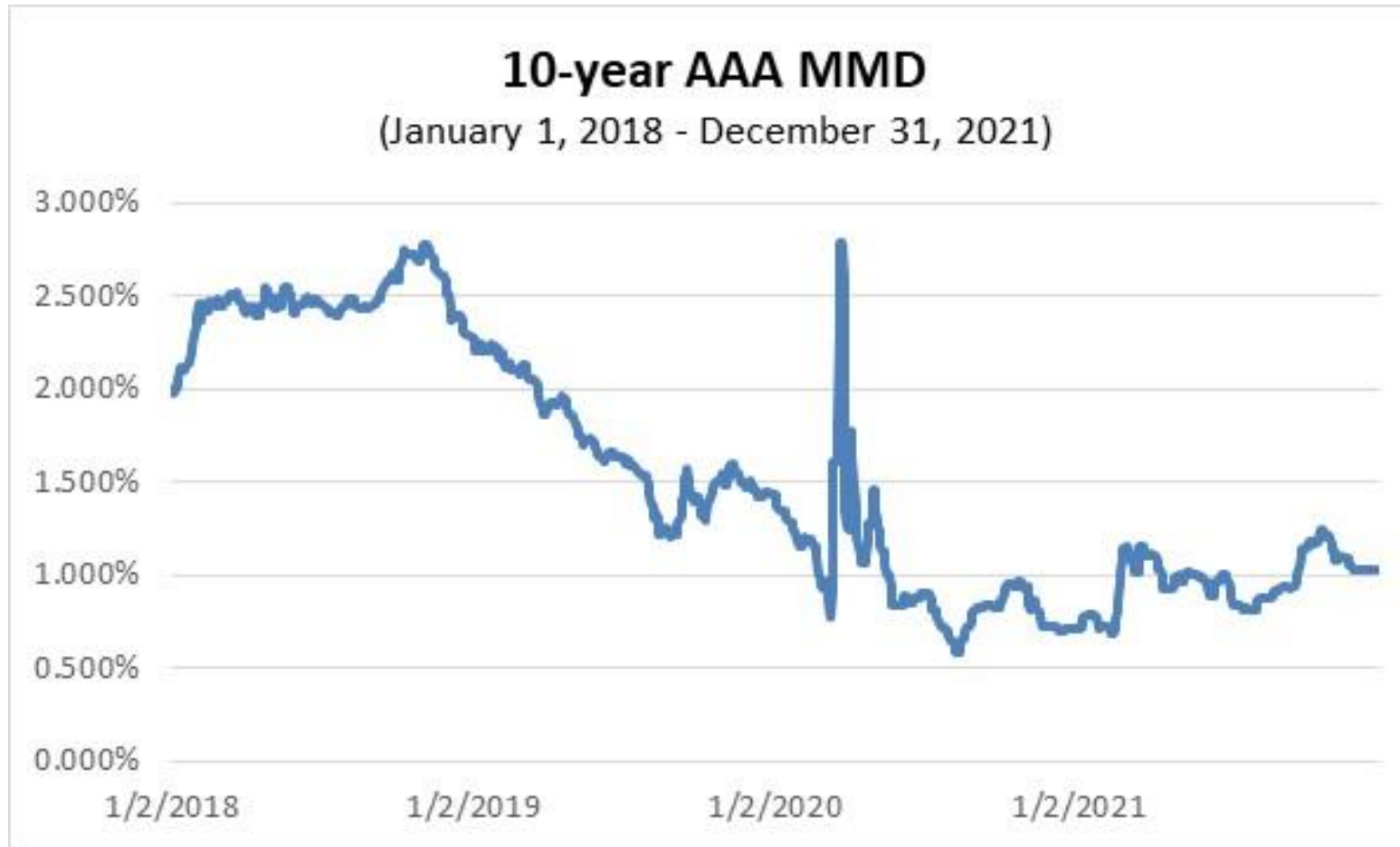
- Transaction size limited to proceeds of taxable bonds; other fund sources disregarded
- PV date: time of taxable transaction
- Discount rate: TIC of taxable bonds
- Cashflow savings increased by option values of callable refunding bonds
  - Actual (taxable bonds): refundable with taxable bonds, interest rate volatility 20%
  - Counterfactual (T/E bonds): interest rate volatility 30%

# Key Analytical Metrics: Savings Lost and Proficiency Ratio

- **Savings Lost = Counterfactual savings - Actual savings**
  - Can be positive or negative
- **Proficiency Ratio = Actual savings/Counterfactual savings**
  - Can exceed 100%, break-even proficiency is 100%

