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The Basics of a Cash Balance Plan Design

Presentation to the KPERS Study Commission

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Today's Discussion Topics

- Basic education on plan design
  - Funding of retirement plans
  - Types of retirement plans
  - Risks associated with retirement plans
- Cash Balance Plan design
  - What are they and how do they work
  - Plan design features
  - Cost drivers
  - Comparison to traditional DB plans and DC plans
- Plan Design Considerations

Retirement Benefit Financing

- Basic Retirement Funding Equation

$$C + I = B + E$$

C = Contributions
I = Investment Income
B = Benefits Paid
E = Expenses

Retirement Plan Overview

- Two broad categories: Defined contribution(DC) and Defined benefit (DB)

- DC plan: a plan which provides for an individual account for each participant and benefits are based solely on the amount contributed and any income, expenses, gains, losses on the account

- DB plan: any plan which is not a defined contribution plan

Retirement Plan Overview

- Defined Benefit (DB) Plans – focus on benefit security
- Defined Contribution (DC) Plans – focus on wealth accumulation
- Defined Contribution Plans include 401(k) plans, 457 plans, 403(b) plans and 401(a) plans
  - Risks include wage inflation risk, price inflation risk, investment risk, longevity risk, contribution risk, leakage risk and non-participation risk

Retirement Plan Overview

- Defined Benefit Plans include final average pay plans, career average plans, and flat dollar plans
  - Risk is either borne by employer or shared employer/employee depending on how contributions are determined
  - Risks include wage inflation risk, postretirement price inflation risk, investment risk, longevity risk, contribution risk
- Hybrid Plans are a combination of both a DB and a DC plan or a plan that has traits of both type plans like a Cash Balance Plan
  - Risks are generally shared between employer and employee

Definition of Risks

- Investment Risk (rate of return on assets)
  - DB plans
    - An assumed rate of return is used in developing the annual contribution rate
    - Actual experience varies year to year from the assumed (expected) rate of return
    - Difference in actual vs expected experience creates changes in the actuarial contribution rate, at times significant
    - Employer usually bears this risk unless contribution increases are shared with employees
  - DC plans
    - Investment risk still exists, but employee bears all
    - Professionally managed DB funds earn approximately 1% more than individually managed DC plans and have lower expenses
    - Timing risk: reactive to market conditions. Change asset allocation at wrong time
    - Differences in actual vs expected returns result in lower benefits or require higher contributions

Definition of Risks

- Inflation Risk
  - Pre-retirement or wage inflation (how salaries increase while working)
    - DB plans are usually based on final average pay so employee has limited cost of living risk before retirement
    - DC plans are based on contributions over the employee's working lifetime, not just prior to retirement, so there is more wage inflation risk
  - Post-retirement inflation
    - DB plans: if plan has COLA, employee has some protection against inflation in retirement. If no COLA, employee fully bears this risk
    - DC plans: employee bears all the risk

Definition of Risks

- Longevity Risk
  - Uncertainty about how long you will live
  - Employee retiring at age 65 can expect to live to age 85
    - 50% chance of living ***beyond*** age 85 and 30% chance of living beyond age 90
  - Financial security depends on ability to manage longevity risk
  - Longevity is impossible to predict at an individual level, but predictable and manageable for larger groups

Definition of Risks

- Longevity Risk
  - DB Plan: Pooling of longevity risk protects the employee and provides retirement security
  - DC Plan: Employee bear longevity risk.
    - Can reduce risk by accumulating excess assets
    - Can eliminate risk by buying an annuity but usually results in a lower benefit

Definition of Risks

- Contribution Risk
  - Level and volatility of annual contributions
  - DB plans: employer often bears this risk. Sometimes this is shared with employees
  - DC plans: contributions are a fixed percentage of salary.
    - No volatility of contributions.
    - If investment returns are low, employees have to make additional contributions to reach retirement goals or receive lower benefits.

Definition of Risks

- Non-participation risk (DC Plan Only): risk that employees will not participate in the plan
  - Common in corporate 401(k) plans
  - Can address with automatic enrollment
  - Can eliminate this risk if participation is mandatory (public plans only)
- Leakage risk
  - Spending money prior to retirement (when terminate employment)
  - DB plans: must leave their money in the plan to receive a monthly benefit at retirement
  - DC plans: low percent of people getting distributions roll them over to another plan or IRA

Retirement Design Strategy

- Determine goals and objectives
  - Cap or reduce costs (what level?)
  - Stabilize costs (how much variation is acceptable?)
  - Reduce or better manage risk
  - Is funded ratio a consideration?
- Retirement philosophy
  - Who should bear the risk?
  - Importance of income security?
  - Career employee – how defined?
  - Which employees will be impacted by change?
    - Current retirees
    - Current actives (future service only)
    - Future hires

