Fooling the market? U.S. states implicit pension debt effects on muni yields

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October 14, 2016

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'

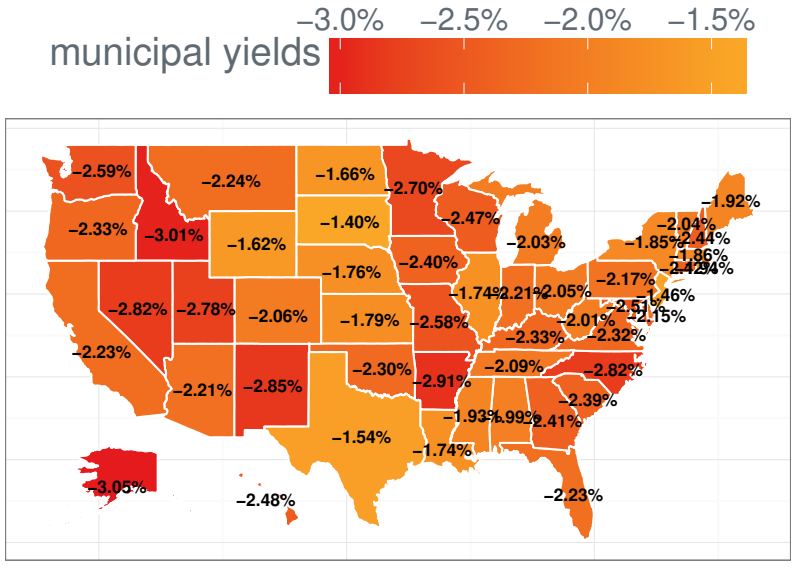
Detroit bankruptcy lesson: Underfunded pension funds could trip up other municipalities

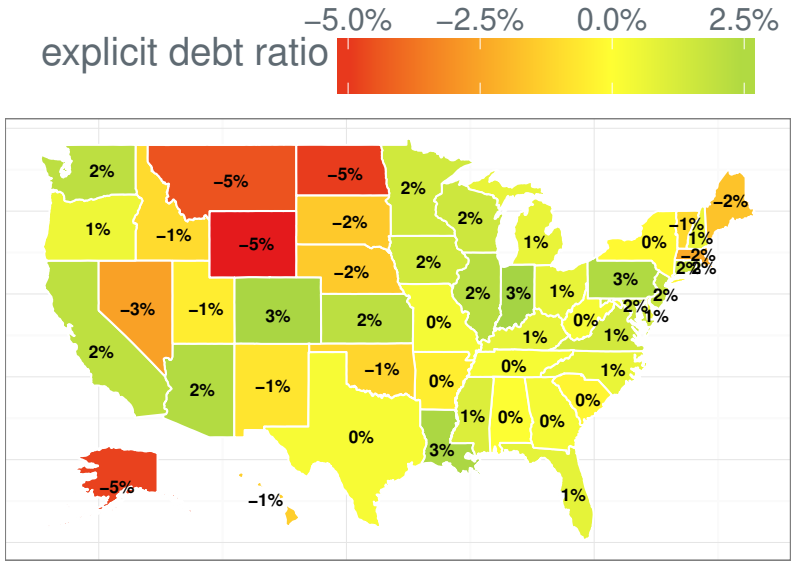
Data

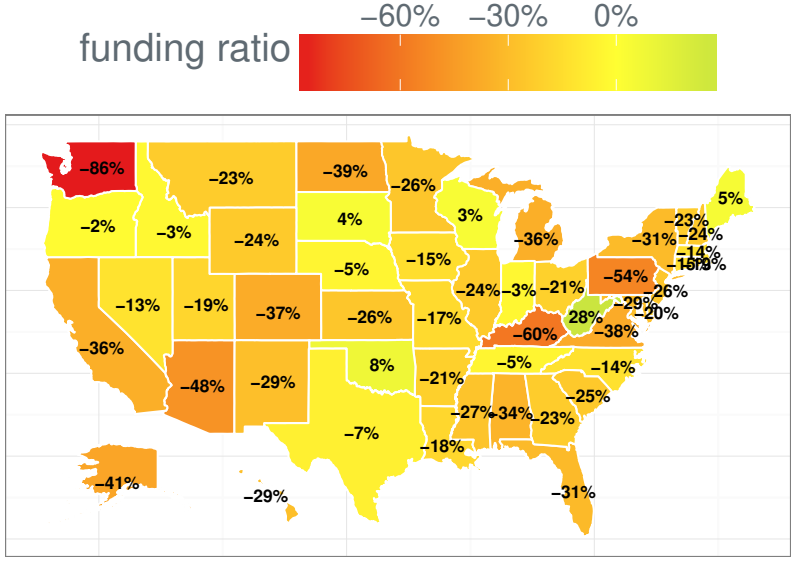
Unbalanced panel for 2001–2014 for the U.S. states:

