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Redesign Of Retirement Benefits; An Opportunity To Rethink Income Adequacy For Individuals In Japan

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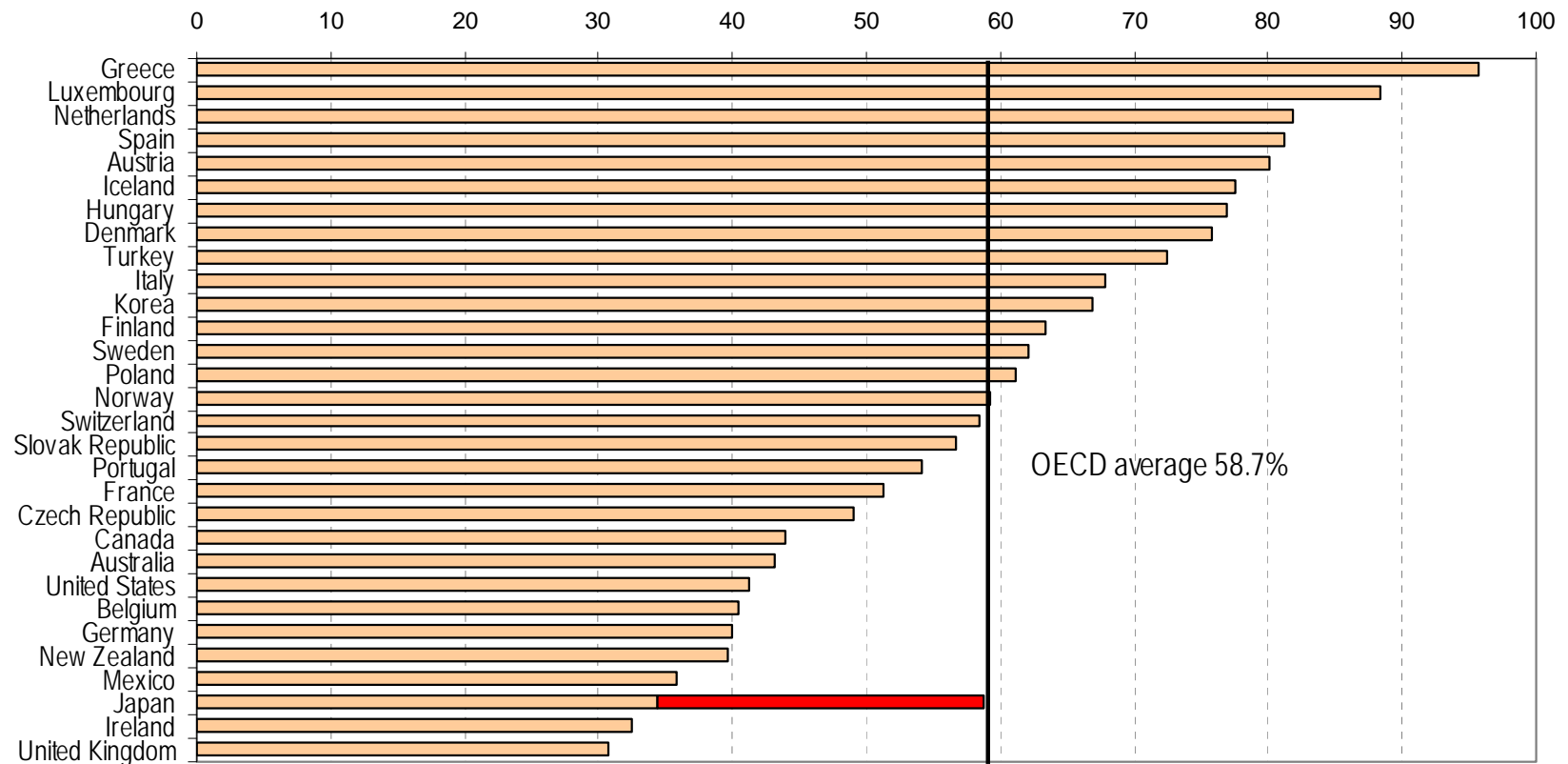
Outline

- Lump sum plans for voluntary pension
- Examination of the benefit features
- Is an annuity better than a lump sum?
- Lump sum plans for workers in Japan

Lump sum plans for voluntary pension

Retirement-savings gap

Gross replacement rate for an average earner from mandatory pension schemes and comparison with the OECD average replacement rate



Source: OECD(2007)

