2018 Municipal Finance Conference: Public Pensions, Political Economy and State Government Borrowing Costs

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Motivation

- Over $1.1 trillion in U.S. state bonded debt outstanding.
- Underfunded pension liabilities of over $1.75 trillion.
- Legal seniority of obligations is not certain.
- "... Illinois is simply the poster child for what is wrong with states." - USA Today (July 12, 2017)
- Schwert (2017) suggests municipal debt yields are primarily default risk.
- Underfunded pension liabilities increase default risk **today**, which may have adverse effect on borrowing costs.

Research Question

- Do underfunded public pension liabilities affect current borrowing costs? By how much?
- How does this compare with effects of bonded debt?
- How do markets account for explicit pension liability legal protections?
- Do states with "stronger" pensioner bargaining power face higher borrowing costs due to higher seniority of pension liabilities?

Results Preview

- One standard deviation increase in pension underfunding to GDP ratio leads to 18 bp increase in credit spread.
- Economic magnitudes are similar for bonded debt.
- Effect of pension liabilities is much stronger in states with legal protections for pension liabilities, suggesting they are more "senior" in these states.
- Sugestive evidence that pensioner bargaining power increases perceived seniority of pension liabilities.
- States are already paying higher borrowing costs as a result of underfunded pensions, increasing need for governments to control problem.

Pension vs. Debt Obligations

- Spreads (which I use to proxy for bororowing costs) are directly tied to **debt** obligations.
- States also have large contractual public pension obligations.
- Unclear whether bondholders or pension members would take priority in fiscal crisis.
- Certain states have explicit constitutional provisions protecting pension liabilities (e.g. Illinois).
- Unions may also extract rents prior to default, leading to higher likelihood of default.

CDS Spreads

- Buyer pays spread to purchase protection against default event of underlying state.
- Cleaner measure of default risk than state bonds. All main results are qualitatively identical when using underlying bonds.
- I use annual observation corresponding with end of FY (usually June), and five year maturity contract.
- Liquidity has decreased, but similar to bonds during most of sample. Only 27 states with CDS contracts.

PCA Sum Stats

CDS Summary Stats

	Statistic (bp)					
Year	Mean	StDev.	Min.	Med.	Max	N
2005	17.66	0.00	17.66	17.66	17.66	1.00
2006	11.75	0.00	11.75	11.75	11.75	1.00
2007	7.96	2.95	4.56	9.50	9.81	3.00
2008	29.38	18.89	15.35	22.77	84.33	21.00
2009	150.99	69.91	86.00	119.59	350.00	23.00
2010	142.67	76.10	67.50	129.25	342.83	24.00
2011	84.67	39.48	45.00	74.33	203.00	23.00
2012	106.81	33.27	71.61	102.71	212.03	23.00
2013	65.21	30.10	41.86	54.40	161.76	22.00
2014	49.40	31.26	27.84	34.04	155.49	25.00
2015	56.96	44.89	29.17	36.57	214.62	24.00
2016	90.17	83.70	42.59	57.65	359.07	13.00

CAFRs

- Each year state issues comprehensive annual financial report (CAFR). Similar to corporate 10-K.
- In 2002, GASB required more comprehensive/standardized reporting.
- Statement of Net Assets similar to corporate balance sheet. Statement of Activities similar to corporate income statement.
- Additional information such as debt outstanding.
- Collect various line items from 2002 - 2016 for 27 states with traded CDS in sample.
- Supplement with public pension plan data from Boston College's Center for Retirement Research.

Example SumStats-Full SumStats-Sample

Regression Analyses

- Main specification:

$$CS_{i,t} = \alpha_t + \beta \frac{PA - PL}{GDP} + \gamma' X_{i,t} + \epsilon_{i,t}$$

- All variables scaled by GDP to standardize (results similar using income/revenue).
- Explore marginal impact of ST vs. LT solvency concerns.
- Year fixed effects pick up common variation.
- 212 CDS/Fiscal Data observations from 2005 - 2016.
- All variables scaled by one standard deviation.
- Standard Errors clustered at state level.

