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Pension Enhancements and the Retention of Public Employees: Evidence from Teaching

Cory Koedel

P. Brett Xiang

American Institutes for Research®

Motivation

- A large fraction of teacher compensation comes in the form of deferred retirement benefits.
  - Pension costs are a substantial and growing share of total expenditures in public education.
    - On average across states, roughly 20 percent of total teacher earnings are devoted to fund pensions (29 percent in Missouri!).

- The research literature on pensions in education is thin, but what evidence is available to date suggests (1) teachers do not value their pensions at the cost of providing them (Fitzpatrick, forthcoming), and (2) pension incentives do not seem to improve workforce quality (Koedel, Podgursky and Shi, 2013; Fitzpatrick and Lovenheim, 2014).

- High costs and questionable benefits to teachers and students in K-12 schools motivate further inquiry.
  - Could resources currently devoted to fund pensions in public education be used more effectively?

Contribution

- We study a significant enhancement to the benefit formula for St. Louis teachers enacted in 1999 (municipal plan). The enhancement resulted in a dramatic, immediate increase in pension benefits for all St. Louis teachers (60 percent increase in pension wealth).
  - The St. Louis enhancement is similar to enhancements to other teacher pension plans that were enacted across the United States around this time (Koedel, Ni and Podgursky, 2014, Munnell, 2012; National Conference of State Legislatures, 1999, 2000, 2001).
  - The estimated (direct) cost to the school district of providing the enhancement was $166 million in 2013 dollars.
    - Just over $52,000 for each teacher in the workforce.
- The enhancement increased teachers' retention incentives.
  - In our view, the potential to improve retention is the only plausible policy rationale for the enhancement.
    - Alternatively: the enhancement was a rent capture opportunity (Glaeser and Ponzetto, 2014; Koedel, Ni and Podgursky, 2014)
  - Did the St. Louis enhancement increase retention?

Preview of Findings

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- After documenting that teachers' retention incentives were substantially and differentially affected by the enhancement, we analyze the enhancement's effect on retention and:
  - find no evidence to suggest that differences in the degree to which teachers' retention incentives were affected translated into differences in retention behavior among retirement ineligible teachers, who make upmost of the workforce.
  - show that teachers who were already eligible for retirement when the enhancement was approved strategically delayed retirement for one year to take advantage of the retroactively improved benefit formula (which was a very sensible thing to do!).

- Even using upper-bound estimates of the effect of the enhancement on retention, it (decisively) fails a cost-benefit test.

- Key takeaway: The school district committed to spending a lot of money to provide improved retirement benefits for teachers with little to show for it.

Background

- Pension Plan Basics
  - The formula that determines benefit is a function of three components: Formula Factor, Years of System Service, Final Average Salary (F*YOS is often referred to as the replacement rate)

$$B = F * YOS * FAS$$

- Pension wealth at time *s*, with collection starting at time *j* where $j \geq s$, can be written as the stream of discounted expected pension payments:

$$\sum_{t=j}^{T} Y_t * P_{t|s} * d^{t-s}$$

- Note that Y_t = B at the point of initial collection. Y_t can be greater than B in future years due to COLA adjustments.

- In typical DB pension plans, wealth accrual is heavily backloaded (more on this later).

