Cash Balance Pension Plan Could Hurt Public Employees and Taxpayers

Lawmakers Should Not Rush to Enact Poorly Understood Proposal

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Keystone Pension Primers: *As Pennsylvania policymakers, media, and citizens continue to evaluate proposals to change pensions for state workers and Pennsylvania public school employees, the Keystone Research Center will continue to release "pension primers" to demystify the often complex details at the heart of the pension debate. This is the eighth installment in that series.*

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While the Pennsylvania Legislature did not enact the pension proposal introduced by Governor Corbett with his February 2013-14 budget, public-sector pensions remain a lively topic of debate in Harrisburg. One new option gaining attention is a so-called cash balance pension plan. This approach would eliminate for new public employees a guaranteed benefit tied to years of service. It would substitute an annual pension payment (or "annuity") that depends, like a 401(k)-type defined contribution plan, on the level of contributions made by employer and employee, and on the rate of interest earned on those dollars.

This briefing paper provides basic information on how cash balance plans work and considers their implications for all who have a stake in Pennsylvania's public pension system, including public employees, taxpayers, and the state and Pennsylvania schools as employers. (This briefing paper is *not* a comprehensive examination or critique of all aspects of Representative Grell's pension plan, unveiled yesterday, but rather focuses on the least familiar part of that plan, the cash balance pension plan.)

The paper finds:

- **Cash balance plans could result in deep reductions in the pension benefits of future public employees.** Actuarial studies of two cash balance proposals advanced by Representative Boyd in the 2011-12 legislative session (HB 1676 covering state employees and HB 1677 covered school employees) projected cuts in benefits averaging about 40%.

- **Representative Grell's cash balance proposal, introduced yesterday, would** provide better benefits but still **cut benefits, by about 20% on average** using the same range of career trajectories and assumptions made in the actuarial studies of the Boyd plan. Long-term career employees who retire from their government job would experience a higher level of benefit cuts, between about 35% and 60%. Employees who work in public jobs for 20 years and then take private jobs for 20 years would enjoy large increases in benefits.

- **In effect, some cash balance plans require new employees to pay for their own retirement benefits without any employer contributions**. This was the case with the Boyd plan for state employees (HB 1676), which required employees to contribute 6.25% of their salaries to cover benefits that cost only 5%. In effect, this is a not very well disguised attempt to get new employees to pay for the state's unfunded pension liability. It is not clear why new public employees have any responsibility for paying an unfunded pension liability they did nothing to create. Nor is it clear why they should forego (or virtually forego) any employer contribution to their pension so that employer contributions can all go to the unfunded liability.

- **Cash balance plans could erode the investment returns on pension plan assets below the current projected 7.5%, increasing the state's unfunded liabilities**. Pennsylvania's pension funds may record lower investment returns if pension fund managers treat the minimum guarantee to workers as their rate-of-return target (rather than the current 7.5%), and invest in more conservative ways once the share of all pension fund members in the cash balance plan becomes substantial.

- Since they reduce pensions most for long-term career employees, cash balance plans could make it more difficult for state agencies and public schools to retain experienced employees. **Public employers may need to provide offsetting wage increases to retain mid-career workers, another potential cost for taxpayers.**

- While cash balance plans do require employees to share financial market risk with their employer (and hence with taxpayers), **Pennsylvania's pensions already include a shared risk feature** because employees covered by Act 120 of 2010 can be required to make larger contributions if financial markets underperform. From the point of view of retirement security, the Act 120 approach is superior because it requires higher contributions while shared risk under cash balance plans translates into lower benefits.

Cash balance plans are also poorly understood by many policymakers and the public, and have not been subject to the scrutiny and discussion of defined contribution plans. Rather than rush to approve a radical pension overhaul without fully weighing the implications, we recommend that Pennsylvania build on the progress already made in a 2010 pension reform law (Act 120) in the following ways:

- Explore the potential of bonds as a way for the state to buy down the current unfunded liability and potentially reduce the spike in pension contributions for school districts and the state.

- Strengthen requirements for the state to make the contributions needed each year to maintain the pension funds on a gradual path to full funding.

- Conduct an actuarial study of the Act 120 risk-sharing provisions to estimate how much higher Pennsylvania's pension funding levels would be today if those provisions had been

in place since 2000. This study could be the basis for considering whether a stronger risk-sharing provision.

- Assess whether the State Employees' Retirement System (SERS) and the Public School Employees' Retirement System (PSERS) could save significant funds without lowering projected investment returns if they relied less on outside firms and relied more on their own professional staff to manage pension fund assets.

- Increase state revenues available to meet all state needs and dedicate a small portion of these funds to pay down the unfunded liability.