Main Specification - CDS Data

	(1)	(2)	(3)	(4)
Rev-Exp	-31.30***	-31.30***	-8.780	-8.780*
	(-6.28)	(-5.12)	(-1.87)	(-2.26)
CA-CL	-5.886	-5.886	-3.416	-3.416
	(-1.66)	(-1.25)	(-0.97)	(-0.74)
A-LTL	1.166	1.166	-13.20**	-13.20*
	(0.26)	(0.19)	(-3.15)	(-2.64)
PA-PL	-19.04***	-19.04**	-17.94***	-17.94**
	(-5.07)	(-3.32)	(-5.50)	(-3.26)
N	212	212	210	210
R^2	0.351	0.351	0.611	0.611
Within R^2			0.346	0.346
Year FE	No	No	Yes	Yes
Cluster	-	State	-	State

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Revenue Adjusted Bond Results

Robustness - Economic Indicators

	(1)	(2)	(3)	(4)	(5)
Rev-Exp	-27.68***	-27.68***	-8.480	-8.480	-13.33**
	(-5.05)	(-4.16)	(-1.78)	(-2.06)	(-2.89)
CA-CL	-5.101	-5.101	-3.343	-3.343	-2.783
	(-1.40)	(-0.95)	(-0.95)	(-0.70)	(-0.50)
A-LTL	-0.902	-0.902	-13.28**	-13.28*	-12.74*
	(-0.20)	(-0.16)	(-3.16)	(-2.69)	(-2.73)
PA-PL	-16.95***	-16.95**	-17.45***	-17.45**	-15.64**
	(-4.27)	(-2.84)	(-4.99)	(-3.08)	(-3.18)
Econ. Index	-7.725*	-7.725	-1.491	-1.491	-0.459
	(-2.19)	(-1.65)	(-0.40)	(-0.30)	(-0.09)
Housing Index					-9.100
					(-1.73)
N	212	212	210	210	210
R^2	0.358	0.358	0.610	0.610	0.621
Within R^2			0.343	0.343	0.361
Year FE	No	No	Yes	Yes	Yes
Cluster	-	State	-	State	State

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

BondResults

Main Results

- All directional relationships are "economically" consistent with distance to default relationship.
- No statistical significance for current liabilities.
- Coefficients have similar economic magnitude (13-18 bp per SD $\approx$ 20% of average total spread).
- Pension effects are independent of economic and "other" fiscal/economic conditions.
- Total R^2 of 60%, 34% within.
- Instrumental variable exercise implies relationship is **causal**.

IV Results

Magnitude of Effects

- One standard deviation "improvement" in pension funding ratio, leads to 17.94 bp decrease in credit spreads.
- For Illinois, if they moved to full funding, they would have a 60 bp improvment in spreads.
- Illinois has $26 billion in outstanding General Obligation Debt.
- They are paying $\sim$ $157 million annually in borrowing costs due to unfunded pension liabilities.
- This is 9% of their total debt service expenditure.

Constitutional Protections

- Legal protections likely to affect perceived seniority of pension debt as compared to bonded debt.
- Thus, we may expect underfunded pension liabilities to have larger effect on spreads in states where they are relatively more senior.
- Use Munnell and Quinby (2012) definition of constitutional protections.
- Explicit Protection: States with explicit clauses protecting pension liabilities.
- Protected: States with contract protection clauses in their state constitutions.
- I test cross-sectional differences in the effect of underfunding on spreads based on protection level.

Constitutional Results - CDS

	(1)	(2)	(3)
Rev-Exp	-8.780*	-5.319	-8.605
	(-2.26)	(-1.29)	(-2.06)
CA-CL	-3.416	-2.730	-5.177
	(-0.74)	(-0.64)	(-1.08)
A-LTL	-13.20*	-13.77*	-15.26*
	(-2.64)	(-2.68)	(-2.63)
PA-PL	-17.94**	-12.88*	2.187
	(-3.26)	(-2.52)	(0.22)
Exp. Prot. x (PA-PL)/ GDP		-13.46	
		(-1.70)	
Prot. x (PA-PL)/ GDP			-21.27*
			(-2.15)
N	210	210	210
R^2	0.611	0.633	0.633
Within R^2	0.346	0.382	0.382
Year FE	Yes	Yes	Yes
State FE			
Cluster	State	State	State

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Constitutional Results - Bonds

