



# CASE STUDY

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## TEACHER PENSION ENHANCEMENT IN MISSOURI: 1975 TO THE PRESENT

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### Abstract

This paper examines the history of benefit enhancements in Missouri's main teacher pension plan from 1975 to the present. The key organizing principle of this analysis is pension wealth, a standard measure, well established in the economics literature, which reflects both the size of an individual's annual pension as well as the number of years over which it is collected. Missouri repeatedly and considerably enhanced its pension benefit formula from 1975 to 2001, resulting in large increases in pension wealth, particularly for those retiring in their 50s with 25-30 years of service. Although many states have reduced benefits in recent years, especially for new teachers, this has not been the case in Missouri. Indeed, two enhancements that were scheduled to expire in 2013 were extended or made permanent.

### Introduction

Retirement benefits have long been an important component of teacher compensation (as with other state and local public employees), and increasingly so over much of the post-war period, as benefit formulas have been periodically enhanced in many states, until recently. One of the main reasons that teacher pensions have become expensive is that eligibility conditions, in combination with the benefit formulas, have often rewarded retirement at relatively early ages, typically in the mid-50s. Thus, a pension that may not carry a large annual payment may still be expensive because of the number of years the individual collects it. Thus, a teacher's "pension wealth" — the cash value of the annuity she has earned upon leaving the classroom — may be significantly larger than the corresponding retirement

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account of comparable individuals in other professions at the same age.

In addition to their cost, the incentives and inequities embedded in teacher pensions have also been examined. Typically, pensions carry strong incentives for teachers to stay in the classroom until their mid-50s and to leave shortly thereafter — a structure that is not well-tailored to the diversity of the teaching workforce. Some teachers who have much to offer in the first part of their career, but not after a certain point, may want to switch careers, but the pension system heavily penalizes them if they do. Consequently, a number of them “hang on” for their pensions. Other teachers, who still have much to offer well beyond their mid-50s, also are penalized by the pension system, if they stay too long. So a number of them may leave the classroom prematurely. In short, the peculiar incentives embedded in traditional teacher pension plans may not maximize teacher quality.<sup>1</sup>

Traditional teacher pensions also distort incentives for mobility. Mid-career teachers pay a heavy price if they move to another state, with a different pension system, or if they move into the state.<sup>2</sup> They may be eligible for pensions in both states if they put in sufficient years of service, but the sum of the two pensions is far less than if they had stayed in one state.<sup>3</sup>

Finally, teacher pension systems are highly inequitable. Teachers who leave the profession before qualifying for retirement often receive far less in the way of

benefits than the contributions made on their behalf would warrant. The reverse is true for those who follow the system’s incentives and retire in their 50s. The large pension wealth for those in the latter group is funded in great measure by the implicit transfer of employer contributions from those in the former group.<sup>4</sup> That is, teacher pension systems depend on the turnover of those who do not stay to reap maximum rewards. Young mobile teachers — and potential teachers — increasingly recognize these inequities. They are rooted in the fact that benefits are not tied to contributions, unlike some other retirement systems.<sup>5</sup>

The recent crisis in public pension funding has drawn greater attention to the structure and cost of these systems. Many states have modified their pension plans, at least for new entrants, and others are considering doing so. Ideally, this fiscal crisis would be an opportunity to re-examine the structure of these plans from the viewpoint of their incentives and equity as well as cost. Thus far, however, the modifications in most states have preserved the basic structure, while tightening up benefits for new hires. Missouri has actually made no significant changes to its main teacher pension plan since the crisis erupted. Thus, it may be timely to consider the structure of Missouri’s plan.

### [Missouri’s Teacher Pension Plans](#)

Missouri has three teacher pension plans. Approximately 92 percent of the state’s teachers are members

of the Public School Retirement System (PSRS);<sup>6</sup> the others are in separate plans for Saint Louis and Kansas City.<sup>7</sup> This report is confined to PSRS.

PSRS is a traditional defined benefit (DB) plan. Employees and employers both contribute to the pension fund, but benefits are not determined by contributions. Instead, age, service, and final average salary determine annual pension payments. Social Security (except due to other employment) generally does not cover PSRS members.

### Annual Pension Benefit

The basic benefit formula in Missouri is typical of “final average salary” (FAS) plans elsewhere.<sup>8</sup> At retirement, the annual payment is:

$$(1) \text{ Annual Benefit} = m \cdot YOS \cdot FAS.$$

In this expression, *YOS* denotes years of service, *FAS* is the average of the three highest consecutive years of salary,<sup>9</sup> and *m* is a percentage commonly referred to as the “multiplier,” which is 2.5 percent for “normal” retirement. For example, a teacher with 30 years of service would receive  $30 \times 2.5\% = 75\%$  of *FAS*. So if the *FAS* were \$60,000, she would receive:

$$\text{Annual Benefit} = .025 \times 30 \times \$60,000 = \$45,000$$

payable for life. The annual benefit is capped at 100 percent of *FAS*.

If the teacher were to separate from service prior to being eligible to receive the pension, the first draw

would be deferred and the amount of the pension would be frozen until that time. Once the pension draw begins, PSRS provides a cost-of-living adjustment (COLA) that typically is 2 percent (compounded) or 5 percent if the consumer price index exceeds 5 percent. There is a cumulative cap, limiting future pension payments to 180 percent of the initial payment.

