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HOW LATE-CAREER RAISES DRIVE TEACHER-PENSION DEBT

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Unfunded pension liabilities for U.S. teachers are massive—nearly $325 billion in 2012—and only one-fifth of states' plans can be considered well-funded. Nearly everywhere, state leaders are scrambling to find politically and constitutionally acceptable ways to gain control of ballooning teacher-pension debt.[1] And yet, most leaders are overlooking an important lever squarely under their control—the salary raises offered to late-career teachers.

Here's how it works: throughout a teacher's career, the district awards her year-to-year pay increases. And year-to-year raises are frequently awarded as percentages of base salary, producing higher-dollar raises for higher-salaried, veteran teachers. Once a teacher retires, the final salary the teacher received from the district determines the teacher's pension payout. Because of the final salary feature, teacher pensions are thus highly sensitive to even modest changes in final salary. Notice that this model is different from Social Security or other defined benefit plans that use a career average salary as the basis of the pension.

This paper analyzes the relationship between late-career raises and pension debt in three states—California, Illinois, and New Jersey—and finds that on average, every dollar awarded to a late-term teacher's final average salary triggers $10 to $16 of new obligations in present-day dollars. When a district gives, say, a $3,000 raise in the final years of teaching, that $3,000 extra salary drives up the pension debt by $30,000 or more. These late-career raises thus have enormous consequences for a state's overall pension debt.

States worried about pension debt ought to be scrutinizing the pay raises awarded to nearly retiring teachers. But in fact, most seem wholly unaware of the connection. Instead, many states are focusing on other, often politically sensitive or less effective mechanisms to tackle their pension obligations. Since 2008, 40 states have raised employer contribution rates, and 27 have raised teacher contributions.[2] Other changes have altered benefit formulas, raised the retirement age, modified cost of living adjustments (COLAS) or expanded the types of

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1 Due to legal and constitutional protections, new changes in pension benefit formulas generally do not apply to the pension plans in which veteran teachers are enrolled; the "California Rule" (and similar statutes in other states) legally prevents changes to an employee's pension-benefit formula during the employee's career and into retirement. Kathryn M. Doherty, Sandi Jacobs, and Trisha M. Madden, "No One Benefits: How teacher pension systems are failing both teachers and taxpayers," *National Center for Teacher Quality* (NCTQ), December 2012, accessed September 20, 2014, http://www.nctq.org/p/publications/docs/nctq_pension_paper.pdf; Aldeman, Chad. "Pension Reform vs. the 'California Rule.'" *Flypaper*, January 09, 2014, http://edexcellence.net/commentary/education-gadfly-daily/flypaper/pension-reform-vs-the-'california-rule'.

2 Doherty, "No One Benefits," iii – iv.

retirement plans they offer. These approaches have been unpopular, partly because the changes tap workers to pay more or to lose some anticipated benefit. In other cases, the changes just don't rein in liabilities that much, often because they don't affect the pension plans in which veteran teachers are enrolled.

While state policymakers burn through political goodwill to make these tough changes with only a modest impact on liabilities, in many states, school districts continue to operate at cross-purposes. Districts award disproportionately large raises to their most senior teachers, driving up the pension bill, yet states appear unaware of the effects. This paper clarifies the relationship between those late-career raises and pension obligations for states and makes suggestions for how policymakers can work together to better manage their pension debt.

The central role of a teacher's final salary

In general, the pension a teacher receives from her defined benefit plan is the product of her final salary, years of service, a pension multiplier, and a cost of living adjustment (COLA), as depicted in Figure 1.[3]

Figure 1: Basic Teacher Pension Formula.

Source: Adapted from Kathryn M. Doherty, "No One Benefits: How teacher pension systems are failing both teachers and taxpayers," National Center for Teacher Quality (NCTQ), December 2012.