The St. Louis Enhancement

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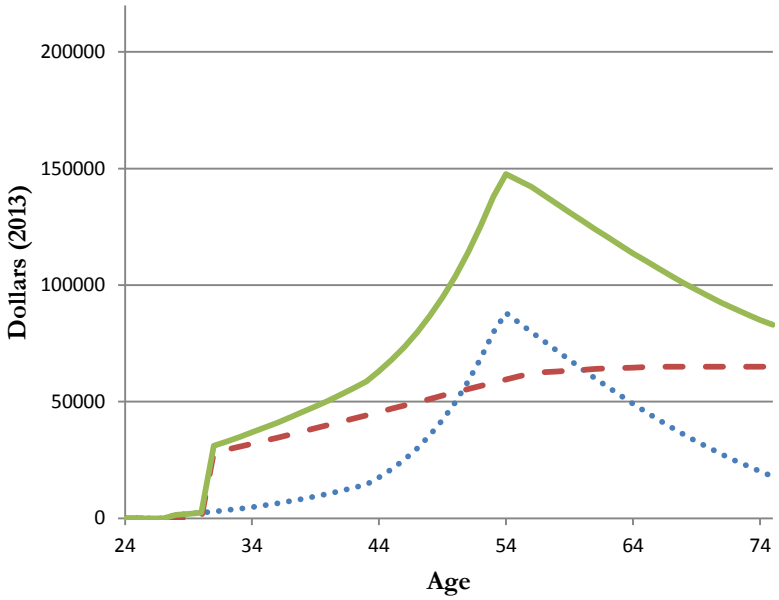
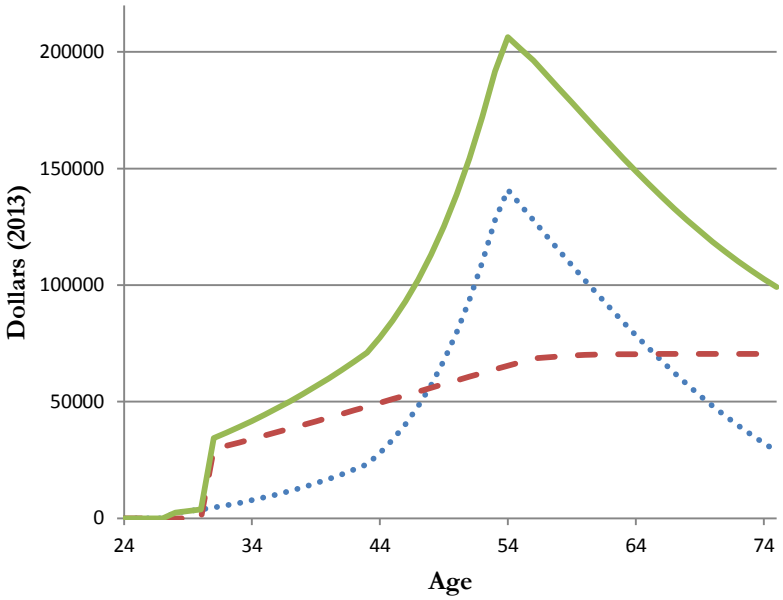
- The St. Louis pension enhancement increased the formula factor for all teachers in St. Louis from 0.0125 to 0.0200.
  - All teachers retiring on or after June 30, 1999 received the improved benefit formula (1998-1999 school year).
  - Like similar enhancements to other state and municipal plans, it was implemented retroactively.
    - Senior teachers had the new formula factor applied to all prior years of service.

The St. Louis Enhancement





The Enhancement's Effect on Pension Wealth and Retention Incentives

Table 2. Pension Wealth Under New and Old Rules at Peak Value, for Teachers by Distance from Full Retirement Eligibility.

	Avg. Years to Rtrmnt Eligible	Peak-Value Pension Wealth		
		Old Rules	New Rules	Difference
Retirement Eligible (Bin 1)	0	209,219	334,774	125,555
Eligible in 1-5 Years (Bin 2)	3.1	183,084	292,989	109,905
Eligible in 6-10 Years (Bin 3)	8.0	137,722	220,532	82,810
Eligible in 11-15 Years (Bin 4)	13.1	99,324	159,540	60,216
Eligible in 16-20 Years (Bin 5)	17.9	86,814	139,873	53,059
Eligible in 21+ Years (Bin 6)	25.2	89,111	143,026	53,916

Note: One characterization of the annualized effect on the retention incentive comes from dividing the gain in peak-value pension wealth by the years until retirement eligibility. For Bin-2 teachers, the average annual incentive was approximately $35,000; for bin-6 teachers it was $2,100

Methodology

- We use a difference-in-difference framework to estimate the enhancement's relative effects on retention across teachers within St. Louis.
  - Prediction: If teachers are responsive to their pension retention incentives, then teachers in lower-numbered bins (more senior) will increase retention post-implementation relative to teachers in higher-numbered bins (less senior).

