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The Basics of a Cash Balance Plan Design

Presentation to the KPERS Board

By: Patrice Beckham, FSA, FCA, EA, MAAA
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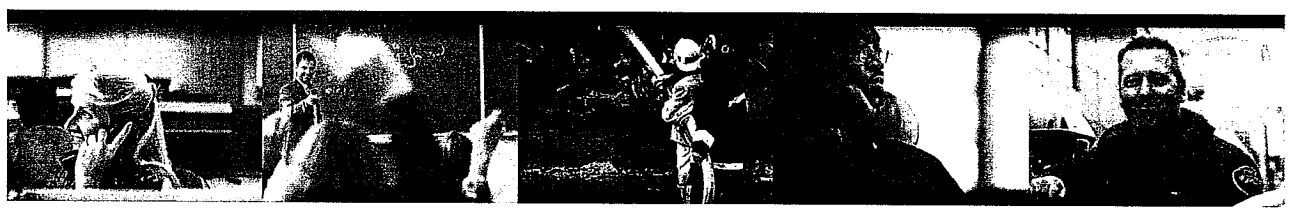


House Pensions & Benefits
Date: 2-6-13
Attachment # 1

Today's Discussion Topics

- Basic education - plan design
  - Types of retirement plans
  - Risks associated with retirement plans
- Cash Balance Plan design
  - What are they
  - How do they work
  - Plan design features
  - Comparison to traditional DB plans or DC plans
- KPERS Tier 3 Design

Retirement Benefit Financing

- Basic Retirement Funding Equation

$$C + I = B + E$$

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

Types of Retirement Plans

- 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

Types of Retirement Plans

- Defined Benefit (DB) Plans – focus on benefit security

- Defined Contribution (DC) Plans – focus on wealth accumulation

Types of Retirement Plans

- Defined Contribution Plans include:
  - 401(k) plans
  - 457 plans
  - 403(b) plans
  - 401(a) plans

- Named for sections of the IRS Code that govern each type of plan

Types of Retirement Plans

- Defined Benefit Plans include:
  - Final average pay plans
  - Career average plans
  - Flat dollar plans

- Hybrid Plans:
  - Combination of two plans: a DB and a DC plan
  - One plan that has traits of both DB and DC plans like a Cash Balance Plan

Retirement Plan Risks

- Investment risk
- Inflation
  - Pre-retirement (wage increases)
  - Post-retirement (loss of purchasing power due to price inflation)
- Longevity
- Contribution
- Leakage (mainly DC)
- Non-participation (mainly DC)

Retirement Plan 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 significantly
    - Employer usually bears this risk unless contribution increases are shared with employees
  - DC plans
    - Investment risk still exists, but employee bears all of it
    - Professionally managed DB funds earn about 1% more than individually managed DC plans and also 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, generally by the employee

Retirement Plan Risks

➢ Inflation Risk

- Pre-retirement = wage inflation (how salaries increase while working)
  - DB plans: usually based on final average pay so employee has limited cost of living risk before retirement
  - DC plans: 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 a COLA, employee has some protection against inflation in retirement. If no COLA, employee fully bears this risk
  - DC plans: employee bears all the risk

Retirement Plan 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
    - 75% chance of at least one of husband and wife living ***beyond*** age 85 and 45% 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

Retirement Plan Risks

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

Retirement Plan Risks

- **Contribution Risk:** Level and volatility of annual contributions
  - DB plans: employer often bears this risk, but sometimes shared with employees
  - DC plans: employer contributions are usually a fixed percentage of salary
    - No volatility of contributions for employer
    - If investment returns are low, employees have to make additional contributions to reach retirement goals or receive lower benefits (full risk is on employee)

Retirement Plan Risks

- Leakage risk: Spending money prior to retirement (terminate employment and take distribution)
  - DB plans: usually employees must leave their money in the plan to receive a monthly benefit at retirement
  - DC plans: small percentage of people getting distributions roll them over to another plan or IRA

Retirement Plan Risks

- Non-participation risk (typically 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)