The eligibility conditions for retirement are complicated, but very important. There is a set of conditions for “normal” retirement and another set for “early” retirement. The normal retirement eligibility conditions are:

(i) age 60, with 5 years of service (*i.e.*, the vesting requirement); *or*

(ii) any age, with 30 years of service; *or*

(iii) age + service = 80 (“rule of 80”)

In addition, for teachers who accrue 31 or more years of service, the multiplier *m* is raised from 2.5 percent to 2.55 percent. This provision, enacted in 2001, was set to expire in 2008, then extended to 2013, and was then extended again through July 1, 2014.<sup>10</sup>

The eligibility conditions for early retirement, and associated penalties, are:

(iv) age 55, with 5 years of service; “age-reduction” to 62.16, 68.20, 74.91, 82.38, and 90.70 percent of full pension,<sup>11</sup> for ages 55, 56, 57, 58, and 59, respectively; *or*

*Typically, pensions carry strong incentives for teachers to stay in the classroom until their mid-50s and to leave shortly thereafter — a structure that is not well-tailored to the diversity of the teaching workforce.*

**Table 1: Annual Pension as Percent of Final Average Salary ("Replacement Rate")**

(Boxed cells indicate optimal first draw by YOS for 25-year-old entrant)

YOS/Age	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
5	0%	0%	0%	0%	0%	8%	9%	9%	10%	11%	13%	13%	13%	13%	13%	13%
6	0%	0%	0%	0%	0%	9%	10%	11%	12%	14%	15%	15%	15%	15%	15%	15%
7	0%	0%	0%	0%	0%	11%	12%	13%	14%	16%	18%	18%	18%	18%	18%	18%
8	0%	0%	0%	0%	0%	12%	14%	15%	16%	18%	20%	20%	20%	20%	20%	20%
9	0%	0%	0%	0%	0%	14%	15%	17%	19%	20%	23%	23%	23%	23%	23%	23%
10	0%	0%	0%	0%	0%	16%	17%	19%	21%	23%	25%	25%	25%	25%	25%	25%
11	0%	0%	0%	0%	0%	17%	19%	21%	23%	25%	28%	28%	28%	28%	28%	28%
12	0%	0%	0%	0%	0%	19%	20%	22%	25%	27%	30%	30%	30%	30%	30%	30%
13	0%	0%	0%	0%	0%	20%	22%	24%	27%	29%	33%	33%	33%	33%	33%	33%
14	0%	0%	0%	0%	0%	22%	24%	26%	29%	32%	35%	35%	35%	35%	35%	35%
15	0%	0%	0%	0%	0%	23%	26%	28%	31%	34%	38%	38%	38%	38%	38%	38%
16	0%	0%	0%	0%	0%	25%	27%	30%	33%	36%	40%	40%	40%	40%	40%	40%
17	0%	0%	0%	0%	0%	26%	29%	32%	35%	39%	43%	43%	43%	43%	43%	43%
18	0%	0%	0%	0%	0%	28%	31%	34%	37%	41%	45%	45%	45%	45%	45%	45%
19	0%	0%	0%	0%	0%	30%	32%	36%	39%	43%	48%	48%	48%	48%	48%	48%
20	0%	0%	0%	0%	0%	31%	34%	37%	41%	45%	50%	50%	50%	50%	50%	50%
21	0%	0%	0%	0%	0%	33%	36%	39%	43%	53%	53%	53%	53%	53%	53%	53%
22	0%	0%	0%	0%	0%	34%	38%	41%	55%	55%	55%	55%	55%	55%	55%	55%
23	0%	0%	0%	0%	0%	36%	39%	58%	58%	58%	58%	58%	58%	58%	58%	58%
24	0%	0%	0%	0%	0%	37%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
25	55%	55%	55%	55%	55%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%
26	59%	59%	59%	59%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
27	62%	62%	62%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
28	66%	66%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
29	70%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%
30	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
31	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
32	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%
33	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
34	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%
35	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%
36	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
37	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%
38	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%
39	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
40	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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(v) age < 55, with 25 years of service (“25-and-out”); no “age-reduction,” but multiplier  $m$  reduced to 2.20, 2.25, 2.30, 2.35, and 2.40 percent for YOS = 25, 26, 27, 28, and 29 respectively. “Twenty-five-and-out” was enacted in 1996, with lower multipliers. The multipliers were increased to the current levels in 1998, with an expiration date of 2000 that was repeatedly extended, to 2013, and has recently been made permanent.

The net result of all these conditions is presented in Table 1, which presents the starting annual pension as a percent of *FAS*, commonly

known as the “replacement rate.” The table is constructed as a grid, with rows corresponding to *YOS*, from five to 40 and columns representing age of first pension draw, from 50 to 65. The grid has several distinct regions.<sup>12</sup>

The pink region represents “normal” retirement, with age  $\geq 60$ ,  $YOS \geq 30$ , or age +  $YOS \geq 80$  (the boundary of which is given by the “stepped” cells). Each cell in this region is simply  $YOS \times 2.5\%$ , except below the bolded line, where  $YOS \geq 31$ , so the multiplier is 2.55%.