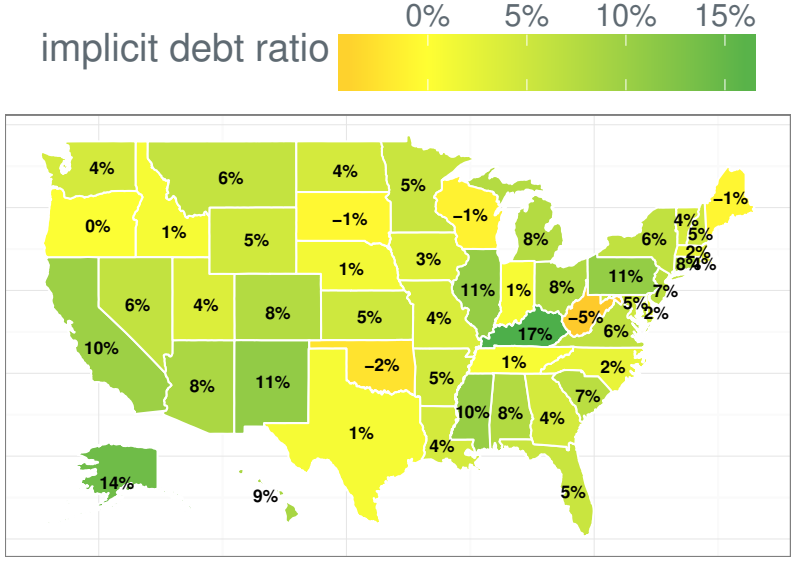
- municipal yields per state
- treasury yields
- state debt (explicit debt)
- gross state product
- state public pension plans:
  - assets
  - liabilities
  - funding ratio
  - unfunded liabilities (implicit debt)

