Working Paper

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

Incentivizing Retirement: An Analysis of Cash Retirement Incentives for Chicago Teachers

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Pension Liabilities are Placing Pressure on Local Budgets

Chicago Public Schools (CPS) in 2017 had to pay $730 million to cover pension costs

- This amounts to 13.5% of its operating budget
- Up from about $200 million in 2010
- CPS has received commitments from the State of Illinois to fund part of this amount

Underfunded pension plans are placing a financial burden on states and districts. In response, they often consider

- Raising taxes
- Intergovernmental transfers
- Changing employee compensation
- Layoffs

In 2016, CPS Negotiated a New Labor Contract

To decrease operating costs and so have more funds for the pension contributions and the classroom, CPS and the Chicago Teachers' Union agreed to a Voluntary Retirement Incentive (VRI).

- The intent of the VRI was to encourage retirement eligible teachers to leave
- Senior teachers' salaries are 70% greater than new teacher salaries
- More broadly, VRIs are workforce shaping tools that are (arguably) less disruptive than layoffs or furloughs

Key features of the CPS VRI

- Eligibility: Only retirement eligible teachers
  - including those eligible for early retirement
- Amount: $1,500 per year of service
- Caveat: 1500 must accept in order for the VRI to be paid
  - out of approximately 2700-3100 eligible

Goals of This Study

In this study, we extend the teacher retention model in Knapp, Brown, Hosek, Mattock, and Asch (2016) to consider the retention and cost impact of the VRI.

The model is used to:

- Predict take-up of a VRI
- Determine if the VRI results in cost savings for the district
- Demonstrate sensitivity of take-up to alternative VRI levels

Dynamic Retention Model (DRM) for CPS Teachers

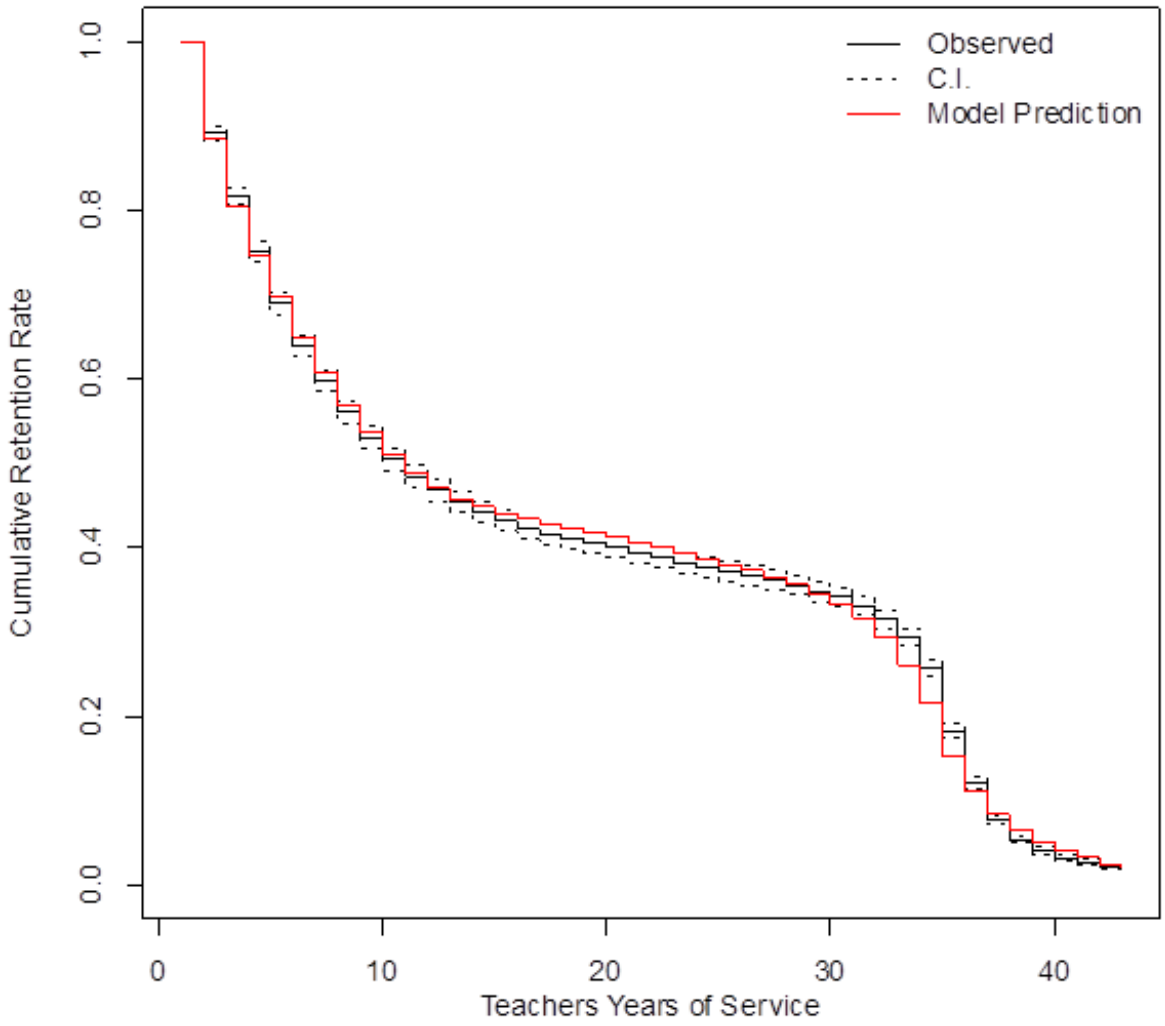
The DRM is a dynamic stochastic model of teacher retention for entry cohorts of CPS teachers (Knapp et. al, 2016)