For example, a teacher entering at age 25 who works continuously

for 30 years would be able to retire at age 55 and receive a pension starting at 75 percent of FAS, as shown in cell (30, 55). If that teacher had taken a break of five years (or, instead, entered service at age 30 and worked continuously), only acquiring 25 years of service by age 55, she still would be eligible for unreduced benefits at 55 under the “rule of 80,” because  $55 + 25 = 80$ . Her pension would be  $25 \times 2.5\% = 62.5$  percent of FAS, as indicated in cell (25, 55). If she left service at age 55 with only 24 years of service, she would not be eligible for normal retirement — cell (24, 55) is not in the pink region. She would either have to defer her first pension draw for a year, until she is 56, to satisfy the “rule of 80” ( $24 + 56 = 80$ , so the cell (24, 56) is back in the pink region), or she could draw early retirement immediately at a much reduced rate.

The blue region represents early retirement with “age-reduction” factors applied, as given in (iv) above. So the teacher retiring at 55 with 24 years of service receives only 37 percent of FAS (cell (24, 55)), considerably less than if she deferred a year and received 60 percent (cell (24, 56)).

The green region represents early retirement under “25-and-out,” with reduced multipliers as given in (v) above, a considerably more attractive proposition, that has now been made a permanent feature of the PSRS formula. For example, a 25-year-old entrant who works continuously for 25 years can retire immediately at age 50 and draw a starting pension at  $25 \times 2.2\% = 55$

percent of FAS.

The boxed cells in Table 1 indicate the optimal<sup>13</sup> age of first pension draw for an individual entering service at age 25 and separating after various lengths of service. Thus, an individual entering at age 25 and leaving as soon as she is vested, after five years, at age 30, is entitled to normal retirement benefits, but must wait until age 60 before drawing it; she could draw reduced benefits at ages 55-59, but our calculations indicate she would be slightly better off waiting until age 60. The boxed cells indicate that this is the optimal age for first pension draw for this individual so long as she leaves with 20 years of service or less. Once she has reached 21 years of service, at age 46, the “rule of 80” comes into play, such that she need only defer the first draw to age 59 to receive normal retirement benefits, and this is optimal for her, as indicated by the boxed cell (21, 59). Each successive year of service, through  $YOS = 24$ , reduces the optimal age of first draw due to the “rule of 80,” culminating in boxed cell (24, 56).

Once this individual reaches 25 years of service, she is eligible for “25-and-out,” which would allow her to take her first pension draw immediately, at age 50; this would be with a reduced multiplier of 2.2 percent instead of 2.5 percent, but our calculations indicate this would be optimal, *i.e.*, she should not defer the first draw, as indicated by the boxed cell (25, 50) and similarly for the boxed cell (26, 51). If she were to leave with 27 years of service, at age 52, our calculations indicate she would do well to defer first draw

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for a year, until age 53, so that she would qualify for the full multiplier of 2.5 percent, due to the rule of 80. Once she reaches 28 years of service, at age 53, there is no reason to defer first draw, as indicated by the boxed cells (28, 53) through (40, 65). Thus, by age 53, she can retire immediately at 70 percent of salary, or at a steadily increasing percent for each additional year of work until reaching 100 percent salary replacement for retirement at age 65.

### Pension Wealth

The calculation of the annual pension benefit, complicated as it is, tells only part of the story. The other part, often omitted from pension discussions, is the number of years over which the pension is drawn. The concept of pension wealth reflects both the size of the annual pension payment and the number of years for which it is received. When an individual retires under a DB plan, he or she is entitled to a stream of payments that has a lump sum value — the present discounted value. This measure adds up the value of all payments, but adjusts them for the time value of money (more distant payments are worth less today than imminent payments) and also for the probability of surviving to the date of payment, using standard actuarial methods.

Formally, consider an individual's pension wealth,  $P$ , at some potential age of separation,  $A_s$ . The stream of expected payments may begin immediately, or may (perhaps must) be deferred until some later retirement age. The present value of those payments is:

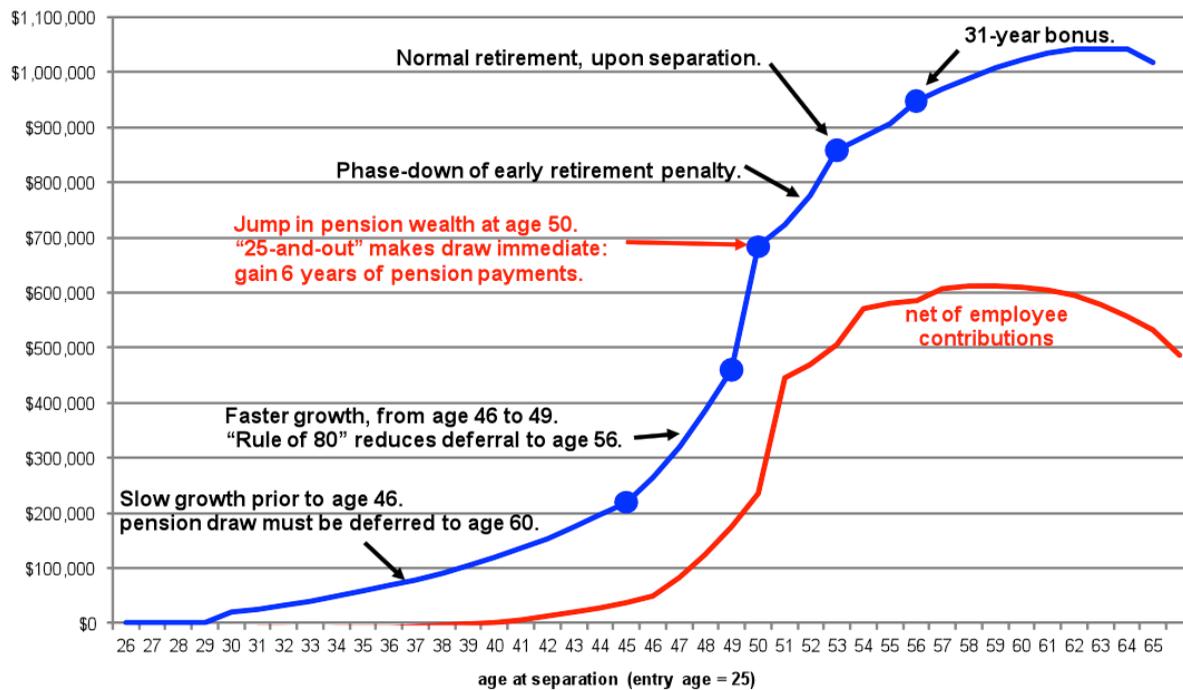
$$(2) \quad P(A_s) = \sum_{A \geq A_s} (1+i)^{(A_s-A)} f(A|A_s) \cdot B(A|A_s),$$