	(1)	(2)	(3)
Rev-Exp	-5.920***	-4.481***	-5.857***
	(-4.18)	(-3.30)	(-4.08)
CA-CL	16.56*	7.970	20.57*
	(1.97)	(0.97)	(2.41)
A-LTL	-48.80***	-41.08***	-64.06***
	(-5.19)	(-4.50)	(-6.54)
PA-PL	-22.13***	-12.28**	22.38***
	(-6.70)	(-3.00)	(4.78)
Exp. Prot. x (PA-PL)/ GDP		-27.43***	
		(-6.01)	
Prot. x (PA-PL)/ GDP			-44.57***
			(-9.44)
N	57469	57469	57469
R^2	0.0699	0.0707	0.0706
Within R^2	0.0455	0.0463	0.0463
Year FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Cluster	CUSIP	CUSIP	CUSIP

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Analyses: Unions and Local Pensions

- In Detroit bankruptcy, there was drawn out negotiation between debtholders and pensioners.
- Perhaps unions with more bargaining power can extract more "senior" claims.
- Use annual union membership (and political donations) as sign of union strength.
- Local pension conditions may also have effects on the state government. (e.g bail-out/aid motive, or just another signal of fiscal conditions)
- Certain states are more "proactive" in Chapter 9 proceedings for municipalities (Gao, Lee, Murphy 2017)

Effect of Union Membership - CDS

	(1)	(2)	(3)	(4)	(5)
Rev-Exp	-8.780*	-10.73*	-10.75*	-6.682	-6.882
	(-2.26)	(-2.53)	(-2.49)	(-1.62)	(-1.65)
CA-CL	-3.416	-3.938	-3.976	-4.344	-4.188
	(-0.74)	(-0.80)	(-0.81)	(-0.91)	(-0.89)
A-LTL	-13.20*	-10.61*	-10.58*	-8.793	-9.673
	(-2.64)	(-2.19)	(-2.30)	(-1.17)	(-1.35)
PA-PL	-17.94**	-18.11**	-17.94***	-19.00**	-21.38*
	(-3.26)	(-3.33)	(-3.74)	(-3.64)	(-2.77)
Union Donation		7.949	7.507		
		(1.87)	(1.15)		
Donat. x PA-PL			-0.286		
			(-0.07)		
Union Mem. %				7.107	8.294
				(1.08)	(1.03)
Union x PA-PL					1.360
					(0.31)
N	210	210	210	210	210
R^2	0.611	0.620	0.618	0.616	0.614
Within R^2	0.346	0.361	0.358	0.353	0.350
Year FE	Yes	Yes	Yes	Yes	Yes
Cluster	State	State	State	State	State

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Bond Results

Local Pension Effects - CDS

	(1)	(2)	(3)	(4)	(5)	(6)
Rev-Exp	-8.780*	-9.438	-6.049	-8.839*	-5.693	-5.736
	(-2.26)	(-0.94)	(-0.65)	(-2.32)	(-0.61)	(-0.62)
CA-CL	-3.416	3.584	-0.678	-3.681	0.00902	-0.393
	(-0.74)	(0.92)	(-0.13)	(-0.81)	(0.00)	(-0.08)
A-LTL	-13.20*	-24.90*	-13.80	-12.70*	-13.09	-13.27
	(-2.64)	(-2.75)	(-1.94)	(-2.19)	(-1.89)	(-1.49)
PA-PL	-17.94**		-15.94*	-17.95**	-16.96**	-4.346
	(-3.26)		(-2.62)	(-3.22)	(-3.10)	(-0.56)
PL Local Def/GDP		-15.11	-16.01*		-17.08*	-35.43***
		(-1.73)	(-2.66)		(-2.89)	(-4.76)
Proactive				3.501	-7.263	23.23
				(0.33)	(-0.54)	(1.37)
Proac. x Local Def						32.57**
						(3.02)
N	210	140	140	210	140	140
R^2	0.611	0.586	0.611	0.610	0.609	0.636
Within R^2	0.346	0.344	0.382	0.343	0.380	0.422
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	State	State	State	State	State	State

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Bond Results

Additional Results

- Union membership/donations have positive relationship with spreads.
- Relationship is not statistically significant in CDS, significant in bond sample.
- Local pension deficits have positive, statistically significant relationship with state-level spreads.
- Local pensions have marginal effect, above statewide deficits.
- No evidence of "proactive" states having higher spreads.

