The Sustainability of State and Local Government Pensions: A Public Finance Approach

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Disclaimers

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Introduction

State and local gov pensions are important economic institutions in US

- \$4 trillion in assets
- 10 million retirees

Plans are not fully funded

- Unfunded liabilities have led to widespread concern, plans in "crisis"
- From academics, policymakers, municipal bond participants

Our approach: Asks whether plans are sustainable, and, if not, what is required to make them sustainable

Preview of Conclusions

In aggregate, pensions can be stabilized with moderate fiscal adjustments under moderate asset return assumptions

Stabilization is more costly, but also less pressing, under low asset return assumptions

Lots of heterogeneity and some plans are far from stable

Calculating Funding for State and Local Pension Plans

Unfunded liabilities = Present value of liabilities less assets

Need discount rate to value liabilities – very contentious

Pensions use expected rate of return on risky asset (high discount rate)

Others argue for risk-free rate (Treasury rate)

 Pensions have strong legal protections and therefore low risk (Novy-Marx and Rauh 2011)

Others argue for low-risk corporate AAA (BEA & FA)

How Funded are State and Local Pension Plans?



Panel A: State and Local Government Pension Funding Ratios Under Plan Choosen Discount Rate

Panel B: State and Local Government Pension Funding Ratios Under AAA Corporate-Bond Interest Rate



Methodology

Analyzing sustainability requires benefit cash flows

Actuarial reports provide the pension liability and actuarial assumptions

Reverse engineer cash flows (Similar to Novy-Marx and Rauh (2011, 2014) and Lutz and Sheiner (2014))

Collect:

For current employees: age, years of service, withdrawal and retirement probabilities, pension benefit calculations, wage growth

For current retirees: ages, average benefit

For all: mortality probability, COLAs, discount rate

Reverse Engineering Cash Flows

Construct statistical machinery to "age" workers and retirees

- Each year: apply quit, disability, death, and retirement probabilities
- Surviving workers gain a year of age & service, receive wage increases
- Calculate PDV of liabilities and compare to reports

Simple conceptually, but very challenging in practice

- Errors are about zero on average but larger for some plans and for current workers
- Make adjustments to benefits to perfectly match PDVs in reports using PDV assumptions

Harmonize assumptions, project new hires, payroll and GDP

- Use same discount rate, inflation rate, wage growth, asset returns for all plans
- Assume life expectancy increases over time (plans typically don't)
- Assume GDP grows by projected productivity and growth of 20-64 year old pop in each area
- Add new hires each year using projections of demographics of each state

Data

- Public Plans Database (PPD) from BC Retirement Center
- 2017 Actuarial Valuations (AVs) and Comprehensive Annual Financial Reports (CAFRs)
- Sample of 40 plans
- Small sample reflects extremely labor intensive nature of methodology
- Sample observationally similar to universe of S&L pensions

Estimation Sample of State and Local Pension Plans

	Estimation Sample	Public Plans Database National Sample
Assets / Liabilities	0.71 (0.16)	0.71 (0.17)
Unfunded Liabiliites / Payroll	2.04 (1.60)	2.07 (1.63)
Total Pension Contributions / Payroll	0.24 (0.11)	0.24 (0.11)
Active Members / Retired Members	1.37 (0.36)	1.34 (0.37)
Projected Percent Active Member Growth	0.41 (0.57)	0.44 (0.60)
Observations	40	180

US Ratio of Beneficiaries to Workforce



Demographic transition increasing ratio of retirees to workforce

Ratio increases about 25% over next two decades

Rise is almost the same as projected for Social Security

- Total - - Actives - - Inactives - - Retirees - - New Hires

US Ratio of Benefit Payments to GDP



Benefits rise much less than #retirees – about 9% over next two decades

Then benefits <u>decline</u> as a share of GDP – not at all like Social Security

Plans get eventual fiscal relief

Governments may wish to smooth through period of peak benefits

Why Don't Benefits Rise More? Reforms



17 out of 40 plans have lowered COLAs since 2007

Others have made plans less generous for new hires (adjusting retirement ages, benefit factors, vesting, etc.)

If COLAs equaled inflation, benefits would rise about 25% over next two decades.

If plans eliminated COLAs (many could do so legally), benefits would eventually fall an additional 9%.

If reforms for new hires eliminated, benefits would be about 12% higher in steady state

Evaluating Sustainability

Requires assumptions for asset returns.

Pension lit. typically examines

- Set of deterministic scenarios
- Stochastic returns

Alternative approach: risk-adjust asset returns

Unresolved debate for federal credit programs:

- Official estimates do not risk-adjust. CBO alternative Fair Value does
 - Pro: Prevents budget from appearing healthier due to risk taking
 - Con: Biased budget forecast (expect to do better and on average will)
 - Not clear what rate of return makes taxpayers indifferent

Our Current Approach

Consider 3 deterministic scenarios.