However, given the varying definitions for each factor across state systems and even within systems, this simple formula can quickly spiral into a collection of complex calculations and nuanced application of terms. Rather than examine the many factors that can complicate the pension formula even further, this analysis explores the connection between final salary and pension allowances by simply analyzing the relationship between these two terms themselves.[4] Shown as a ratio in Table 1, we examine the relationship between the final salary and the pension payment in order to quantify the impact of final average salary on pension allowances, and subsequently on pension debt.[5]

[3] All but two states use a defined benefit plan, which guarantees a specified monthly pension allowance for life and is funded by established employer, employee, and/or state contributions during a teacher's employment (calculated as a percentage of her salary). Alternative retirement plans include defined contribution plans, cash-balance plans, or hybrid retirement plans. Doherty, "No One Benefits," 7-10.

[4] See technical appendix for a full explanation of state-specific pension terms, additional factors that can further complicate the pension equation, sources, and averages in each state.

[5] Ratios in Table 1 may marginally overestimate or underestimate the true relationship between final salary and beginning pension due to additional variables (e.g., retirement age, longevity bonuses) and pension formula modifications (e.g., for early retirement) that are not fully represented by state-wide averages. However, based on data available, we believe this estimate to be suitable for our analysis as we adjust the final average salary and observe changes in debt obligations in the following sections.

Table 1: Ratios of beginning pension to final average salary for veteran teachers.[6]

	Average Beginning Pension (yearly)	Final Average Salary (Number of years for basis)	Ratio of Beginning Pension to Final Average Salary
California	$70,200	$91,108 (Final 1 year)	77%
Illinois	$65,900	$91,800 (Average of last 4 years)	72%
New Jersey[7]	$56,500	$90,100 (Average of last 3 years)	63%

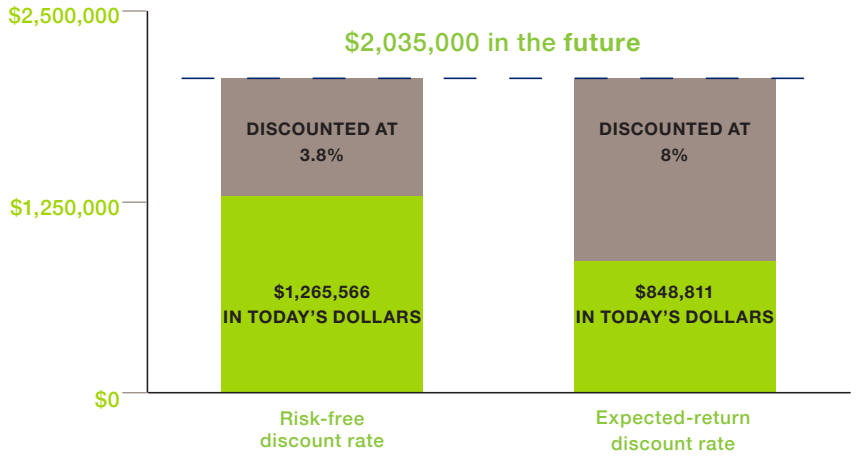
Source: Author's calculations (see technical appendix for calculations).

Notice that California's pension plan considers only the teacher's salary in the last year as the basis for its computation. Illinois uses the average of the last four years and New Jersey uses the average of the last three. Other defined benefit plans tend to draw on an average salary over much longer periods of time, which makes the impact of any few years' earnings less dramatic. Social Security payments, for example, are based on the recipient's average salary over 35 years.

Understanding today's cost of future pension payouts

On average, a retired veteran teacher in California will receive approximately $2 million of future pension allowances over her lifetime.[8] What is $2 million in the future worth to us today? By applying the principles of cash flow discounting to each individual future pension payment, we are able to translate and then sum these allowances into an equivalent present-day value (see Figure 2). In doing so, we find that this teacher's lifetime pension is worth approximately $1.3 million today, when discounted at a risk-free rate of return (or $848,811 when discounted at an expected rate of return). In other words, the state of California would need to set aside $1.3 million at the point of this teacher's retirement in order to finance her future pension allowances.