Retirement-savings gap

- **Gross replacement ratio**
 - Gross replacement ratio of the mandatory pension scheme in Japan is 34.4% of average earnings for average earners
 - OECD countries' average of 58.7%
- **The importance of voluntary pensions in filling the retirement-savings gap**

Abandon traditional DBs

- **Small public pension countries struggled to extent voluntary pension**
 - Traditional DBs in UK and US
 - Employees' Pension Fund (EFPs) in Japan
- **Economic environment force employers to abandon DB**
 - UK and US shift to DC
 - JPN back to traditional lump sum based plan

Lump sum is the middle way

- Retirement resources have several forms in terms of what to focus on

Measure	Payment	Plan	Focus
Replacement ratio	Life annuity	Traditional DB	Guarantee standard of living
Pension wealth	Lump sum at retirement	Lump sum based plan	Lump sum value at retirement
Contribution rate (or Saving ratio)	Deferred ratio on salary	DC	Deferred income to accumulate money

Special feature of lump sum plans for individuals

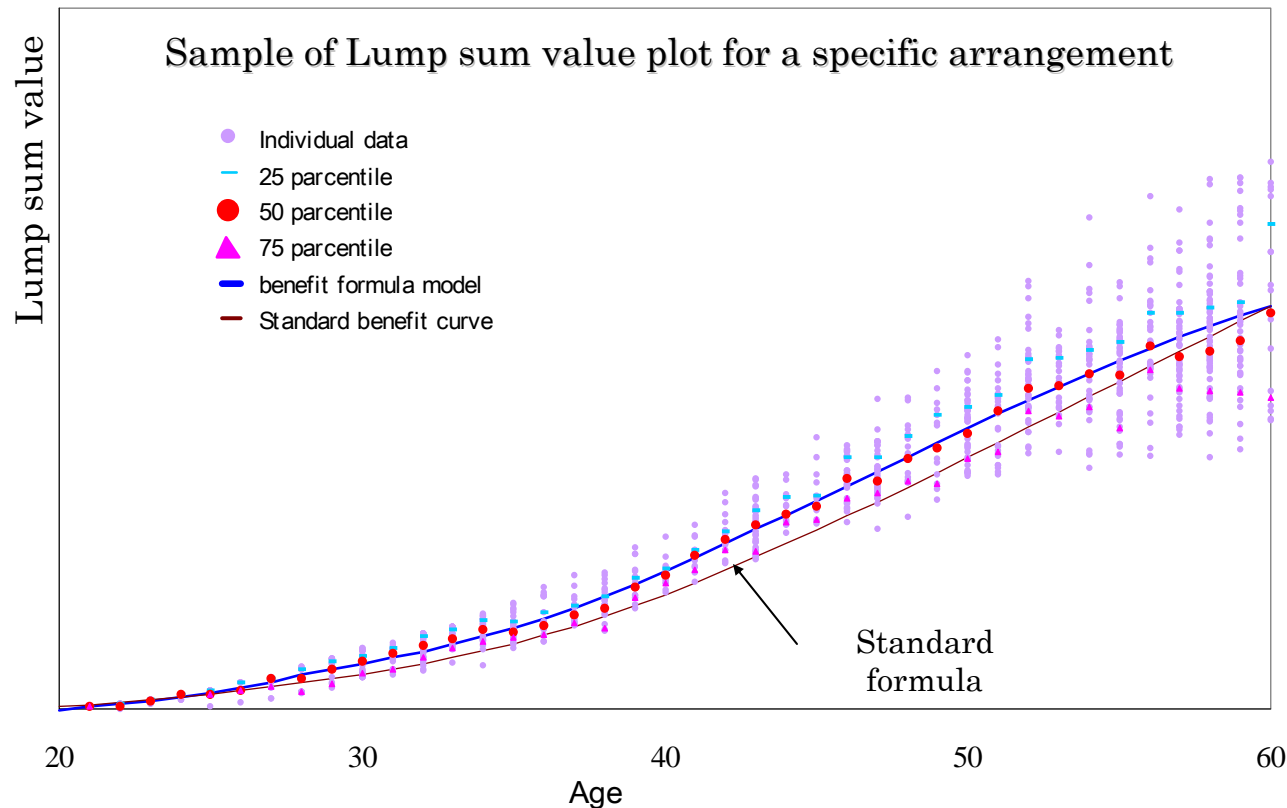
- **Basic**
 - No tax in accumulation phase
 - Cash out (or loan) is not available before withdrawal
- **Plus, for statutory funded DB plans stimulated by pension laws, e.g.**
 - Backed by plan asset with strict funding standard
 - Pension right e.g. avoid foreclosure
 - Comparatively highly guaranteed interest rate after separation from the service without withdrawal penalty
 - Defer income allowance, if available
 - Annuity option