Conclusion

- Pension funding has strong, robust relationship with spreads, even after controlling for fiscal and economic conditions.
- One standard deviation increase in pension underfunding to GDP ratio leads to 18 bp increase in credit spread (effect slighly lower for LT debt).
- Legal outcome of default is "uncertain", and legal protections matter for assessing current default risk.
- Borrowing costs are already affected by underfunded pensions, increasing need for governments to control problem.

Additional Results

Time Series - Revenue/GDP Full

	Revenue/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2002	0.1008	0.0256	0.0406	0.0979	0.1486
2003	0.1006	0.0243	0.0427	0.1004	0.1472
2004	0.1037	0.0219	0.0556	0.1020	0.1500
2005	0.1045	0.0220	0.0550	0.1024	0.1517
2006	0.1056	0.0238	0.0545	0.1064	0.1695
2007	0.1059	0.0245	0.0559	0.1045	0.1811
2008	0.1066	0.0245	0.0566	0.1040	0.1696
2009	0.1102	0.0254	0.0649	0.1079	0.1748
2010	0.1180	0.0228	0.0771	0.1183	0.1776
2011	0.1186	0.0236	0.0774	0.1179	0.1788
2012	0.1119	0.0189	0.0746	0.1100	0.1654
2013	0.1106	0.0185	0.0711	0.1070	0.1613
2014	0.1163	0.0409	0.0185	0.1080	0.2949
2015	0.1080	0.0191	0.0729	0.1074	0.1614
2016	0.1075	0.0198	0.0765	0.1077	0.1653

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Time Series - CL/GDP Full

	CL/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2002	0.0150	0.0079	0.0000	0.0151	0.0299
2003	0.0174	0.0080	0.0000	0.0185	0.0290
2004	0.0171	0.0076	0.0000	0.0178	0.0296
2005	0.0170	0.0067	0.0000	0.0188	0.0300
2006	0.0171	0.0068	0.0000	0.0177	0.0314
2007	0.0185	0.0073	0.0000	0.0188	0.0320
2008	0.0188	0.0062	0.0080	0.0189	0.0350
2009	0.0189	0.0063	0.0076	0.0188	0.0327
2010	0.0197	0.0072	0.0083	0.0191	0.0339
2011	0.0180	0.0069	0.0054	0.0189	0.0316
2012	0.0171	0.0068	0.0063	0.0144	0.0319
2013	0.0161	0.0063	0.0070	0.0139	0.0313
2014	0.0189	0.0163	0.0032	0.0159	0.1096
2015	0.0160	0.0057	0.0056	0.0151	0.0246
2016	0.0163	0.0064	0.0048	0.0175	0.0273

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Time Series - NCL/GDP Full

	NCL/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2002	0.0415	0.0309	0.0084	0.0354	0.1245
2003	0.0443	0.0300	0.0081	0.0400	0.1159
2004	0.0441	0.0293	0.0081	0.0376	0.1108
2005	0.0440	0.0295	0.0075	0.0399	0.1146
2006	0.0458	0.0291	0.0071	0.0403	0.1124
2007	0.0454	0.0268	0.0071	0.0448	0.1068
2008	0.0492	0.0280	0.0081	0.0518	0.1157
2009	0.0545	0.0304	0.0100	0.0534	0.1246
2010	0.0592	0.0327	0.0113	0.0573	0.1367
2011	0.0601	0.0337	0.0113	0.0547	0.1334
2012	0.0637	0.0375	0.0124	0.0565	0.1444
2013	0.0639	0.0386	0.0124	0.0560	0.1473
2014	0.0503	0.0360	0.0030	0.0384	0.1530
2015	0.0858	0.0678	0.0122	0.0556	0.2670
2016	0.0912	0.0734	0.0138	0.0621	0.2913

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Time Series - PL/GDP Full

	PL/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2002	0.1844	0.0608	0.0470	0.1762	0.3242
2003	0.1870	0.0612	0.0513	0.1786	0.3309
2004	0.1857	0.0609	0.0552	0.1780	0.3324
2005	0.1868	0.0610	0.0584	0.1801	0.3398
2006	0.1896	0.0630	0.0620	0.1830	0.3517
2007	0.1955	0.0650	0.0623	0.1793	0.3603
2008	0.2041	0.0653	0.0686	0.1996	0.3833
2009	0.2187	0.0705	0.0787	0.2027	0.4109
2010	0.2212	0.0707	0.0846	0.2033	0.4117
2011	0.2206	0.0684	0.0900	0.2066	0.4078
2012	0.2201	0.0679	0.0927	0.2081	0.4044
2013	0.2220	0.0666	0.1034	0.2059	0.3797
2014	0.2151	0.0749	0.0359	0.2110	0.3741
2015	0.2261	0.0730	0.1128	0.1992	0.3813
2016	NaN	NaN	NaN	NaN	NaN