Figure 2: Value of a veteran teacher's total lifetime pension allowances.



Source: Author's calculations.

[6] Veteran teachers are considered to be those with at least 25 years of service.

[7] NJ operates somewhat differently than other states and may represent an outlier. See Appendix for a full discussion of how NJ pension obligations were calculated.

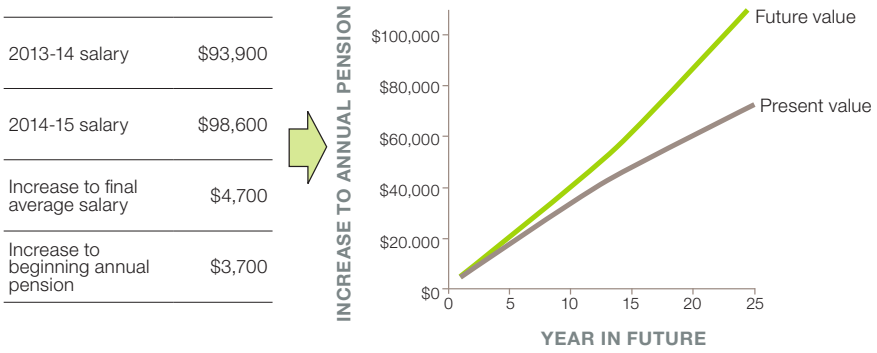
[8] Notes in the technical appendix explain all future value and present value calculations presented in this section.

Translating pay raises to pensions: The case of San Diego Unified

School districts often award pay raises of $1,000 or more to late-term teachers without a full appreciation for the obligations they entail. Take San Diego Unified School District's recent collective bargaining negotiations, where it is likely that policymakers and district leaders did not fully recognize the long-term pension debt that will result from the 5% pay raises awarded for the 2014-15 school year.[9] As a result of the raises, a veteran teacher set to retire at the end of the year will enjoy a $4,700 increase in final average salary in 2015.[10]

To understand how these changes in compensation affect future pension obligations, we repeat the previous exercise of discounting future pension payments, but under the assumption of a $4,700 increase to the final average salary of a veteran teacher in San Diego Unified. This salary adjustment elevates the teacher's beginning pension by $3,700. Figure 3 shows that over time, the teacher's cumulative pension earnings increase at an exponential rate, due to the higher salary used in the teacher's pension formula as well as the added effect of an annual COLA.

Figure 3: Cumulative increases in pension earnings due to a $4,700 raise given in final year.



Source: Author calculations, includes rounding for simplicity.

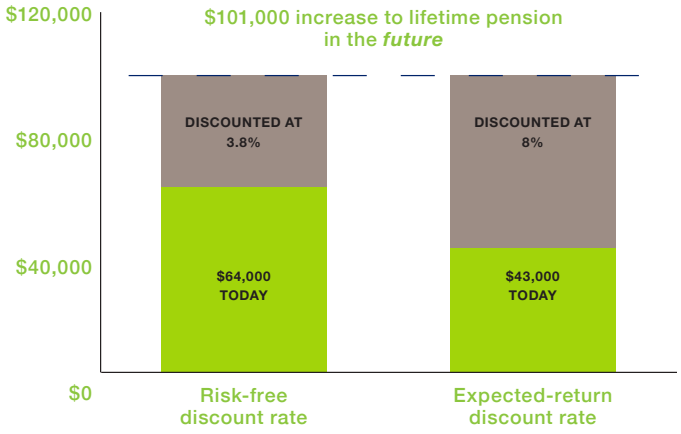
All told, the cumulative effect is an increase of $101,000 to future lifetime pension allowances.[11] What's this $101,000 in the future worth to us today? By applying the principles of cash flow discounting to each individual future pension payment, the analysis is able to translate and then sum these allowances into an equivalent present-day value (see Figure 4). In doing so, we find that this $4,700 salary raise triggers some $64,000 in present day value of cumulative pension debt, when discounted at a risk-free rate of return (or $43,000 when discounted at a more risky "expected rate of return"). In other words, when the San Diego Unified School District awarded $4,700 to a teacher in her final year, the pension fund incurred a debt of $64,000 in that same year.

