

# Teacher Pension Workshop: Connecting Evidence-Based Research to Pension Reform

## How Much Do Teachers Value Deferred Compensation? Evidence from Defined Contribution Rate Choices

Dan D. Goldhaber  
Kristian Holden

RAND Education

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# How Much do Teachers Value Deferred Compensation? Evidence from Defined Contribution Rate Choices

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**Dan Goldhaber & Kristian Holden**

CALDER, American Institutes for Research

# Motivation

- DB pensions can separate teacher preferences from retirement decisions
  - Most DB plans do not allow teacher choice
  - Most teachers are served by DB plans (NEA, 2010)
  - Teachers earn over 10 percent of total compensation through retirement benefits, nearly twice the rate of the average private employee (Alderman, 2017)
- Consequences for the teacher labor market
  - Teaching may be less desirable for potential entrants
  - Difficulties retaining teachers
- If compensation is over-allocated towards retirement, are there pareto-efficient redistribution policies?

# Why Not Choose Parameters to Match Preferences?

- DB pensions as a tool to improve student achievement
  - Reduce attrition and shirking behavior (Lazear, 1979, 1984; Gustman and Steinmeier, 1995)
    - “Push” and “pull” incentives (Costrell and Podgursky, 2009)
    - Alternatively, Ippolito (2002) suggests that this may improve quality through selection of employees that prefer deferred compensation, consistent with teacher preferences
    - Pension incentives and teacher quality (Fitzpatrick and Lovenheim, 2014; Koedel, Podgursky, and Shi, 2013)
- Political economy and rent capture
  - May shroud benefits from public notice, allowing policymakers to increase total compensation (Glaeser and Ponzetto, 2014)
  - Experienced teachers have asymmetric bargaining power (Monk and Jacobson, 1985)
  - Disproportionately large shares of salary increases to veteran teachers
  - (Lankford and Wyckoff, 1990)
- Virtually no research has considered whether teachers value their retirement benefits

# What We Do Here

Very simple: We explore preferences for current vs deferred retirement compensation using data on contribution rates in a DC plan in Washington State

- Unique pension plan in Washington State
  - TRS3 provides both DB and DC pension benefits
  - We observe the contribution rate decisions of teachers
- Revealed preference approach:
  - If teachers choose to set aside current compensation today, they value the expected future compensation more than the cost of forgone current compensation.
- We find that more than 76% of teachers choose to set aside more than Washington State's minimum requirements

# Evidence from an Illinois Pension Upgrade

Fitzpatrick (2015):

- Teachers are offered a pension upgrade
  - Increase their benefit formula for prior years
  - Cost is 20% of salary
- The upgrade is quite generous:
  - \$15k today for around \$95k PDV in retirement (rate of return of 25.8%)
  - Over 70% of teachers purchase the upgrade
- IV strategy to estimate demand:
  - Scheduled salary paid to beginning teacher with Bachelor's
  - Scheduled salary paid to teacher with X years Exp and Bachelor's

