

Redesign of Retirement Benefit; Underlying Issues in Japan

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Outline

- Annuity or lump sum on redesigning retirement benefit
- Backgrounds (public pension, corporate pension plans, delayed retirement)
- Numerical illustration
- Retirement resource will be scant

Introduction

Annuity or Lump Sum

- Major question on redesigning corporate retirement benefit
- Lump sum is more popular than life annuity
 - ‘Pension’ is often provided in form of annuity certain
 - Retirees choice lump sum option
 - Thanks to tax break on personal income tax

Life Annuities Provided by Employers

- Traditional DB plan grant life annuities
 - In US, UK etc.
 - Transform to hybrid plan, or frozen
- Employees' pension funds (EPFs)
 - Substitute public pension
 - Life annuity mandated
 - But, many plan transformed to new DB plan (i.e. Reversion; 'Daiko henjo')

Annuity Is Better Than Lump Sum?

- Traditional retirement benefit is lump sum
- Retiree choose lump sum, albeit annuity granted
- ‘Annuity puzzle’

Backgrounds

Public Pension

- Benefit is shrinking
 - Macro-economical indexation
 - Average compensation rate is ceiling
 - Replacement ratio is decreasing
 - Fifty (50) percent for standard household

Corporate Retirement Benefit

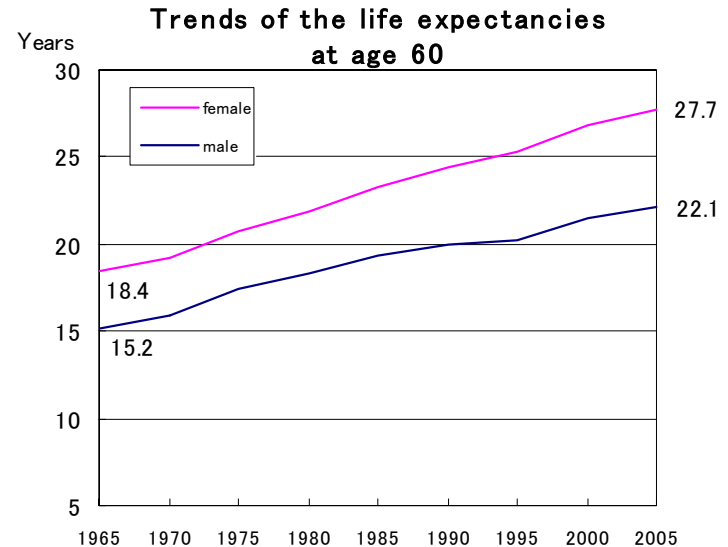
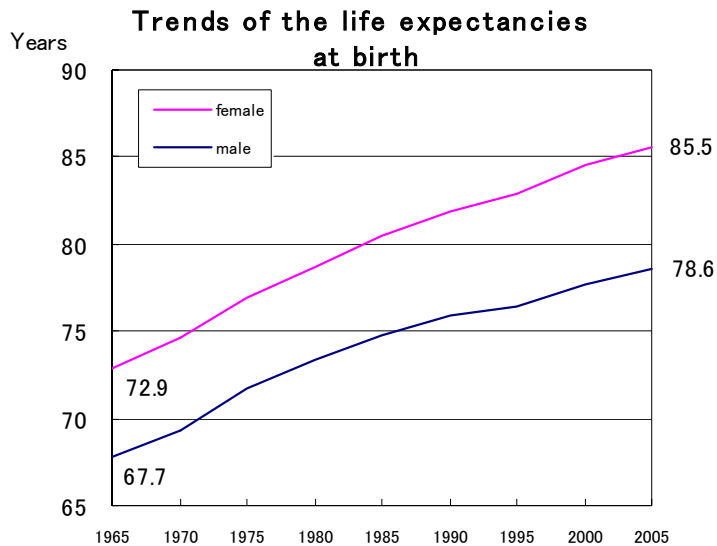
- 85.5% of employers provide lump-sum benefit for retirement
- Life annuity isn't popular feature
- Moreover, joint life is rare option

Corporate Retirement Benefit

- Downsizing
 - Benefit formula changed
 - Prior benefit cut
 - Interest rate implied in conversion factor is reduced , or variable rate
 - Cash balance plan
 - Benefit cut is permitted by pension law if employees (union) agree
 - What if it wasn't?