where  $B(A|A_s)$  is the defined benefit one will receive at age  $A$ , (as specified in equation (1), along with any COLA), given that one has separated at age  $A_s$ ,  $f(A|A_s)$  is the conditional probability of survival to that age, and  $i$  is the discount rate.<sup>14</sup>

In principle,  $P(A_s)$  represents the market value of the annuity.<sup>15</sup> If, instead of providing a promise to pay annual benefits, the employer were to provide a lump sum of this magnitude upon separation, the employee could buy the same annuity on the market. The teacher's pension wealth,  $P(A_s)$ , is the size of the 401(k) that would be required to generate the same stream of payments she would be owed upon separation at age  $A_s$ .

Figure 1 depicts pension wealth, in inflation-adjusted dollars, for a 25-year-old entrant to the Missouri teaching force who works continuously until leaving service at various ages of separation. The salary schedule assumed is that of the Jefferson City School District (the state capital) for 2013-14, under which teachers receive annual step increases and also lane increases as they move from a bachelor's to a master's degree. The entire salary grid is assumed to increase at 2 percent inflation. We assume a 5 percent discount rate,<sup>16</sup> and use the most current female life tables (2008 intercensal) from the CDC.<sup>17</sup> The results are shown for gross pension wealth, given by  $P(A_s)$ , and net pension wealth, subtracting

**Figure 1. Pension Wealth, 25-year-old MO PSRS entrant  
adjusted for inflation**



the cumulative value of employee contributions (with interest) at the current contribution rate (14.5 percent).

The accumulation of pension wealth is not smooth and steady, but rises with fits and starts, due to rules of eligibility for early and normal retirement. After vesting at five years, this teacher's pension wealth grows steadily to age 45, reaching about \$219,000, representing the present value of a steadily growing annuity collectible at age 60. The curve in Figure 1 gets steeper at age 46, because Missouri's "rule of 80" would allow such a teacher, leaving with 21 years of service, to collect her pension for an extra year, starting at age 59.<sup>18</sup> The rule of 80 continues to add an extra year of pension benefits for each additional

year of service up to the 24th year, at age 49, at which point she need only defer her pension to age 56. Then, there is a big jump in Figure 1 at age 50, because her 25th year of service makes her eligible for an immediate pension, albeit with a reduced multiplier. This adds six years' worth of pension payments to what she had been eligible for at age 49.<sup>19</sup> Her pension wealth that year jumps from \$460,000 to \$683,000. In subsequent years, the age of first pension draw rises, but the growth in pension wealth continues to be rapid as the multiplier is increased to its "normal" rate of 2.5 percent. Following a final bump to the multiplier of 0.05 percent at 31 years of service (age 56),<sup>20</sup> growth in pension wealth slows, and pension wealth net of

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*[A] 25-year-old entrant who works continuously for 25 years can retire immediately at age 50 and draw a starting pension at  $25 \times 2.2\% = 55$  percent of FAS.*