The DRM captures a teacher's decision to stay in CPS or to leave over his or her career based on available information:

- Current and deferred compensation
- Incentives to stay/leave built into pensions
- Permanent "taste" for teaching in CPS relative to outside opportunity
- Uncertainty

The DRM is estimated using panel data of teachers present in 1992 plus teachers entering through 2000, all tracked through 2012

The DRM Fits Observed CPS Teacher Retention



Key Adaptations to the DRM for VRI Analysis

- Modeling a one-time VRI offer
  - Teachers internalize the offer will not be available in future years
- DRM must be able to handle the policy transition
  - The VRI's effect on teacher's retirement decision will depend on her/his age and years of service
  - Estimation procedure accounts for selective retention among incumbent teachers in 1992
- DRM must be able to compute the cost of each teacher, for example,
  - The total salary costs for teachers that continue teaching,
  - Salary costs of replacement hires
  - VRI payments based on tenure for teachers leaving

Simulated impact of the VRI

- Simulated differences in retention from a VRI
  - Immediately
  - Over next six years
- Simulated differences in cost over the next six years
- Simulated differences in retention and cost of alternative VRI
  - If the incentivized teachers are replaced
  - If the incentivized teachers are not replaced

Simulated Differences in Retention from a VRI

Using CPS data, we predicted that 2,696 teachers would be eligible for retirement at the end of the 2016-17 school year.

We considered the approved VRI offer of $1,500 per year of service relative to a baseline with no VRI.

	VRI (per years of service)	
Fiscal year	Baseline	$1,500
2017	2,696	2,696
2018	2,266	2,108
Retirements	430	588
Additional takers		158

Most Teachers Would Retire within the Next Few Years

Fiscal Year	Retention at Baseline	Implied New Hires at Baseline	Retention under $1,500 VRI	Implied New Hires under VRI	Difference in New Hires
2017	2696		2696		
2018	2266	430	2108	588	158
2019	1865	401	1761	347	-54
2020	1506	359	1438	323	-36
2021	1196	310	1152	286	-24
2022	920	276	893	259	-17
2023	684	236	668	225	-11

1. The VRI results in economic rents: 430 teachers would have retired without the incentive
2. The VRI causes teachers to "move up" their retirement, which results in decreased retirements in future years

VRI Does Not Reduce Costs if Teachers are Replaced

Salary costs over next six years comparing baseline and $1,500 VRI (millions of dollars). Assumes all teachers are replaced with new hires.