Examination of the benefit features

How to weigh the Lump sum plan against DC

Lump sum value approach

- Lump sum value plot is useful approach to show benefit



Lump sum value approach

- Plot pairs of participant age and actual amounts of lump sum value under current arrangements for each of the participants on a 2-dimensional graph.
- Appropriate if employees think employers promise the lump sum value instead of the annuity value in the context of employer-labor relations
- Can discuss non-DB plans using the same approach
- Rich information that helps the stakeholders to recognize the special features

Standard formula

- “Standard formula” is equivalent to a flat rate on earnings at specific interest rates

Benefit amount and uncertainty

- From the lump sum value plots, we can observe:
 - Benefit curve for average workers
 - Benefit level
 - Virtual guaranteed benefit
 - Volatility of the benefit, depending on the specific benefit provision
- “Defined benefit” does not “guaranteed benefit”

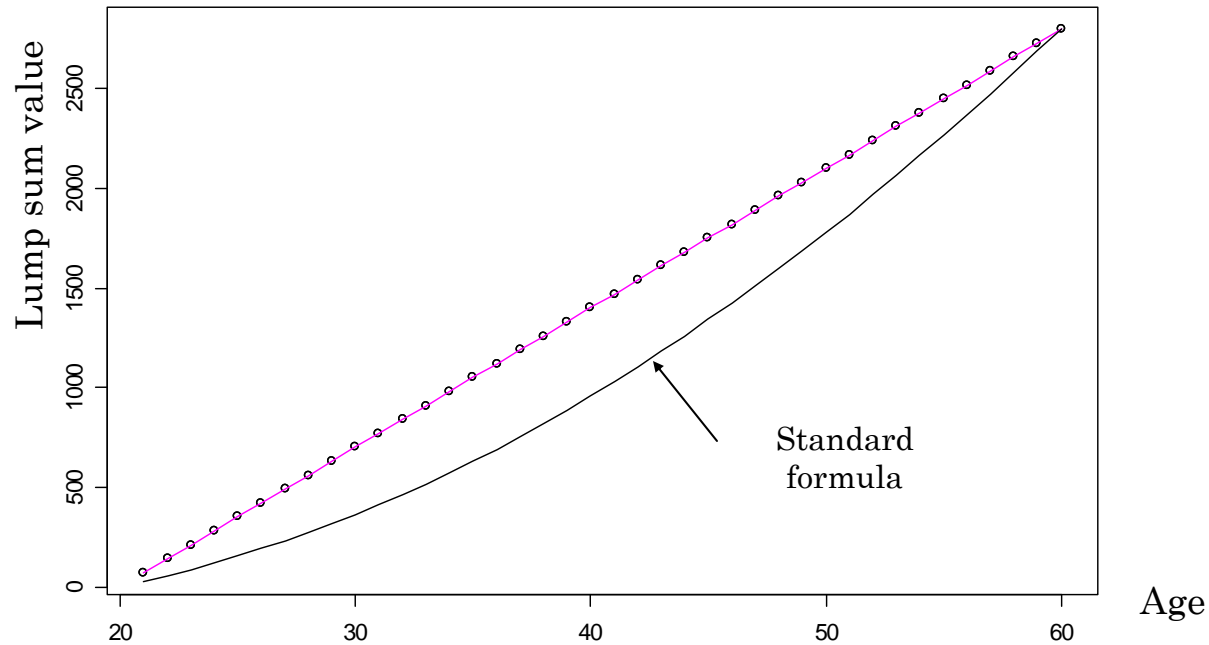
How to measure these risk and reward

- In practice, principals grasp intuitively by examining the plots
- Other approach
 - Mean-variance relationship