[9] San Diego Education Association 2014-15 salary schedules are available at http://www.sdea.net/wp-content/uploads/Appendix-A-July-20141.pdf.

[10] Based on the compensation of a teacher at the highest salary rate (Grade 014, Step 17).

[11] Notes in the technical appendix explain all future value and present value calculations presented in this section.

Figure 4: San Diego's $4,700 raise triggers $64,000 in pension debt.



Source: Author's calculation.

Late-career pay raises trigger ten times their value in pension debt in three states

Table 2 shows our findings when this analysis is replicated for late-term teachers across the state of California as well as Illinois and New Jersey. Every $1 awarded in final salary triggers $13.89 in California's pension obligations, $15.51 for the Illinois pension fund, and $9.66 in New Jersey's pension obligations.

Table 2: New obligations triggered by each dollar added to final average salary.

	Discounted at 3.8% (risk-free rate)	Discounted at 8% (expected rate of return)
California	$13.89	$9.32
Illinois	$15.51	$9.91
New Jersey	$9.66	$6.69

Source: Author's calculations (see technical appendix for explanation of return rates).

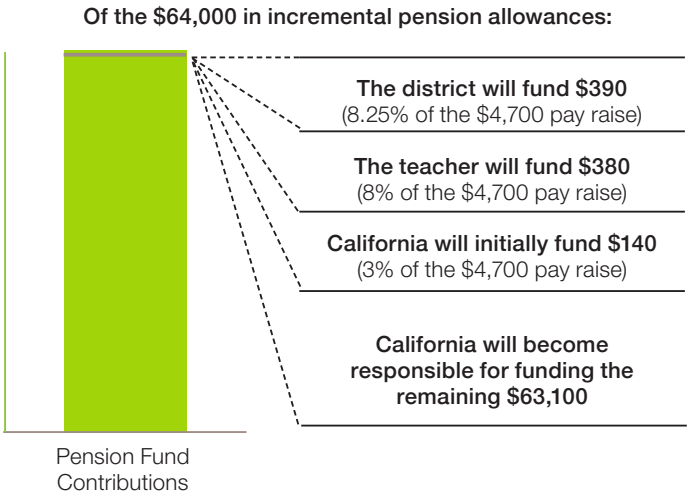
Pay raises and pension obligations in San Diego: Who decides? Who pays?

Of the $64,000 in incremental obligations, the teacher, the district, and the state together will all finance about $900 through contributions made during the teacher's last year of employment (see Figure 5).[12] At the time the raise was granted, the outstanding obligation of $63,100 was effectively passed on to the state of California; for every dollar added to the teacher's final average salary, $13.52 of new public debt is added to the state's books.[13]

[12] The liability figure of $63,100 assumes current employer, employee, and state contribution rates of 8%, 8.25%, and 3% respectively. When calculated assuming full phase-in of the Governor's recently approved contribution rates of 19.10%, 10.25%, and 6.25%, the liability passed on to the state is reduced to $62,300. Governor's Budget May Revision 2014-15, California Department of Finance, accessed September 30, 2014, http://www.dof.ca.gov/documents/2014-15_May_Revision.pdf.

[13] Here, public debts refer to the state's share of the pension obligations whereas figures in the previous section refer to obligations shared by employers, employees, states, and taxpayers combined. Some figures differ between the San Diego and California statewide averages due to the use of city-specific and statewide average final salary rates in pension calculations.

Figure 5: Pension fund contributions in San Diego–who pays?



Source: Author's calculations, includes rounding for simplicity.