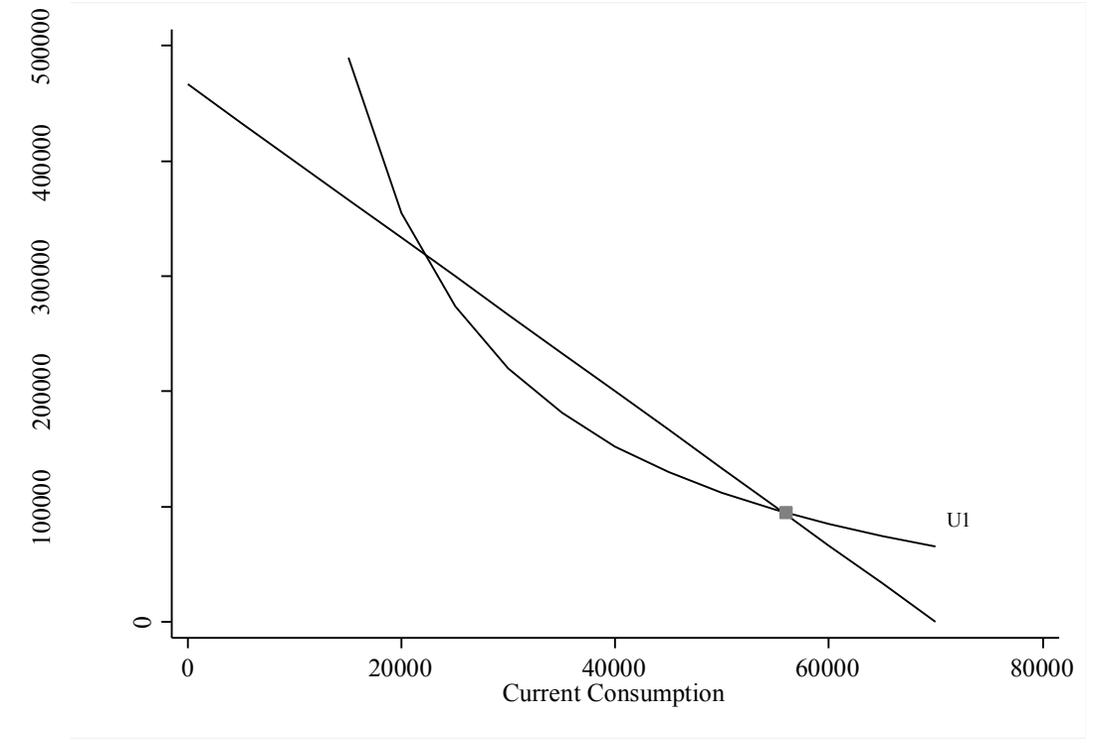
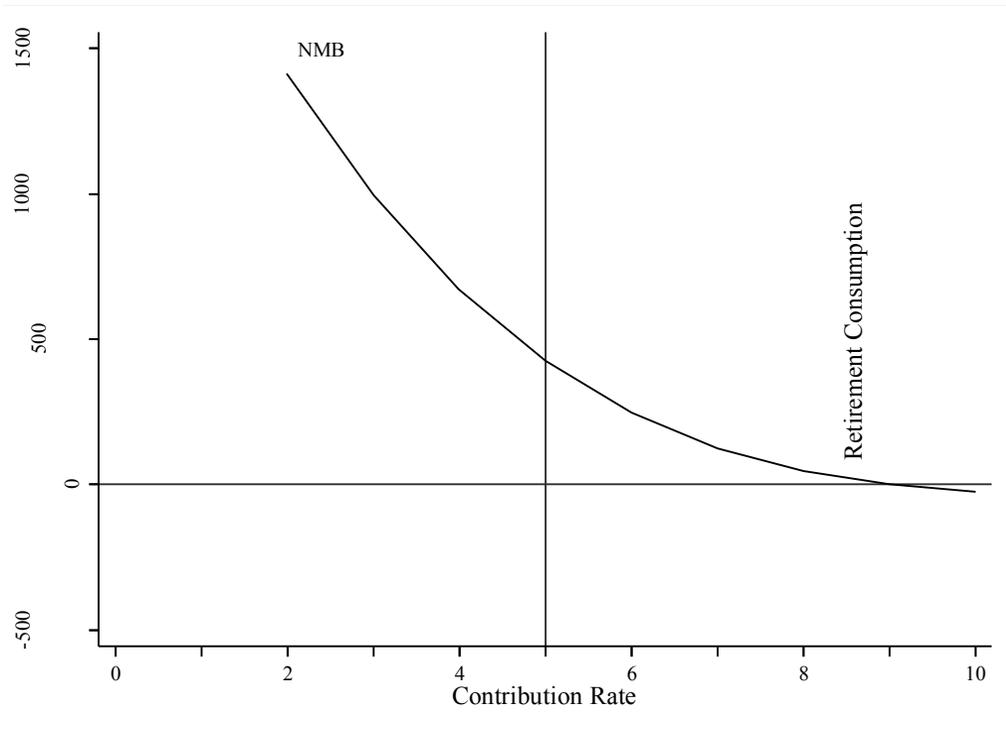
Conclusion:

“(On the margin) Employees are willing to trade just 20 cents of current compensation for each expected dollar of future compensation”

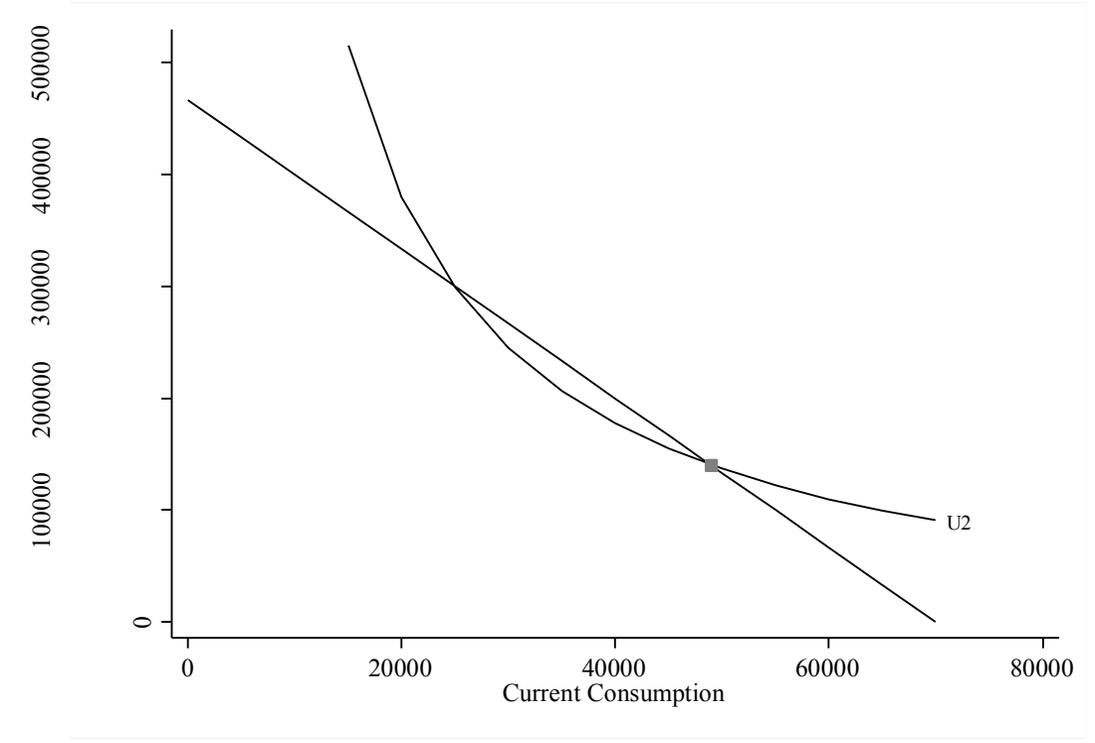
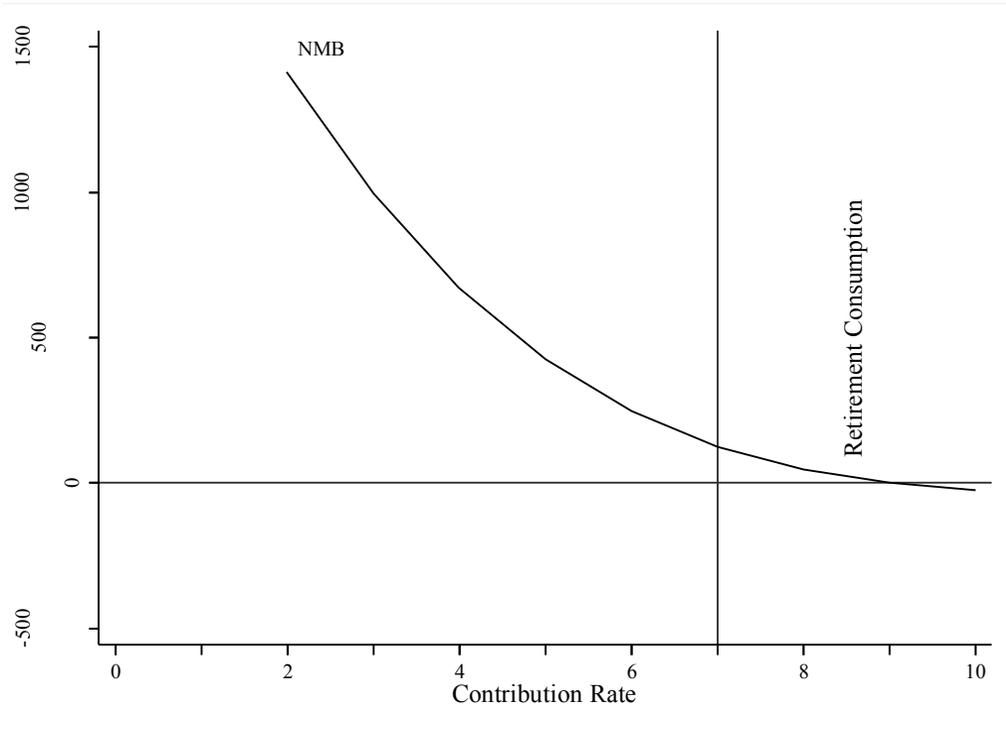
# Evidence from an Illinois Pension Upgrade