Simple Example

- **Ex.1 Flat dollar**

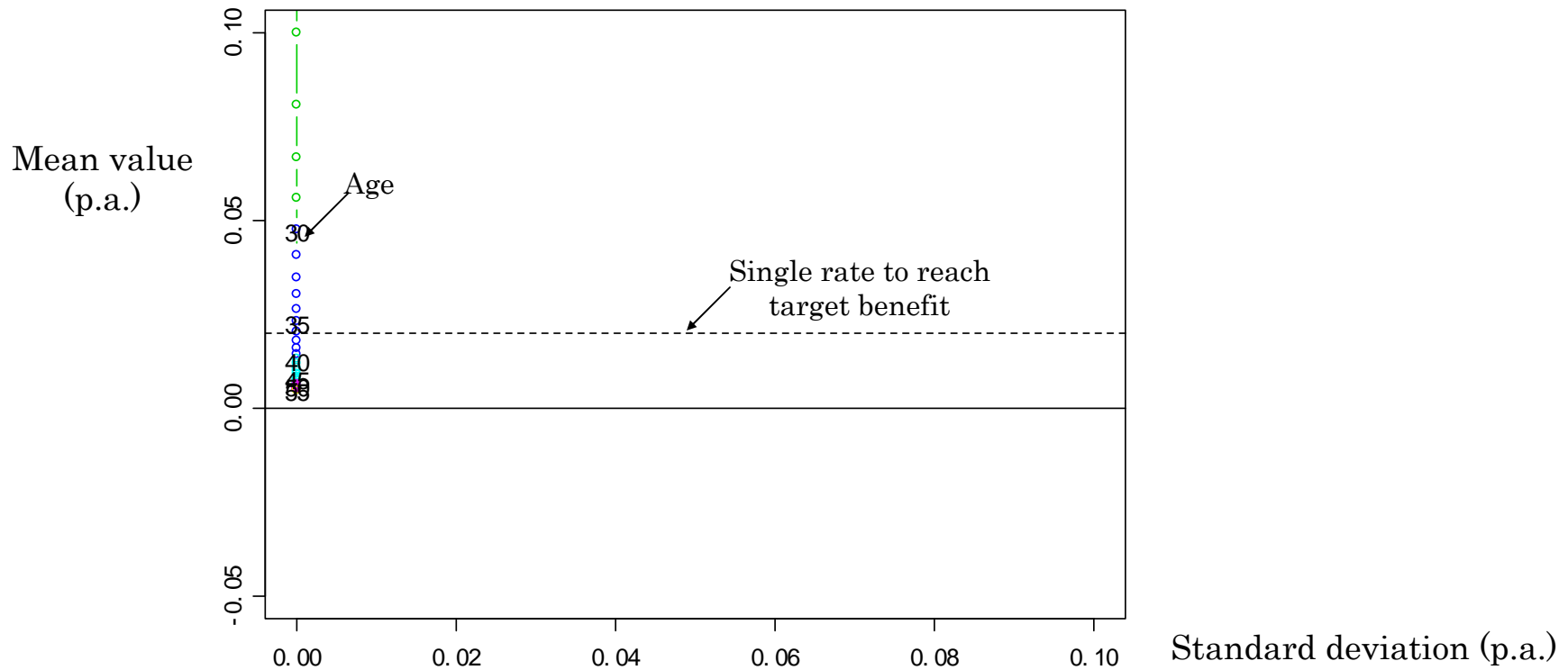
Lump sum value for an each age



Example of Mean-variance relationship

- **Ex. 1 Flat dollar**

Mean-variance relationship



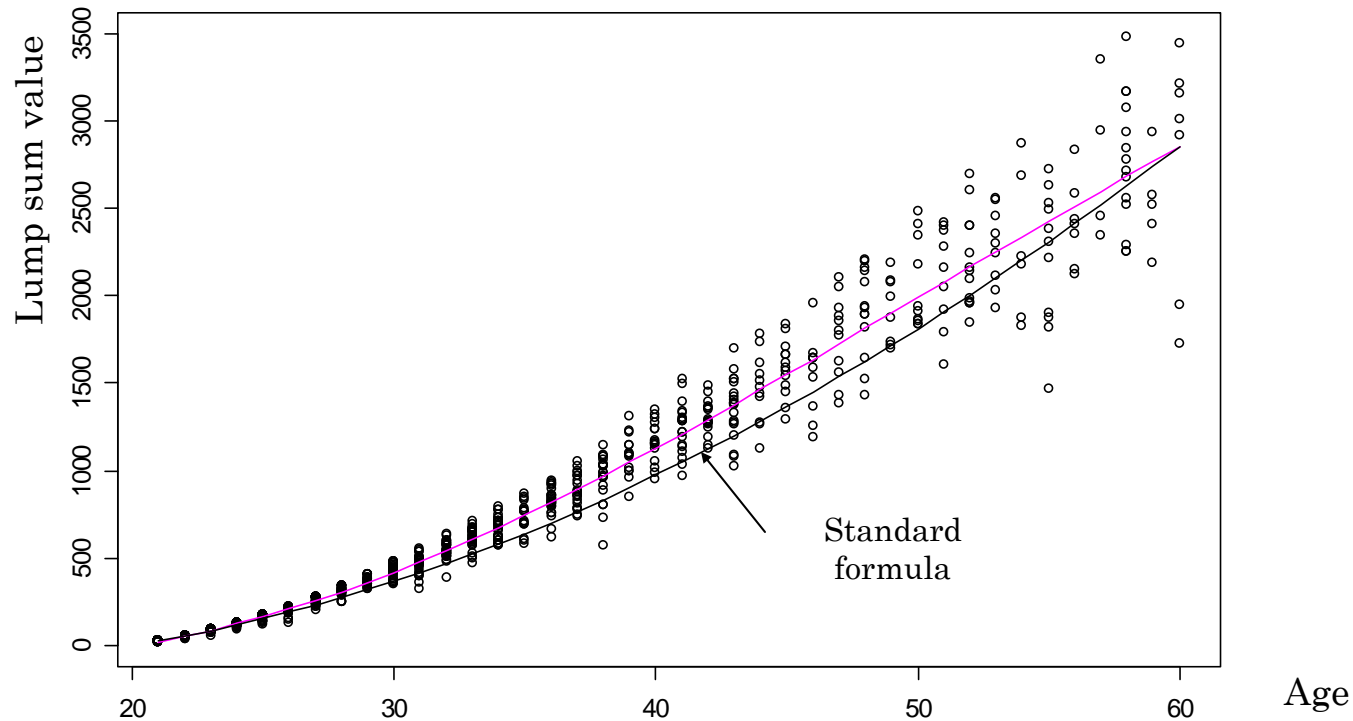
Illustrative Example

- **Ex. 2 Pile-up formula**
 - Defined by:
 - Benefits from the system vary from employee to employee in line with their performance on the job as assessed by employers