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Time Series - CA/GDP Full

	CA/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2002	0.0531	0.0360	0.0075	0.0397	0.1486
2003	0.0532	0.0322	0.0036	0.0411	0.1271
2004	0.0564	0.0292	0.0096	0.0584	0.1076
2005	0.0547	0.0281	0.0039	0.0569	0.1039
2006	0.0540	0.0261	0.0038	0.0530	0.1042
2007	0.0542	0.0262	0.0050	0.0540	0.1084
2008	0.0562	0.0265	0.0052	0.0511	0.1113
2009	0.0589	0.0278	0.0049	0.0524	0.1192
2010	0.0596	0.0306	0.0022	0.0510	0.1396
2011	0.0589	0.0288	0.0031	0.0506	0.1249
2012	0.0569	0.0297	0.0035	0.0484	0.1271
2013	0.0567	0.0294	0.0046	0.0484	0.1292
2014	0.0566	0.0293	0.0050	0.0488	0.1316
2015	0.0562	0.0293	0.0051	0.0487	0.1350
2016	0.0543	0.0282	0.0044	0.0484	0.1386

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Time Series - Revenue/GDP Sample

	Revenue/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2005	0.0971	0.0000	0.0971	0.0971	0.0971
2006	0.0987	0.0000	0.0987	0.0987	0.0987
2007	0.0935	0.0075	0.0882	0.0935	0.0988
2008	0.1046	0.0226	0.0566	0.1040	0.1628
2009	0.1072	0.0225	0.0649	0.1053	0.1674
2010	0.1170	0.0226	0.0771	0.1175	0.1776
2011	0.1178	0.0240	0.0774	0.1179	0.1788
2012	0.1110	0.0186	0.0746	0.1100	0.1654
2013	0.1098	0.0187	0.0711	0.1068	0.1613
2014	0.1040	0.0253	0.0185	0.1051	0.1615
2015	0.1072	0.0187	0.0729	0.1070	0.1614
2016	0.1120	0.0208	0.0854	0.1088	0.1653

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Time Series - CL/GDP Sample

	CL/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2005	0.0186	0.0000	0.0186	0.0186	0.0186
2006	0.0194	0.0000	0.0194	0.0194	0.0194
2007	0.0212	0.0026	0.0194	0.0212	0.0230
2008	0.0199	0.0060	0.0080	0.0196	0.0350
2009	0.0193	0.0064	0.0076	0.0199	0.0327
2010	0.0197	0.0074	0.0083	0.0192	0.0339
2011	0.0185	0.0067	0.0090	0.0189	0.0316
2012	0.0174	0.0067	0.0092	0.0144	0.0319
2013	0.0165	0.0062	0.0074	0.0140	0.0313
2014	0.0155	0.0057	0.0032	0.0150	0.0270
2015	0.0165	0.0053	0.0063	0.0173	0.0246
2016	0.0175	0.0053	0.0056	0.0191	0.0273

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Time Series - NCL/GDP Sample

	NCL/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2005	0.0523	0.0000	0.0523	0.0523	0.0523
2006	0.0508	0.0000	0.0508	0.0508	0.0508
2007	0.0375	0.0184	0.0244	0.0375	0.0505
2008	0.0532	0.0275	0.0207	0.0523	0.1157
2009	0.0557	0.0304	0.0100	0.0534	0.1246
2010	0.0589	0.0334	0.0113	0.0554	0.1367
2011	0.0620	0.0335	0.0149	0.0547	0.1334
2012	0.0658	0.0375	0.0152	0.0565	0.1444
2013	0.0676	0.0388	0.0279	0.0582	0.1473
2014	0.0645	0.0423	0.0030	0.0562	0.1530
2015	0.0896	0.0698	0.0207	0.0561	0.2670
2016	0.0955	0.0603	0.0384	0.0650	0.2142