Recent legislation will have districts paying larger contributions in the coming years, with the actual costs pooled across all districts.[14] With the new formula, employees and districts will be contributing more to the pension fund via a fixed share of total payroll. However, given the relationship between pension obligations and final salary (versus total payroll) the contributions will not reflect the impact of larger late-career pay raises which do more to drive up pension debt than total payroll. In other words, depending on the nature of the pay raises they award, districts may be "free-riding" by offering to their teachers a benefit that they are only partially obligated to pay for while the bulk of the payments are passed off to state taxpayers who don't control the salary decisions.

Better management of final salary to reduce future obligations

In contrast to plans like Social Security—which award pensions based on average salary—teacher pensions are structured around final salary. Because of this final salary feature, teacher pensions are highly sensitive to pay raises given to teachers in their final years of teaching. Where districts award a pay raise to a very senior teacher in the last years before retirement, those salary dollars drive up pensions by a factor of ten or more.

While some policymakers are working hard to overhaul their pension systems, many seem unaware of how much of their pension debt could be mitigated simply by better management of final salaries. It is true that states can relieve pension debt by restructuring pension terms (including items such as employee contributions, COLAs, requirements for years of service, and the number of years required for the final average salary calculation). However, given the dramatic impact of changes in final salary on pension debt, awarding fewer new salary dollars

[14] Chris Megerian, "Jerry Brown signs bill increasing teacher pension funding," *LA Times*, June 24, 2014, accessed on September 30, 2014, http://www.latimes.com/local/political/la-me-pc-jerry-brown-teacher-pensions-20140624-story.html.

in the final years of teaching can substantially reduce the total pension burden. Toward this end, policymakers looking to manage pension debt without overhauling the pension systems might consider the following strategies for modifying decisions on pay raises for very senior teachers:

1. Improve compensation transparency and its effect on pension obligations.
As our analysis points out, a seemingly minor adjustment to final salary can trigger much larger increase in pension obligations. Changes to salary for near-retirement teachers, then, must be translated, communicated, and recognized as public debt. Where district leaders are making decisions on salaries, they must better understand the extent to which a raise awarded and paid only for a year or two works to constrain public funds for public education in many years to come because of the pension obligations triggered by the raise. These pension costs should be clearly communicated alongside the pay raises with which they are associated so that policymakers can plan for the financing of future obligations.

2. Combine compensation decisions and pension obligations under one set of stakeholders at the district level.
Today, as in San Diego Unified, those awarding raises may be in different governmental agencies entirely from those responsible for financing pension funds. Merging the responsibilities for compensation and related pension debt to one set of district-level decisionmakers provides better incentives for reducing total obligations in the long term. States might send their pension monies to districts (in per pupil increments) and then require that districts directly pay their share of the pension debt that their employees accrue.[15] District leaders would be naturally compelled to rethink pay raises that drive up pension costs if faced with the burden of financing their ensuing debt.

3. For districts, restructuring the pay scale could enable larger raises to junior teachers and lower pension debt.
School district salary schedules have been criticized for their inability to properly retain newer or mid-career teachers. In many districts, an educator's compensation is based on years of experience and educational attainment, resulting in a back-loaded salary effect. Fewer compensation rewards are gained during novice years, followed by steep inclines in later years as teachers reach longevity thresholds on the salary schedule.[16] When raises are applied in fixed percentage terms to such salary schemes, late-career teachers receive larger year-to-year dollar raises than do their less-experienced peers.

Districts worried about the pension implications of their salary schemes might choose to pay out the same total funds, but do so in fixed-dollar increments (versus fixed-percentage increments). Doing so would distribute a more equitable reward to teachers at all steps on the pay scale, while expending the same total district funds. Fixed-dollar raises would also mean a lower final retiring salary for late-term teachers—and therefore reduced pension debt for the

[15] Illinois does fine districts for awarding raises in excess of 6%.