Retirement Design Strategy

- Attraction and retention of employees
  - Are retirement benefits important in attracting employees?
  - Are retirement benefits important in retaining employees?
  - Marketplace competition for talent and importance of benefits
  - Future hires – what type of workers will be needed and what retirement program will attract and retain those employees
- Total compensation
  - Salary, retirement, health, life and other fringe benefits

Cash Balance Plans

- Combines features of both DB and DC plans
- DC features: value of benefit is expressed during working years as account value.
- DB features:
  - Benefit is paid as lifetime income at retirement (lump sum may be optional form of payment)
  - Guaranteed interest crediting rate
  - Assets are pooled and professionally managed
  - Employer contributions will vary depending on the actual experience compared to actuarial assumptions

Plan Design Features of Cash Balance Plans

- Employee contribution rate
- Employer pay credit
- Interest crediting rate
  - Guaranteed rate
  - Additional credit when experience is good?
- Conversion of account value to monthly income
  - Requires an investment return assumption and a mortality assumption
  - Conservatism can be built into the assumptions
  - Can provide for prospective changes in assumptions with Board action
  - Partial/full lump sum can be offered as optional form of payment

Actuarial Funding of Cash Balance Plans

- Cash balance plans are DB plans that use actuarial assumptions and require an actuarial valuation
- Valuation determines the employer contribution rate based on census data for current members, expected benefit payments, plan assets and the actuarial assumptions
  - Actuarial contribution rate will vary with experience
  - Could set a fixed employer contribution rate like Nebraska
- Investment return assumption vs interest crediting rate and other assumptions will impact the employer contribution rate

Actuarial Funding of Cash Balance Plans

- Example: Assume an employer pay credit of 5%
  - If interest crediting rate is 7% and actuarial assumption is 7%, the employer contribution = 5%
  - If interest crediting rate is 5% and actuarial assumption is 7%, the employer contribution < 5%
- As actual return varies from assumed, it is reflected in the actuarial contribution rate
- Actual investment experience will ultimately drive the cost of the plan, but easier to build in some conservatism than with traditional DB plan

Public Sector Cash Balance Plans

- Nebraska State and County Plans
  - Initially DC plans when started (1964 and 1965)
  - Converted to Cash Balance Plans in 2003
- Texas County & District Retirement System
  - Established as Cash Balance Plan in 1967
  - Each participating employer chooses the benefit structure and individual valuations are performed for each employer
- Texas Municipal Retirement System
  - Established as Cash Balance Plan in 1948
  - Each city selects plan design and individual valuations are performed

Hypothetical Cash Balance Account Value

YEAR	Beginning Balance	Total Pay Credits	Interest Credit	Ending Balance
Year 1	0	3,600	108	3,708
Year 2	3,708	3,900	340	7,948
Year 3	7,948	4,000	597	12,545
Year 4	12,545	4,200	879	17,624
Year 5	17,624	4,400	1,189	23,213
Year 6	23,213	4,500	1,528	29,241

Assumes 6% interest credit with monthly crediting.

Impact of Interest Crediting Rate on Account Balance

YOS	5%	6%	7%	8%
35	451,000	539,000	650,000	789,000
25	207,000	234,000	267,000	304,000
15	80,000	86,000	93,000	100,000
10	13,000	13,000	14,000	14,000

All projections assume the member works the designated years, has a starting salary of $35,000, 8% total pay credit, and annual salary increases of 4%.

Conversion of Cash Balance Account of $350,000 to Monthly Income

Age at retirement	5%	6%	7%
55	1,937	2,153	2,376
60	2,117	2,329	2,547
62	2,207	2,418	2,634
65	2,365	2,575	2,788
67	2,490	2,698	2,910

All conversions assume an account balance of $350,000 and use of the RP 2000 Mortality Table projected to 2030, 50%/50% male/female blend.

Cost Factors of a Cash Balance Plan

- Employer Pay Credit
  - Higher pay credits will result in higher cost
  - Higher vesting requirement lowers cost
- Interest Crediting Rate
  - A higher expected return than the guaranteed interest crediting rate will lower the employer cost
  - Actual costs will depend on actual investment experience
  - Can reduce the risk to the plan by setting guaranteed interest rate low and granting “dividends” if the funded status of the plan permits
  - If dividends are granted, there is one time increase in the actuarial liability

Cost Factors in a Cash Balance Plan

- Basis used to convert the account balance to monthly income (annuity purchase rates)
  - Requires both an investment return assumption and mortality assumption
  - Can be conservative in setting the investment return assumption (lower than expected return)
  - Can be conservative in setting the mortality assumption (project mortality improvements)
  - Enable Board to change the assumptions prospectively for those not yet retired
  - COLAs are paid for by the member in the form of reduced initial benefit
- Longevity risk is manageable for large groups