How Do Cash Balance Pensions Work?

Cash balance pension plans maintain individual accounts for each worker like a defined contribution plan. With a cash balance pension, however, these accounts are "hypothetical" or "on paper" and invested together with all the other cash balance accounts. Money in hypothetical cash balance accounts may also be co-mingled with assets of traditional defined benefit plans prior to a transition to a cash balance plan. Thus, in Pennsylvania, a cash balance plan could become a new "tier" within the existing Pennsylvania State Employees' Retirement System (PSERS) or State Employees' Retirement System (SERS).

Each year the employee and employer contribute to the "on paper" individual accounts. In addition, the funds already in the account at the start of the year are credited with a rate of interest that may be fixed or vary based on the rate of return earned by the entire pool of pension funds.

One cash balance proposal introduced in the last legislative session by Representative Scott Boyd would have switched new state (HB 1676) and school (HB 1677) employees into cash balance plans earning a fixed 4% rate of interest each year. Other cash balance proposals (such as Representative Grell's) credit each hypothetical account with both a fixed minimum rate of interest (such as 4%) and a portion (e.g., half) of the pension plan's investment earnings over the minimum.

Legally, cash balance plans are considered defined benefit plans. But unlike traditional defined benefit plans, the benefit is described in terms of the cash value of each individual's hypothetical individual account.

Cash balance plans are similar to 401(k)-type defined contribution plans in that there is no benefit defined in advance, although they avoid some of the downsides of the defined contribution approach. First, contributions to cash balance accounts are pooled and professionally managed. Second, employees' cash balances are typically converted into annual payments (or annuities) when they retire, and longevity risk is pooled so that workers get larger annuities than they would

get as individuals buying annuities on the open market.[1] Third, placing new employees in a separate cash balance tier within an existing defined benefit plan maintains a balance between younger, older, and retired members in the overall plan. This can help avoid the erosion of investment returns that results when a defined benefit plan closes to new members and those left in the plan age and retire as a group. An important caveat, however: as explained later in the brief, cash balance plans may lead to lower investment returns for a different reason. Fourth, cash balance plans provide workers with an assurance of some growth in their retirement account and some protection against financial market risk near the end of their career. Cash balance plans do still shift some financial market risk to individuals. Thus, employees do not know in advance what their pension benefit will be or how it will compare to their income before retirement.[2]

Why Do Cash Balance Proponents Advocate These Plans?

One reason some proponents favor cash balance plans is that by providing new employees with a low guaranteed interest rate on their interest rate accounts, Pennsylvania could capture excess investment returns over and above the interest crediting rate to pay down the state's unfunded pension liability. Since future public employees had no role in accumulating the unfunded liability, however, it seems arbitrary and unfair to stick them with the bill for paying it down.

A second motivation for cash balance plans is to avoid accumulating future unfunded liabilities. Since the Pennsylvania Legislature took major steps to eliminate future unfunded liabilities in Act 120 in 2010, however, it is not clear that Pennsylvania needs further action on this issue. The actions taken in 2010 included lowering the future cost for public-sector pensions for new employees to 3% on average and adding a "risk-sharing" feature to the pensions of employees hired since 2010. This feature allows for increases in employee contributions of up to 2% of salary if SERS and PSERS investment returns disappoint in the future. The Legislature also smartly made these increases in employee contributions contingent on employers (the state and school districts) maintaining adequate contributions if markets fall sharply. Thus, Pennsylvania's Act 120 of 2010 and cash balance plans provide two different approaches to the same goal of shared financial market risk between employee and the public sector. Act 120 requires employees to share risk by contributing more of their salaries to their pension. Cash balance plans require employees to share risk by accepting lower investment returns and thus lower benefits. If the goal is to ensure adequate retirement security, sharing risk using the Act 120 approach is the better approach. Before taking any further action to guard against future unfunded liabilities, Pennsylvania should,

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[1] "Longevity risk" refers to the risk that a retired person will live much longer than normal life expectancy and thus the provider of their pension benefit (or annuity) will have to pay benefit checks for much longer. When individuals buy annuities on the open market, the insurance company will give them a lower pension check to guard against the risk that they live an unusually long period of time. With defined-benefit pension pools that have large numbers of participants, retirees, on average, will live exactly the expected length. When cash balance accounts are converted into an "annuity," therefore, pension plans can give people annuity amounts that use up the full cash balance in the period up to only the average life expectancy.

[2] As a result of the guaranteed minimum investment return, the employees' monthly annuity becomes more predictable towards the end of a career, which would enable employees to receive financial statements that specify a "minimum monthly benefit" and, possible, an "expected" benefit (if assets reach their projected rate of return not just the minimum guaranteed level).

at minimum, conduct a study of how much lower current unfunded liabilities would be if the risk-sharing provisions of Act 120 had been in place since 2000.

