

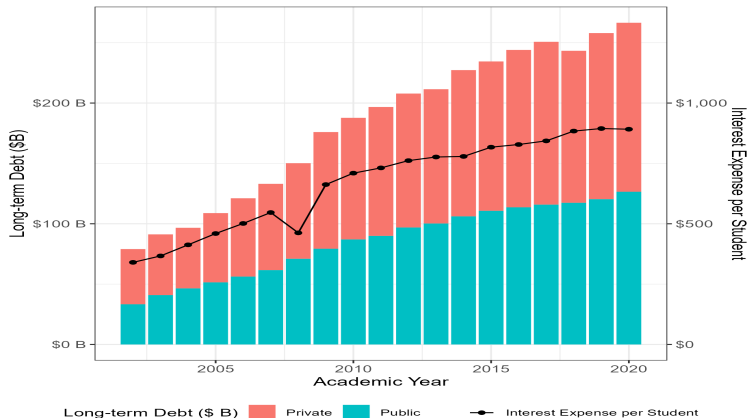
The Role of Debt in Financing Higher Education

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Increasing Use of Debt by Universities



Goals and Inputs

Goals

- ▶ Document descriptive trends *across* time at the intersection of universities' use of debt
- ▶ Examine variation *within* time, location, and bond features to understand the behavior of universities

Inputs

1. Debt issuances of universities with bond features
2. University operating and financial related data

Main Results

1. Large changes in universities' use of debt over time
 - Increasing use of taxable issuances following Great Recession
 - Increasing leverage for public universities; decreasing leverage for private universities
 - Increasing issuance yield net of the risk-free rate following the breakdown of the municipal bond insurance market
2. Public universities have a lower cost of debt by ≈ 20 basis points compared to private universities
3. Declines in state support lead to increases in leverage for *public* universities
4. Increases in leverage lead to increases in quality expenses rather than improvements in educational quality
 - Costs borne by in-state students

Institutional Details

- ▶ Debt serves as primary source of external financing for universities
- ▶ Universities have the ability to issue **tax-exempt** and **taxable** debt
 - Proceeds from tax-exempt bonds cannot be used in for-profit collaborations, advanced refinancings, and in supporting operating budget
- ▶ Universities typically issue revenue bonds from specific projects rather than general obligation bonds
- ▶ Credit rating agencies provide signal of underlying credit quality of university
- ▶ Many universities relied on bond insurance *prior* to the Great Recession

Data Sources and Sample

1. Debt Issuance Level: Data on bond features at the issuance level from Refinitiv SDC Platinum
 - 9,473 issuances from 1985 to 2022 for U.S. 4-year public and private non-profit universities
2. University \times Year Level: Data on financial position and operations of universities from 1985 to 2022 from Integrated Postsecondary Education Data System (IPEDS)

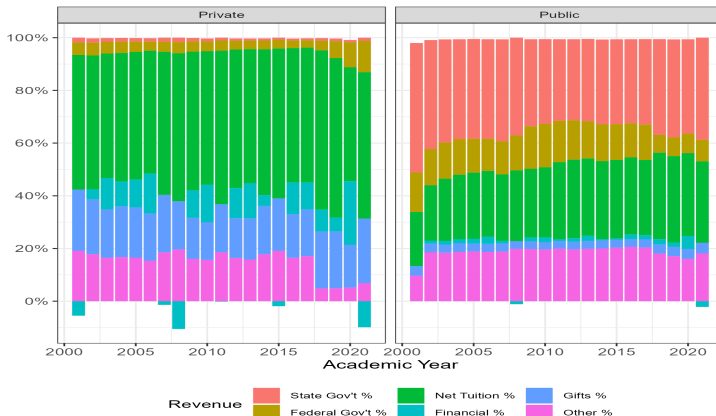
Summary Statistics: Bond Features

University Type:	Public	Private	HBCU	R1	System	Hospital	NCAA D1
% of Observations:	62%	38%	2%	41%	35%	13%	63%
Panel A: Bond Characteristics							
<u>Yield Measures</u>							
Yield	4.50	4.96	5.00	4.57	4.57	4.57	4.58
Yield - R_f Rate	-0.03	0.15	0.18	-0.17	-0.05	-0.12	-0.07
<u>Bond Characteristics</u>							
Gross Spread	7.12	8.04	8.20	6.38	6.94	6.67	6.93
Years to Maturity	20.47	22.53	22.06	20.69	20.83	20.68	20.92
Issue Amount	76.09	53.97	32.69	107.02	96.60	154.64	83.37
Refinancing	0.42	0.45	0.46	0.43	0.41	0.40	0.43
Tax-Exempt	0.86	0.91	0.88	0.85	0.84	0.83	0.86
Revenue Bond	0.93	0.96	0.98	0.91	0.94	0.86	0.93
Insured	0.31	0.17	0.46	0.24	0.29	0.20	0.29
<u>Bond Ratings</u>							
AAA Rated Underlying	0.04	0.06	0.01	0.09	0.05	0.07	0.06
AA Rated Underlying	0.36	0.13	0.11	0.46	0.42	0.44	0.36
Below AA Rated Underlying	0.25	0.35	0.30	0.17	0.19	0.16	0.26
Unrated Underlying	0.35	0.46	0.58	0.29	0.34	0.33	0.33