# Refunding Entails Interest Rate Risk

## Option Valuation Can Provide Guidance to Timing



# Massachusetts School Building Authority Case Study

- MSBA issued \$715MM taxable advance refunding bonds in Nov 2019 (TIC 3.205%), to advance refund \$747MM T/E bonds, callable on 10/15/2021, coupons 5% and 5.25%
- Proceeds sufficient to refund \$667MM bonds (fund 89.22% of the escrow)
- Savings of taxable advance refunding in 2019: **\$121.63MM**
  - Cashflow PV savings: \$104.33MM; Option value acquired: \$17.30MM
  - *Option-based refunding efficiency 70%, expected savings lost \$50 million*
- Savings of counterfactual tax-exempt current refunding in 2021: **\$221.63MM**
- **Savings Lost: \$100MM; Proficiency Ratio: 54.88%**

# Selected Taxable Advanced Refunding Transactions

- 14 transactions analyzed
- Includes 6 of the 10 largest between 2018 and 2021
  - Other 4 have call dates in 2023, so could not construct counterfactual
- 8 other were chosen for large size and computational convenience
  - Single call date
  - Avoid multi-purpose issues
- In total \$5.69 billion taxable advance refunding bonds, \$5.36 billion refunded bonds, and diverse issuers (in terms of geography, types, call dates, and credit ratings)



# Taxable Advance Refundings Analyzed

	Issuer	Refunding Bond Size (\$MM)	Refunding Issue Date	Refunded Bonds Call Date(s)
1	State of California	1,200.00	4/25/18	4/1/19
2	NYS Thruway Authority	857.63	10/30/19	1/1/22
3	Massachusetts School Building Authority	715.42	11/20/19	10/15/21
4	San Francisco City/County Public Utility Commission	656.96	1/9/20	11/1/20 11/1/21 5/1/22
5	City of Houston	539.14	8/19/20	11/15/21 11/15/22
6	Arizona Transportation Board	510.28	2/12/20	7/1/21 7/1/22
7	Harris County Metropolitan Trans. Authority	304.13	2/27/20	11/1/21
8	California State University Trustees	207.76	2/27/20	11/1/21
9	PA State Public School Building Authority	188.29	11/20/19	4/1/22
10	Kent State University	172.83	1/29/20	5/1/2022
11	City of Philadelphia	118.03	1/16/20	7/15/21
12	South Central Conn. Reg. Water Authority	83.43	7/2/19	8/1/22
13	Miami-Dade County, Florida	77.15	9/5/18	10/1/19
14	Virginia Port Authority	60.35	7/26/18	7/1/20
	<b>Total</b>	<b>5,691.40</b>		