Fiscal Year	Decrease in Salary Cost (Retirements)	Increase in Salary Cost (New Hires)	Cost of VRI	Budget Savings
2018	$14.5	$7.8	$25.3	-$18.6
2019	$9.6	$5.9		$3.7
2020	$6.3	$4.3		$1.9
2021	$4.0	$3.3		$0.7
2022	$2.5	$2.6		-$0.07
2023	$1.5	$2.0		-$0.5
Total	$38.3	$25.8	$25.3	-$12.8

1. Costs are greater in the first year due to VRI outlays, but lower in FY19-21 since junior teachers cost less.
2. Costs converge by FY22 as teachers who retire early with a VRI would have retired without it.

Alternative VRI Retention Simulations

We considered VRIs of $1,000, $1,500, $3,000 and $5,000 relative to a baseline with no VRI.

		VRI (per years of service)			
Fiscal year	Baseline	$1,000	$1,500	$3,000	$5,000
2017	2,696	2,696	2,696	2,696	2,696
2018	2,266	2,166	2,108	1,909	1,608
Retirements	430	530	588	787	1,088
Additional takers		100	158	357	658

Raising the VRI Increases Costs if Retiring Teachers are Replaced

Comparison of salary costs (millions of dollars) over next six years assuming all retiring teachers are replaced

	VRI (per years of service)			
Fiscal year	$1,000	$1,500	$3,000	$5,000
2018	-$10.9	-$18.6	-$53.0	-$128.9
2019	$2.3	$3.7	$8.6	$16.5
2020	$1.2	$1.9	$4.6	$9.3
2021	$0.5	$0.7	$1.9	$4.1
2022	-$0.06	-$0.1	-$0.05	-$0.32
2023	-$0.3	-$0.5	-$1.1	-$1.8
Total	-$7.3	-$12.8	-$39.0	-$100.6

Costs increase as the VRI increases because higher rents are being paid in order to get the marginal teacher to retire.

VRI Reduces Costs if Retiring Teachers are Not Replaced

Comparison of salary costs (millions of dollars) over next six years assuming no incentivized retiring teachers are replaced

	VRI (per years of service)			
Fiscal year	$1,000	$1,500	$3,000	$5,000
2018	-$6.0	-$10.8	-$35.3	-$96.3
2019	$6.0	$9.6	$22.2	$42.4
2020	$3.9	$6.3	$14.7	$28.9
2021	$2.5	$4.0	$9.6	$19.3
2022	$1.6	$2.5	$6.1	$12.5
2023	$0.9	$1.5	$3.6	$7.5
Total	$8.9	$13.0	$20.9	$14.2

1. Savings increase as the VRI increases because the incentivized teachers are not replaced
2. At higher VRIs, the cost of economic rents is greater than the salary savings

Summary

- We use an estimated dynamic model of teacher retention to simulate the outcome of a VRI under multiple conditions.
- We find that a $1,500 VRI would result in:
  1. 588 retirements, far short of 1,500 retirement required for the VRI to be paid
  2. 73% of retirements would have retired without the incentive
  3. If all incentivized retiring teachers were replaced, it would result in negative savings over six years
  4. If no incentivized retiring teachers were replaced, then savings would be positive over six years

What Happened?

- CPS teachers had to declare whether they are going to retire by March 31, 2017
  - Additionally, failure to pass the pension legislation in January 2017 led to CPS furloughing teachers
- News reports indicate the realized take rate was 27 percent.
  - Far short of the 1,500 retirements required for the VRI to be paid out
  - Close to our predicted take rate of 22 percent (= 588 / 2,696)