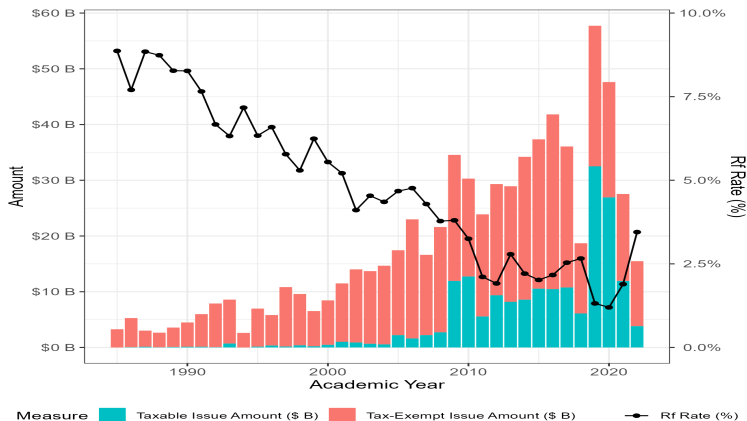
Summary Statistics: Balance Sheet University Issuers

University Type:	Public	Private	HBCU	R1	System	Hospital	NCAA D1
% of Observations:	62%	38%	2%	41%	35%	13%	63%
Panel A: Bond Characteristics							
<u>Yield Measures</u>							
Issuance Yield	4.50	4.96	5.00	4.57	4.57	4.57	4.58
Issuance Yield - R_f	-0.03	0.15	0.18	-0.17	-0.05	-0.12	-0.07
Panel B: Issuer Characteristics							
<u>Balance Sheet Measures (\$B)</u>							
Assets	1.96	1.73	0.30	4.03	2.07	5.78	2.56
Liabilities	0.79	0.51	0.13	1.42	0.81	2.15	0.93
Long-term Debt	0.40	0.31	0.08	0.72	0.41	1.07	0.48
Value of Endowment	0.60	0.79	0.05	1.34	0.70	1.76	0.85
Long-term Debt/Assets	0.26	0.23	0.28	0.23	0.24	0.22	0.24
Liabilities/Assets	0.45	0.33	0.46	0.39	0.43	0.40	0.41
Endowment/Assets	0.23	0.40	0.14	0.34	0.25	0.34	0.28
<u>University Prestige</u>							
Total Enrollment	23.02	6.26	5.15	28.49	25.11	26.99	23.37
Average SAT	11.34	11.98	9.10	12.24	11.57	12.49	11.70

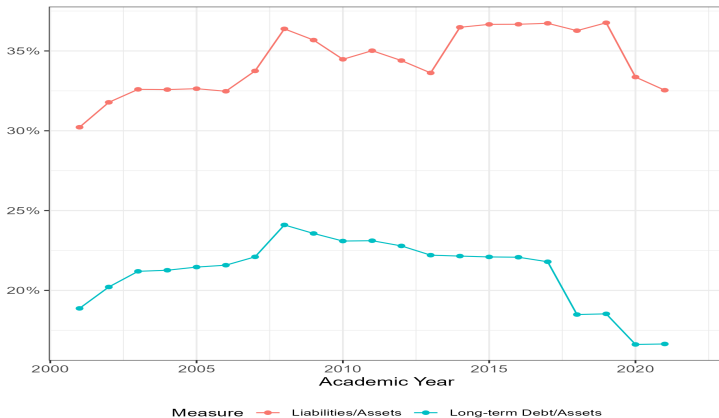
Revenue Breakdown Private vs. Public Universities