 - Benefit accruals for each period of service change when promotion or demotion occurs
 - So the benefit is volatile between employees.
 - Enable employers to design various benefit patterns to meet their HR strategies

Example of Mean-variance relationship

- **Ex.2 Pile-up formula**

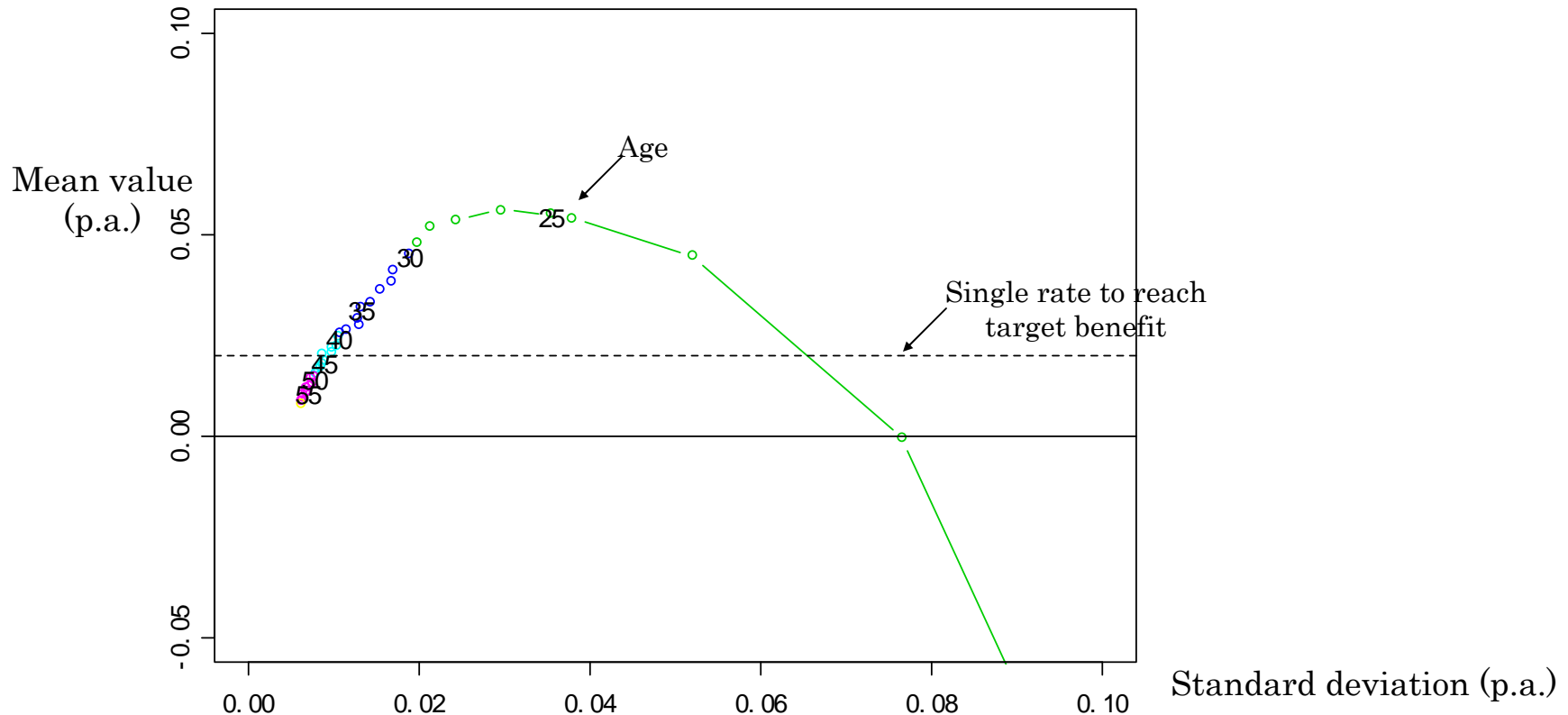
Lump sum value for an each participant, generated by a stochastic model