Hybrid Plans

- Combination of DB and DC Plans (two plans)
  - DB plan operates like a traditional DB plan with corresponding treatment of risk
    - Guaranteed monthly income
    - Benefit related to final salary
    - Lifetime income
    - Funded in aggregate with assets invested by professionals
  - DC plan operates like regular DC plan
    - Individual account plan
    - Benefit is account balance at retirement
    - Investments usually directed by member
    - Portable

Hybrid Plans

- Cash Balance Plan
  - DC features
    - Value of benefit is expressed during working years as account value
    - Investment risk may be shared with employee
  - 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
    - Contributions to fund the system will vary depending on the actual experience compared to actuarial assumptions

Hybrid Plans

- Allocation of retirement risks
  - Depends heavily on the design of the hybrid plan
- Tends to be more "sharing" of the various retirement risks
  - Cash Balance Plans
    - Additional interest credits/dividends can give some of the favorable experience (and arbitrage) to members
    - Ability to change mortality for conversion serves to transfer future mortality improvement risk
- Typical designs result in risk being more balanced than a final pay DB plan (primarily employer risk unless contributions are shared) or a DC plan (almost entirely employee risk)

Risk Features of Different Plan Designs

Economic Risk	KPERS Defined Benefit		Defined Contribution		Cash Balance	
	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	

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 similarly 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.

General Plan Design Features of Cash Balance Plans

- Employee contribution rate
- Employer pay credit
- Interest crediting rate
- Payments at termination of employment
- Conversion of account value to monthly income at retirement

Factors Affecting Benefits in a Cash Balance Plan

- Pay credit
  - Often a fixed percentage of pay
  - Can vary with age, service, or both
- Interest credit
  - Can be fixed – most common in public sector
  - Often linked to a Treasury rate or other bond rate in private sector
  - Can be linked to equity indices, even the actual fund return (subject to a 0% cumulative return floor)

Factors Affecting Benefits in a Cash Balance Plan

- Additional interest credits (dividends)
  - More common in public plans (perhaps because they are contributory)
  - In some plans, earnings above certain threshold may be shared with members by granting an additional credit
  - Can be formula based or discretionary, depending upon recent returns, funded status, etc.

- Interest crediting frequency
  - Annual, quarterly, or monthly
  - Usually calculated on balance at beginning of period

Factors Affecting Benefits in a Cash Balance Plan

- Annuity factors (converting the account balance into monthly income)
  - Requires an investment return assumption and a mortality assumption
  - Investment return and mortality can be fixed or variable
  - Can build in a self-funded COLA or fund a COLA in advance as part of the benefit structure
  - Conservatism can be built into the assumptions (mortality improvement in future)
  - Can provide for prospective changes in assumptions with Board action
  - Partial/full lump sum can be offered as optional form of payment

Factors Affecting Benefits in a Cash Balance Plan

- Vested termination
  - Member is always vested in their own contribution balance and may elect to withdraw it upon termination
  - Specific provisions of the plan will govern the employer provided benefit
    - May pay employer account balance as lump sum at termination
    - May provide that the employer account balance is forfeited if the member takes their contributions out (as is often done in traditional DB plans)
    - If employee contributions remain in the plan, interest credits are usually applied to the account value

Factors Affecting Benefits in a Cash Balance Plan

- Pre-retirement death, disability
  - Commonly provides only the account balance
    - Benefit is small, especially in the early part of career
  - Could offer something similar to a traditional plan or continued accruals during disability
  - Much more flexibility in this area than DC plans because it is a DB plan

Calculating a Benefit – Before Retirement

- A Cash Balance plan maintains notional accounts for each member
- Accounts are increased with pay credits and interest credits
- Credits are applied (usually) annually, quarterly, or monthly
- Interest credits are usually on the beginning of period balance
  - $CB_{t+1} = CB_t \times (1+i_t) + p_t$
- Observations
  - The accounts are <u>hypothetical</u> – there are no matching assets. This is very different from a DC plan where assets and account balances are exactly matched.
  - No self-direction of investments by employee. Asset allocation is determined by Board and assets invested in aggregate.