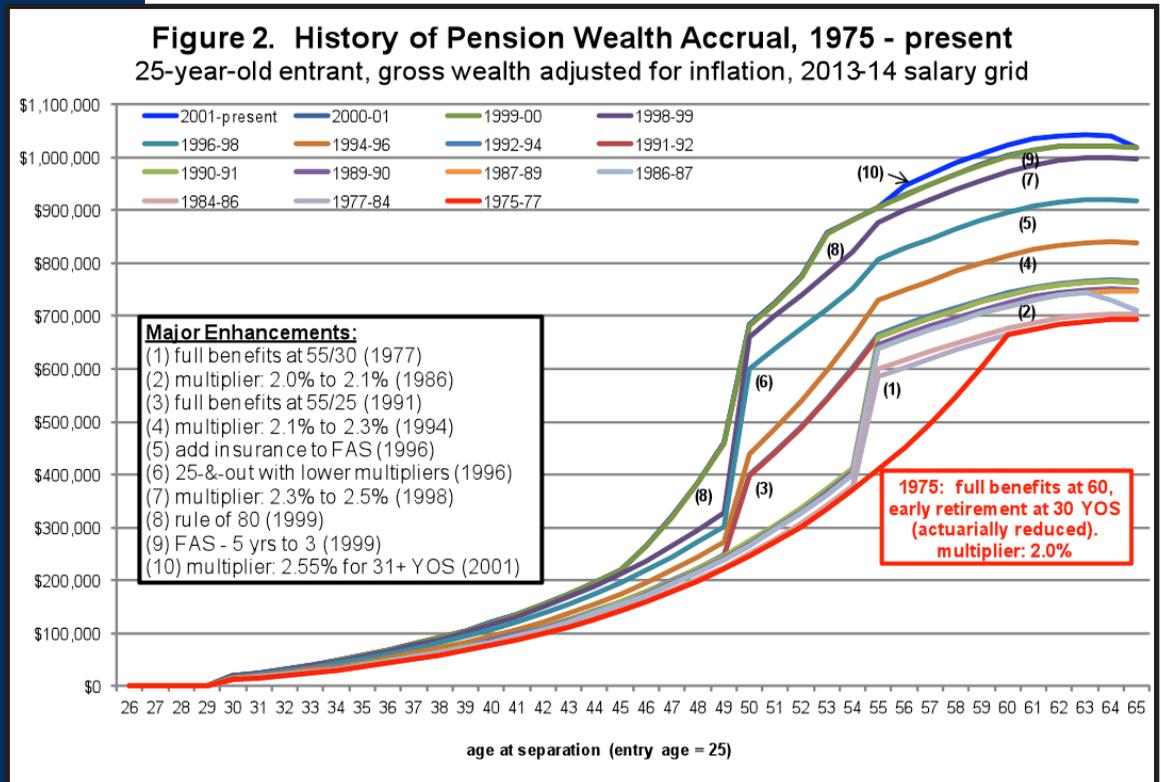
employee contributions (shown on the lower curve) actually declines for separation after age 58. We have gone through this detail to illustrate how the complex pension rules, replete with discontinuities, not only lead to pension wealth curves that are irregularly shaped, but, more specifically, bear no resemblance to the smoothly growing cumulative value of contributions (not shown).

Figure 2 depicts the historical evolution of pension wealth accrual in Missouri, since 1975, for a 25-year-old entrant. In 1975, to receive full pension benefits (i.e., unreduced annual benefit =  $m \cdot YOS \cdot FAS$ ), one had to be 60 years old (reduced from 65 in 1967).

Unlike today, one could not qualify for “normal” retirement by YOS, or by a “rule of 80.” The condition

for early retirement, with actuarially reduced benefits, was also simple:  $YOS = 30$ . The multiplier was lower than today (2.0 percent), FAS was averaged over five years (versus three today), and FAS did not include the value of health insurance. The 1975 pattern of accrual is shown by the red curve in Figure 2. All curves in this diagram are based on the current (2013-14) salary grid for Jefferson City, so the curves depict only the impact of formula changes, not salaries. The most important formula changes are listed in the text box of Figure 2, with the enumeration tied to the numbers given on the graph showing the value of the enhancements.

The overall picture is one of numerous pension enhancements since 1975, with corresponding



increases in pension wealth accrual along any given career path.<sup>21</sup>

Table 2 reports the pension wealth increases at separation ages of 50, 55, and 60, from the 1975 formula to

an increase of 122 percent, as shown in Table 2. The additional enhancement that was most relevant here was in 1977, when eligibility for full benefits was extended from

**Table 2: Pension Wealth, 25-year-old Entrant, Under 1975 and Current Formulas**

(dollar amounts in thousands, inflation adjusted, 2013-14 salary scale for Jefferson City)

age	Gross Pension Wealth			Net Pension Wealth		
	1975	current	%change	1975	current	%change
50	\$246	\$683	178%	\$114	\$445	289%
55	\$409	\$906	122%	\$232	\$586	152%
60	\$664	\$1,024	54%	\$433	\$605	40%

today. An individual retiring at age 60, with 35 years of service, would have accrued gross pension wealth of \$664,000 under the 1975 formula versus \$1,024,000 under the current formula, a 54 percent increase. More than half of that is due to the increase in the multiplier, from 2.0 percent to 2.55 percent for such an individual (enhancements (2), (4), (7), and (10) in Figure 2). Other big factors include the addition of health, dental, and vision insurance benefits to the calculation of FAS, in 1996 (enhancement (5)), numerous changes to the lifetime COLA cap, raising the pension cap from 80 percent of FAS to 100 percent in 1987, and changing FAS from five highest years to three in 1999 (enhancement (9)).

For an individual separating at age 55, after 30 years of service, the formula enhancements were much more powerful, raising pension wealth from \$409,000 under the 1975 formula to \$906,000 currently,