# Actual Taxable Advance Refunding vs. Counterfactual Tax-Exempt Current Refunding

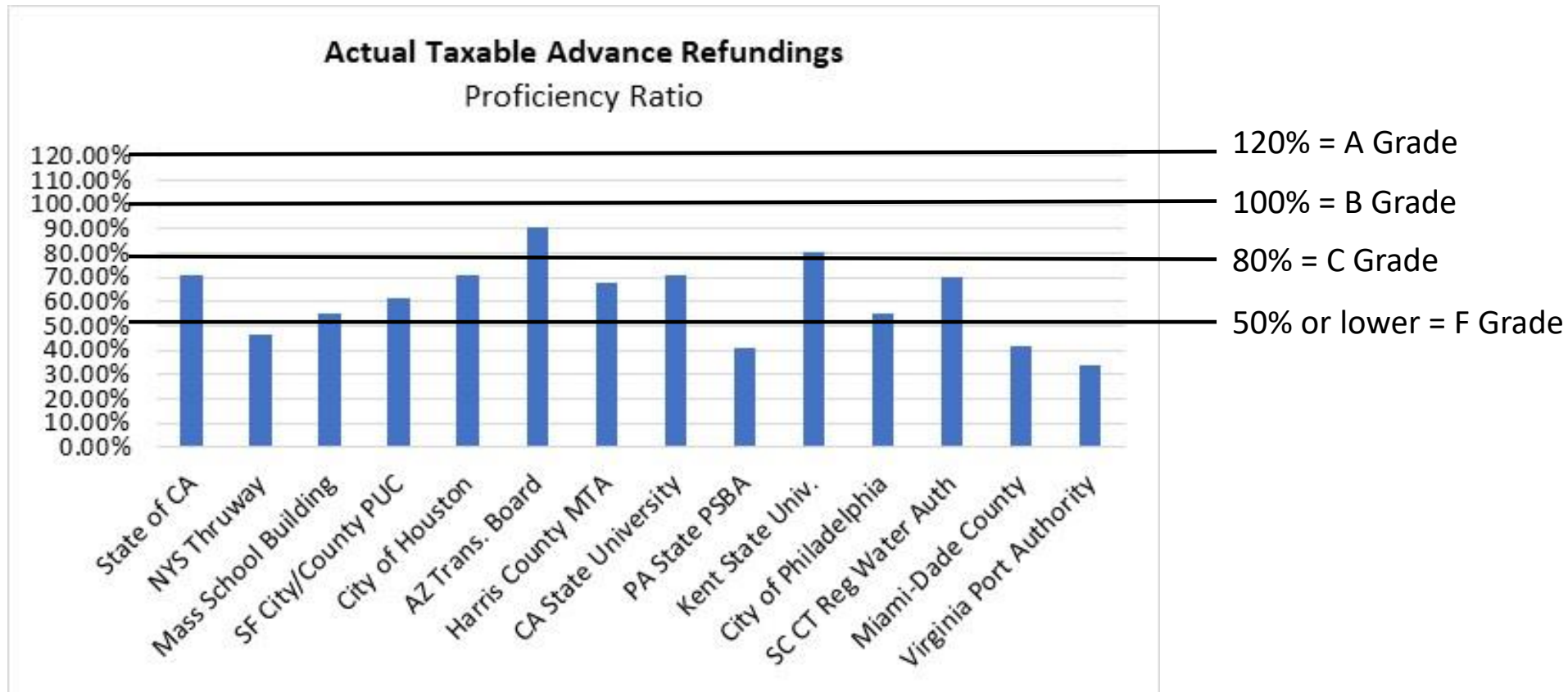
	Issuer	Description	Counter-factual Cashflow PV Savings (\$MM)	Actual Option - adjusted PV Savings (\$MM)	Savings Lost (\$MM)	Proficiency Ratio
1	State of California	GO Refunding Bonds	444.21	314.40	129.81	70.78%
2	NYS Thruway Authority	General Revenue Bonds, Series M	226.91	104.87	122.04	46.22%
3	Massachusetts School Building Authority	Sub. Dedicated Sales Tax Bonds, Series 2019B	221.63	121.63	100.00	54.88%
4	SF City/County Public Utility Commission	Water Revenue Bonds, Subseries 2019A	179.81	110.40	69.41	61.40%
5	City of Houston	Utility Revenue Refunding Bonds, Series 2019C	142.56	101.39	41.17	71.12%
6	Arizona Transportation Board	Highway Revenue Refunding Bonds, Series 2020	53.03	48.15	4.88	90.80%
7	Harris County Metro. Trans. Authority	Sales & Use Tax Ref.Bonds, Series 2020A	109.30	74.15	35.15	67.84%
8	California State University Trustees	Systemwide Revenue Bonds, Series 2020B	61.07	43.36	17.71	71.00%
9	PA State Public School Building Authority	School Lease Rev. Ref. Bonds, Series 2019	22.88	9.40	13.48	41.08%
10	Kent State University	General Receipts Bonds, Series 2020B	28.68	23.06	5.60	80.47%
11	City of Philadelphia	GO Refunding Bonds, Series 2020A	28.14	15.58	12.56	55.37%
12	South Central Conn. Reg. Water Authority	Water System Revenue Bonds, 34 <sup>th</sup> Series B	12.26	8.62	3.64	70.31%
13	Miami-Dade County, Florida	Prof Sport Franchise Faci.Bonds, Series 2018	17.44	7.33	10.11	42.03%
14	Virginia Port Authority	Port Fund Refunding Bonds, Series 2018	17.62	6.03	11.59	34.22%
		<b>Aggregate Results</b>	<b>1,565.54</b>	<b>988.37</b>	<b>577.17</b>	<b>61.25%</b>

# Summary of Results

- Actual Taxable Advance Refunding savings: **\$988.37MM**
  - **18.46% of refunded bonds**
- Counterfactual TE Current Refunding savings = **\$1,565.54MM**
  - **29.23% of refunded bonds**
- Savings Lost = **\$577.17MM**
- Proficiency Ratio (arithmetic average) = **61.25%**
- Proficiency Ratio (weighted by bond size) = **63.13%**
  - None above 100%, maximum 90.80%, minimum 34.22%

# Proficiency Ratios

If you are under 80%, please see Dr. Kalotay



# Recommendations and Policy Implications

- Structuring and refunding decisions should be based on robust option-based analysis
  - Rules of thumb, such as 5% PV savings, unacceptable
- Certification of municipal advisors should require command of fixed income analytics
- Keep score! Perform counterfactual analysis of advance refundings prior to 2017, disclose results to constituents and the MSRB
- Consider issuing optionless tax-exempt bonds
  - Expected cost lower than that of callable bonds
- Should Congress restore tax-exempt advance refundings?
  - Recently proposed by Bond Dealers of America and National Association of Bond Lawyers

# References

## **Book**

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## **Trade press**

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Are Taxable Advance Refundings Leaving Money on the Table? *Bond Buyer, November 8, 2019*