Cost Factors in a Cash Balance Plan

- Full or partial lump sum options reduce the longevity risk for the Plan

- Buy annuities from an insurance company at retirement will eliminate longevity risk
  - Usually the Plan can provide higher benefit than the insurance company
  - Fiduciary responsibility of selecting an insurance company
  - Annuity rates vary with market conditions so similarly situated members could end up with different benefit amounts if they retire at different times
    - Difficult for members to anticipate actual monthly income until at retirement

Summary of Different Plan Designs

Type	Description	Example	Variations	Pros	Cons
1. Final Average Pay DB Plan	Benefit based on a percentage of participant's average earnings during specified period	1.75% x Final 5-year Average Earning x Years of Service	Multiplier can vary with years of service. May limit service or salary; Can limit overall dollar amount	Benefit linked to salary growth; keeps pace with pre-retirement wages. Provides benefit security.	Back-loaded accrual/cost pattern. Highest value in last years. Much of risk lands on employer
2. Cash Balance Plan	Benefit based on account balance that may be converted to annuity at retirement; Account balance is hypothetical and determined similar to DC Plan	9% of pay contributed to account; account balance grows 5% per year for interest credit	Contributions may vary by age and/or service. Additional dividends can be granted when affordable	Benefit partially linked to salary growth; Easier for participants to understand; Benefit defined in terms of account balance	Not common in public sector; Potential increased administration. Still risks that need to be managed.
3. Defined Contribution Plan	Individual account is maintained for each employee with actual investment earnings credited to the account.	9% of pay contributed to the account. Actual investment earnings credited to the account.	Contributions may vary by age and/or service	Easier for participants to understand and grasp the value of the account;	Much of risk lands on employee. Requires ongoing education of employees.

EE/ER Risk Features of Different Plan Designs

	KPERS Defined Benefit		Defined Contribution		Cash Balance	
Economic Risk	**ER**	**EE**	**ER**	**EE**	**ER**	**EE**
Investment Risk	High	Low	None	High	Medium	Low
Inflation Risk – wage (pre-retirement)	High	None	None	High	None	High
Inflation Risk – price (post-retirement)	None	High	None	High	None	High
Contribution Risk	High	Low	None	High	Medium	Low
Longevity Risk	Medium	None	None	High	Medium	None
Features						
Rewards older/longer service employees	High		Low		Medium	
Provides retirement security	High		Low		Medium	
Attract employees	Medium		High		High	
Retain employees	High		Low		Medium	
Provides systematic retirement of employees	High		Low		Medium	

Adequate Retirement Income

- Replacement ratio: common method used to analyze and compare retirement programs and measure the relative income provided by the retirement plan as a percentage of employee's final salary
- Replacement ratio includes income from all sources including employer provided retirement plans, Social Security, and employee savings
- Benchmark is 75% to 90% of pre-retirement income (replacement ratio) is needed to maintain the employee's standard of living after retirement
- Not a perfect measurement because of diversity in the population

Replacement Ratio Comparison

- Modeling assumptions
  - DC returns pre-retirement of 7%
  - Retire at age 65 with 30 years of service
  - Conversion of DC account balance to monthly income is based on 5% and RP 2000 Mortality Table projected to 2030
  - Contributions to DC Plan: 6% employee, 2% employer
  - DB benefit structures: current and HB 2194 Defaults
  - Cash Balance plan: 6% employee contribution, 3% employer pay credit, 6% guaranteed interest crediting rate. Conversion to monthly income based on 6%/RP2000 projected to 2030
  - Results are sensitive to the underlying assumptions used to estimate the monthly plan benefits
  - Further analysis is appropriate

Replacement Ratio Comparison

Percentage of final salary replaced
(Not all plan designs have same cost)

Current plan – Tier 1	50.5% *
New hires under HB 2194	48.6%
DC plan (6%/2%)	31.3%
Cash Balance plan	43.7%

* Tier 1 would have allowed unreduced retirement at age 60 with 25 years – the replacement ratio would have been 42.1%, but the benefit would be payable for five more years

Replacement Ratio Comparison

Percentage of final salary replaced
(Not all plan designs have same cost)

New hires under HB 2194	48.6%
DC plan (6%/2%) with 7% return	31.3%
DC plan (6%/2%) with 9% return	43.6%
DC plan (6%/2%) with 5% return	23.0%

Plan Design Considerations
Risk Management

- Risk components
  - Investment return
  - Longevity
  - Inflation (pre and post retirement)
  - Contribution
- Is it in the proper place?
- Can it be managed by the person bearing it?
- Short term vs. long term risk (don't solve the short term problem and create a long term problem)
- Implications of wrong choice

Plan Design Considerations

- Retirement Philosophy
  - Adequacy of benefits
  - Importance of benefit security
  - Protect purchasing power after retirement
  - How are benefit dollars allocated and who receives the greatest value
- Funding Policy
  - Amount of contributions
  - Stability in contribution rate
  - Flexibility
  - Funded ratio
- Balance stakeholder interests
  - Employer
  - Employee
  - Taxpayer