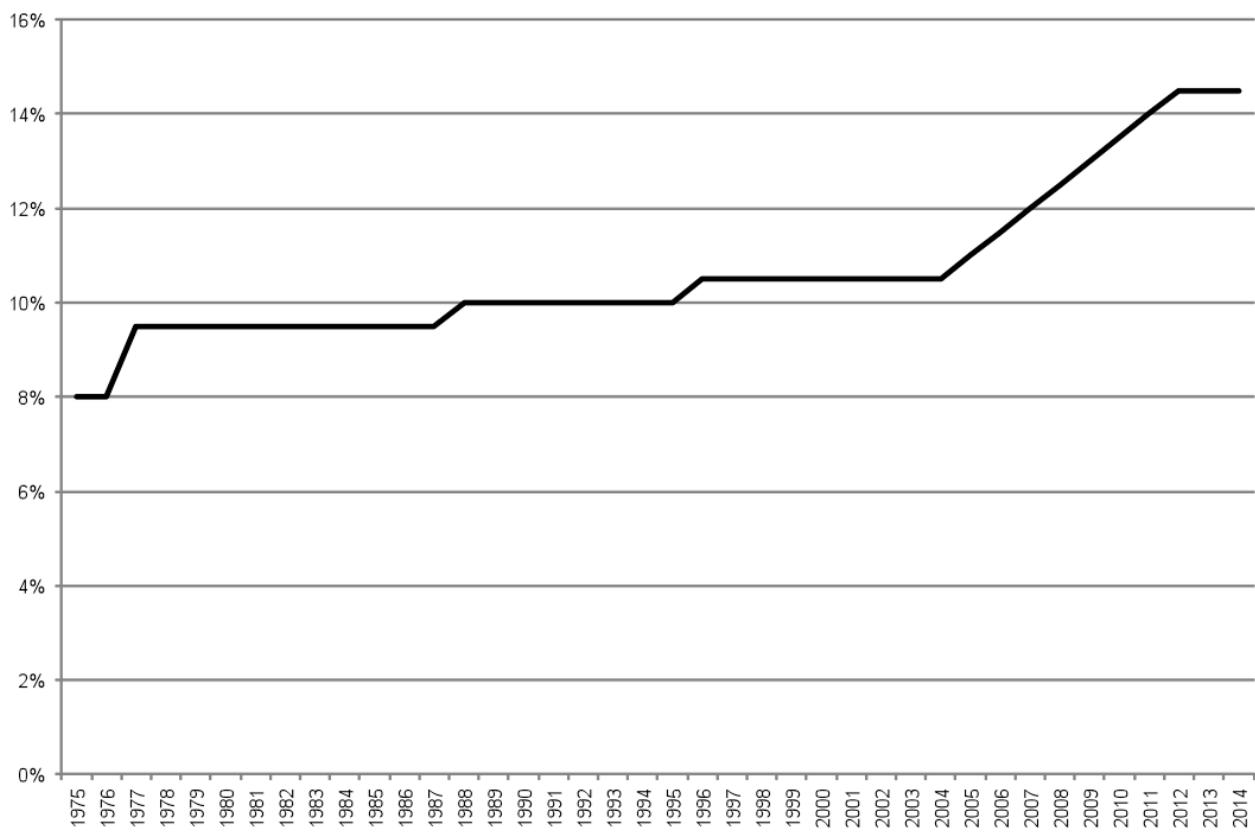
60-year-olds to 55-year-olds with 30 YOS (enhancement (1) in Figure 2).

The largest benefit enhancements were for an individual separating at age 50, with 25 years of service. Under the 1975 formula, that individual would have accrued pension wealth of \$246,000, which jumped by 178 percent to \$683,000 under the current formula. One of the main additional enhancements here was the 1991 extension of full benefits to 55-year-olds with 25 years of service (instead of 30; enhancement (3) in Figure 2), which meant that a 25-year-old entrant leaving at age 50 need only defer the first pension draw to age 55 instead of 60. Then, starting in 1996, such an individual could begin drawing a pension immediately, albeit with a slightly reduced multiplier (2.0 percent; enhancement (6) in Figure 2). That multiplier was raised along with the normal multiplier in 1998 (to 2.2 percent; enhancement (7) in Figure 2).<sup>22</sup>

*The accumulation of pension wealth is not smooth and steady, but rises with fits and starts, due to rules of eligibility for early and normal retirement.*

**Figure 3. History of Employee Contributions, 1975 - present**

(Note: employer contributions are the same)



*The overall picture is one of numerous pension enhancements since 1975, with corresponding increases in pension wealth accrual along any given career path.*

Figure 2 depicts gross pension wealth, prior to netting out employee contributions. Employees paid for some of the increase because the employee contribution rate rose, from 8 percent in 1975 to 14.5 percent today, as depicted in Figure 3. In percentage terms, however, the increase in net pension wealth — *i.e.* excluding the cumulative value of employee contributions — is even larger than the increase in gross pension wealth, for those separating at 50 and 55, as Table 2 shows.<sup>23</sup>

### **Conclusion**

As in many states, educators' pension benefits were steadily

enhanced in Missouri until 2001. Contributions did not appear to rise commensurately with benefits through the early 2000s, as the system considered itself well-funded from the bull market gains of that period. Over the next several years, however, the system found it necessary to steadily ratchet up contributions, in effect providing a delayed adjustment to the previous benefit enhancements. Contributions continued to rise through the recession, reaching the relatively high levels of 14.5 percent for employee and employer by 2012. Unlike many other states, there was no reduction in benefits for new hires (let alone current

employees). Indeed, one major formula enhancement (25-and-out) that had been set to expire in 2013 was made permanent. A relatively minor enhancement (31-year bump) that had been repeatedly extended was allowed to expire this year.

If funding pressures lead the legislature to consider benefit cuts, the history of enhancements provides a ready menu. However, it might be preferable to reconsider the fundamental structure of the system, which generates idiosyncratic incentives and gross inequities, due to the disjuncture between benefits and contributions.

## Salary Spiking Boosts Pensions, but Cripples Taxpayers

By James V. Shuls, Ph.D.

Show-Me Institute  
Director of Education  
Policy

When Terry Adams decided to retire from being the Wentzville School District (Saint Charles County, Mo.) superintendent in April of 2013, he had some good reasons. After a 38-year career in education and being named Missouri School Public Relations Association Superintendent of the Year in 2010, Adams was looking forward to spending time with his grandchildren. Instead of retiring, however, Adams accepted the interim superintendent position in the Rockwood School District (Saint Louis County, Mo.). He had good reasons for this decision as well.