[16] One study finds that 92% of districts base compensation on years of experience and educational attainment and that half of all districts back-load salary schedules; the average back-loading district awards 134% greater yearly returns to veteran than to novice teachers. Jason A. Grissom and Katharine O. Strunk, "How Should School Districts Shape Teacher Salary Schedules? Linking School Performance to Pay Structure in Traditional Compensation Schemes," *Educational Policy* vol. 26 no. 5 (2012): 663-695, DOI 10.1177/0895904811417583.

state and local taxpayers. In addition to the pension relief, this approach would increase pay for new teachers, which provides greater incentive for them to persist through the demonstrably tough early years and which has been shown to increase educator effectiveness.[17]

Ultimately, many policymakers might find good reasons to take on the politically tough work of true pension reform, but in the meantime, they can better recognize the effect of late-career salary decisions on pension obligations. Where changes to pension plans often prompt legal challenges and may only apply to newly hired teachers, decisions around late-career teacher raises are squarely under the control of district leaders, and the effects on pensions are nearly immediate.

[17] Grissom and Strunk argue that "school districts maximize the returns to their overall salary expenditures by frontloading their salary schedules to attract and retain high-quality teachers," finding that "frontloaded compensation schemes—those that allocate greater salary returns to experience to novice teachers—are associated with better performance in multiple grades and throughout the achievement distribution." Grissom, "How Should School Districts Shape Teacher Salaries?," (676, 663)

TECHNICAL APPENDIX

Sources of Data

The findings in this policy brief were based primarily on publicly available data from the 2012-2013 Comprehensive Annual Financial Reports (CAFR) for California, Illinois, and New Jersey state teacher pension systems. Some additional information was retrieved from state pension websites and from state departments of education when not available in the state's CAFR.

Explanation of terms used in the pension formula (Figure 1):

- **Final average salary:** Final salary is computed as an average rate as defined in the pension plan – e.g., a one-year average, a three-year average, a four-year average, etc.
- **Multipliers:** Multipliers may be constant or change based on a retiree's years of service or age.
- **Cost of living adjustment (COLA):** The COLA supplements a retiree's pension starting in the second year of retirement at an increasing rate for every year that she receives an allowance. The COLA can vary in percentage terms as well as the financial method by which it is computed (simple interest annually compounded)
- **Years of service:** Only years of service is defined relatively consistently across plans. It's determined by the number of years an educator has worked (and maintained active pension plan membership through annual contributions), as well as credit earned through extra duties, credit from unused sick leave, or purchased credit.

Other factors that can further complicate the pension equation include longevity bonuses for veteran teachers, career factors that affect the multiplier, compensation caps for final average salary used in the retirement formula, and pension modifications for early retirement. For example, in California longevity bonuses are permanently added to the monthly retirement benefit at a set dollar amount of $200-$400 if the teacher earned 30+ years of service credit on or before December 31, 2010 and a career factor of 0.2% is added to the multiplier. In Illinois, cap on creditable earnings that can be used to determine the final average salary is $110,631.

Assumptions and Adaptation of Data for Analysis

Overall

For simplicity and accuracy, our analysis focuses on only the costs associated with defined benefit pension allowances. Because this brief is focused on veteran teachers nearing retirement, the average final salary, average years of service, average pension multiplier, and average beginning pension statistics were isolated for teachers retiring with 25 years of experience or more (see Table A1). This includes teachers under the CALSTRS 2% at 60 benefit structure in California, under the Tier I benefit structure in Illinois, and under the Tier I benefit structure in New Jersey.[18]

California and Illinois

California and Illinois CAFRs publish average beginning pension allowances, final average salary, and retirement by demographic (e.g., age or years of service). These values were used to "back into" each state's pension formula, which allowed us to observe average pension multipliers.

New Jersey

Because New Jersey's CAFR does not present these statistics by demographic (but does provide overall averages), further data retrieval and modification was necessary to isolate statistics for veteran teachers in the same way. We obtained 2012-2013 teacher salary data published by the Asbury Park Press website to calculate the average salary for all teachers in New Jersey with 25 years of service or more.[19] Then, to determine the average beginning pension for veteran teachers, we modified New Jersey's published average pension for all teachers to represent only those with 25 years of service or more. This was achieved by first determining the ratio of the average pension differential for all retirees vs. those retiring with 25 years of service or more in Illinois and California; we found that on average, the beginning average pension for a veteran teachers is approximately 141% higher that that of the average retiree. Finally, we applied this ratio to the published beginning average pension for all retired teachers in New Jersey (as listed in the state's CAFR).