Third, some proponents favor cash balance plans because they provide better benefits for the "workers of today" who make more frequent career changes. For example, if a teacher or nurse leaves public service mid-career (e.g., at age 45), her cash balance "account" will continue to receive interest while she works outside the public sector. By contrast, her defined benefit pension would remain unchanged for 20 years until retirement. Cash balance plans also reduce the benefits of long-term employees who stay in public service for an entire career. With a defined benefit plan, these employees' final salaries determine their pension. With cash balance plans, salaries earlier in a career matter more because contributions based on these salaries have earned interest for the longest period of time. Since cash balance plans are more generous to public sector workers who leave mid-career but less generous to those who stay until retirement, they no longer serve as a human resource management tool for retaining experienced teachers, nurses, and other public servants. Higher turnover among experienced public servants could reduce the quality of public services and/or require offsetting wage improvements that increase taxpayer costs.

Experience with Cash Balance Plans in Other States and the Private Sector

Especially in the public sector, there is much less experience with and knowledge of cash balance plans than with traditional defined benefit pensions and state-administered 401(k)-type individual accounts.

- Nebraska has the longest active cash balance plan for state workers established in 2002.[3] Employees put in 4.8% and the state puts in 7.49%. Account balances are credited at 5%, with no sharing of investment returns with employees above 5%.[4] Nebraska converts accumulated assets to an annuity at an assumed rate of 7.75%. The current average benefit for the 910 individuals currently receiving benefits in Nebraska is $15,353.

- Kansas established a cash balance plan in 2012 for new employees beginning in 2015.[5] Employees will contribute 6% and employer contributions will vary based on years of service, from 3% for 1-4 years; 4% for 5-11 years; 5% for 12-23 years; and 6% for 24+ years. Account balances are credited at 5.25% with additional credits possible based on investment returns and plan funding levels. Additional interest rate credits of 0% to 4%

[3] See Buck Consultant, *Nebraska Public Employees Retirement Systems 2013: State Employees' Retirement System Cash Balance Benefit Fund Actuarial Valuation Results as of January 1, 2013 for State Fiscal Year Ending June 30, 2015*, online at http://npers.ne.gov/SelfService/public/howto/publications/ActuarialReports/ActuaryState2013.pdf.

[4] Technically, the Nebraska rule is 5% or the midterm "IRS rate" (average rate on three-to-nine year U.S. government bonds, currently 1.66%), whichever is higher.

[5] Cavanaugh Macdonald, Kansas *Public Employees Retirement System Valuation Report as of December 31, 2011*, p. 3, online at http://www.kpers.org/reports/valuationreport123112.pdf.

credit may be granted by the Kansas Public Employee Retirement System Board. Kansas converts accumulated assets to an annuity at an assumed rate of 6%.[6]

- At the urging of the Pew Trusts, Kentucky established a cash balance plan earlier this year for new employees. Employees will contribute 5%, employers 4% of pay. Accounts will be credited with 4% interest plus three-fourths of investment earnings over 4%. Annuities will be paid at the pension plan's assumed rate of return, currently 7.75% but subject to change.[7] Estimates by the Kentucky Pension Coalition found that benefits would be cut between 13% and 29% for workers hired between ages 24 and 34 and retiring from ages 60 to 65.

In the private sector in the 1990s, many defined benefit plans converted from traditional defined benefit pension to cash balance plans, with this conversion applying to current plan members as well as future employees. (In Pennsylvania and many other states, constitutional protections mean that current members cannot be converted on a mandatory basis from a traditional defined benefit plan to a cash benefit plan.) According to the General Accountability Office, conversions in the 1990s from traditional defined benefit pension plans to cash balance plans usually reduced the pension benefits of most workers, regardless of age.[8] Older workers whose pensions were converted experienced a greater loss of expected benefits than younger workers.

The Impact of Pennsylvania Cash Balance Proposals on Retirement Security

While there has been considerable discussion in Harrisburg about cash balance as a pension option, until Representative Grell's press conference yesterday no specific proposal had been advanced in 2013.

In the 2011-12 legislative session, Pennsylvania cash balance proposals were advanced by now-retired Representative Scott Boyd and analyzed by actuaries for PSERS and SERS. The Boyd bills would have provided employees with a fixed 4% interest rate on their cash balance accounts. Employers would have contributed 4.75% to SERS pensions and employees 6.25%, for a total contribution of 11%. Employers would have contributed 5% to PSERS pensions and employees 7.5% for a total contribution equal to 12.5% of salary. Tables A1-A3 (in the Appendix) summarize actuarial estimates of the impact of HB 1676 and HB 1677 on retirement benefits. These tables show that the Boyd cash balance plans would have reduced pension benefits for almost all career

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[6] See "Kansas Public Employees Retirement System Omnibus Bill (Including New Tier 3 Plan); Senate Sub. for Sub. For HB 2333," p. 2, online at http://www.kslegislature.org/li_2012/b2011_12/measures/documents/summary_hb_2333_2012.pdf.

