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March 25, 2021
Overview

• Paper studies sustainability of pension promises

• Goal is stabilization of pension debt to GDP

• Hard question: requires projections of annual pension fund cash flows and accruals in landscape of heterogeneous plan design

• Relies on modeling of new entrants into the system under current pension deals that new entrants receive
  ➢ which in many cases are different from earlier tiers due to reforms
Main Comments

• Stabilization goal is reasonable to consider

• However, public sector’s approach to funding with risk assets creates additional issues for this type of debt (unfunded pension liabilities) relative to government bonds

• Instability due to market risk isn’t in the model, because the model is deterministic: no distribution of possible outcomes
  ➢ Higher expected return you target, the greater the distribution of outcomes

• Only meaningful scenario is r=d=0% → fiscal adjustment is 14.9% of payroll vs. current 29%. So a 51% increase.
  ➢ I will provide some reasons I think this might still be too low
State and Local Pensions in the Federal Reserve Financial Accounts of the U.S. (1)

Federal Reserve State and Local Pension Asset and Liabilities - Original and Revised (Nominal)
Source: Federal Reserve Flow of Funds Z.1 (L.120.b)

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State and Local Pensions in the Federal Reserve Financial Accounts of the U.S. (2)

Federal Reserve State and Local Pension Asset and Liabilities - Original and Revised (% of Nominal GDP)

Sources: Federal Reserve Flow of Funds Z.1 (L.120.b); Bureau of Labor Statistics.

S&P 500 total return (dividends reinvested)
2009Q1-2020Q4 = 517%

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Standard Finance Market Model: $E[R]=7\%, \ MRP=4\%, \ \beta=1.5$

Black-Scholes-Merton assumptions: lognormal returns

\[ S_T = S_0 e^{[R_T T]} \]

\[ R_T \sim \phi \left( r + MRP - \frac{\sigma^2}{2}, \frac{\sigma}{\sqrt{T}} \right) \]

Source: econgraphs.org/graphs/finance/capm/simulated_returns
Standard Finance Market Model: \( \text{E}[R]=6\%, \ MRP=5\%, \ \beta=1 \)

Black-Scholes-Merton assumptions: lognormal returns

\[
S_T = S_0 e^{[R_T T]}
\]

\[
R_T \sim \phi \left( r + MRP - \frac{\sigma^2}{2}, \frac{\sigma}{\sqrt{T}} \right)
\]
Implications of Modelling Stochastic Process Deterministically

• Agree that $d$ and $r$ can and should play distinct roles
  • $d$ measures liability
  • $r$ is determined by asset allocation
  • It may be optimal to fund less <100%, effectively borrowing to invest in risk assets, expose to distribution of outcomes with higher mean

• But what does it mean to separate $d$ and $r$ in a deterministic analysis?
  • Costrell and McGee (2020) analyze steady state of this paper
    • Steady state contribution rate ultimately becomes independent of $d$
      \[
      \text{contributions} = \text{benefits} - (r - g) \frac{a}{(1 + g)}
      \]
      \[
      a \equiv \frac{\text{Assets}}{\text{GDP}}
      \]
  • Relying on earning above risk-free profits with certainty
Only meaningful Scenario: $r=d=r_f$

- Accounting definition of stability in level dollars: must pay
  - PV of new benefit accruals ("normal cost" or "NC");
  - Plus interest on unfunded liability
- Rauh (2017) found **83% increase** in employer contributions necessary to cover these quantities as of 2017

- LLSS are looking for stability as share of nominal GDP, so benefit from $g$
- They find 14.9% of pay increase on 29% of pay baseline -> **51% increase**

<table>
<thead>
<tr>
<th>Real rate of return</th>
<th>Start Today</th>
<th>Start In 10 years</th>
<th>Start In 20 years</th>
<th>Start In 30 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>14.91%</td>
<td>12.71%</td>
<td>10.71%</td>
<td>8.82%</td>
</tr>
</tbody>
</table>

- But it is LOWER if you wait 30 years (8.82% of pay, or **30% increase**)
Comments About Adjustments

1. 15 plans (37.5% of plans) are insolvent before 30 years (Table 2)
   • Authors rely on idea that plans can issue debt to “smooth through the period of peak benefit outflows”
   • Add any volatility and there is a chance more could become insolvent

2. Waiting would stabilize the funding ratio at a much lower level
   • Still less costly as share of payroll because GDP higher and NCs much lower(?)
   • However, it again adds risk that due to volatility the plan becomes insolvent and must have big contribution increase to afford PAYGO

3. To really understand mechanics, need some more info:
   • NC at stated rate, t=0 and t=30
   • NC at risk-free rate, t=0 and t=30
   • Calculated PAYGO rate, t=0 and t=30
   • Funding ratio if start increasing contributions at t=0 vs t=30
Conclusions

• Interesting paper, asking good question and taking on difficult modeling

• Appreciate “public finance” goal of stabilization of pension debt/GDP

• But not advisable to ignore the “finance” insight of distributions of outcomes

• In talking about this paper, I will emphasize r=d=r_f scenario until stochastic analysis is introduced

• Much potential to learn something from r=d=r_f, namely how much the new tiers have reduced necessary contribution increases