Hypothetical Cash Balance Account Value

YEAR	Beginning Balance	Total Pay Credits	Interest Credit	Ending Balance
Year 1	$0	$3,600	$95	$3,695
Year 2	3,695	3,900	296	7,891
Year 3	7,891	4,000	519	12,410
Year 4	12,410	4,200	762	17,372
Year 5	17,372	4,400	1,028	22,800
Year 6	$22,800	$4,500	$1,315	$28,615

Assumes 5.25% interest credit.

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%.

Calculating a Monthly Retirement Benefit

- At termination (including retirement, death, or disability), the account balance may be available as a lump sum
  - Could be rolled over to an IRA or other retirement plan
- If member is vested, the account can be allowed to grow with interest credits until a later distribution date
- If a lump sum distribution is not offered or elected, the lump sum (account balance) is converted at retirement to an annuity under some specified actuarial basis
  - As a qualified defined benefit plan, an annuity option must be offered.

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

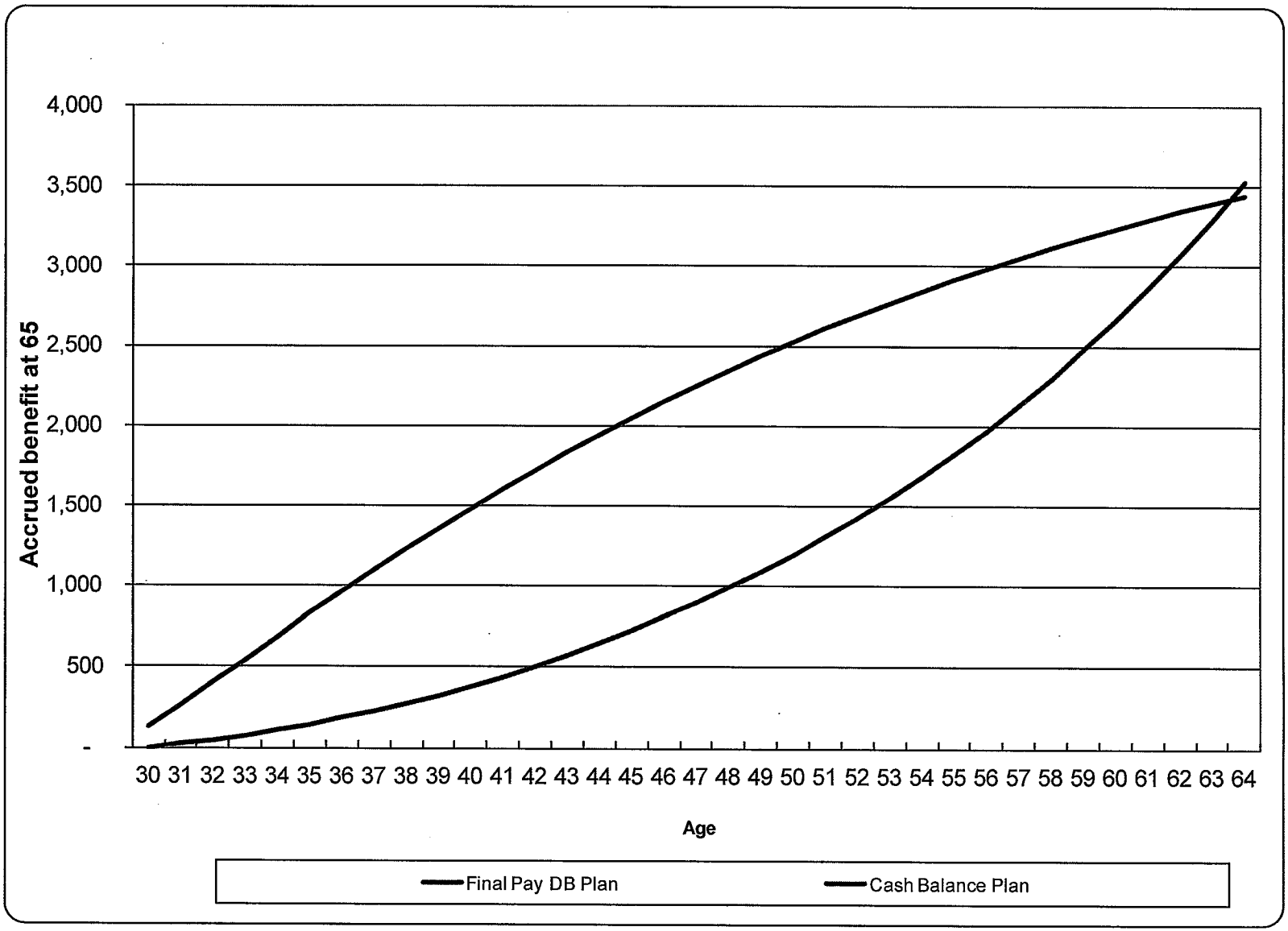
Age at retirement	5%	6%	7%
55	$1,937	$2,153	$2,376
60	2,117	2,329	2,547
62	2,207	2,418	2,634
65	2,365	2,575	2,788
67	2,490	2,698	2,910