[7] Cavanaugh Macdonald, *Report on the Annual Valuation of the Kentucky Employees Retirement System Prepared as of June 30, 2012*, https://kyret.ky.gov/Actuarial%20Valuations/2012-valuation.pdf. The law says plan participants will "have his or her accumulated account balance annuitized based upon the assumptions set by the system at the member's retirement date" (see the text of the law, online at http://www.lrc.ky.gov/record/13rs/SB2.htm). This means that if the plan investment return assumption is lowered, the interest rate used to calculate annuities would be lowered, and benefits would be lowered.

[8] United States Government Accountability Office, *Private Pensions: Information on Cash Balance Pension Plans*, online at http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-06-42/pdf/GAOREPORTS-GAO-06-42.pdf.

trajectories analyzed (each specifying a hypothetical employee's age of hire, separation, and retirement, starting and ending salary, etc.). The size of the estimated Boyd bill benefit cuts vary widely but would have averaged roughly 40% across five sample career trajectories examined by the PSERS actuary and five analyzed by the SERS actuary (with SERS generating projections for its five trajectories using two different salary growth assumptions).

The flip side of the low quality of retirement benefits under the Boyd proposals is their low cost to the state. In fact, HayGroup, the actuary for SERS, concluded that HB 1676 would have made money for the state. Hay concluded that the total normal cost of the Boyd plan would have been 5%, with the result that employee contributions of 6.25% would more than cover this cost: "The compounded effect of earning 8% [the assumed SERS rate of interest at the time] while only paying 4% results in a plan that is completely funded by the employee contributions."[9]

It is possible to estimate the impact of other cash balance plan variations on retirement security, including the Grell proposal introduced yesterday, by using the actuarial studies of the Boyd plan. The basic approach is to compare the "cash balance" accumulated under alternative proposals (for career trajectories A-E in each of Tables A1-A3) relative to the Boyd plan proposals.[10] If an alternative cash balance proposal generates twice as much in a hypothetical employee's account by retirement age and the Boyd plan benefit equaled 50% of the Act 120 benefit for that employee than the alternative proposal benefit would equal 100% of the Act 120 benefit.

We focus in Tables 1-3 on the Grell proposal. The Grell proposal differs from the two Boyd proposals along two dimensions. First, the Grell plan provides a higher interest rate on employees' cash balance accounts – the same fixed 4% as under the Boyd plan plus half of any earnings above 4%. This different tends to improve employee benefits. Second, the Grell proposal has different levels of employee contributions for many employees. For PSERS employees, Grell proposal total contribution levels (11% in years 1-14 and 12% from years 15 forward) are lower than under the Boyd plan (12.5% in all years). For SERS employers, Grell proposal contribution levels are the same in years 1-14 (11%, based on employers contributing 4% and employees 7% while the Boyd plan reached the same 11% based on employees contributing 4.75% and employers 6.25%). Grell plan contribution levels are higher in years 15 forward (12% versus 11%) because of an increase in the

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[9] HayGroup," Actuarial Cost Note – Projected Impact of Cash Balance Proposal," p. 4. This cost note is an attachment to Public Employee Retirement Commission, *Actuarial Note* Transmitta*l House Bill Number 1676, Printer's Number 2123;* online at https://ctcoas02.state.pa.us/pls/public/rlws.download?p_file=F29839/House%20Bill%201676,%20PN%202123.pdf.

[10] The SERS actuarial study provides a starting salary, rates of annual salary increase, and an ending salary, as well as the ages of hire, termination, and retirement. The study also assumed that the investment earnings were actually a steady 8% each year (the SERS projected investment return when the study was done). We assumed a steady 7.5% annual return – which translates into a 5.75% interest rate each year under the Grell proposal because it shares half of returns over 4% with employees. With this information, computing account balances under each CB option and employee variation requires only an Excel spreadsheet. Once you have the ratio of account balances at retirement with the Grell proposal compared to the Boyd fixed 4% option, it is straightforward to generate from the Boyd actuarial studies the comparison with existing Act 120 benefits for the Grell plan. The PSERS actuarial studies did not (that we could find) indicate explicitly the starting salary or rate of salary increase, only a final salary and dates of hire and "termination." We assumed a 3% annual salary increase and then worked backwards to generate salaries in each year. KRC's spreadsheets comparing cash balances generated by the Boyd vs. Grell plans are available upon request.