- Technical issues:
  - The enhancement was approved during the 1997-1998 school year, but not enacted until the end of the 1998-1999 school year. We were unable to determine how much teachers knew about the enhancement prior to its enactment.
    - We estimate models that allow for flexible teacher responses to approval and enactment. Based on their behavior, we are confident that retirement eligible teachers during the 1997-1998 school year knew of the enhancement that was to come.
  - During the second half of the 1990s the economy was booming, which led to differential retention patterns prior to the approval/enactment of the enhancement in 1997-1998/1998-1999.
    - We account for trends in retention rates for teachers at different points in the career in the models . The trends are identified using "policy constant" variation in retention rates over time. Failing to account for the trends leads to an overstatement of the effect of the enhancement on retention, but even using the overstated estimates the enhancement effect, it still fails a cost-benefit test.

Results

Table 5. The Effects of the Pension Enhancement on Teacher Retention.

	Model 3	**Model 4**
Bin-1*1998 (retirement eligible)	0.0931	**0.0723**
	(0.0238)**	**(0.0372)***
Bin-2*1998	0.0485	**0.0192**
	(0.0195)**	**(0.0291)**
Bin-3*1998	0.0428	**-0.0045**
	(0.0200)**	**(0.0293)**
Bin-4*1998	0.0286	**0.0049**
	(0.0210)	**(0.0311)**
Bin-5*1998 (16-20 years from eligibility)	0.0104	**-0.0133**
	(0.0231)	**(0.0333)**
Bin-1*POST (retirement eligible)	-0.0192	**-0.0569**
	(0.0205)	**(0.0537)**
Bin-2*POST	0.0267	**-0.0259**
	(0.0159)*	**(0.0406)**
Bin-3*POST	0.0506	**-0.0335**
	(0.0155)**	**(0.0405)**
Bin-4*POST	0.0142	**-0.0288**
	(0.0166)	**(0.0429)**
Bin-5*POST (16-20 years from eligibility)	-0.0072	**-0.0507**
	(0.0188)	**(0.0454)**
Teacher Characteristics	X	**X**
Age Indicators	X	**X**
Time Trend Controls		**X**
R-Squared	0.0719	0.0729
N	18825	18825

Results

Summary of findings:

- No evidence of a differential retention effect across retirement-ineligible teachers (this is the policy relevant result).
- Retirement-eligible teachers delayed retirement for one year to gain eligibility for the improved benefit formula

Two outstanding issues:

1. Conditioning on retention time trends is costly in terms of statistical power (we have large standard errors in the full model).
   - In an omitted analysis, we perform a cost-benefit analysis using the upward-biased estimates from the restricted model without the linear time trends, which are more precisely estimated, and show that the enhancement is still not cost effective.

2. We are unable to evaluate novice teachers (bin-6) directly in our study.
   - We use the cost-benefit framework to determine how large an effect on novice teachers would be required for the enhancement to be a cost-neutral policy, and find that the effect would need to be implausibly large.

Discussion

- Pension benefits were enhanced for most teachers in the late 1990s and early 2000s (Koedel, Ni and Podgursky, 2014; Munnell, 2012).
  - This was a very expensive, nationwide policy reform. Perhaps because the costs associated with pension enhancements are not immediate, and can be easily convoluted, the policy reform on the whole seems to have gone largely unnoticed.

- In St. Louis, the present value of the 1999 pension enhancement was $166 million. Despite this substantial cost, we are unable to document a meaningful policy effect.
  - If a state or school district were to spend this kind of money on a more tangible educational input, and no impact was detectable, we suspect it would receive much more scrutiny than the pension enhancement.

Discussion

Three policy implications of our study:

1. Most directly, although new enhancements do not appear to be on the immediate horizon, there may come a time in the not-so-distant future when economic expansion again leads to calls to enhance public-sector pensions and our study will be informative at that time.

2. To the extent that there is symmetry to our findings, they will be informative for current pension reform debates. Current proposed and enacted reforms are structurally similar to the enhancement that we study but aim to pare back rather than improve benefits.

3. More generally, our study is consistent with recent evidence from Fitzpatrick (forthcoming), who shows that teachers do not value their pension benefits at the cost of providing them. This opens up the possibility for Pareto improving policies that pare back pension benefits in state and municipal plans. Reduced pension benefits could be replaced with, for example, higher teacher salaries.

Discussion

- Contribution rates to St. Louis Public Schools Employee Pension Fund as a Percent of Salaries, 1997-2013.