- Important contribution
  - Frequently cited (Backs et al, 2016; Nagler, Piopiunik, Marc, and West, 2015; Goda et al., 2015)
  - News attention (Ed. Week, Baltimore Sun, etc.)
- Challenges
  - Upgrade generosity
  - Benefits & price depend on salary
  - Out of sample estimates
  - Assumptions for pension wealth (retirement timing, survival, EOC salary)
- Outline of presentation:
  - Outline our theoretical model
  - Present results from Washington
  - Compare those results to Fitzpatrick's estimates
  - Discuss potential explanations for differences

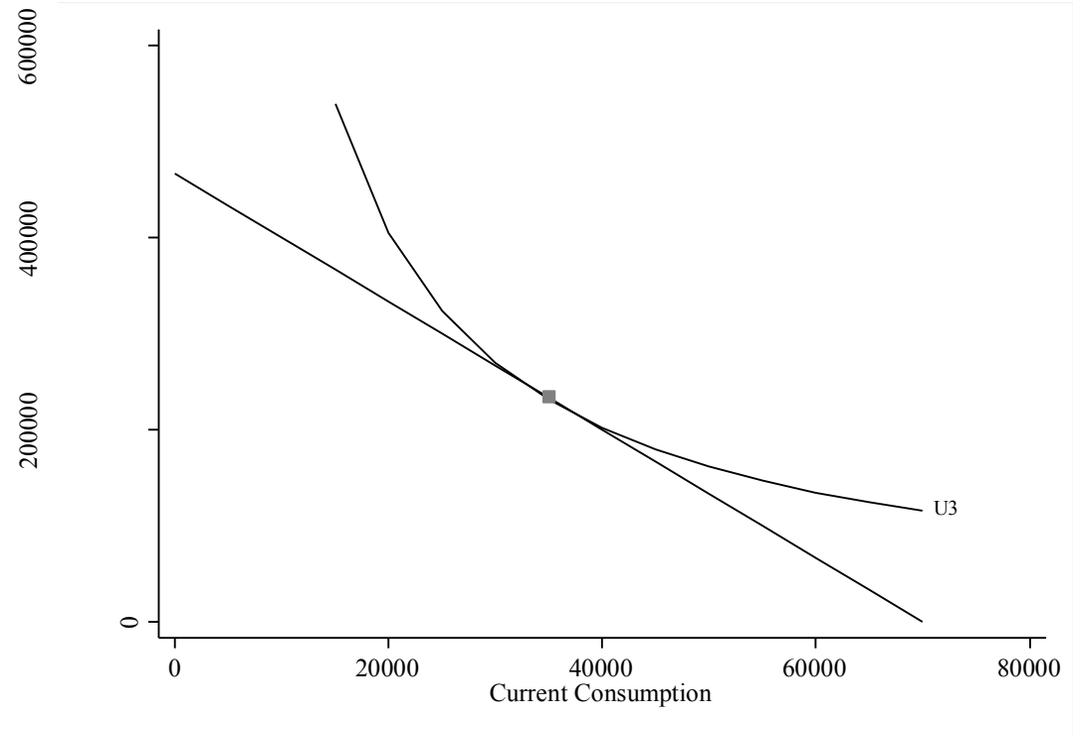
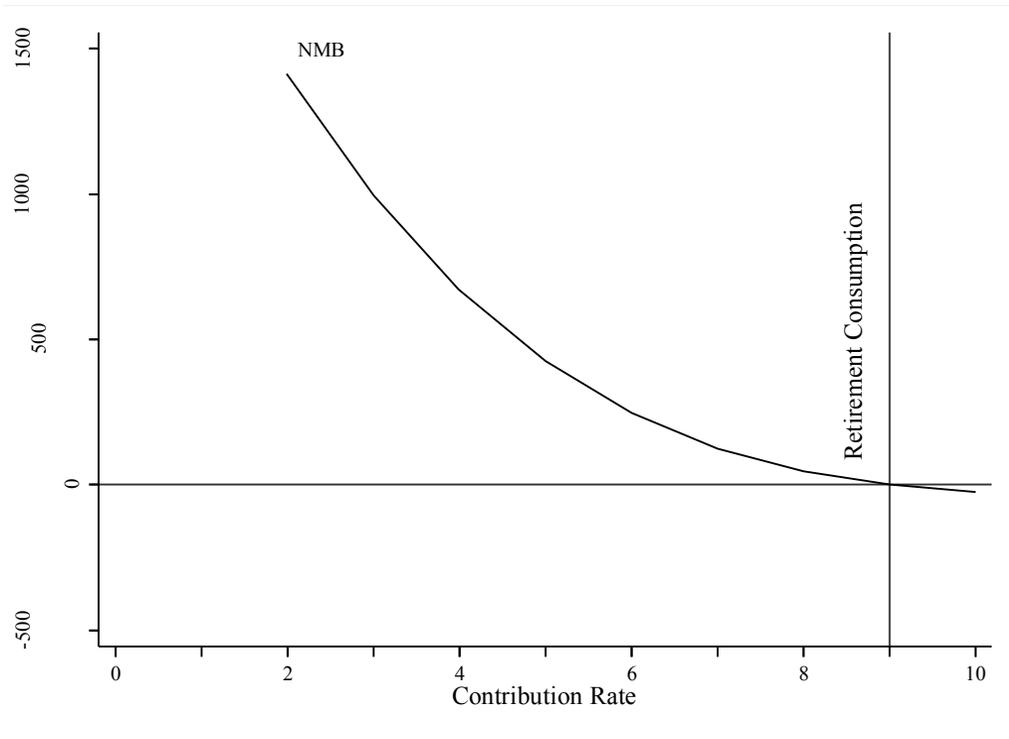
# Theoretical framework