Value changes over 2001–2014

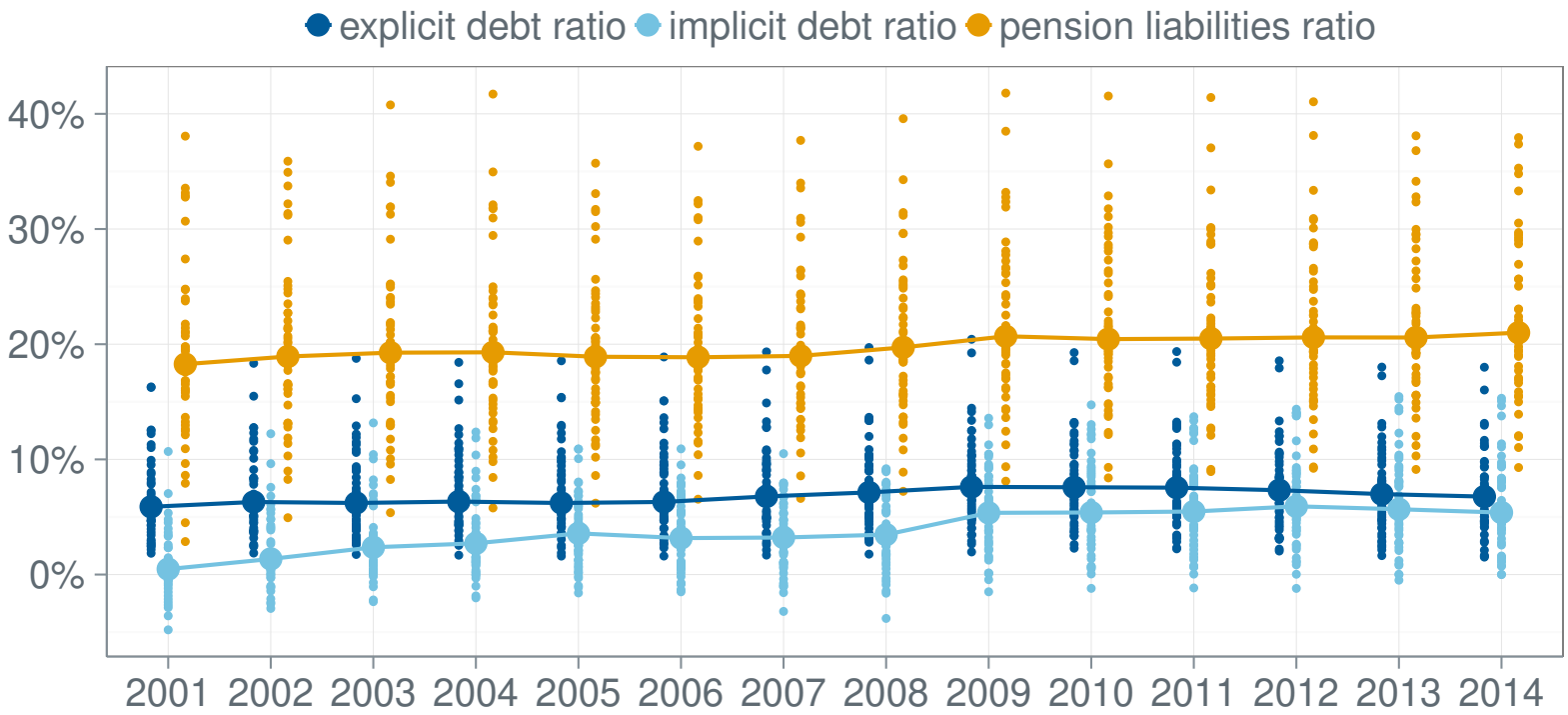