Grell employer contribution in year 15 to 5% instead of 4%. The differences in contribution levels will make Grell plan benefits for PSERS employees lower than the Boyd plan and the Grell plan benefits for SERS employees with more than 14 years seniority slightly higher.

Table 1 presents the results of our estimates for PSERS employees. Table 2 and 3 present the results for SERS employees under the SERS actuary's two different assumptions about the rate of salary growth during a career. On average, across all three tables, the projected cuts under the Grell plan are a bit less than half as big as under the Boyd plan – 19% across all three tables. As under the Boyd plan, there is substantial variation in the size of the cuts across different career trajectories. Employees that start in state government at 25 but then leave at 45 to work in the private sector for two decades would have higher benefits under the Grell plan – 39% to 72% higher. The four other hypothetical employees in the tables (B-E) all experience projected benefit cuts under the Grell proposal: small ones (1% to 16%) for the employee that works in the public sector from 35 to 55 then separates and works in the private sector for a decade before retiring; large ones (46% to 66%) for all three employees that stay with government until they retire, whether they started at 22, 30, or 45.

Table 1. Comparison of Benefits for PSERS Members Under Act 120 Grell Cash Balance Proposal

Employee	A	B	C	D	E	Average for A-E
Age at Hire	25	35	45	30	22	
Age at Termination	45	55	65	65	57	
Retirement Age	65	65	65	65	57	
Salary at Termination	$32,000	$52,000	$80,000	$80,000	$57,000	
Current Defined Benefit Under Act 120	$12,071	$19,902	$30,713	$53,748	$38,206	$30,928
Cash Balance Benefit Under Grell Proposal	$16,735	$18,540	$17,649	$32,561	$17,584	$20,614
Ratio Grell Proposal Benefit to Act 120 Benefit	139%	93%	57%	61%	46%	79%
Projected Grell Proposal Benefit Cut	-39%	7%	43%	39%	54%	21%

Source. KRC estimate of the difference in cash balances accumulated in the Grell vs. Boyd cash balance plan for school employees (HB 1677 of 2011-12) plus actuarial estimate of benefits under the Boyd plan (HB 1677 of 2011-12 session) (see Table A1).

Table 2. Comparison of Benefits for SERS Members Under Act 120 and Grell Cash Balance Proposal (salary growth equals 4%)						
Employee	A	B	C	D	E	Average for A-E
Age at Hire	25	35	45	30	22	
Age at Termination	45	55	65	65	57	
Retirement Age	65	65	65	65	57	
Salary at Entry	$30,000	$30,000	$30,000	$30,000	$30,000	
Salary at Termination	$63,205	$63,205	$63,205	$113,829	$113,829	
Current Defined Benefit Under Act 120	$24,322	$24,322	$24,322	$76,655	$76,655	$45,255
Cash Balance Benefit Under Grell Proposal	$41,930	$23,973	$13,706	$50,581	$44,860	$35,010
Ratio Grell Proposal Benefit to Act 120 Benefit	172%	99%	56%	66%	59%	90%
Projected Grell Proposal Benefit Cut	-72%	1%	44%	34%	41%	10%

Source. KRC estimate of the difference in cash balances accumulated in the Grell vs. Boyd cash balance plan for school employees (HB 1676 of 2011-12) plus actuarial estimate of benefits under the Boyd plan (HB 1677 of 2011-12 session) (see Table A2).

Table 3. Comparison of Benefits for PSERS Members under Act 120 and Grell Cash Balance Proposal (salary growth equals 6%)						
Employee	A	B	C	D	E	Average for A-E
Age at Hire	25	35	45	30	22	
Age at Termination	45	55	65	65	57	
Retirement Age	65	65	65	65	57	
Salary at Entry	$30,000	$30,000	$30,000	$30,000	$30,000	
Salary at Termination	$90,768	$90,768	$90,768	$217,531	$217,531	
Current Defined Benefit Under Act 120	$34,291	$34,291	$34,291	$143,815	$143,815	$78,101
Cash Balance Benefit Under Grell Proposal	$50,552	$28,902	$16,525	$69,442	$61,588	$45,402
Ratio Grell Proposal Benefit to Act 120 Benefit	147%	84%	48%	48%	43%	74%
Projected Grell Proposal Benefit Cut	-47%	16%	52%	52%	57%	26%

Source. KRC estimate of the difference in cash balances accumulated in the Grell vs. Boyd cash balance plan for school employees (HB 1676 of 2011-12) plus actuarial estimate of benefits under the Boyd plan (HB 1677 of 2011-12 session) (see Table A3).