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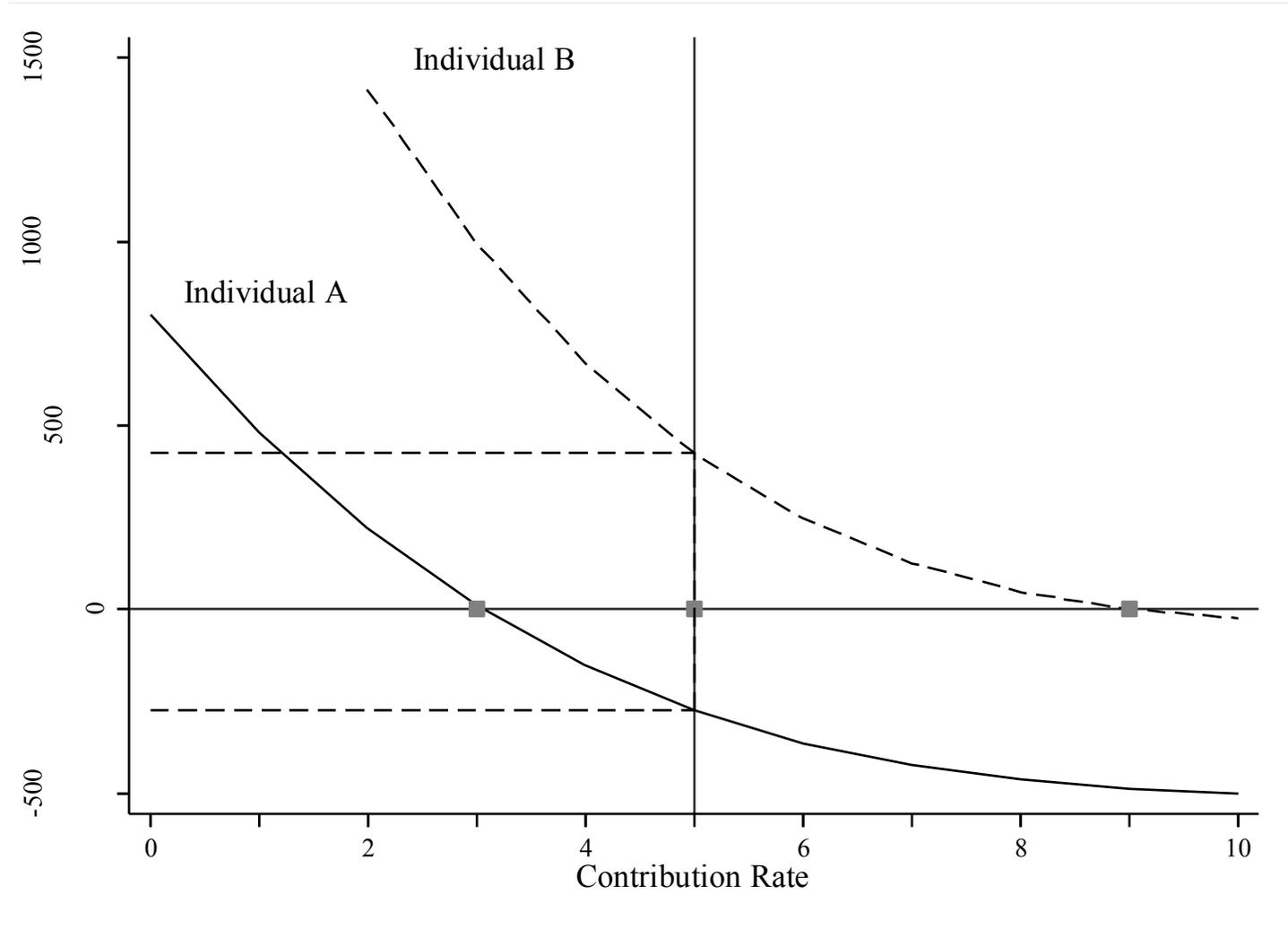


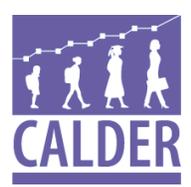
# Theoretical framework



# Theoretical framework

- Contribution rate plans:
  - 5%
  - 7%
  - 10%
  - 15%
  - (age-based plans)
  