Demographic Environment

- Longevity improvement is proceeding

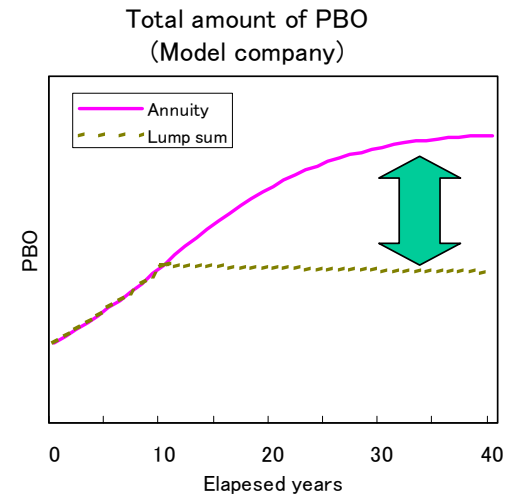


Economical Environment

- Historical lowest interest rate
 - Discount rate for PBO calculation purpose declines from 3.17% per annum on march 31, 2001 to 2.13% on march 31, 2006.

Corporate Retirement Benefit

- Lump sum benefit has lower PBO than annuity benefit
 - ‘Entry to withdrawal’ or ‘entry to death’
 - Around half amount of PBO
 - Investment risk minimal



Benefit Levels

- Major surveys say:
 - Average 25 million yen (college grad, retirement model)
 - 30 million (actuarial present value)

Benefit Levels

- How much cost can employer bear for pension fund?

Trend of per-capita liability of corporate retirement benefit

End of Fiscal Year	Average PBO per employee	Average Service Cost Per employee	Average Discount rate per annum
March 31, 2001	7.47 million yen	0.33 million yen	3.17%
March 31, 2006	6.05 million yen	0.26 million yen	2.13%

Source: Calculated from financial data of 1157 public companies extracted from entities listed on the Tokyo Securities Exchange (TOPIX)

Statutory Change

- Tax-qualified pension being scraped
 - It has prevailed funded plan for retirement benefit plan
- New DB pension enacted in 2001
 - ‘Annuity for elderly’ oriented
 - But, life annuity not mandated

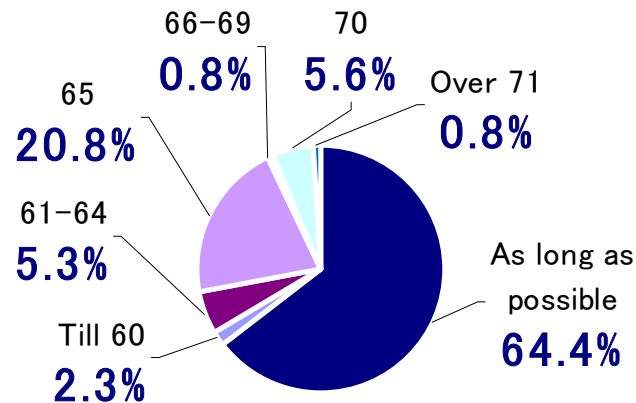
Mandatory Employment Extension

- Amendment of Law Concerning Stabilization of Employment of Older Persons enacted in 2006
 - Continuous Employment Program (CEP)
 - Can work through 65, but salary generally cut
 - Mandatory retirement age is more generally still 60 years old

Delayed Retirement

- Elderly wants to work
- “How long will you keep working?”

How long will you keep working?



Source: Ministry of Labour, Health and Welfare, The 1st Continuous Research regarding life style of middle-aged or elderly, 2006,

Hamper for annuity

- Sufficient public pension benefit
 - A thing of past
 - Pensionable age goes up to 65 years old
- Budget restriction on Corporate benefit
 - 25 million yen is enough?
 - Employees really want?
 - Tax break
 - Some workers welcome to DC plan

Numerical illustration

Optimal Allocation; Annuity and Lump Sum

- Model for optimization
 - Years of adversity: y (yrs)
 - Number of years that money account is less than zero while surviving
 - If account gets to zero at age 70 and died at age 80, then $y=10$
 - Loss function: $L(y) = K y^2$
 - K may interpreted as how employees prefer to avoid from economical adversity during their retirement

Simulation

- Example A: Annuities of public pension and corporate pension plan are payable at age 60
- Example B: Annuities of public pension and corporate pension plan are payable at age 65
- Example C: Annuities of public pension and corporate pension plan are payable at age 65 and the continuous employment program allows employees to work through age 65 after the traditional retirement age 60

Assumptions

- (a) Times of iteration in the Monte Carlo simulation for expected value of random variable $L(y)$: 1000 times per a parameter r
- (b) Annual consumption of the elderly households: 3.2 million yen per annum
- (c) Annually payment of a life annuity granted by social security: 2.1 million yen per annum
- (d) Annual compensation that the employees earn from 60 till 65 in the case C: 2.0 million yen per annum
- (e) The interest rate is applied in calculating actuarial factor of life annuity: 2.0% annum
- (f) The expected return of the saving account: 2.0% annum
- (g) The mortality rate: the statutory standard rate of Defined Benefit Corporate Pensions, 2005, female
- (h) The coefficient K of the Loss Function: 0.1
- (i) Initial account balance: 0 yen.