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.

Cash Balance Plans

- Benefits are earned much like a DC plan
  - Front loaded compared to a final pay plan
  - Benefits younger employees at hire more than older employees
  - Allocation of benefit dollars is very different
- Cash balance plan costs more to deliver the same retirement benefit as traditional DB plan
  - More benefit dollars are allocated to employees who terminate and leave employment before retirement than traditional DB plan
  - See graph on next slide

Benefit Accrual Pattern
For Employee Hired at Age 30



Cash Balance Plans In the Public Sector

- Cash balance plans have typically been for new tiers or new systems

- Used typically for general government employees
  - Cash balance designs do not provide the death and disability provisions that public safety groups expect
  - Cash balance plans don't facilitate early retirement ages that typically go with public safety groups
  - Cash balance plans don't work well for judges who start late in their career

Texas Municipal Retirement System

- Agent employer plan started in 1947
  - No prior plan
- Each employer determines plan design
  - Member contribution rate: from 5% to 7%
  - Employer selects pay credit as multiple of member contribution rate (1 to 1, 1.5 to 1, or 2 to 1)
  - Vesting and retirement eligibility are also selected by the individual employer
- Interest is credited at 5% or more at Board discretion
- Paid as an annuity at retirement – partial lump sum available
- At termination, can roll-over member portion of account

Texas County & District Retirement System

- Agent employer plan started in 1967
  - No prior plan
- Each employer determines plan design
  - Member contribution rate from 4% to 7%
  - Employer selects pay credit as multiple of member contribution rate (1.6 to 1, 2 to 1, etc.)
  - Vesting and retirement eligibility are also selected by the employer
- Interest is credited at 7%
- Paid as an annuity at retirement
- At termination, can roll-over member portion of account

Nebraska Public Employees Retirement System

- Prior to 2003, state and county employees were in a defined contribution plan
  - New hires into Cash Balance Plan
  - For transfers into Cash Balance Plan, assets were equal to starting liabilities
- Members contribute 4.8% (County 4.5%)
  - Employer credit (and contribution) is 156% (County is 150%)
  - Same contributions as the DC plan
- Interest credit is greater of 5% or Federal Mid-term plus 1.5%
  - Historically granted dividends before 2008
- Can take total vested account value as a lump sum at termination and full/partial lump sum at retirement