Cash balance plans work better for those who start in the public sector early but then leave public service because these employees have the longest period during which compound interest can work its magic to grow their cash balance account. Anyone who stays with government service

until they retire has little time during which compound interest can grow the contributions made when they had their highest salary.

While the Grell proposal projected cuts are less dramatic than the Boyd plan cuts, it is worth remembering that the point of comparison – benefits under Act 120 – is pension plans that already have low costs to taxpayers: projected to be 3% of payroll across the PSERS and SERS plans together. Since employees under Act 120 contribute to their pensions about 7% of their salary on average, they already account for 70% of total contributions for their benefits. A 20% cut in employee benefits relative to Act 120 in effect means that new employees under the Grell plan would pay for nearly 90% of their own benefits. In sum, while the Grell plan does not lead to the perverse result of the Boyd plan – under which new employees would have more than paid for their own benefits – it does lower the cost to the public sector of pension for new employees to almost nothing. In effect, new employees would be shouldering a large burden of the cost of the pension fund unfunded liabilities because paying little for new employees frees up state and school district resources to pay down the unfunded liability. As noted earlier, since new employees had nothing to do with accumulating the unfunded liability it is not clear why they should effectively pay off that liability.

One last note on estimates of benefit cuts under the Grell plan: we make one critical assumption that could result in Tables 1-3 being underestimates of the size of the benefit cuts. We assume that the average investment return achieved by SERS and PSERS will remain at 7.5%. If in the long term, as discussed below, the pension plans' investment returns drift down towards the guaranteed 4% interest rate then the Grell plan interest rate applied to cash balance accounts each year will drift down from 5.75% to the same 4% provided under the Boyd plans. In this scenario, the benefit cuts under the Grell plan would increase towards the levels shown in Tables A1 to A3 for the Boyd plan.[11]

The Impact of a Cash Balance Plan on Investment Returns

As noted earlier, one positive feature of cash balance plans is that they do not require closing the existing defined benefit plans and can be established as a new "tier" within the PSERS and SERS plans. This means that the PSERS and SERS plans overall will retain a balanced mix between

[11] Two other technical issues in our estimates should be addressed in actuarial estimates of the benefit impact of the Grell proposal. One critical issue is the interest rate used to convert cash balances at retirement to an annuity. As the Appendix notes, we could not find the rate used by the Boyd plans actuarial studies, although we expect it was 8%, the project investment return of PSERS and SERS at the time of those studies. This rate would thus be 7.5% now, a change that would slightly lower benefits under the Grell plan versus the estimates made earlier for the Boyd plan. A second technical issue is that SERS and PSERS do not, in reality, earn a steady 7.5% but rather a fluctuating rate that sometimes drops below 4%. Assuming a steady rate – and an interest credit of 5.75% each year – underestimates the average Grell rate of return compared to a fluctuating rate. For example, the Grell interest rates for two years at 7.5% would be 5.75% and 5.75%, whereas the Grell interest rates for one year at 0% and one year at 15% would be 4% and 9.5%, a sum of 13.5% rather than 11.5%. More generally, since we generate our estimates without actuarial models but piggybacking on earlier estimates generated with actuarial models, it is important that PSERS, SERS, and PERC generate their own actuarial estimates or actuarial notes specifically for the Grell plan.

younger workers, older workers, and retirees. It also means that the existing pension plans members do not age and retire as a group as they would if the state had close the plans to new members and created 401(k)-type individual accounts for new employees. This, in turn, means that adopting a cash balance plans avoids the need to shift to more conservative and liquid investments because plan members are aging and retiring as a group – and avoids the decline in investment returns associated with this shift.

There is, however, a different reason that cash balance plans could lead to lower investment returns. Specifically, if workers are only guaranteed a certain minimum rate of return – such as 4% under the Boyd and Grell proposals – the pension plans are only "on the hook" to deliver that amount. This could make pension plan managers become more conservative because as long as they earn 4% they would not accrue any new unfunded liabilities. How quickly this effect would come into play with funds that still have large unfunded liabilities is both open to debate and uncharted territory because of the limited experience with public sector cash balance plans. For example, it could be that this effect becomes important only once a substantial share of active plan members belong to the cash balance tier of PSERS and SERS.