In all, assume plans maintain current contribution as share of payroll to pensions in the baseline. Discount the value of the liabilities at a risk-free rate.

Consider 3 rates of return on pension assets.

- 1.5% real return = risk-free rate
- 5.5% real return = expected rate
- About what plans have realized since 2000
- 3.5% real return = middle ground.

Exhaustion Dates: One way of assessing sustainability



In aggregate, plans don't exhaust (hit zero assets) for 30 years under a 1.5% rate of return, and not until after 50 years under 3.5%

At 5.5% real return, plans are overfunded on average

Making Pensions Sustainable

- 3 Stabilization Exercises:
- Choose time-varying contribution to
- 1. Keep implicit debt to GDP ratio constant at today's level every year

Choose one-time permanent change in contributions to GDP to:

2. Reach constant share of GDP in steady state

Requires in equilibrium: Contribution = Newly accrued Benefits + (r – g) Implicit Debt

3. Return to today's debt to GDP ratio by the end of 30 years

Annual Contribution to Maintain Constant Implicit-Debt to GDP Ratio



Time varying contribution: more now, less later when benefits are lower

At 3.5% real return, increase funding about 8% of payroll.

At 5.5% real return, lower contributions now.

At 1.5% real return, need much larger increases in contribution—18% of payroll, or about 75%.

But is this optimal policy? Probably not, especially at 1.5% rate of return.

Contribution to Stabilize Implicit Debt

	Increase in contribution rate required if changes are made (percent of payroll):				
Real rate of return	Start Today	Start In 10 years	Start In 20 years	Start In 30 years	
1.5%	12.7%	12.89%	13.06%	13.2%	
3.5%	4.28%	5.46%	6.82%	8.41%	
5.5%	-5.2%	-7.55%	-10.97%	-15.87%	

At 1.5% return, contribution increase about 13% of payroll, regardless of when you start. Why? At 1.5% Return, r ≈ g. Debt has no fiscal costs. (Blanchard, 2019).

At 3.5% return, contribution increase about 4% of payroll today. Rises to 8% if delay 30 years.

The lower the interest rate, the larger the unfunded liability, but the less urgency to act.

Implicit Debt to GDP Returns to Today's Level in Year 30

	Implicit debt gets back to todays level in 30 years				
Real rate of return	Start Today	Start In 10 years	Start In 20 years		
1.5%	13.97%	18.32%	22.81%		
3.5%	4.19%	6.25%	9.05%		
5.5%	-5.74%	-9.61%	-14.84%		

At 3.5% return, contribution increase about 4% of payroll today. Rises to 9% if delay 20 years.

At 5.5% return, can decrease contributions.

At 1.5%, contribution does increase over time, because have to not just stabilize but pay down debt

Implicit Debt Trajectories under 2 Exercises



Full Funding Requires Much Larger Adjustments

	Stabilize Implicit Debt to GDP			Fully Funded in 30 Years			Implicit debt gets back to todays level in 30 years		
Real rate of return	Start Today	Start In 10 years	StartIn 20 years	Start Today	Start In 10 years	Start In 20 years	Start Today	Start In 10 years	Start In 20 years
1.5%	12.7%	12.89%	13.06%	35.57%	55.86%	120.32%	13.97%	18.32%	22.81%
3.5%	4.28%	5.46%	6.82%	20.39%	35.73%	85.25%	4.19%	6.25%	9.05%
5.5%	-5.2%	-7.55%	-10.97%	6.19%	12.39%	33.12%	-5.74%	-9.61%	-14.84%

Percentage Point Increase in Contribution Rate Required (Percent of Payroll):

Lots of Heterogeneity Across Plans

- All of this for the aggregate state and local pension sector
- Some plans in much better shape, some in much worse
- One key question we hope to address in future work:
- For plans that are in poor shape, how did they get there? And what's optimal response?

Percent of Plans (Weighted by Liabilities) that Need to Change their Contribution Rate by x Percentage Points Today to Stabilize



Conclusions

Approaching pension situation from a public finance angle suggests less of a "crisis" than typically portrayed.

In aggregate, plans can become sustainable with modest changes in funding, at moderate asset returns.

At very low returns, changes are larger, but less urgency in acting sooner rather than later

At higher interest rates, plans mostly in fine shape, though not all.

Need to trade off benefits of acting sooner with costs:

For example, if classrooms being starved for funds in order to increase pension funding, may not be optimal if rate of return on education > rate earned on assets

Future Work

Sensitivity Analysis: Demographics Productivity Growth Mortality No Colas

Broaden context to overall state and local fiscal outlook

State and local governments have debt as well as pension assets. Lower interest rates mean lower rates of return on pension assets, but also lower interest costs on debt. Net effect should be smaller than calculated here.

How does fiscal stress from pensions compare to stress from Medicaid over long run?

Thank you!

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