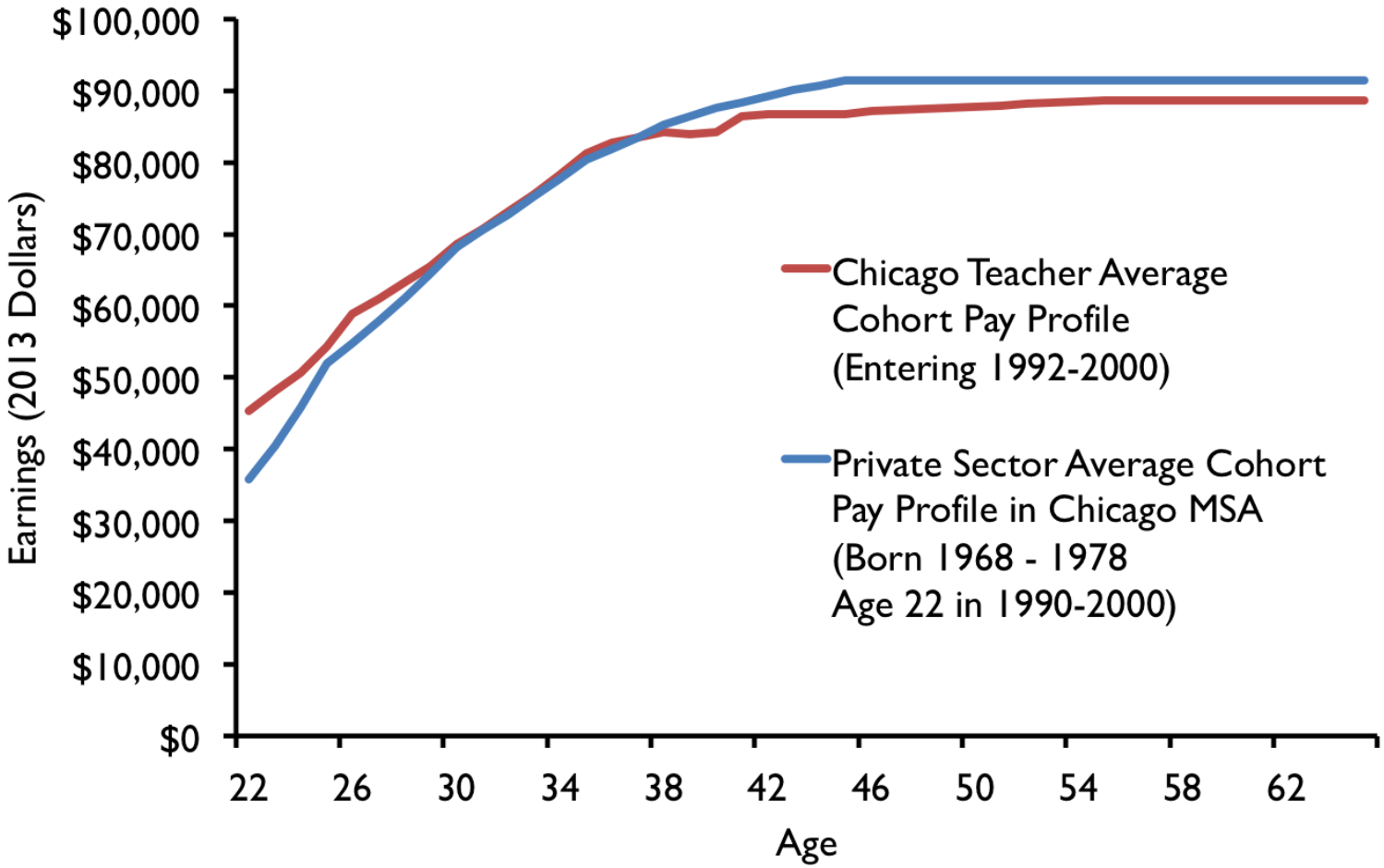
What We Learned

- Economic rents are substantial: Policy design could be used to reduce these rents (e.g., target younger teachers)
- Who retires matters: many of the teacher retiring, would have retired soon regardless
- Sometimes the role of policy evaluation is to eliminate bad options

Looking Ahead

- Conduct an analysis of the teachers who retire (and rescind, if applicable) to understand "who retires"
  - Can be used to explore the role of teacher characteristics in who retires and takes a VRI (e.g. teaching effectiveness)
  - Can be used to validate or improve the DRM
- Consider more optimal policy design
  - Separations payments targeted at younger teachers
  - VRI combined with eliminating or reducing early retirement penalty
- Evaluate cost and retention effects of recent or potential policy changes
  - Transitions to DC or cash balance plans

Earnings Profiles for Chicago Teachers by Age



Model Parameter Estimates

Parameter	Model w/ Early Career Taste est.	se	z
Taste			
Mean	-8.61	1.44	-5.98
Std. Dev	49.78	1.17	42.55
Shock scale	68.29	1.61	42.42
Discount factor			
Untransformed*	2.86	0.0331	86.40
Transformed	0.946		
Early Career Taste	69.42	3.01	23.06