In an actuarial note on the Boyd cash balance plans, the actuary for the Public Employee Retirement Commission (PERC) recommended that PSERS consider lowering its investment return when cash balance membership has grown: "Lastly, once active membership in PSERS has significantly become cash balance members with a guaranteed investment return and PSERS continues to have a sizable population of retired members, the System should consider revising their [sic] investment policy. The System may be inclined to invest assets in a more conservative manner…"[12]

If a cash balance plan results in investment returns declining towards the guaranteed minimum, it has three negative effects. First, to the extent that Pennsylvania still has unfunded liabilities these would increase, with taxpayers having to pick up the slack. Second, lower investment returns means that benefits even under a plan that shares investment returns above the minimum (such as the Grell plan) would decline towards the level of a plan that only provides the minimum. Thus estimates of the pension cuts under the Boyd plan (Tables A1-A3) would increasingly apply to the Grell plan. Third, lower investment returns means a less efficient pension plan, which requires higher levels of taxpayer and employee contributions to achieve the same benefit.

The Impact of a Cash Balance on Retention of Experienced Employees

The estimates above make very clear that cash balance plans reduce pensions most for long-term career employees who retire straight from public service. Cash balance plans also benefit experienced workers who leave government service after a decade or two and work in the private sector starting in their late thirties to early fifties. These two changes mean that public sector

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[12] Timothy J. Nugent and Katherine A. Warren letter to PERC Executive Director James McAneny containing Milliman (PERC actuary) actuarial note on House Bill 1677, p. 7, attached to PERC Actuarial Note Transmittal on HB 1677, August 4, 2011, online at online at https://ctcoas02.state.pa.us/pls/public/rlws.download?p_file=F12034/House%20Bill%201677,%20PN%202124.pdf.

pensions would no longer be an effective human resource management tool for retaining mid-career experienced employees. As a result, public employers might to provide offsetting wage increases to retain mid-career workers, another potential cost for taxpayers.

The transmittal of the actuarial note on the Boyd bill covering school employees points out that "One unintended effect of the bill may be to decrease the attractiveness of public school employment. The General Assembly and the Governor must determine whether the benefit provisions of the bill are consistent with the long-term personnel management goals of school and Commonwealth employers." [13]

PERC itself noted in its transmittal of the actuarial note: "…if the pension benefits are reduced, there may be pressure to increase other compensation to provide for the same total compensation as before." [14]

Conclusion

While superior in a number of respects to 401(k)-type individual accounts, cash balance plans have a number of potential drawbacks.

- Depending on the details of the cash balance plan, they may result in large cuts in employee benefits, especially for long-term employees who remain with public service until they retire.

- Second, they could result in an erosion of pension plan investment returns once a large share of overall pension fund members are in the cash balance plan. This would
    - increase the size of any remaining unfunded liability,
    - further erode benefits under any cash balance plan that shares with employees investment returns above the guaranteed interest rate, and
    - increase the cost of any given level of retirement benefits for both taxpayers and employees.

- Third, the erosion in the quality of benefits for long-term employees could lead to an exodus from public service mid-career of experienced employees who hold our schools and our state agencies together. This could require offsetting wage increases, another cost to taxpayers, as well as erode the quality of public service.

Cash balance plans are also poorly understood by many policymakers and the public, and have not been subject to the scrutiny and discussion of defined contribution plans. Rather than rush to approve a radical pension overhaul without fully weighing the implications, we recommend that

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[13] Nugent and Warren, letter to PERC Executive Director James McAneny containing Milliman (PERC actuary) actuarial note on House Bill 1677, p. 7.

[14] PERC Actuarial Note Transmittal on HB 1677, August 4, 2011, p. 13, online at online at https://ctcoas02.state.pa.us/pls/public/rlws.download?p_file=F12034/House%20Bill%201677,%20PN%202124.pdf.

Pennsylvania build on the progress already made in a 2010 pension reform law (Act 120) in the following ways:

- Explore the potential of bonds as a way for the state to buy down the current unfunded liability and potentially reduce the spike in pension contributions for school districts and the state.

- Strengthen requirements for the state to make the contributions needed each year to maintain the pension funds on a gradual path to full funding.

- Conduct an actuarial study of the Act 120 risk-sharing provisions to estimate how much higher Pennsylvania's pension funding levels would be today if those provisions had been in place since 2000. This study could be the basis for considering whether a stronger risk-sharing provision.

- Assess whether the State Employees' Retirement System (SERS) and the Public School Employees' Retirement System (PSERS) could save significant funds without lowering projected investment returns if they relied less on outside firms and relied more on their own professional staff to manage pension fund assets.

- Increase state revenues available to meet all state needs and dedicate a small portion of these funds to pay down the unfunded liability.