- Lower censoring
- Upper censoring
- Discrete integer censoring





# Washington Sample of Teachers

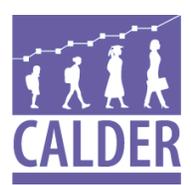
- Data from Washington State teachers
  - 157,515 teacher-level records
  - Spans 1997 to 2007
- TRS3 participation varies across our sample
  - Hired before 1996: Transferred from TRS2
  - Hired between 1996 and 2006: Chose between TRS2 and TRS3
  - Hired after 2006: Mandated into TRS 3
- Three samples:
  - All teachers in TRS3
  - Experienced teachers who resemble Fitzpatrick's sample (non-random selection)
  - Less experienced teachers, but were mandated into TRS3

# Contribution Rate Decisions in Washington

Table 1. Percent of Teachers Choosing Contribution Rate Plans

		All TRS3 teachers	Experienced TRS3 teachers (YOS > 22)	Mandated TRS3 teachers
Plan A:	5%	37.84	23.51	32.44
Plan B:	5-7.5%	12.56	7.68	14.63
Plan C:	6-8.5%	14.33	13.14	18.59
Plan D:	7%	12.74	26.7	8.04
Plan E:	10%	12.83	16.18	15.09
Plan F:	15%	9.7	12.8	11.22
Observations		76643	6760	6085

Notes: Calculations are based on the most recent observation of teachers in each category to capture changes in contribution rates in the flexibility period or due to changes in employer.



# Contribution Rate Decisions in Washington

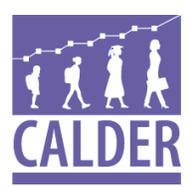
Table 2. Average and Lower-Bound Contribution Rates, and Percent Choosing to Contribute More than Plan A

	All TRS3 teachers	Experienced TRS3 teachers (YOS > 22)	Mandated TRS3 teachers
Contribution rate using:			
Average	6.53	8.18	7.48
Lower bound	5.34	7.01	5.86
Proportion choosing to defer more compensation than the minimum requirement	62.16	76.49	67.56

Notes: Calculations are based on the most recent observation of teachers in each category to capture changes in contribution rates in the flexibility period or due to changes in employer. Average contribution rates are calculated using the fixed values of 5, 7, 10, and 15 percent for teachers who choose plans A, D, E, and F, respectively. We use data on teacher age for contribution rate plans that vary by age to determine the level of contribution. Lower-bound average contribution rates set Plan A 5 percent contribution rates to zero. Proportion choosing to defer more compensation than the minimum requirement is calculated as the proportion of teachers choosing plans other than Plan A.

# Comparing results in Washington and Illinois

- Many differences between both states:
  - Pension structure (DB vs Hybrid DB-DC)
  - Payment choices (contribution rates vs lump-sum)
  - Investment returns (Interest rates vs state determined benefits)
- Address some of these by placing both estimates into a similar context
- The rate of return on investments and the time preferences of teachers determine allocations of current and retirement consumption
  - Higher rates of return => more retirement compensation for contributions
  - Stronger preferences for deferred compensation => set aside more current compensation
  - Weak preferences for deferred compensation could be motivated to save for retirement if the rate of return is high enough