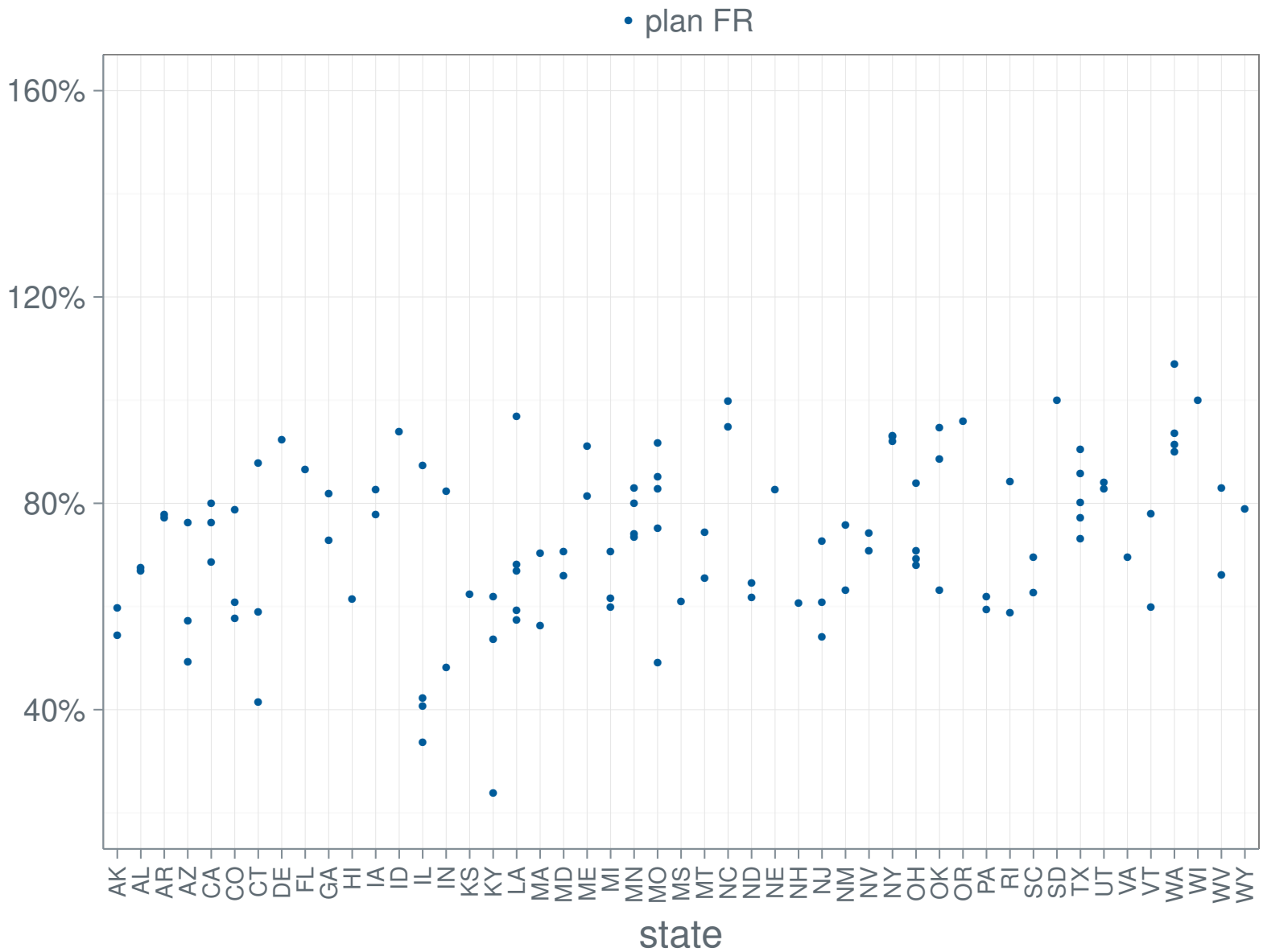




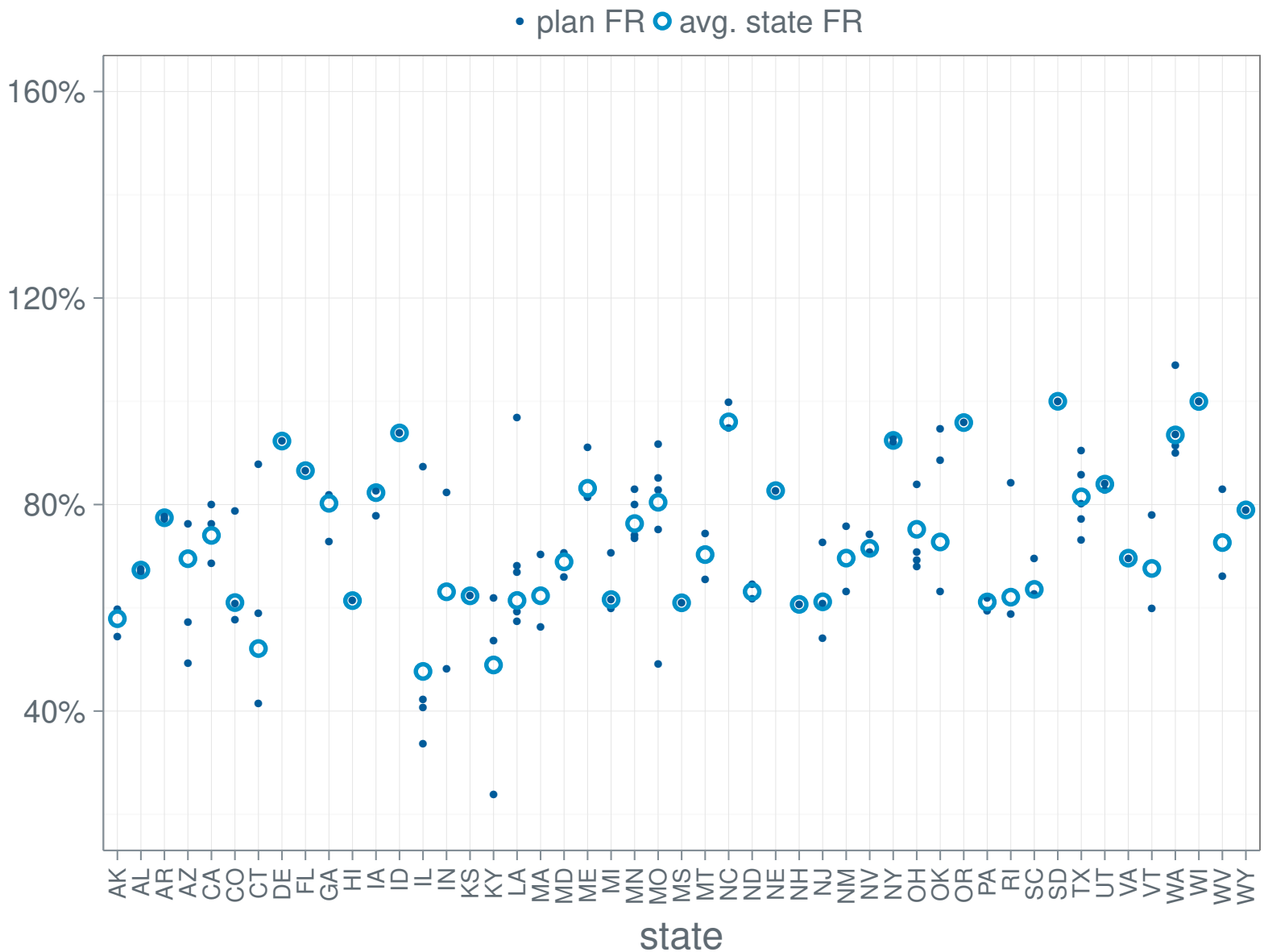
Magnitude of implicit