Appendix A
Actuarial Estimates of the Impact of the Boyd Cash Balance Plan on Retirement Benefits

As noted in the text, introduced cash balance bills covering state (HB 1676) and school (HB 1677) employees in the 2011-12 session. These bills would have provided employees with a fixed 4% interest rate on their cash balance accounts. Employers would have contributed 4.75% to SERS pensions and employees 6.25%, for a total of 11%. Employers would have contributed 5% to PSERS pensions and employees 7.5%. Tables 1-3 summarize actuarial estimates of the impact of the Boyd bills on state and school employee pensions. [15] These tables reveal that:

- Employees who retire when they leave their government job – especially after 35 years but also after only 20 – experience the largest cuts in benefits (46% to 71%). This is partly because their salary in their later years does not have much time to accumulate compound interest – and thus does little to boost their cash balance benefit whereas it does boost their defined benefit pension.

- Employees who work for government for the first part of their career but then work outside the public sector for a full 20 years, while their cash balance accounts grow (but their defined benefit pensions do not increase) received the smallest cuts in projected benefits with the transition to the Boyd plans: anywhere from a 12% cut to a 2% increase.

- Employees who work for government for 20 years, retire at 55, and then work outside government for 10 years before receiving their benefit, experience a 26% to 41% cut in benefits

Table A1. Comparison of Benefits for PSERS Members under Act 120 and Boyd Cash Balance Proposal in HB 1677

Employee	A	B	C	D	E	Average for A-E
Age at Hire	25	35	45	30	22	
Age at Termination	45	55	65	65	57	
Retirement Age	65	65	65	65	57	
Salary at Termination	$32,000	$52,000	$80,000	$80,000	$57,000	
Current Defined Benefit Under Act 120	$12,071	$19,902	$30,713	$53,748	$38,206	$30,928
Cash Balance Benefit Under Boyd Proposal	$11,256	$14,735	$16,574	$25,880	$12,857	$16,260
Ratio Act 120 to Boyd Proposal Benefit	93%	74%	54%	48%	34%	61%
Projected Boyd Proposal Benefit Cut	7%	26%	46%	52%	66%	39%

Source. Actuarial estimate of benefits under Boyd cash balance proposal (HB 1677 of 2011-12 session), online at https://ctcoas02.state.pa.us/pls/public/rlws.download?p_file=F12034/House%20Bill%201677,%20PN%202124.pdf

[15] In the actuarial estimates of benefit adequacy under the Boyd proposals, we could not find the interest rate used in determining the annuity generated by the amount of money in employees' accounts. We expect it was the plan's project rate of return at the time of the actuarial estimates (8%).

Table A2. Comparison of Benefits for SERS Members under Act 120 and Cash Balance Proposal in HB 1676 (salary growth equals 4%)

Employee	A	B	C	D	E	Average for A-E
Age at Hire	25	35	45	30	22	
Age at Termination	45	55	65	65	57	
Retirement Age	65	65	65	65	57	
Salary at Entry	$30,000	$30,000	$30,000	$30,000	$30,000	
Salary at Termination	$63,205	$63,205	$63,205	$113,829	$113,829	
Current Defined Benefit Under Act 120	$24,322	$24,322	$24,322	$76,655	$76,655	$45,255
Cash Balance Benefit Under Boyd Proposal	$24,909	$16,828	$11,368	$35,829	$29,233	$23,633
Ratio Boyd Proposal Benefit to Act 120 Benefit	102%	69%	47%	47%	38%	61%
Projected Boyd Proposal Benefit Cut	-2%	31%	53%	53%	62%	39%

Source. Actuarial estimate of benefits under Boyd cash balance proposal (HB 1676 of 2011-12 session), online at https://ctcoas02.state.pa.us/pls/public/rlws.download?p_file=F29839/House%20Bill%201676,%20PN%202123.pdf

Table A3. Comparison of Benefits for SERS Members under Act 120 and Cash Balance Proposal in HB 1676 (salary growth equals 6%)

Employee	A	B	C	D	E	Average for A-E
Age at Hire	25	35	45	30	22	
Age at Termination	45	55	65	65	57	
Retirement Age	65	65	65	65	57	
Salary at Entry	$30,000	$30,000	$30,000	$30,000	$30,000	
Salary at Termination	$90,768	$90,768	$90,768	$217,531	$217,531	
Current Defined Benefit Under Act 120	$34,291	$34,291	$34,291	$143,815	$143,815	$78,101
Cash Balance Benefit Under Boyd Proposal	$30,031	$20,288	$13,706	$50,451	$41,163	$31,128
Ratio Boyd Proposal Benefit to Act 120 Benefit	88%	59%	40%	35%	29%	50%
Projected Boyd Proposal Benefit Cut	12%	41%	60%	65%	71%	50%

Source. Actuarial estimate of benefits under Boyd cash balance proposal (HB 1676 of 2011-12 session), online at https://ctcoas02.state.pa.us/pls/public/rlws.download?p_file=F29839/House%20Bill%201676,%20PN%202123.pdf