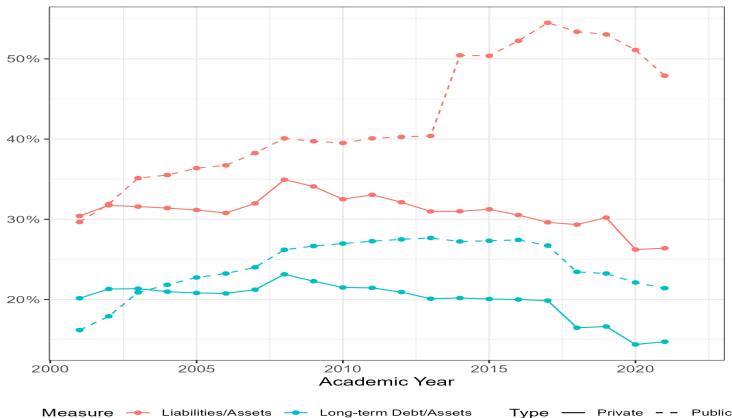
Taxable vs. Tax-Exempt Issuances Over Time



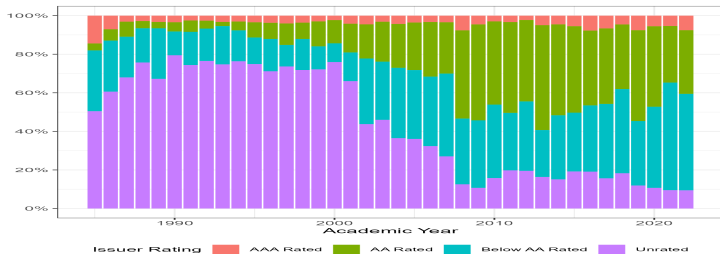
Unconditional Leverage Levels



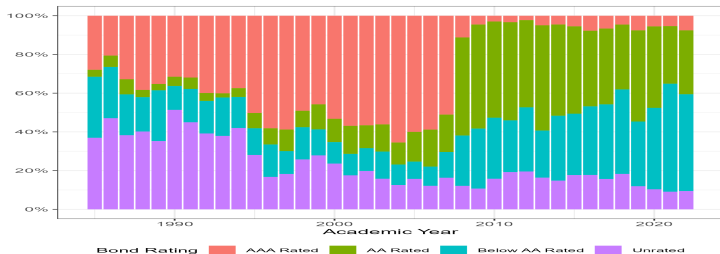
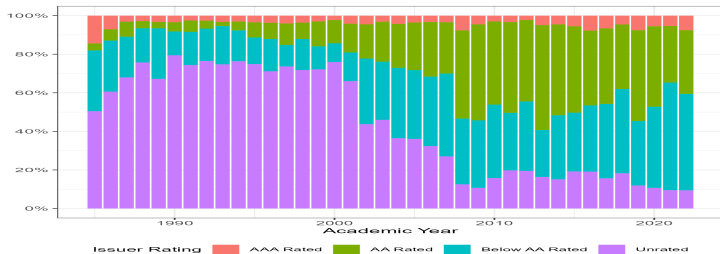
Conditional Leverage Levels



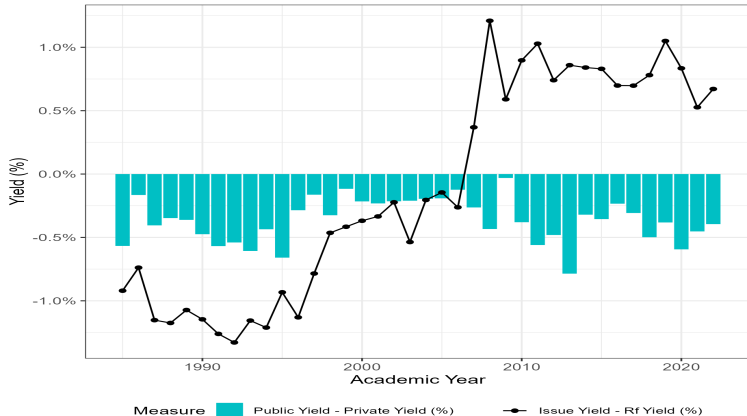
Underlying Rating and Bond Ratings Over Time