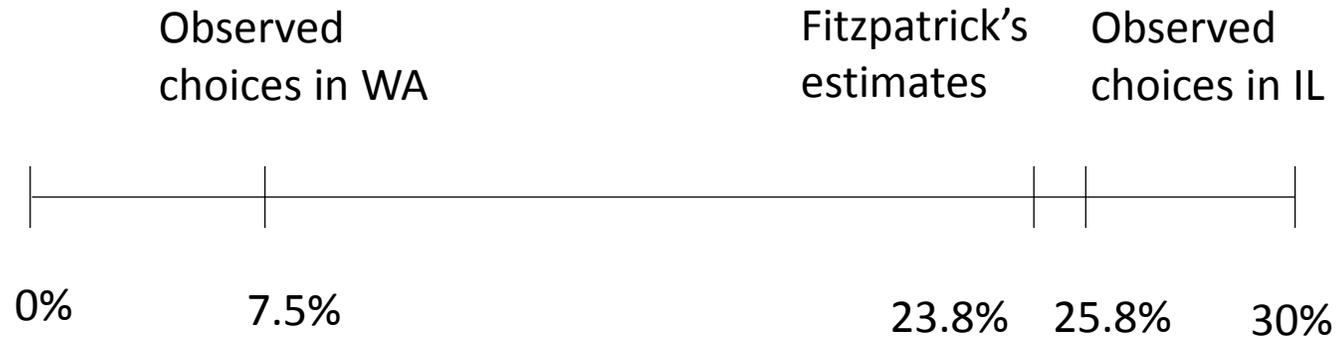
# Washington state teacher choices and the interest rate

- Implied Rate of Return: how high does the rate of return need to be to induce the average teacher to defer at least some current compensation?
- Washington:
  - Teachers earn investment returns on their DC account
  - State actuary: 7.5%
  - Department of Retirement Services: not more than 6%
  - Also consider “high expected rates”
- Because the majority of teachers participate, the Implied Rate of Return is at least 7.5% in Washington

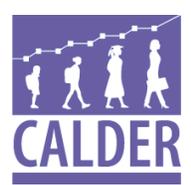
# Illinois estimates of WTP and the implied interest rate

- Illinois:
  - Teachers earn returns based on the state's generosity
  - Fitzpatrick's estimates suggest a minimum rate required:  
“(On the margin) Employees are willing to trade just 20 cents of current compensation for each expected dollar of future compensation”
  - Implied interest rates via compound interest formula:  $T = P[(1 + r)^n]$ 
    - $T = \$1$
    - $P = \$0.20$
    - $n = 7.55$  years
- The Implied Rate of Return is 23.8% in Illinois

# How Does the Setting Compare to Illinois?



- How high does the rate of return have to be in order to induce the average teacher to set aside some amount of current compensation?



# Conclusion: Reconciling Results

- What may affect the demand for future compensation?
- Total retirement wealth
  - Decreasing marginal utility will decrease WTP
  - Back of the envelope:
    - IL: 54% replacement rate without the upgrade
    - WA: 57.1% replacement rate without DC account
- Family savings
  - Family savings could crowd-out WTP
  - Census data suggests relatively similar family structure in 2015:
    - Married, children, employment
- Tax incentives
  - Washington contributions are pre-tax
  - Illinois benefit is paid post-tax

# Conclusion: Reconciling Results

- Teachers may view DB and DC as distinct products (Brown and Weisbenner, 2014)
  - Smaller penalties for mobility and attrition (Lazear, 1979, 1984; Gustman and Steinmeier, 1995; Ippolito, 2002; Costrell and Podgursky, 2009)
  - Cross state and employer mobility (Goldhaber et al., 2015)
  - Unique policy implication
- What does this mean for policy?
  - Regardless of why, teachers in Washington State would be worse off if they were not given the opportunity to contribute more than the state minimum
  - Differences across states suggest care should be used when applying policy
  - Teacher heterogeneity implies teachers are likely better off with choice

# Additional Slides

## Could you estimate an Average WTP > MC?

- Consider:  $D = \beta_0 + \beta_1 P + \beta_2 B + \theta X + \varepsilon$ , IV for  $P$  &  $B$
- One property of regressions:  $\bar{Y} = \beta \bar{X}$ , and for IV,  $\bar{Y} = \beta \bar{X}$ 
  - This means that the model will fit  $\beta$  such that mean take-up is associated with the mean price, which is \$15k.
- What does this mean?
  - Only out-of-sample estimates can consider whether WTP = MC at some other price

# Out-of-Sample Estimation