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Time Series - PL/GDP Sample

	PL/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2005	0.1995	0.0000	0.1995	0.1995	0.1995
2006	0.2016	0.0000	0.2016	0.2016	0.2016
2007	0.2000	0.0464	0.1487	0.2123	0.2390
2008	0.2045	0.0681	0.0686	0.1996	0.3833
2009	0.2157	0.0725	0.0787	0.1967	0.4109
2010	0.2181	0.0703	0.0846	0.2021	0.4117
2011	0.2225	0.0696	0.0900	0.2066	0.4078
2012	0.2222	0.0689	0.0927	0.2081	0.4044
2013	0.2242	0.0689	0.1034	0.2043	0.3797
2014	0.2194	0.0777	0.0359	0.2035	0.3741
2015	0.2262	0.0749	0.1128	0.1990	0.3813
2016	NaN	NaN	NaN	NaN	NaN

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Time Series - CA/GDP Sample

	CA/GDP				
Year	Mean	StDev.	Min.	Med.	Max
2005	0.0455	0.0000	0.0455	0.0455	0.0455
2006	0.0449	0.0000	0.0449	0.0449	0.0449
2007	0.0479	0.0088	0.0417	0.0479	0.0541
2008	0.0540	0.0253	0.0052	0.0511	0.1113
2009	0.0575	0.0263	0.0049	0.0524	0.1192
2010	0.0603	0.0310	0.0022	0.0531	0.1396
2011	0.0582	0.0289	0.0031	0.0506	0.1249
2012	0.0560	0.0299	0.0035	0.0484	0.1271
2013	0.0535	0.0280	0.0046	0.0471	0.1292
2014	0.0534	0.0281	0.0050	0.0484	0.1316
2015	0.0531	0.0284	0.0051	0.0478	0.1350
2016	0.0503	0.0318	0.0044	0.0434	0.1386

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CDS Common Component

- First PC explains 84% of monthly variation for full sample.
- Each year, look at all states with observations every month.
- Regressions show PC1 most related to US CDS.

Year	Valid States	PC1	PC2	PC3	PC4	PC5
2008	12	99	1	0	0	0
2009	12	92	4	2	1	0
2010	12	82	11	3	2	1
2011	12	92	4	2	1	1
2012	12	87	3	3	2	2
2013	12	58	35	4	1	1
2014	12	63	33	2	1	1
2015	11	92	3	2	1	1
2016	9	80	11	5	2	1

Massachusetts - Current Assets

Statement of Net Position
June 30, 2015
(Amounts in thousands)

	Primary Government			
	Governmental Activities	Business-Type Activities	Government Wide Total	Component Units
ASSETS AND DEFERRED OUTFLOWS				
Current assets:				
Cash, cash equivalents and short-term investments	$ 3,206,633	$ 1,010,314	$ 4,216,947	$ 2,842,328
Cash with fiscal agent	197,836	—	197,836	—
Assets held in trust	—	—	—	148,066
Receivables, net of allowance for uncollectibles:				
Taxes	3,084,006	—	3,084,006	—
Federal grants and reimbursements receivable	2,135,280	100,702	2,235,982	155,141
Loans	8,998	47,616	56,614	424,108
Other receivables	435,791	549,743	985,534	303,440
Due from cities and towns	19,722	—	19,722	—
Due from component units	488	383	871	—
Due from primary government	—	—	—	689,469
Other current assets	—	51,711	51,711	57,046
Total current assets	9,088,754	1,760,469	10,849,223	4,621,598

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Massachusetts - LT Assets

Noncurrent assets:				
Cash and cash equivalents - restricted	—	752,683	752,683	855,081
Long-term investments	—	914,457	914,457	1,708,327
Investments, restricted investments and annuity contracts	2,662,627	843	2,663,470	165,392
Receivables, net of allowance for uncollectibles:				
Taxes	463,648	—	463,648	—
Federal grants and reimbursements receivable	48,735	—	48,735	—
Loans	101,218	9,292	110,510	4,199,099
Other receivables	43,757	47,909	91,666	22,147
Due from component units	9,508	—	9,508	—
Non-depreciable capital assets	1,822,239	878,231	2,700,470	8,905,874
Depreciable capital assets, net	2,780,083	5,805,985	8,586,068	25,247,444
Other noncurrent assets	—	20,955	20,955	36,894
Other noncurrent assets - restricted	—	1,008,476	1,008,476	—
Total noncurrent assets	7,931,815	9,438,831	17,370,646	41,140,258
Deferred outflows of resources:				
Deferred change in fair value of interest rate swaps	329,833	46,111	375,944	241,180
Deferred loss on refunding	142,805	114,672	257,477	363,301
Deferred outflows related to pension	1,827,615	74,097	1,901,712	163,903
Total deferred outflows of resources	2,300,253	234,880	2,535,133	768,384
Total assets and deferred outflows	19,320,822	11,434,180	30,755,002	46,530,240

