Research on Public Pension Funding

Kenneth A. Kriz
Regents Distinguished Professor of Public Finance

Outline

• Background on Public Pension Funding
• "The Big Themes" of Public Pension Research
  – Recently published work
• My Work in Progress

Recent Headlines

Judge rules Stockton can sever CalPERS pensions; Wall Street approves
BIG THEMES OF PUBLIC PENSION RESEARCH

Determinants of Funding

- Governance
  - Chen, Ebdon, Kriz (2015)
    - Board composition affects funding ratios
      - Positive relationship between employee percentage, political appointees, and funding ratios

- Financial Determinants

Assumed Rate of Return

- Novy-Marx and Rauh (2010, 2012)
  - Plan discount rates (assumed rates of return) are “too high”
  - Appropriate rate is risk-free rate (2010) or local government borrowing rate (2012)

- Chen and Kriz (Under Review)
  - Holding period risk
    - NMR are likely right if holding period is 1 year
    - They are clearly not right if holding period is 20 years

Probability of Minimum Portfolio Return
Investment Behavior

- Do Plans Take on “Too Much” Risk?
  - Stalebrink, Kriz, & Guo (2010)
    - Yes, if the assumed rate of return is 8%
  - Mohan & Zhang (2014)
    - Yes, if they are underfunded, face fiscal constraints, have higher return assumptions, or watch what CalPERS does

WORK IN PROGRESS I: KPERS

KPERS Funding

Normal Cost Trends
Change in KPERS Actuarial Funding Ratio, 1993 - 2013

<table>
<thead>
<tr>
<th>Source of Change</th>
<th>Impact on Unfunded Actuarial Liability ($ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Experience vs. Assumed</td>
<td></td>
</tr>
<tr>
<td>- Investment</td>
<td>$1,556</td>
</tr>
<tr>
<td>- Other</td>
<td>496</td>
</tr>
<tr>
<td>Assumption Changes</td>
<td>800</td>
</tr>
<tr>
<td>Changes in Data/Procedures</td>
<td>377</td>
</tr>
<tr>
<td>Change in Cost Method</td>
<td>1,147</td>
</tr>
<tr>
<td>Effect of Contribution Cap/Lag</td>
<td>3,644</td>
</tr>
<tr>
<td>Amortization Method</td>
<td>1,003</td>
</tr>
<tr>
<td>Change in Benefit Provisions</td>
<td>283</td>
</tr>
<tr>
<td>Change in Actuarial Firm/Software</td>
<td>-27</td>
</tr>
<tr>
<td>Bond Issue</td>
<td>-481</td>
</tr>
</tbody>
</table>

Interview Results & Conclusions

- To Be Added Later...
WORK IN PROGRESS II: RELATIONSHIP BETWEEN ASSUMED RATES OF RETURN AND CONTRIBUTION LEVELS

Assumed Dynamics

• Plans inflate their investment return assumptions in order to cut their contribution rates
• In essence they play games with assumptions to duck funding responsibility

Descriptive Statistics on Changes

<table>
<thead>
<tr>
<th>Relaxation Assumption</th>
<th>Decrease</th>
<th>No Change</th>
<th>Increase</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxation Assumption</td>
<td>Decrease</td>
<td>No Change</td>
<td>Increase</td>
<td>Total</td>
</tr>
<tr>
<td>Relaxation Assumption</td>
<td>38</td>
<td>77</td>
<td>0</td>
<td>115</td>
</tr>
<tr>
<td>Relaxation Assumption</td>
<td>100</td>
<td>8</td>
<td>11</td>
<td>190</td>
</tr>
<tr>
<td>Relaxation Assumption</td>
<td>13</td>
<td>114</td>
<td>116</td>
<td>1044</td>
</tr>
<tr>
<td>Relaxation Assumption</td>
<td>62</td>
<td>969</td>
<td>13</td>
<td>1044</td>
</tr>
</tbody>
</table>
Conclusions

- Plans do not change nominal rate of return assumptions often;
- However, they change inflation assumptions more frequently and often do not change rate of return assumptions;
- Strong inverse relationship between real rate of return assumption and plan contributions;
- Lingering questions:
  - Intentionality?
  - Smaller plans