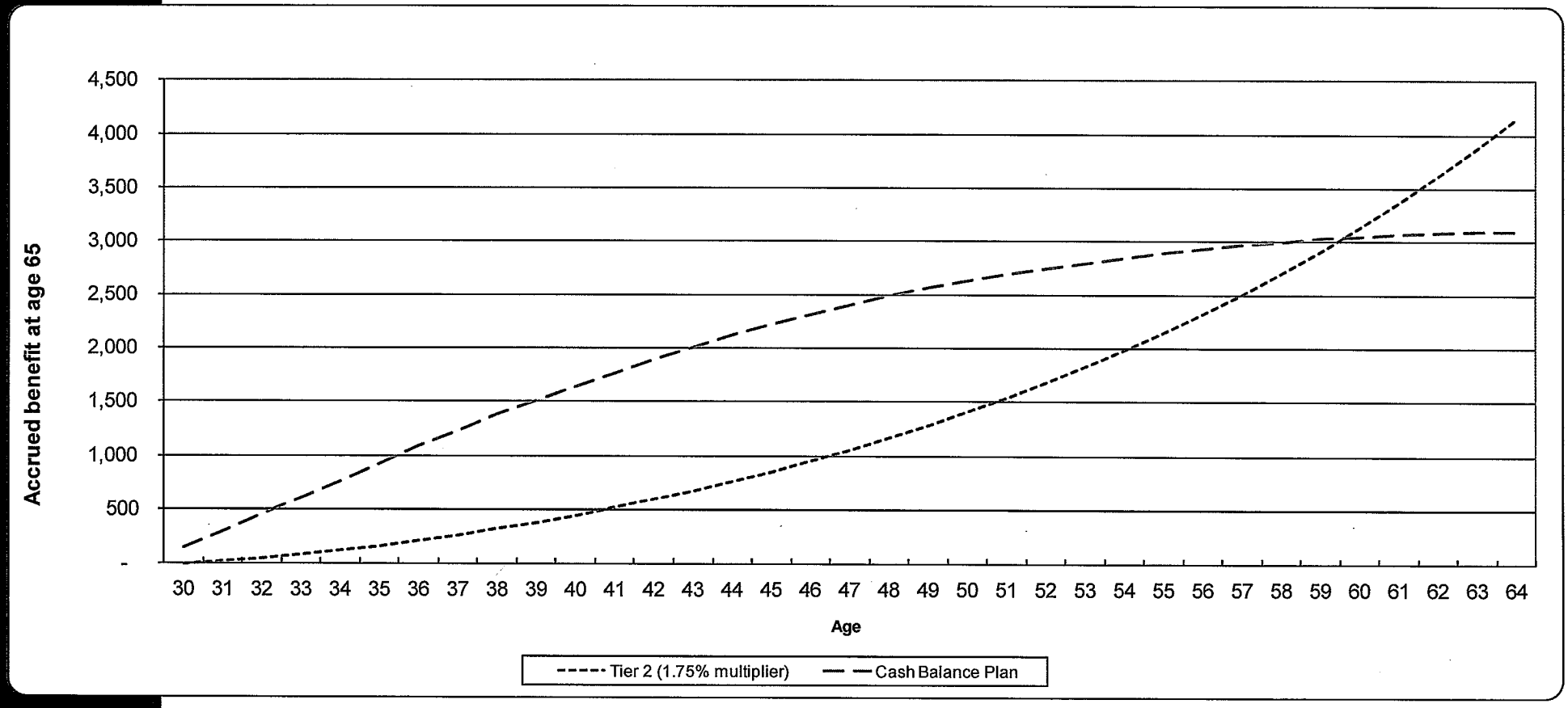
Louisiana State Employees Retirement System

- Legislation passed this year sets up a new cash balance plan starting in July, 2013, for new state employees
- Pay credit: 12% (of which members contribute 8%)
- Interest credit: Return on actuarial assets less 1%, but not less than 0%
- On termination, member may take the vested account value as a lump sum or leave in system without future interest credits
- At retirement, can have either an annuity or lump sum

KPERS Tier 3 Plan Provisions

Plan Provision	KPERS Cash Balance Plan
Employee contributions	6%
Employer pay credit	Based on years of service: 1-4 yrs = 3%, 5-11 years = 4%, 12-23 years = 5%, 24 years+ = 6%
Interest credits	5.25% guaranteed. Possible additional interest credits (0-4%) at Board discretion based on actual investment experience and system's funding
Vesting	5 years
Normal Retirement Age	Age 65 with 5 yrs service or age 60 with 30 yrs service
Early Retirement Age	Age 55 with 10 yrs service
Retirement Benefit	Account balance converted to monthly benefit at retirement using annuity factors based on 6% and mortality table selected by Board. Various forms of payment including survivor options. Partial lump sum option up to 30% (not available at early retirement)
Termination before retirement	Can withdraw employee contribution balance, but forfeits employer account balance. Vested members can leave contributions in and receive benefit at retirement age.