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[18] "Together We Grow: Comprehensive Annual Financial Report 2012-2013", California State Teachers' Retirement System (CalSTRS), accessed on September 30, 2014 http://www.calstrs.com/sites/main/files/file-attachments/cafr2013.pdf. ; *Comprehensive Annual Financial Report*, 2012-2013, Teachers' Retirement System of the State of Illinois (TRS), accessed on September 30, 2014, https://trs.illinois.gov/pubs/cafr/FY2013/fy13.pdf.; *Comprehensive Annual Financial Report*, 2012-2013, New Jersey Division of Pension & Benefits, accessed on September 30, 204, http://www.state.nj.us/treasury/pensions/annrprts.shtml.

[19] "NJ Public School Teachers, 2012-13," *DataUniverse.* Asbury Park Press, accessed on September 30, 2014, http://php.app.com/edstaff/search.php.

Cash Flow Discounting

Future Values

To calculate the value of a future year's pension allowance in a given state, we begin with the state's average beginning pension (for veteran teachers) and applied the respective annual COLA beginning in year two, using the appropriate interest formulas:

Simple interest: $FV = \text{Beginning allowance} \times (1 + [\text{COLA} \times (\text{Year} - 1)])$

Compound interest: $FV = \text{Beginning allowance} \times (1 + \text{COLA})^{(\text{Year} - 1)}$

Note: We use (Year – 1) to represent time because COLAs begin in the second year of pension payments.

We then determined the average lump sum of one teacher's total pension allowances over her lifetime by applying actuarial projections of lifespan. Table A2 displays these calculations from our California analysis.

This calculation was based on the state's average teacher retirement age (or minimum retirement age, when averages were not published) and the percentage of veteran retirees expected to live to a given year in the future. This proportion was calculated using unisex mortality rates published in the Internal Revenue Service's Static Mortality Tables for the Year 2014.[20] We then multiplied each year's proportion of retirees still alive (column H) by that year's respective pension allowance (column B), up to a maximum age of 120 years (the highest listed on the IRS mortality tables). Finally, we summed these products to find an overall average of lifetime pension allowances. Table A2 displays the future value calculations for our California analysis.

Present Values

Next, we used cash flow discounting to translate each future year's pension allowance into an equivalent present day value, using the present value formula (which assumes compounded interest):

$$PV = FV \div (1 + r)^n$$

Note: PV is Present Value of the annual allowance, FV is Future Value of the annual allowance, r is the discount rate, and n is the number of compounding periods.

Once again, we multiplied the present value of each year's pension allowance by the proportion of retirees expected to live to the given year, and summed these products to find an overall average. Table A3 displays the present value calculations for our California analysis.

Discount Rate Assumptions

This cash flow discounting process required that we make assumptions regarding the appropriate discount rate. Two schools of thought exist regarding the valuation of pension debts, each with distinct assumptions about rates of return. Because there is no clear consensus, our analysis illustrates the present value of pension debt under both valuation methods:

- Expected market return valuation, traditionally used by actuaries to analyze pension debt, assumes relatively higher interest rates of 7.5% – 8%. These rates are based on long-term expected returns from a fund's current investment portfolio and incorporate actuarial smoothing to spread risks and gains over a long time horizon (typically 30+ years).
- Fair market valuation is based on a risk-free interest rate, typically 3% – 5%. Financial economists and actuarial experts are increasingly calling for the use of this market-based method, arguing that reliance on a risk-free rate provides a more realistic picture of pension liabilities by accounting for the risk of future inflation and providing greater certainty that today's funds will be sufficient to meet tomorrow's obligations.[21] A commonly cited proxy for the risk-free rate is the current interest rate of a US treasury security, although there is no clear consensus over the appropriate security (e.g., a treasury bill vs. a treasury bond) and time horizon (e.g., short-term vs. long-term) on which to base this proxy.