Adams earned \$221,769 from Wentzville in the 2012-13 school year. He signed with Rockwood for \$250,000. This move will not only earn him more money this year, he will reap the rewards for the rest of his life. Wentzville and Rockwood are part of the Public School Retirement System of Missouri (PSRS). This pension system is a defined benefit pension system. That means retirees are guaranteed benefits based on their final average salary.

Final average salary in PSRS is based on the last three years of employment. By working one additional year at a higher salary, Adams boosts his final average from \$213,877 to \$228,200.

I visited the PSRS benefit estimate calculator and plugged in these figures along with Adams' years of service and his approximate birthdate (I had to guess). By my

calculations, Adams would have received more than \$207,000 a year in retirement benefits. By working one extra year, he will earn an extra \$15,000 per year for the rest of his life. Over the course of 20 years, this will add up to more than \$300,000 in extra retirement benefits. Not bad for an extra year's work.

I certainly do not blame Adams for his decision. He was doing what was best for him and his family. Moreover, Adams is not alone. The final average salary rule is well known among teachers, principals, and superintendents, making switches like this quite common. The problem is not the individual, but rather a poorly designed system that rewards this type of behavior.

Spiking of final average salary is one factor among many that contributes to the underfunding of defined benefit pension systems. According to a recent policy study by Andrew Biggs for the Show-Me Institute, the total amount of unfunded liabilities for PSRS is more than \$5 billion. That is assuming an 8 percent return on current investments — an ambitious assumption. If we assume a more moderate 4 percent rate of return, the unfunded liabilities of PSRS swell to more than \$31 billion.

So who pays for Adams and the countless other individuals who spike their pay in their final years? Who pays the mounting unfunded liabilities? The taxpayers do.

*An individual retiring at age 60, with 35 years of service, would have accrued gross pension wealth of \$664,000 under the 1975 formula versus \$1,024,000 under the current formula, a 54 percent increase.*

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**About the Author:**

*Robert M. Costrell, Ph.D., is professor of education reform and economics and holds the endowed chair in education accountability at the University of Arkansas. His current research topics include teacher pension policy, fiscal impact of school choice, and methodologies for school funding estimation. He is also an expert in standards-based reform. His writings have appeared in the American Economic Review, the Journal of Political Economy, Education Finance and Policy, Brookings Papers on Education Policy, Education Next, The Wall Street Journal and Education Week. Costrell has served on the U.S. Department of Education's Advisory Council on Education Statistics and the National Technical Advisory Council for NCLB. He was also fellow in education reform of the George W. Bush Institute at Southern Methodist University in Dallas. He received his B.A. in economics from the University of Michigan in 1972 and his Ph.D. in economics from Harvard University in 1978.*

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## NOTES:

<sup>1</sup> Costrell, Robert M., and Michael Podgursky. "Peaks, Cliffs and Valleys: The Peculiar Incentives in Teacher Retirement Systems and their Consequences for School Staffing." *Education Finance and Policy*. Spring 2009 (Vol. 4, No. 2), 175-211; Costrell and Podgursky. "Peaks, Cliffs, and Valleys: The Peculiar Incentives of Teacher Pensions," *Education Next*. Winter 2008 (vol. 8, no. 1), 22-28.

<sup>2</sup> There are also a few districts that have their own pension plan (see note 7 on Kansas City and Saint Louis).

<sup>3</sup> Costrell, Robert M., and Michael Podgursky. "Distribution of Benefits in Teacher Retirement Systems and their Implications for Mobility." *Education Finance and Policy*, Fall 2010 (Vol. 5, no. 4), 519-557; Costrell and Podgursky. "Golden Handcuffs: Teachers who change jobs or move pay a high price." *Education Next*. Winter 2010 (vol. 10, no. 1), pp. 60-66.

<sup>4</sup> See references above, in Note 3.

<sup>5</sup> These not only include "defined contribution" plans, such as 401(k) plans (for private employees) and 403(b) plans (for public employees). They also include "cash balance" plans — a form of defined benefits that ties benefits to contributions, but which offers a guaranteed investment return, so that the investment risk remains with the employer (or is shared), rather than being borne by the employee. See Costrell and Podgursky. "Reforming K-12 Educator Pensions: A Labor Market Perspective." TIAA-CREF Institute Policy Brief. February 2011.

<sup>6</sup> PSRS covers other certificated school employees as well.

<sup>7</sup> The Saint Louis and Kansas City teachers are covered by Social Security and each district has its own separate DB pension plan. There is no reciprocity between the Saint Louis plan and PSRS: the employer contributions do not travel with the teacher and she would only have her own contributions available to buy service years in the new plan. There is a reciprocity agreement between the Kansas City plan and PSRS, but in practice there are still significant costs for most educators who switch plans mid-career. These frictions are a serious barrier to mobility of teachers and school leaders between the suburban and city districts in both metropolitan areas. See Koedel, Cory, Jason Grissom, Shawn Ni, and Michael Podgursky. "Pension- Induced Rigidities in the Labor Market for School Leaders." Working Paper 67. Washington DC: CALDER, January 2012.