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Massachusetts - LT Liabilities

Noncurrent liabilities:				
Compensated absences	205,446	66,729	272,175	21,598
Accrued interest payable	—	—	—	215,127
Due to primary government	—	—	—	9,508
Due to federal government - grants	—	10,692	10,692	—
Unearned revenue	—	—	—	38,722
Prizes payable	1,243,000	—	1,243,000	—
Capital leases	35,052	7,424	42,476	61,246
Bonds payable and unamortized premiums	23,047,571	4,302,876	27,350,447	10,944,888
Massachusetts School Building Authority bonds and unamortized premiums	6,027,865	—	6,027,865	—
School construction grants payable	723,919	—	723,919	—
Environmental remediation liability	197,047	—	197,047	—
Liability for derivative instruments	329,833	72,517	402,350	483,309
Net pension liability	24,531,950	403,393	24,935,343	1,399,888
Post-employment benefits obligations (other than pensions)	5,605,000	—	5,605,000	856,556
Other noncurrent liabilities	468,795	120,314	589,109	228,974
Total noncurrent liabilities	62,415,478	4,983,945	67,399,423	14,259,816

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Main Specification - Revenue Adjusted

	(1)	(2)	(3)	(4)
Rev-Exp	-30.22***	-30.22***	-9.066	-9.066
	(-6.19)	(-5.36)	(-1.92)	(-1.78)
CA-CL	-5.672	-5.672	-2.189	-2.189
	(-1.63)	(-1.27)	(-0.60)	(-0.47)
A-LTL	0.552	0.552	-12.33**	-12.33*
	(0.12)	(0.10)	(-2.75)	(-2.52)
PA-PL	-17.60***	-17.60**	-17.60***	-17.60**
	(-3.93)	(-3.08)	(-5.07)	(-2.94)
N	208	208	206	206
R^2	0.364	0.364	0.611	0.611
Within R^2			0.362	0.362
Year FE	No	No	Yes	Yes
Cluster	-	State	-	State

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

◂ Back

Main Specification - Bond Data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rev-Exp	-22.31***	-22.31***	-5.258*	-5.258***	-5.920***	-8.024***	-8.838***
	(-14.27)	(-13.30)	(-2.44)	(-3.84)	(-4.18)	(-5.04)	(-4.60)
CA-CL	7.899**	7.899*	12.65**	12.65***	16.56*	41.54***	14.25
	(2.60)	(2.46)	(3.02)	(3.96)	(1.97)	(4.27)	(1.01)
A-LTL	0.00598	0.00598	-13.22***	-13.22***	-48.80***	-61.86***	-69.07***
	(0.00)	(0.00)	(-3.48)	(-4.00)	(-5.19)	(-5.57)	(-10.34)
PA-PL	-5.609***	-5.609***	-7.935***	-7.935***	-22.13***	-15.51***	-13.16***
	(-6.08)	(-5.72)	(-8.29)	(-8.15)	(-6.70)	(-5.69)	(-4.20)
N	57469	57469	57469	57469	57469	43505	33815
R^2	0.0502	0.0502	0.0630	0.0630	0.0699	0.0818	0.0987
Within R^2			0.0504	0.0504	0.0455	0.0486	0.0558
Year FE	No	No	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	Yes	Yes	Yes
Bond Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	All	All	GO	GO Non. Insur.
Cluster	-	CUSIP	-	CUSIP	CUSIP	CUSIP	CUSIP