Examples of Mean-variance relationship

- **Ex. 2 Pile-up formula**

Mean-variance relationship



National average salary approach

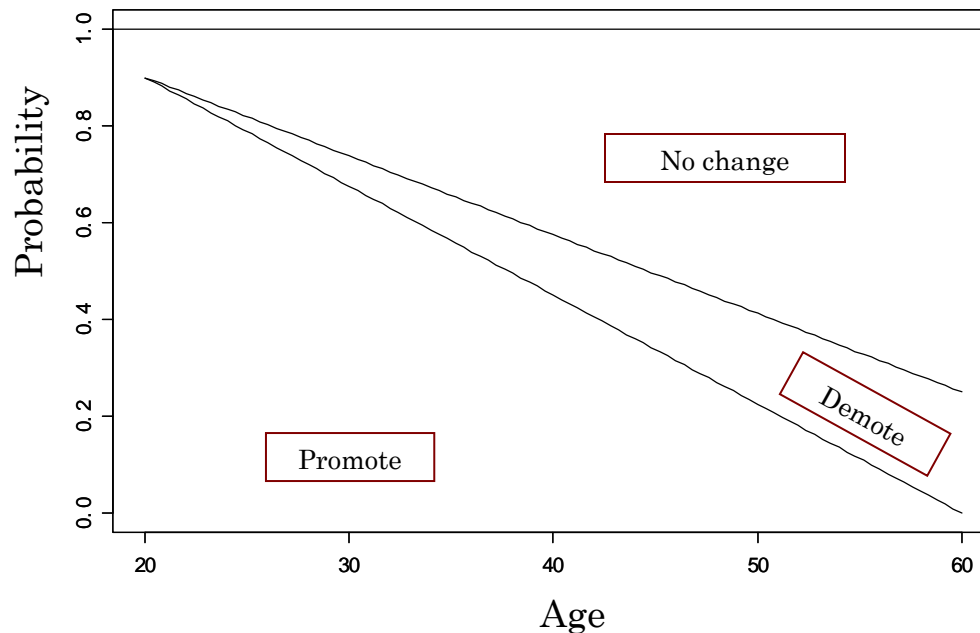
- Assume that:
 - Everyone can potentially earn the national average salary at each age
 - they want to or must put aside some flat rate part of salary for their retirement to supplement the public pension
- Then, we can calculate :
 - Rates of return on lump sum value for each data
 - Mean and standard deviation for each age

Modeling to calculate the mean-variance structure

- **Modeling, if necessary**
 - Construct a stochastic model based on the provisions of the plan and real data from the lump sum approach
 - Calculate the rates of return on lump sum value and the volatility
 - It is necessary to develop goodness-of-fit tests for the models