*For an individual separating at age 55, after 30 years of service, the formula enhancements were much more powerful, raising pension wealth from \$409,000 under the 1975 formula to \$906,000 currently, an increase of 122 percent.*

*As in many states, educators' pension benefits were steadily enhanced in Missouri until 2001. Contributions did not appear to rise commensurately with benefits through the early 2000s, as the system considered itself well-funded from the bull market gains of that period.*

<sup>8</sup> Teacher pension formulas are generally similar in structure to those of state employees. In some states, the formulas are identical and in other states, the eligibility rules favor earlier retirement for teachers. On the other hand, public safety workers will typically be eligible for earlier retirement than teachers. Among private sector workers, DB pensions are vanishing. Beginning in the 1980s many private-sector employers shifted to defined contribution plans. Of those private employers who have maintained DB systems, many have opted for cash balance or hybrid systems. Twenty-five percent of private sector workers covered by DB plans are now cash balance DB plans. An example of a hybrid plan is the federal civil service, which replaced its traditional DB plan decades ago with a plan combining a thrift (DC) plan, along with a reduced DB pension. (See Hansen, Janet S. “An Introduction to Teacher Retirement Benefits.” *Education Finance and Policy*, Vol. 5 (4), pp. 402-437, Fall 2010 and Costrell, Robert M., Richard W. Johnson, and Michael Podgursky. “Modernizing Teacher Retirement Benefit Systems” in *Creating a New Teaching Profession*, edited by Dan Goldhaber and Jane Hannaway. Urban Institute Press, Washington, DC, 2009, Chapter 10.) More recently, Rhode Island and Utah adopted hybrid plans. In the 1980s, when traditional DB plans were more common in the private sector, they were much studied and the accrual patterns were calculated. In examining this literature, Costrell and Podgursky (2009), op. cit., found that the spikes in accrual — which generate the uneven retirement incentives and inequities — were dwarfed in size by the teacher pension accrual spikes in several states, typically by an order of magnitude.

<sup>9</sup> PSRS also includes the value of employer-paid health, dental, and vision insurance in the measure of *FAS*, a practice that is not found in other states I have studied. This provision was added in 1996. See <http://www.brainshark.com/jcschools/vu?pi=805963249> for presentation (slide 20) of 2013-14 value of employer contribution in Jefferson City: \$6,000/year with wellness; \$5,640/year without wellness.

<sup>10</sup> The 2014 legislative session ended in May without extending this provision.

<sup>11</sup> These are the age-reduction factors reported in the PSRS 2013-14 *Handbook*; they are subject to change with the actuarial assumptions.

<sup>12</sup> The boxed cells are discussed on page 5.

<sup>13</sup> By “optimal,” I mean the choice that maximizes present value of pension benefits, i.e. pension wealth, as discussed in Note 14.

<sup>14</sup> The benefit stream may itself be a choice among alternative streams open to the individual, based upon the choice of when to begin receiving payments. Often, the best choice is simply to receive benefits as soon after separation as possible, but not always, because there may be a penalty for receipt prior to “normal” retirement age. In modeling pension wealth for

Figures 1 and 2, we assume that individuals separating at age  $A_s$  choose the stream of payments that maximizes present value.

<sup>15</sup> In practice, the private annuity market generally prices the benefit using a different discount rate than used by the public plans.

<sup>16</sup> There is a dispute between financial economists and actuaries regarding the prudent discount rate. The 5 percent figure here is closer to the economists' recommendation than that of the actuaries, who typically use about 8 percent. The higher discount rate will affect the dollar amount for Figures 1 and 2 (e.g. the gross pension wealth for a teacher separating at age 55 drops from \$906,000 to \$657,000), but will not have much effect on the shapes of the diagrams, which determine the incentives embedded in the system.

<sup>17</sup> Most teachers are female. For males, the pension wealth is a bit lower, due to shorter life expectancies, but the curves have very similar shapes.

<sup>18</sup> As discussed previously, this is depicted in Table 1, where the boxed cells show the age of first draw drops from 60 to 59 at year 21.

<sup>19</sup> As discussed previously, this is depicted in Table 1 by the jump in the boxed cell from (24, 56) to (25, 50).

<sup>20</sup> As Note 10 stated, this bump expires for retirements after July 1, 2014, unless future legislation renews this provision.

<sup>21</sup> The diagram depicts gross pension wealth, i.e., without netting out employee contributions. As discussed on page 10, higher employee contributions pay for some of the increase in gross pension wealth.

<sup>22</sup> The introduction of the "rule of 80" in 1999 did not affect the pension wealth of a 50-year-old separator with YOS=25, because that individual already was eligible for full benefits (with reduced multiplier). As discussed previously, however, it did raise the pension wealth of those who separate at ages 46-49, by bringing the first pension draw closer than before. It also raised pension wealth for those separating at ages 53-54, by making them eligible for the unreduced multiplier. These two effects can be seen in Figure 2, for enhancement (8).

<sup>23</sup> The condition for this to hold is that the percentage increase in gross pension wealth be greater than the percentage increase in the contribution rate, which was  $(14.5-8.0)/8.0 = 87$  percent. For 60-year-old separators, that condition did not hold, so their percentage increase in net pension wealth was less than that of gross pension wealth.

*If funding pressures lead the legislature to consider benefit cuts, the history of enhancements provides a ready menu. However, it might be preferable to reconsider the fundamental structure of the system, which generates idiosyncratic incentives and gross inequities, due to the disjuncture between benefits and contributions.*



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