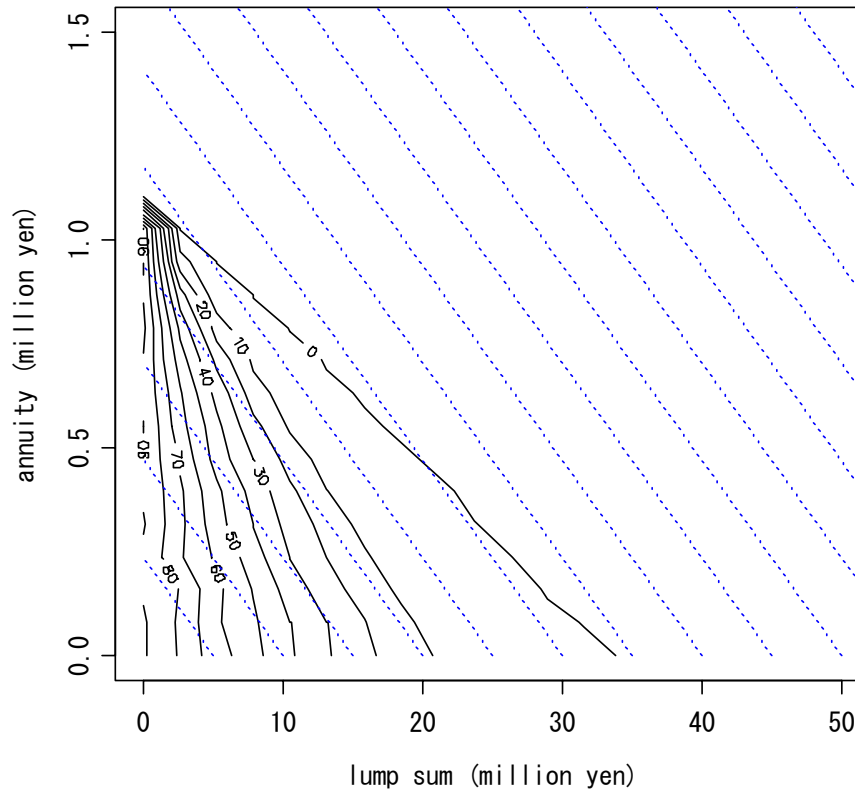
Example A:

- Annuities of Public Pension and Corporate Pension Plan Are Payable at Age 60

Example A - Expected Loss in the case A for each of benefit allocation

*Dotted lines express the equation (3) of each C (equal cost lines).

* Numbers in the contour map express values of Expected Loss (million yen)



Ref.
Major surveys say:
Average 25 million yen, or
30 million (actuarial present value)

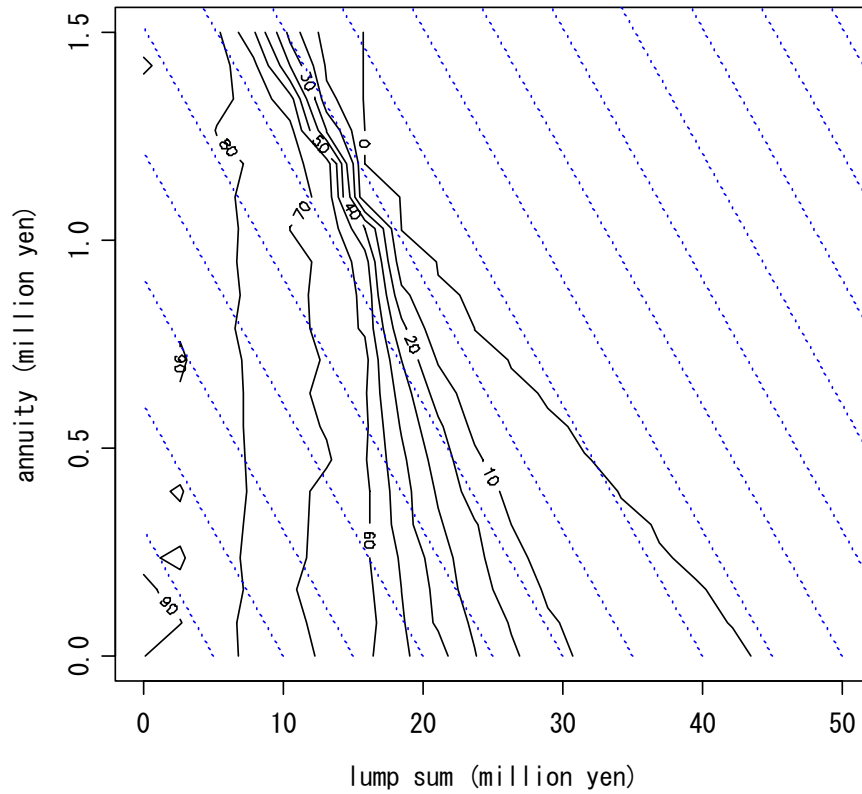
Example B:

- Annuities of public pension and corporate pension plan are payable at age 65

Example B - Expected Loss in the case B for each of benefit allocation

*Dotted lines express the equation (3) of each C (equal cost lines).

* Numbers in the contour map express values of Expected Loss (million yen)



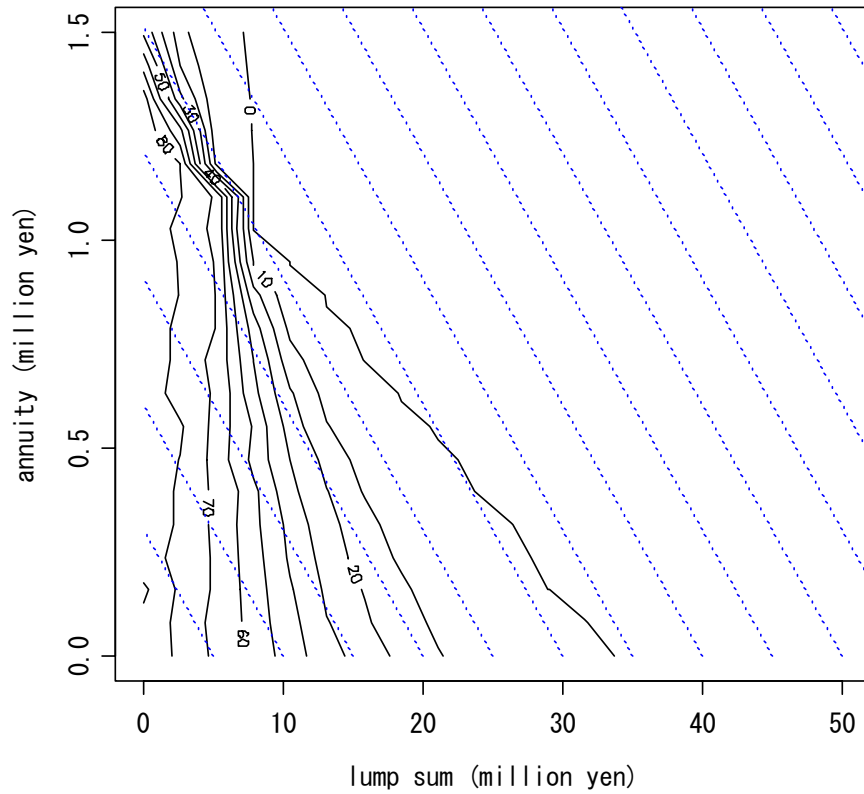
Example C:

- Annuities of public pension and corporate pension plan are payable at age 65 and the continuous employment program allows employees to work through age 65 after the traditional retirement age 60

Example C - Expected Loss in the case C for each of benefit allocation

*Dotted lines express the equation (3) of each C (equal cost lines).

* Numbers in the contour map express values of Expected Loss (million yen)



Findings

- Lump sum only benefit can be an optimum allocation when funding is short
- Pensionable age delaying will cause retirement resource deficient
- Continuous employment program may work for its solution

Insufficient retirement resource

- Under pensionable age 65, for average worker
 - Retirement benefit only NO GOOD
 - Retirement benefit + CEP SO-SO
- What if you are below-average worker ?
- Participants in labor market concern it?

Needs?

- Fix information gap in retirement benefit between employers and (future) employees
 - We need informative reference in order to choose expected benefit and risk on retirement benefit

Thank you for your attention

All the opinions expressed in this paper are that of the author alone and do not necessarily reflect the views of his employer.

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