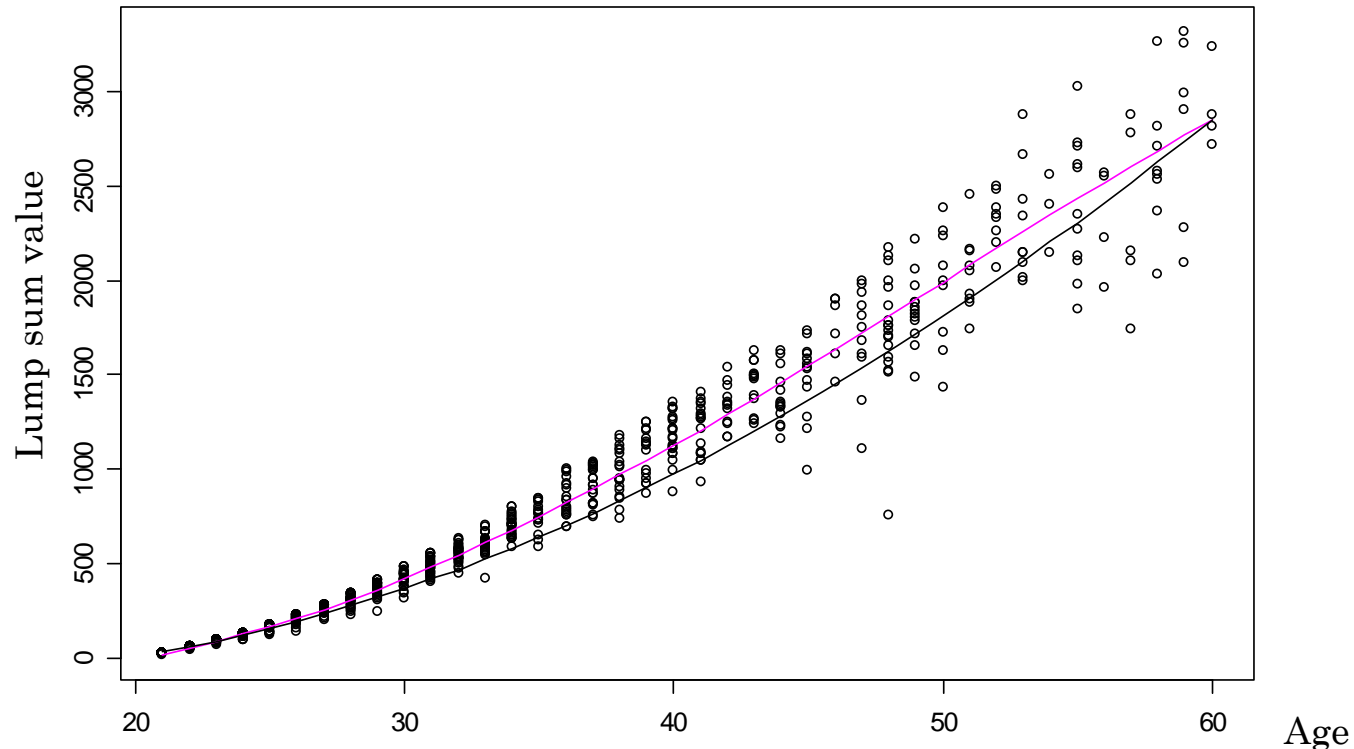
Promotion and demotion probabilities in Pile-up formula

- Promotion and demotion probabilities should be defined for each model to reflect the realities of the specific company's benefit plan