KPERS Benefit Accrual Pattern
(Entry Age 30)



Evaluating 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

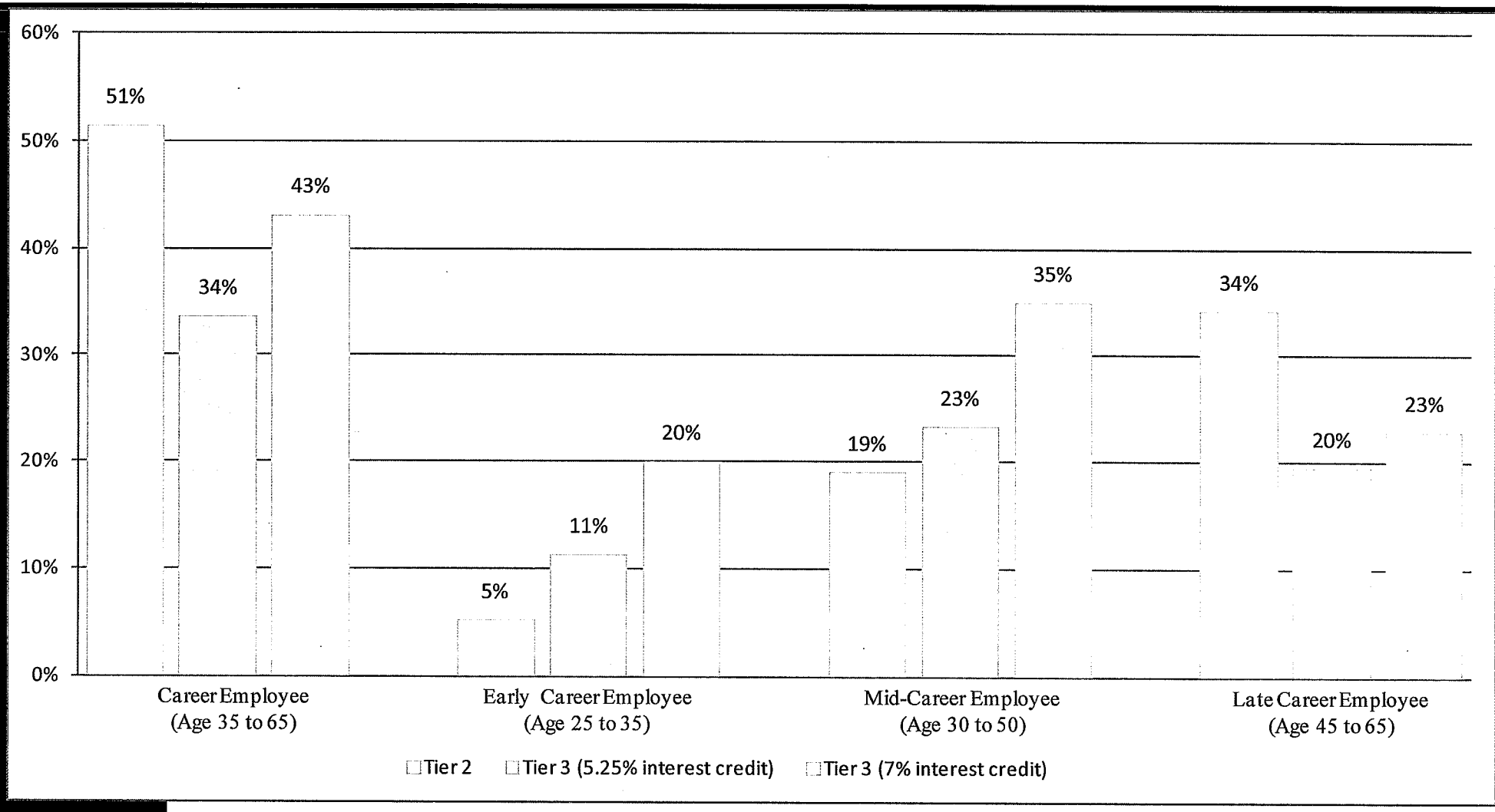
- Replacement ratio typically includes income from all sources including employer provided retirement plans, Social Security, and employee savings

