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

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NCPERS 2020 Public Pension Funding Forum
September 2020
Disclaimers

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Introduction

• Topic: Fiscal sustainability of state and local gov. pensions
• Questions:
  • Are state and local pensions fiscally sustainable under current benefit and funding levels?
  • If not, what is required to make them sustainable?
Preview of Conclusions

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

• Only moderate returns to stabilizing immediately versus in the future (e.g. 10 years in future)

• Lots of heterogeneity and some plans are far from stable

• COVID-19 shock: If low interest rates persist, stabilization is relatively more challenging
Background

- Discount rate required to value liabilities
- Pensions use rate of return on risky asset → high discount rate
- Principles of financial valuation suggest discount rate should reflect riskiness of payments (Modigliani and Miller 1958)
- Pensions have strong legal protections → low discount rate (Novy-Marx and Rauh 2009; Brown and Wilcox 2009)
Concern over Sustainability

- Lower discount rates increase pension liabilities
  - Unfunded pension liabilities ≈ $4 trillion (Rauh 2017 & FA)
  - 50% funding ratio
- Unfunded liabilities → widespread sustainability concerns
  - Plans have failed to “provide economic security in old age in a financially sustainable way” (Novy-Marx & Rauh 2014)
Fiscal Sustainability

• Prefunding not required for fiscal sustainability
• Fully unfunded pay-as-you-go (paygo) pension systems can be sustainable
  • e.g. Samuleson (1958)
• PAYGO sustainable if internal rate of return does not exceed the growth rate of the wage base (labor force growth + productivity growth)
• Context: U.S. Social Security can be viewed as a PAYGO system
Sustainability of PAYGO

• Stable PAYGO can become unsustainable if
  1. Demographic or economics changes increase outlay growth and/or lower revenue growth
  2. Policymakers increase benefits
• Blended system – partially PAYGO and partially prefunded – can be stable in face of these shocks
• Most S&L pensions have effectively long been blended systems
Caution Required

- We analyze pension sustainability from perspective of sustainability
- Caution required
  - Of course some plans are clearly not on a sustainable path
  - Partial PAYGO viewpoint relatively more appropriate for states than localities
Appropriateness of Sustainability Focus

Our focus on sustainability, as opposed to the more typical focus on a full funding benchmark, is useful and appropriate:

1. Answers question of whether public pensions will spark a crisis
   ◦ Failure to fully prefund need not spark a crisis

2. Consistent with history: In aggregate, plans have always operated well short of full prefunding
Methodology

• Analyzing sustainability requires benefit cash flows

• Actuarial reports provide the pension liability and actuarial assumptions

• Reverse engineer cash flows
  • Method pioneered by Novy-Marx and Rauh (2011, 2014)
  • Used in Lutz and Sheiner (2014)
  • Sample of 40 plans – observationally similar to universe of S&L pensions
Sustainability Analysis

• Assume plans maintain current contribution as share of payroll
• Discount the value of the liabilities at a risk-free rate
• Consider 3 deterministic rates of return on pension assets based on historic rates of return
  • 1% real return = risk-free rate
  • 5% real return = expected rate
  • 3% real return = middle ground
• Does not account for COVID-19 shock
Exhaustion Dates: One way of assessing sustainability

In aggregate, plans don’t exhaust (hit zero assets) for about 25 years under a 1% rate of return, and not until after 40 years under 3%.

At 5% real return, plans are overfunded on average.
Exhaustion Dates: Heterogeneity Across Plans

Percent of Total Liabilities in Plans that Exhaust their Assets over Various Time Horizons

Real Rate of Return: 1%, 3%, 5%
Sustainability Analysis: COVID-19 Shock

• COVID-19 economic shock

  • Lower interest rates
    • - 0.4% real return = risk-free rate
    • 3.6% real return = expected rate
    • 1.6% real return = middle ground

• Lower GDP over medium-term
Exhaustion Dates: Post-COVID-19 Rates of Return

Post-COVID scenario:

Slower employment growth

Real rates of return: -0.4%, 1.6%, 3.6%
Making Pensions Sustainable

2 Stabilization Exercises

Choose one-time permanent change in contributions:

1. **Long-run**: Debt as share of GDP is constant in long run (without regard to the level)

2. **30-year Medium-run**: Return to today’s debt-to-GDP ratio by the end of 30 years
## Contribution to Stabilize Implicit Debt in Long-Run

### Increase in contribution rate required if changes are made (percent of payroll):

<table>
<thead>
<tr>
<th>Real rate of return</th>
<th>Today</th>
<th>In 10 years</th>
<th>In 20 years</th>
<th>In 30 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>11.20%</td>
<td>10.68%</td>
<td>9.98%</td>
<td>9.23%</td>
</tr>
<tr>
<td>3%</td>
<td>5.81%</td>
<td>6.62%</td>
<td>7.53%</td>
<td>8.46%</td>
</tr>
<tr>
<td>5%</td>
<td>-2.01%</td>
<td>-2.72%</td>
<td>-3.75%</td>
<td>-5.09%</td>
</tr>
</tbody>
</table>

At 3% return, contribution increase about 6% of payroll today. Rises less than 1 pp if delay 10 years.
### Implicit Debt to GDP Returns to Today’s Level in Year 30

<table>
<thead>
<tr>
<th>Real rate of return</th>
<th>Implicit Debt Gets Back to Today's Level in 30 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Today</td>
</tr>
<tr>
<td>1%</td>
<td>13.10%</td>
</tr>
<tr>
<td>3%</td>
<td>4.96%</td>
</tr>
<tr>
<td>5%</td>
<td>-3.53%</td>
</tr>
</tbody>
</table>

- At 3% return, contribution increase about 5% of payroll today. Rises to only 7% if delay 10 years.
- Delay causes contribution to increase, because have to not just stabilize but pay down debt.
- At 5% return, can decrease contributions.
Implicit Debt to GDP Returns to Today’s Level in Year 30

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</table>

- At 3% return, contribution increase about 5% of payroll today. Rises to 7% if delay 20 years.
- Delay causes contribution to increase, because have to not just stabilize but pay down debt.
- At 5% return, can decrease contributions.
## Full Funding Requires Much Larger Adjustments

<table>
<thead>
<tr>
<th>Real rate of return</th>
<th>Fully Funded 30 Years from today</th>
<th>Implicit Debt Gets Back to Today's Level in 30 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Today</td>
<td>In 10 years</td>
</tr>
<tr>
<td>1%</td>
<td>41.81%</td>
<td>44.87%</td>
</tr>
<tr>
<td>3%</td>
<td>26.57%</td>
<td>28.43%</td>
</tr>
<tr>
<td>5%</td>
<td>12.40%</td>
<td>10.69%</td>
</tr>
</tbody>
</table>
## Sustainability Pre-Post Covid-19

### Rates of Return

<table>
<thead>
<tr>
<th>Pre-COVID:</th>
<th>Real rates of return:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1%, 3% and 5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-COVID:</th>
<th>Real rates of return:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>-.4%, 1.6%, 3.6%</td>
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</table>

### Contribution Change Required to Achieve Stability

<table>
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<th>Percent of Payroll</th>
<th>Long-Run</th>
<th>Same Debt/GDP in 30 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-COVID</td>
<td>Post-Covid</td>
</tr>
<tr>
<td>Asset Returns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>low</td>
<td>11.20%</td>
<td>10.60%</td>
</tr>
<tr>
<td>medium</td>
<td>5.81%</td>
<td>9.46%</td>
</tr>
<tr>
<td>high</td>
<td>-2.01%</td>
<td>3.50%</td>
</tr>
</tbody>
</table>
Conclusions

• In aggregate, plans can become sustainable with moderate changes in funding assuming moderate asset returns

• Delaying stabilization increases contribution change needed by only moderate-to-small amount

• Significant heterogeneity

• If Post-COVID-19 interest rates persist, stabilization is more challenging
Thank you!

Comments welcome:

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