and explicit debt



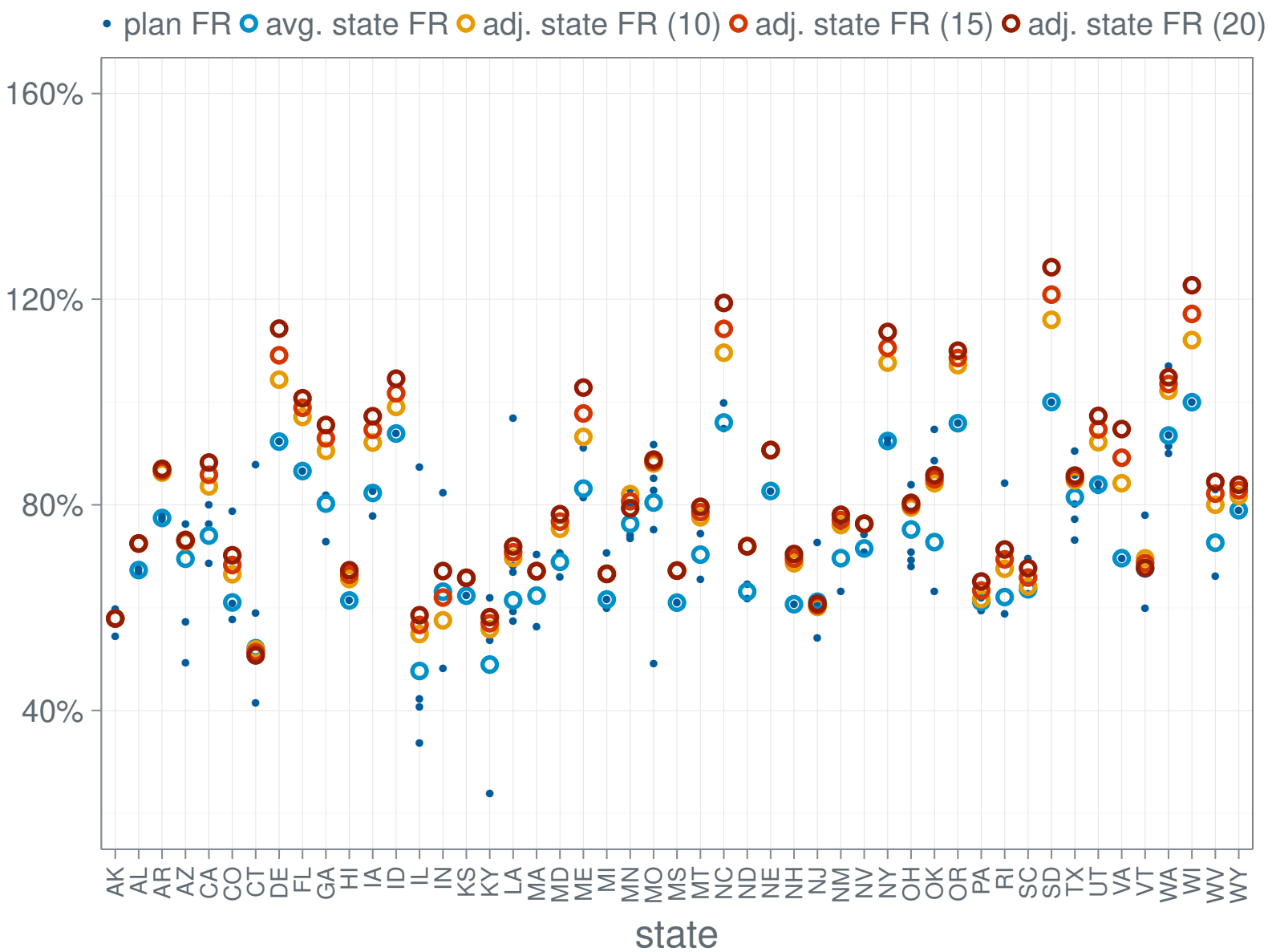
FR adjustment (2014)