- 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

Comparison of KPERS Benefits

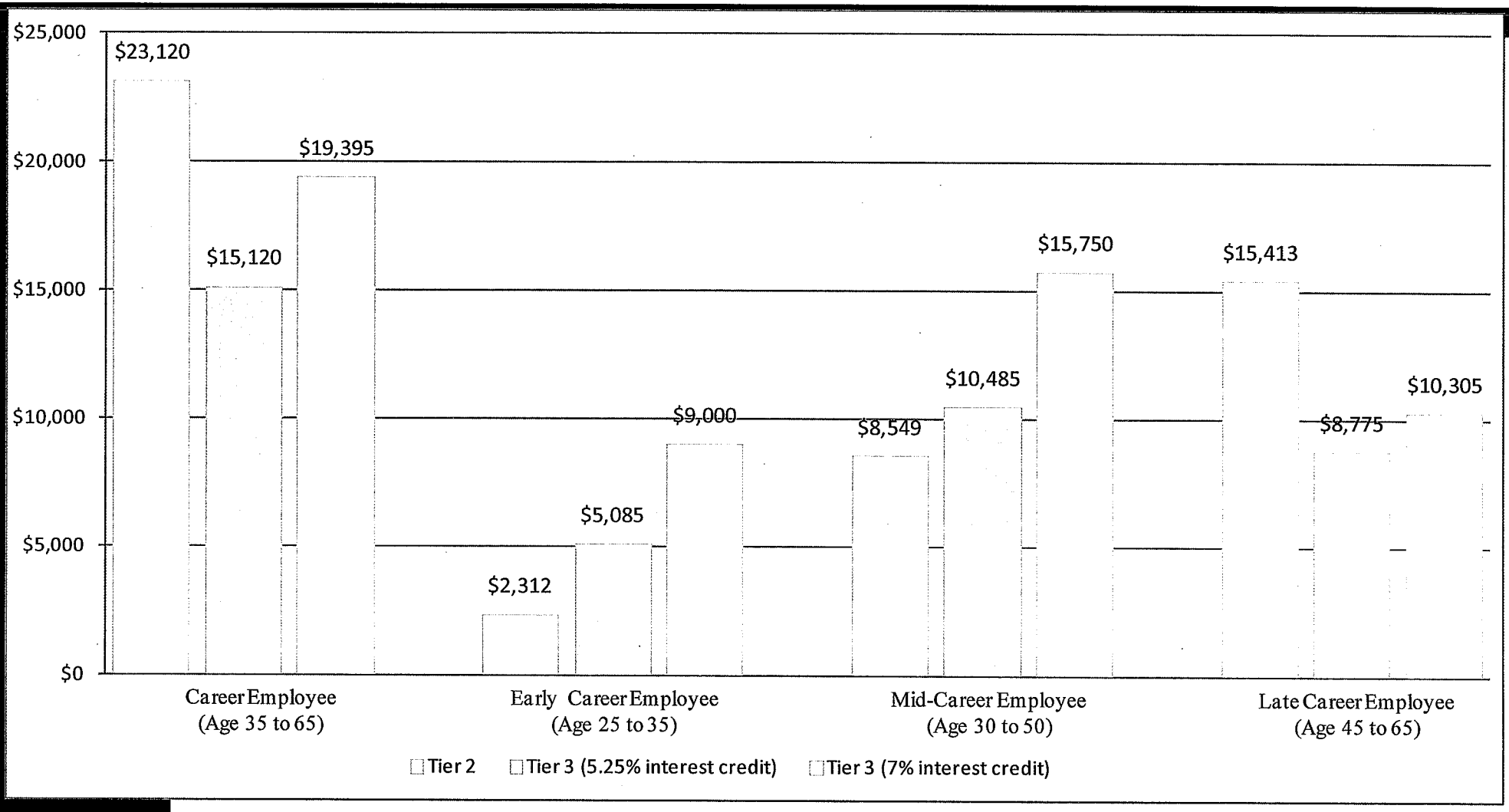
Under various employment scenarios (all benefits start at age 65)



Tier 2 is a final average pay defined benefit plan. Tier 3 is a cash balance defined benefit plan that has a guaranteed interest crediting rate of 5.25%, and it provides for discretionary dividends by the KPERS Board under certain circumstances. A 7% total interest credit is shown to illustrate the potential effect of such dividends. The annuity conversion interest rate, which is used to convert the cash balance account into a monthly benefit amount, is 6%.

Comparison of KPERS Benefits

Under Various Employment Scenarios (based on $45,000 pay at age 65)



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