Our analysis applied a discount rate of 8% under expected market return valuation and a risk-free rate of 3.78% under fair market valuation, which is equivalent to the five-year average forward rates of 10-year treasury bonds.[22]

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[20] "Updated Static Mortality Tables for the Years 2014 and 2015." Interval Revenue Service, accessed on September 30, 2014 http://www.irs.gov/pub/irs-drop/n-13-49.pdf.

[21] "Measuring Pension Obligations" *American Academy of Actuaries Issue Brief* (2013); Andrew G. Biggs, "The Market Value of Public-Sector Pension Deficits," *American Enterprise Institute for Public Policy Research*: Retirement Policy Outlook no. 1 (2010); Eileen Norcross, "Getting an Accurate Picture of State Pension Liabilities," *Mercatus on Policy no. 85* (2010); Ken Smetters and Andrew G. Biggs, "Understanding the argument for market valuation of public pension liabilities," *American Enterprise Institute*, May 29, 2013; *Report of the Blue Ribbon Panel on Public Pension Plan Funding*, Society of Actuaries, February 2014.

[22] *Report of the Blue Ribbon Panel on Public Pension Plan Funding*, Society of Actuaries February 2014, accessed September 30, 2014, http://www.soa.org/blueribbonpanel.

It is worth noting that our overall approach to discounting future cash flows is very similar to the annuity factor method, which can be used to find the present value of a series of annuities.[23]

Adjustments Under a Late Term Pay Raise Scenario

Our analysis assumes a late-term pay raise that increases the overall final average salary used in a teacher's pension formula by $1,000. To determine the corresponding Average Beginning Pension, we multiplied the new Final Average Salary by its respective pension-salary ratio listed in Table A1. Then, repeating the dollar discounting approach described in the previous section, we again translated future cash flows into present day terms and applied mortality rates to determine an overall lifetime average. Table A3 shows the results from our California Analysis.

Finally, to evaluate the effect of this pay raise, we compared the lump sum present value of a teacher's lifetime pension to that under a late term pay raise scenario. For example, in California a teacher's lifetime pension is worth $1,265,566 today when discounted at 3.78%. After adjusting for a late-term pay raise, her lifetime pension is worth $1,279,457. The difference, $13,891, is the effect of the $1,000 pay raise. Therefore, we can conclude that about $13.90 of new pension obligations are generated by every one dollar added to a teacher's final pay.

Link to Tables

Table A1:

Observed and/or adapted pension terms and statistics for veteran teachers (for use in future and present value calculations) .

Table A2:

Future values of annual pension allowances in California.

Table A3:

Present values of annual pension allowances in California.

Table A4:

Present values of annual pension allowances in California after a late-term pay raise which increases the teacher's final average salary by $1,000.

[23] An annuity factor is applied to the cash flow using the following formulas: Annuity Factor = $1/r \times [1-(1+r)^{-n}]$; PV of Annuity = C x Annuity Factor (where r = the discount rate, n = number of payments, PV = present value of the sum of future cash flows, and C = cash flow per period). The IRS publishes annuity factors based on mortality rates for a series of possible interest rates. However, we determined that the annuity factor method is not appropriate for our analysis because it cannot account for the variety of applications of a pension's annual COLA.

THIS SERIES OF RAPID RESPONSE BRIEFS IS DESIGNED TO BRING RELEVANT FISCAL ANALYSES TO POLICYMAKERS AND EDUCATION LEADERS AMIDST THE CURRENT ECONOMIC ENVIRONMENT.

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Edunomics Lab is a university-based research center dedicated to exploring and modeling complex education fiscal decisions and growing the capacity of education leaders on the topic of education finance. The Edunomics Lab is affiliated with the McCourt School of Public Policy at Georgetown University.