Underlying Rating and Bond Ratings Over Time



Public vs. Private Yields and Excess Return



Public Universities Have Lower Cost of Debt

	Yield							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public	-0.35*** [0.07]	-0.26*** [0.05]	-0.18*** [0.04]	-0.15*** [0.04]	-0.21*** [0.04]	-0.28*** [0.07]	-0.16** [0.07]	-0.56*** [0.16]
State Economic Activity	-0.01** [0.00]							
State Unemployment Rate	0.04** [0.02]							
Log(Maturity)		0.67*** [0.06]	0.69*** [0.05]	0.69*** [0.05]	0.67*** [0.05]	0.75*** [0.08]	0.77*** [0.09]	0.80*** [0.11]
Log(Issue Amount)		-0.06*** [0.01]	-0.08*** [0.01]	-0.08*** [0.01]	-0.04*** [0.01]	-0.02 [0.01]	-0.02 [0.02]	-0.05 [0.03]
Underlying Rating			-0.06*** [0.01]	-0.06*** [0.01]	-0.04*** [0.01]	-0.05*** [0.01]	0.00 [0.00]	-0.01 [0.01]
Public × Taxable				-0.30*** [0.10]				
Average SAT					-0.09*** [0.02]	-0.10*** [0.03]	-0.07** [0.03]	0.02 [0.06]
HHI Revenue					0.19* [0.10]	0.22 [0.19]	0.04 [0.22]	-0.20 [0.34]
Log(Revenue)					-0.03 [0.02]	-0.03 [0.03]	-0.02 [0.02]	0.12* [0.06]
Long-Term Debt/Assets						0.27 [0.19]	0.36* [0.19]	1.34** [0.59]
Log(Endowment)						-0.02 [0.02]	0.00 [0.01]	-0.17*** [0.05]
Observations	9439	9185	9185	9185	8615	5051	4399	2786
Adjusted R^2	0.68	0.78	0.84	0.84	0.85	0.75	0.80	0.84
Year & State F.E.	Yes	No	No	No	No	No	No	No
Year × State F.E.	No	Yes	Yes	Yes	Yes	Yes	No	No
Year × State × Rating F.E.	No	No	No	No	No	No	Yes	No
Year × County × Rating F.E.	No	No	No	No	No	No	No	Yes
Issuer Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bond Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Y-mean	4.67	4.65	4.65	4.65	4.66	3.90	3.88	3.84

↓ in State Support ↑ *Public* University Leverage

	Long-Term Debt/Assets _{t+1}			Liabilities/Assets _{t+1}		
	(1)	(2)	(3)	(4)	(5)	(6)
% Government Revenue	-0.06** [0.03]			-0.20*** [0.07]		
% State Revenue		-0.10 [0.07]	0.03 [0.07]		-0.26 [0.15]	0.19* [0.10]
Public × % State Revenue			-0.17* [0.08]			-0.71*** [0.21]
% Federal Revenue		-0.05* [0.03]	-0.06** [0.03]		-0.23 [0.13]	0.00 [0.08]
Public × % Federal Revenue			-0.00 [0.08]			-0.90*** [0.26]
Observations	28507	28507	28507	31583	31583	31583
Adjusted R^2	0.74	0.74	0.74	0.77	0.77	0.77
University Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year × State F.E.	Yes	Yes	Yes	Yes	Yes	Yes
University Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Revenue Composition Controls	Yes	Yes	Yes	Yes	Yes	Yes
Y-mean	0.22	0.22	0.22	0.36	0.36	0.36

Debt Increases Quality Expenses and Capacity

Panel A: Quality & Capacity				
	Quality Exp. (%) _{t+1}	$\frac{\text{Quality Exp.}_{t+1}}{\text{Academic Exp.}_{t+1}}$	$\text{Log} \left(\frac{\text{Quality Exp.}_{t+1}}{\text{Enrollment}_{t+1}} \right)$	Log(Dorm Cap.) _{t+1}
	(1)	(2)	(3)	(4)
LTD/Assets _t	0.01* [0.00]	0.04* [0.02]	0.15*** [0.03]	0.23*** [0.04]
Controls	Yes	Yes	Yes	Yes
Observations	28200	28200	26452	25283
Adjusted R^2	0.90	0.85	0.91	0.97
Year × State F.E.	Yes	Yes	Yes	Yes
University F.E.	Yes	Yes	Yes	Yes
Y-mean	0.25	0.60	8.60	6.96

Debt ↑ In-State Tuition & ↑ Out-State Students

Panel B: Cost and Enrollment

	Tuition		Enrollment	
	Log(In-State) _{t+1}	Log(Out-State) _{t+1}	Log(Total) _{t+1}	Log(Out-State) _{t+1}
	(1)	(2)	(3)	(4)
LTD/Assets _t	0.08*** [0.03]	0.01 [0.02]	0.01 [0.01]	0.18** [0.06]
Controls	Yes	Yes	Yes	Yes
Observations	25871	25871	26644	19574
Adjusted R^2	0.98	0.94	1.00	0.94
Year × State F.E.	Yes	Yes	Yes	Yes
University F.E.	Yes	Yes	Yes	Yes
Y-mean	9.69	9.97	7.89	4.72

Conclusion

- ▶ Document growth in universities' use of debt which has been targeted towards amenities rather than instructional quality
 - Increases in leverage for public universities while decline for public universities
- ▶ Declines in state support lead to increases in debt for public universities
- ▶ Document trends in this market to aid practitioners' understanding
 1. Increasing use of taxable debt
 2. Breakdown of municipal bond insurance market leading to increase in issuance yields in excess of the risk free rate