Public Pension Portfolio Management

- Investment returns are a critical funding component;
- Two of the most important investment decisions:
  - Selection of a policy asset allocation
  - Choice of passive management vs. active management

Tracking Fund Management Performance

- Previous Papers Used Rate of Return Almost Exclusively
  - Issue: A large portion of this return is driven by the market as a whole
- We Use the “Information Ratio”
  - Compares fund return to a benchmark both in terms of absolute return and risk
  - Idea is whether plan is compensated for taking on additional risk

WORK IN PROGRESS III: DOES “ACTIVE MANAGEMENT” IMPROVE PENSION FUND INVESTMENT PERFORMANCE
Conclusions

- Using more expensive active managers is associated with greater risk-adjusted returns
- Plans that shift their asset allocation more have higher risk-adjusted returns
- Active management and asset allocation shifting are effective in increasing returns relative to risk

Plan Enrollment

- Not enough people participate, and at levels that are too low to ensure a sound retirement
  - Choi, et.al. (2005): 40 percent of people in a plan that offers instant arbitrage opportunity either don’t participate or participate enough to get full match
- What works?
  - Automatic enrollment (negative election)
  - Madrian and Shea (2001): Contribution rates rose from 20%/65% (3 month take-up) to 90%/98%
  - Active decision making (check yes or no)
  - Simplifying decision making process (combine enrollment, saving rate, asset allocation)
  - Increasing match (Huberman et.al. 2007)
  - Relatively few options
    - Iyengar, Huberman, Jiang (2004): Addition of ten funds reduces likelihood of employee participation by two percentage points

Contribution Rates

- People spend little time considering contribution rates
  - Benartzi and Thaler (1999): 58 percent of USC faculty and staff spent less than 1 hour making contribution rate and investment election decisions
- People use heuristics to set contribution rates
  - Rule of 5
  - Maximum savings rate
  - Minimum required to get maximum match
- What works
  - Change formulas to lower match rate but higher threshold
  - Make threshold multiple of 5
Asset Allocation

- People use naïve diversification rules
  - 1/n (Zweig 1998)
  - Conditional 1/n (Huberman and Jiang 2006: if divisible evenly say by 2 or 4, then allocate evenly, if not, use some other heuristic)
  - Menu following (if 5 equity funds and 1 bond fund are offered, invest more in equity funds)
  - Constrained by the number of lines on election form
  - Overload default (if too many choices offered, default to money market/bond – Iyengar and Kamenica 2006)
- "Lifestyle" funds effects may be less helpful than thought
  - High correlation between lifestyle and core funds (Benartzi and Thaler 2007, Vanguard 2004)
  - People tend to be more aggressive in lifestyle fund choice (Fox and Langer 2005)

Asset Allocation (continued)

- People time the market wrong
  - Increase equity exposure when equities are expensive, reduce when they are cheap(er)
  - Hypersensitivity to short-term losses
    - Benartzi and Thaler (1999): People viewing one-year returns of bond and stock funds allocated 41 percent of their portfolio to stocks, those viewing long-term returns allocated 82 percent to stocks
- People reallocate infrequently if ever
  - Tend to reallocate mostly new contributions
    - Ameriks and Zeldes (2000): Only 27 percent of TIAA-CREF participants reallocated existing assets, 53 percent reallocated new investments

Asset Allocation (continued)

- People rely heavily on their peers for advice
  - Duflo and Saez (2002): High variation in branches of a library both in participation and asset allocation
- What works?
  - Reminders
  - Default portfolios of either "lifestyle" funds or "target maturity" funds
    - Have to screen funds for appropriateness
  - "Impartial" educational materials (maybe)
    - Universities, "Financial Engines"
  - Combination of risk profiling and "target risk" portfolios
  - Index Funds Advisors
  - Present as much historical data as possible

My Research

- How do people perceive risk?
  - Q: How much more risk is there for a 15 year investment in a portfolio consisting of 90 percent stocks/10 percent bonds compared to a portfolio of 10 percent stocks/90 percent bonds?
Questions/Comments?

- Ken Kriz
  316-978-6959
  ken.kriz@Wichita.edu