FR adjustment (2014)



FR adjustment (2014)



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

	Dependent variable:				
	municipal yield (YM)				
	(1)	(2)	(3)	(4)	(5)
treasury yield	0.426^{***}	0.484^{***}	0.488^{***}	0.488^{***}	0.488^{***}
	(0.017)	(0.022)	(0.018)	(0.018)	(0.019)
explicit debt ratio	0.083^{***}	0.068^{***}	0.065^{**}	-0.002	
	(0.021)	(0.022)	(0.026)	(0.032)	
funding ratio		-0.013^{***}			
		(0.004)			
implicit debt ratio			0.067^{***}		
			(0.011)		
total debt ratio				0.067^{***}	0.067^{***}
				(0.011)	(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

Robustness

- 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

Before and after the crisis

	Dependent variable:					
	municipal yield					
	2001–2007			2008–2014		
	(1)	(2)	(3)	(4)	(5)	(6)
treasury yield	0.395***	0.400***	0.413***	0.805***	0.819***	0.818***
	(0.020)	(0.020)	(0.021)	(0.023)	(0.023)	(0.024)
explicit debt ratio	−0.055	−0.055	−0.054	0.226***	0.150***	0.149***
	(0.037)	(0.037)	(0.036)	(0.034)	(0.027)	(0.029)
funding ratio		−0.001			−0.018***	
		(0.001)			(0.002)	
implicit debt ratio			0.018*			0.072***
			(0.009)			(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

	Dependent variable:					
	municipal yield					
	market A actuarial L		actuarial A adjusted L		actuarial A actuarial L	
	(1)	(2)	(3)	(4)	(5)	(6)
treasury yield	0.844^{***}	0.845^{***}	0.850^{***}	0.838^{***}	0.861^{***}	0.843^{***}
	(0.024)	(0.025)	(0.028)	(0.027)	(0.032)	(0.030)
explicit debt ratio	0.152^{***}	0.153^{***}	0.221^{***}	0.216^{***}	0.228^{***}	0.223^{***}
	(0.028)	(0.030)	(0.031)	(0.031)	(0.032)	(0.032)
funding ratio	-0.020^{***}		-0.014^{***}		-0.013^{**}	
	(0.003)		(0.005)		(0.006)	
implicit debt ratio		0.077^{***}		0.044^{**}		0.035^{**}
		(0.011)		(0.018)		(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	

Conclusions

- Investors seem to take implicit debt into account.
- Both explicit and implicit debt have similar effects on the yields.
- The effect is mostly after the financial crisis – possibly due to higher investor risk aversion.
- The effects for market/adjusted values are much stronger than for actuarial reported values.
- Policymakers might be manipulating the funding, but it does not seem to fool the markets.

Thank you!

Questions and comments are welcome!

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