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Redesigning Defined Benefit Plans: What Can State Pensions Learn From Social Security?

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The number of severely underfunded public pensions around the country suggests that not only are short-term fixes required but also that long-term fundamental redesigns are necessary. The median funding level for state pensions in 2016 was 71.1% with Kentucky pensions one of the worst funded at 31.4%.¹ If the shortfalls were just isolated cases due to a rogue investment manager or unexpected workforce shifts, these cases could be considered outliers in an otherwise workable system. The breadth and depth of the funding shortfalls suggests public defined benefit (DB) plans, as currently designed, are flawed.

Some commentators have suggested ending DB plans for public employees and moving them to a defined contribution (DC) fund “just like everyone else.” This strategy is hindered by a couple of logistical and psychological barriers. First, most DB plans have some degree of pay-as-you-go component where current employee contributions are being paid out to retirees’ pensions. An abrupt shift to all contributions going into a DC fund would create near-term shortfalls for the legacy DB fund. Secondly, public employees have been accustomed to the promise of a generous, early retirement in exchange for subpar current compensation. Even without having to define the terms “generous,” “early” and “subpar,” there is a general consensus to have a permanent retirement benefit.

This essay discusses the components of current DB plans that contribute to unsuccessful pension plans. The Social Security system, while not without its own solvency challenges, presents a model for how state public pensions can be redesigned. The Kentucky teachers’ pension is used to illustrate the current challenges as well as how a redesigned system could improve sustainability and equity.

Set up to Fail

The challenges facing public pension systems provide an opportunity for the actuarial profession to reshape pension design going forward. The historical problems with pensions can be traced to several factors, some within the control of the designers and account managers, including politicians.

Four design features have made pension solvency particularly risky, using Kentucky as an example.²

- Public pensions typically have eligibility for full pension benefits at relatively young retirement ages. Often, a worker’s career is less than the years they will spend in retirement drawing a pension. For example, public teachers in Kentucky can retire after 27 years of employment; a teacher who worked continuously from college could retire at around age 50 with a life expectancy into their 80s.
- The public pensions benefit formula typically relies on the average of the high three income years rather than being based on the full earnings history. This simplifies the information demands but also invites spiking of benefits by cashing in accumulated sick days in the last year, taking on extra paid work in the high years or occupying a much higher paid position for only a few years.

Kentucky teachers are granted 10 sick days per year and can use up to 300 days of unused leave in the pension benefit calculation. A school year is defined as 189 days so even 100 days of unused leave would boost the final year pay by more than 50% and increase the three-year high income and pension benefit by about 17%.

Within teaching, this could be a teacher moving to an administrative position. Within the legislature,

1 Laura Meisler, “Pension Fund Problems Worsen in 34 States,” *Bloomberg*, last updated Aug. 29, 2017, <https://www.bloomberg.com/graphics/2017-state-pension-funding-ratios/>.

2 Teachers’ Retirement System of the State of Kentucky, “Summary Plan Description,” updated through 2011, <https://trs.ky.gov/wp-content/uploads/Publications/SPD.2011.pdf>.

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a part-time politician could secure a highly paid judgeship or leadership role in government for a few years. Those teachers who exhaust sick days and choose or cannot move into a higher paying role for a few years are disadvantaged relative to those who spike their benefit (even if unintentionally).

- Upon reaching pension eligibility age, there is typically no incentive to continue working in that position. The pension benefit can be received only if the worker retires from their current position. If they continue to work in the same position, they must forgo their pension. While they will be accumulating more experience years, there is no actuarial bonus for delaying the inception of the pension benefits. Essentially, they are working for less than half pay.

The eligible retiree can take a three-month work break and return to employment in the public sector in a different position and then draw a pension and salary. This may be a welcome career shift or an unwanted move out of their profession. Similarly, they can draw their full public pension and work full-time in a private sector job.

- The excess of employee and employer contributions to pension accounts is typically invested in a portfolio of risky and safe assets. Professional money managers run the portfolios with guidance from a review board. The pension benefit levels are typically calculated based on a formula independent of the trust fund performance. During several decades of work and retirement, even relatively small differences in average returns can swing a fund

from solvency to insolvency. Furthermore, short-term volatility or market drops can be disruptive to funding current cash flows.

The actuarial demands are particularly steep for the second (spiking) and fourth (investment returns) issues. Historical “career shift” data can be utilized to model these patterns but the trends tend to be hard to document and can shift over time. Importantly, even if sufficient reserve funds can be built in to cover spiked benefits, the equity issue remains for those who did not benefit from a handful of irregularly high years of income. Investment returns can be modeled using Monte Carlo simulations but these results illustrate the challenges rather than solving them.