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

◂ Main Specification

Robustness - Economic Indicators Bond Data

	(1)	(2)	(3)
Rev-Exp	-5.920***	-3.511**	-4.523***
	(-4.18)	(-2.90)	(-3.72)
CA-CL	16.56*	12.25	18.54*
	(1.97)	(1.45)	(2.24)
A-LTL	-48.80***	-37.97***	-26.60**
	(-5.19)	(-4.08)	(-2.77)
PA-PL	-22.13***	-23.46***	-21.63***
	(-6.70)	(-6.79)	(-6.32)
Econ. Index		-28.70***	-8.118
		(-5.30)	(-1.43)
Housing Index			-28.11***
			(-7.42)
N	57469	56802	56802
R^2	0.0699	0.0703	0.0736
Within R^2	0.0455	0.0460	0.0493
Year FE	Yes	Yes	Yes
State FE	YES	YES	YES
Cluster	CUSIP	CUSIP	CUSIP

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

◂ Main Results

Robustness - Pension Returns IV

	(1)	(2)	(3)
Δ R-E	-7.665	-6.789	-16.05*
	(-1.44)	(-1.21)	(-2.23)
Δ CA-CL	-2.867	-2.933	4.671
	(-1.21)	(-1.34)	(0.50)
Δ A-LTL	-5.383**	-4.974*	-7.272
	(-2.99)	(-2.72)	(-1.42)
Δ PA-PL	-6.246	-5.418	-123.7***
	(-1.57)	(-1.17)	(-4.08)
Pension Return		-23.59*	
		(-2.18)	
N	184	183	185
Year FE	Yes	Yes	Yes
Cluster	State	State	State
IV			Pens. Ret.

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

◂ Results Summary

Effect of Union Membership - Bond

	(1)	(2)	(3)	(4)	(5)
Rev-Exp	-5.920***	-5.997***	-5.951***	-6.275***	-7.045***
	(-4.18)	(-4.22)	(-4.18)	(-4.40)	(-4.93)
CA-CL	16.56*	16.08	14.45	13.64	9.401
	(1.97)	(1.91)	(1.71)	(1.59)	(1.08)
A-LTL	-48.80***	-47.24***	-44.57***	-42.89***	-34.04***
	(-5.19)	(-5.01)	(-4.69)	(-4.41)	(-3.48)
PA-PL	-22.13***	-22.54***	-25.71***	-21.90***	2.066
	(-6.70)	(-6.80)	(-5.97)	(-6.65)	(0.40)
Union Donation		1.932	3.603*		
		(1.94)	(2.17)		
Donat. x PA-PL			1.344		
			(1.67)		
Union Mem. %				13.86**	3.496
				(2.93)	(0.64)
Union * PA-PL					-9.328***
					(-5.32)
N	57469	57322	57322	57152	57152
R^2	0.0699	0.0699	0.0699	0.0697	0.0701
Within R^2	0.0455	0.0455	0.0455	0.0455	0.0458
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
Cluster	CUSIP	CUSIP	CUSIP	CUSIP	CUSIP

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

◂ Main Results

Local Pension Effects - Bond

	(1)	(2)	(3)	(4)	(5)	(6)
Rev-Exp	-5.920***	-25.51***	-25.94***	-5.920***	-25.94***	-25.81***
	(-4.18)	(-5.11)	(-5.28)	(-4.18)	(-5.28)	(-5.22)
CA-CL	16.56*	-24.54	-19.90	16.56*	-19.90	-20.14
	(1.97)	(-0.74)	(-0.61)	(1.97)	(-0.61)	(-0.62)
A-LTL	-48.80***	-75.37***	-68.82***	-48.80***	-68.82***	-68.07***
	(-5.19)	(-5.96)	(-5.22)	(-5.19)	(-5.22)	(-5.11)
PA-PL	-22.13***		-9.236*	-22.13***	-9.236*	-10.03*
	(-6.70)		(-2.08)	(-6.70)	(-2.08)	(-2.12)
PL Local Def/GDP		-26.47***	-23.55***		-23.55***	-23.03***
		(-9.13)	(-6.81)		(-6.81)	(-6.50)
Proactive				503113.7	0	0
				(0.00)	(.)	(.)
Proac. x Local Def						62.12
						(1.72)
N	57469	46859	46859	57469	46859	46859
R^2	0.0699	0.0717	0.0719	0.0699	0.0719	0.0719
Within R^2	0.0455	0.0465	0.0466	0.0455	0.0466	0.0467
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	CUSIP	CUSIP	CUSIP	CUSIP	CUSIP	CUSIP

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

◂ Main Results