

Fooling the market?

Municipal yields and unfunded state pension liabilities

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- Private pension plans shift from DB to DC
- Public state pension plans mostly DB
- Poor funding situation of public plans due to:
 - financial crisis
 - longevity
 - lack of political discipline

US public pension system facing \$3T funding gap: report

March 6, 2016 9:37 am

US public pension deficits squeeze city and state budgets

Are American governments making promises that American taxpayers can't keep? The answer may well be "yes" when it comes to public pensions.

March 17, 2016 11:59 am

Problems pile up for US public pensions

The US government has a \$20.4 trillion retirement problem

BOB BRYAN

APR 7, 2016, 1:34 AM

The US public pensions crisis 'is really hard to fix'

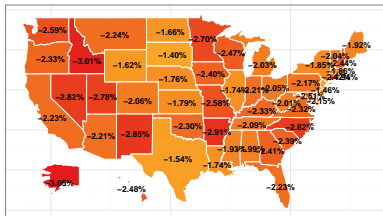
Detroit bankruptcy lesson: Underfunded pension funds could trip up other municipalities

Unbalanced panel for 2001–2014 for the U.S. states:

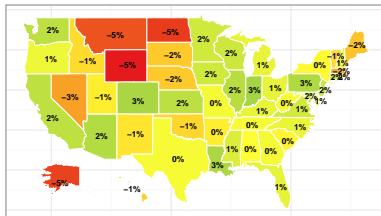
- municipal yields per state
- treasury yields
- state debt (explicit debt)
- gross state product
- state public pension plans:
 - assets
 - liabilities
 - funding ratio
 - unfunded liabilities (implicit debt)

Value changes over 2001–2014

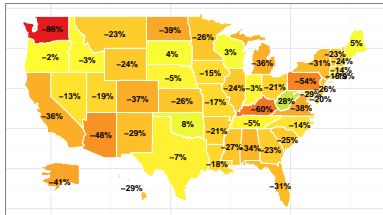
municipal yields



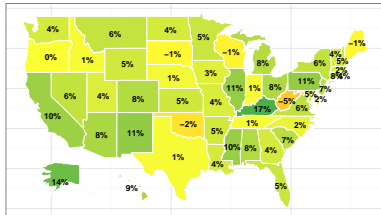
explicit debt ratio



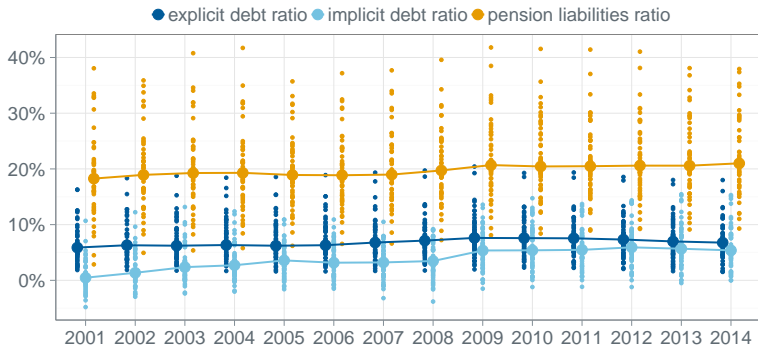
funding ratio



implicit debt ratio



Magnitude of implicit and explicit debt



The original pension data is adjusted for comparability:

- For states with multiple plans, assets and liabilities are aggregated over plans
- Liabilities are recalculated on a uniform basis:
 - using a uniform 8% discount rate
 - assuming liability duration of 15

Correlations: pooled data

	municipal yields	treasury yields	funding ratio	implicit debt ratio	explicit debt ratio
municipal yields	1	0.72	0.17	-0.17	0.02
treasury yields	0.72	1	0.34	-0.32	-0.04
funding ratio	0.17	0.34	1	-0.87	-0.31
implicit debt ratio	-0.17	-0.32	-0.87	1	0.33
explicit debt ratio	0.02	-0.04	-0.31	0.33	1

Fixed effects regressions: baseline

	<i>Dependent variable:</i>				
	municipal yield (YM)				
	(1)	(2)	(3)	(4)	(5)
treasury yield	0.426*** (0.017)	0.484*** (0.022)	0.488*** (0.018)	0.488*** (0.018)	0.488*** (0.019)
explicit debt ratio	0.083*** (0.021)	0.068*** (0.022)	0.065** (0.026)	-0.002 (0.032)	
funding ratio		-0.013*** (0.004)			
implicit debt ratio			0.067*** (0.011)		
total debt ratio				0.067*** (0.011)	0.067*** (0.009)
Model	FE	FE	FE	FE	FE
Observations	687	687	687	687	687
R ²	0.674	0.707	0.712	0.712	0.712
Adjusted R ²	0.623	0.653	0.657	0.657	0.658

Note:

* p<0.1; ** p<0.05; *** p<0.01

Before and after the crisis

	<i>Dependent variable:</i>					
	municipal yield					
	2001–2007			2008–2014		
	(1)	(2)	(3)	(4)	(5)	(6)
treasury yield	0.395*** (0.020)	0.400*** (0.020)	0.413*** (0.021)	0.805*** (0.023)	0.819*** (0.023)	0.818*** (0.024)
explicit debt ratio	-0.055 (0.037)	-0.055 (0.037)	-0.054 (0.036)	0.226*** (0.034)	0.150*** (0.027)	0.149*** (0.029)
funding ratio		-0.001 (0.001)			-0.018*** (0.002)	
implicit debt ratio			0.018* (0.009)			0.072*** (0.012)
Model	FE	FE	FE	FE	FE	FE
Observations	338	338	338	349	349	349
R ²	0.641	0.641	0.646	0.809	0.844	0.838
Adjusted R ²	0.542	0.541	0.544	0.688	0.716	0.711

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Actuarial vs. market values

	<i>Dependent variable:</i>					
	municipal yield					
	market A actuarial L		actuarial A adjusted L		actuarial A actuarial L	
	(1)	(2)	(3)	(4)	(5)	(6)
treasury yield	0.844*** (0.024)	0.845*** (0.025)	0.850*** (0.028)	0.838*** (0.027)	0.861*** (0.032)	0.843*** (0.030)
explicit debt ratio	0.152*** (0.028)	0.153*** (0.030)	0.221*** (0.031)	0.216*** (0.031)	0.228*** (0.032)	0.223*** (0.032)
funding ratio	-0.020*** (0.003)		-0.014*** (0.005)		-0.013** (0.006)	
implicit debt ratio		0.077*** (0.011)		0.044** (0.018)		0.035** (0.018)
Model	FE	FE	FE	FE	FE	FE
Observations	349	349	349	349	349	349
R ²	0.844	0.816	0.813	0.838	0.813	0.811
Adjusted R ²	0.716	0.692	0.690	0.711	0.690	0.688

Note:

* p<0.1; ** p<0.05; *** p<0.01

- Balanced panel
- Assumed liability duration
- Assumed discount rate to 4%
- Assumed discount rate to treasuries
- Reporting lag
- Non-linearities: FR less than 0.75
- Interaction with pension flexibility dummies

Conclusions

- Investors seem to take implicit debt into account.
- The financial crisis must have drawn investors' attention to underfunding.
- The effects for market/adjusted values are stronger than for actuarial reported values.
- Policymakers might be manipulating the funding and reported figures, but it does not seem to fool the markets.
- State governments can save on interest payments by adequately addressing the pension underfunding.

Thank you!

Questions and comments are welcome!
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