Social Security: A Model of How to Build a Robust DB Plan

Social Security, which has its own set of solvency challenges, does not have to deal with these design flaws—retirement benefits cannot commence until age 62, benefits are based on the full earnings history, and delaying the benefits up to age 70 will result in higher benefits (see Table 1). Social Security benefits are progressive in that higher earners receive less than proportionate benefits.

A workable pension redesign must meet the expectations of public employees in the following areas: keep a DB plan, allow for flexible retirement dates with actuarially fair benefit adjustments, and receive a good retirement benefit with cost of living adjustments (COLAs). The public employer (state) could

Table 1 Comparison of Kentucky State Pensions and Social Security

	State Pension	Social Security
Retirement age(s)	Age 50 if 27-year career; age 60 with 5-year career	Ages 62 to 70 with 10 years of earnings minimum
Benefit base	High 3 (or 5) income years; not indexed	35 years of earnings indexed by nominal wages
Benefit timing	No actuarial adjustment for delaying past earliest eligibility age	5% to 8% annual adjustment for postponing Social Security after age 66
Progressive benefits	Flat percentage of high 3 income; long-duration workers receive proportionally higher benefits	Three benefit brackets (90%, 32% and 15%) with lower career earners receiving higher proportion of average indexed monthly earnings (AIME)
Investment return	Subject to market volatility and swings	Earnings indexed to relatively stable national wage index; trust fund implicitly linked to government bond rate

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also expect to base benefits on the employee’s full career contributions to the public sector and have the benefit levels tied to the state’s economic performance.

These revised criteria would benefit public employees in that their pension is not artificially tied to an age 50 retirement date and COLAs are guaranteed. Furthermore, with a pension tied to career earnings, a more equitable distribution of benefits can be established. The employer gains by having good employees stay in their jobs up to a normal retirement age. Furthermore, they shed market risk with benefits tied to the state’s economic growth—something public workers have a direct impact on.

A major challenge with long-term plans that stretch over several decades is that the solvency of the system is highly sensitive to investment returns. By basing the formula on one of the state’s economic metrics, long-range investment risk is shed and aligned with state tax revenues. The state’s ability to fund pensions is directly coupled with the state’s gross product or total income. Nominal values will then include real and inflationary growth that can become inputs in the DB benefit formula. COLAs in retirement can also be tied to the inflation rate rather than set by a fixed-rate formula.

Case Study: Kentucky Teachers’ Pension

To illustrate these issues, consider again the case of the Kentucky Teacher’s Retirement System (KTRS).

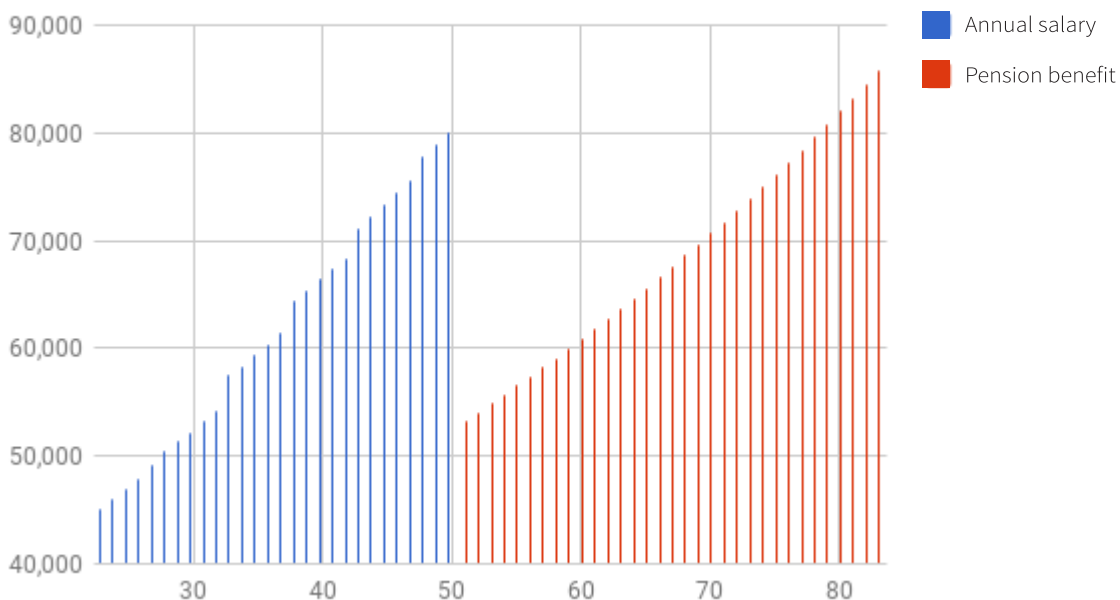
Status quo projections (see Figure 1):³

- 27-year career using Fayette County salary scale; initial and final salaries are \$45,189 and \$80,092, respectively
- The initial pension based on the three highest annual salaries is \$53,251 with a 1.5% COLA through age a life expectancy of age 83
- Investment returns are assumed at 5.75% (nominal) through her career and retirement; employee and employer contributions are 9% and 16% of salary, respectively
- The “trust fund” reaches \$939,610 upon her retirement—an amount few workers attain—and is nearly exhausted at her death at age 83

Redesigned DB projections (see Figure 2):

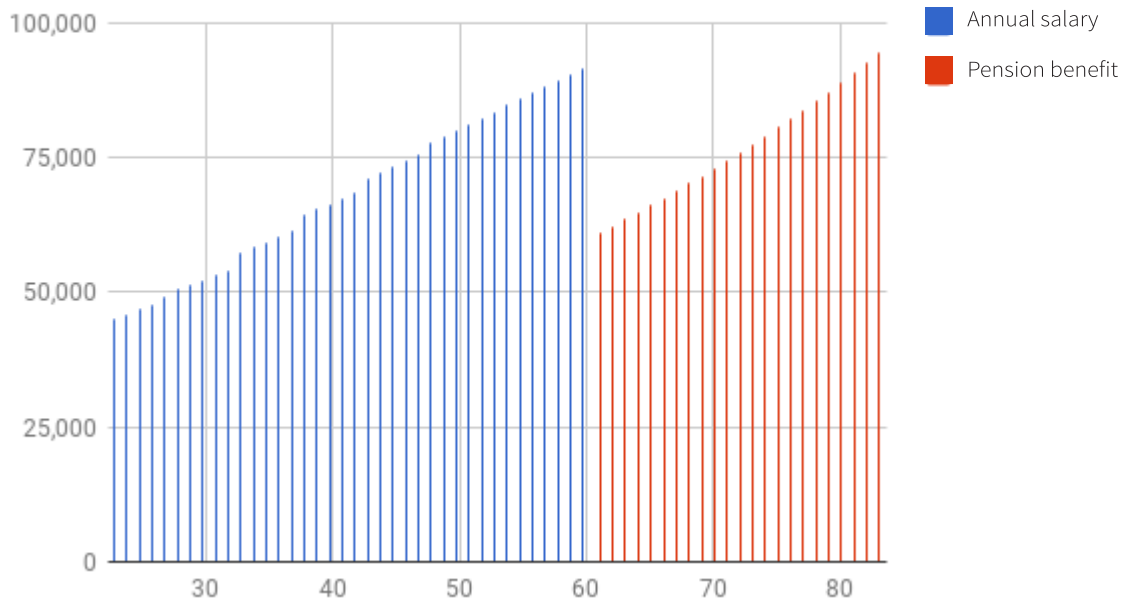
- Same starting salary at age 23 of \$45,189 but works until age 60 with final salary of \$91,752
- Employee and employer contributions are same as the status quo (25% of salary)

Figure 1 Current KTRS Pension Benefit



³ Cavanaugh MacDonald Consulting, LLC, “GASB Statement no. 67 for the Teachers’ Retirement System of the State of Kentucky,” prepared June 30, 2016, https://trs.ky.gov/wp-content/uploads/2016/11/TRS-GASB-67-Report-2016.FINAL_.pdf.

Figure 2 KTRS Pension Redesign



- Investment returns are assumed to be 4%: 2% steady real economic growth in Kentucky and 2% inflation
- The age 60 trust fund is \$729,722
- The initial pension of \$61,146 is set to exhaust the funds contributed during her career by age 83; a COLA of 2% is included in the pension benefit

The graphs of her income and benefit paths in Figures 1 and 2 differ primarily in the 10 years she continues to work and build up her pension. Her initial pension is then about \$8,000 higher than the status quo. The key to the reform is that the redesigned DB is robust to economic conditions and sustainable, whereas the status quo plan

hinges on uncertain investment returns and a COLA that may be too low or even suspended by the state.

Concluding Thoughts

The public pension crisis will call upon the actuarial profession and others to design improved plans containing a combination of tax hikes and benefit cuts. This redesign affords plan providers the opportunity to assess how to avoid future scenarios where pensions have to be rescued. Common features of public pension plans have made their sustainability and equity suspect by design. Transitioning to plan features similar to those found in Social Security will ensure more robust public pensions in the future.

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