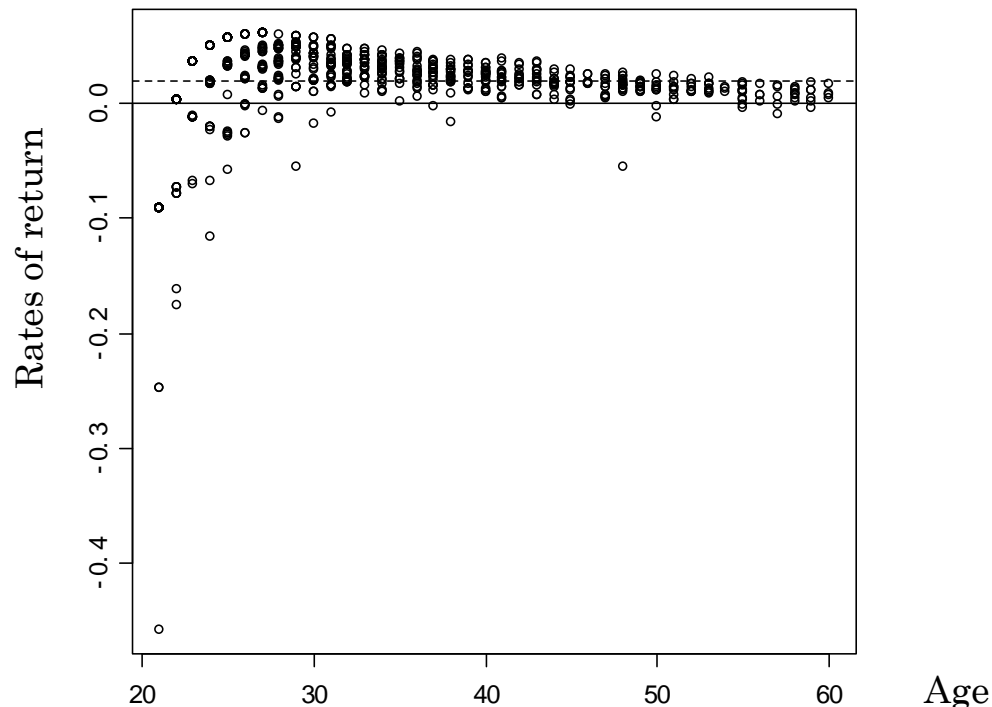
Model for Pile-up formula

- Plots generated by pile-up model



Rates of return on lump sum value for each data

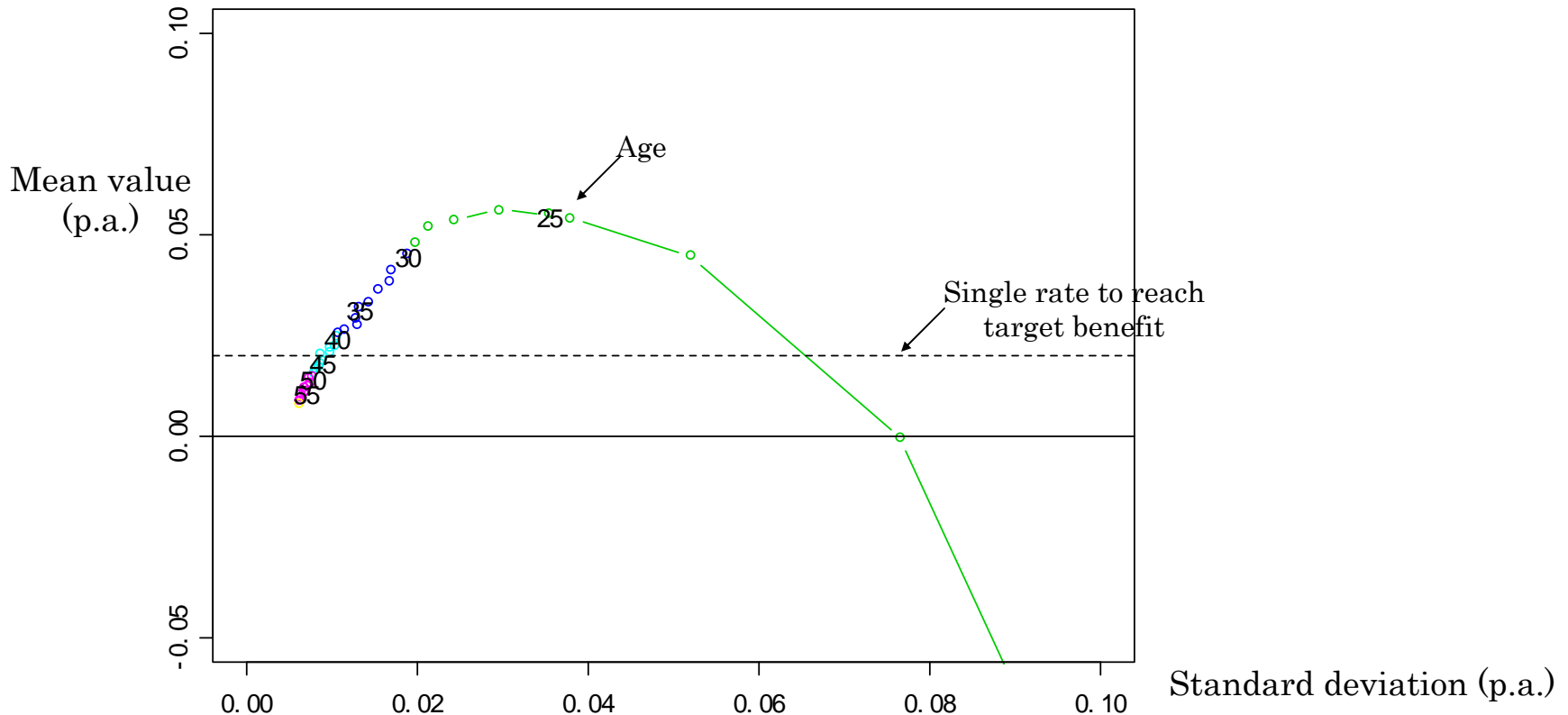
- Rates of return on lump sum value in the pile-up model



Mean and standard deviation for each age

- Again, Ex. 2 Pile-up formula

Mean-variance relationship



Benefit features of Lump sum plan

- By mean-variance structure for the rates of return and volatility, we can in a broad sense compare a DC plan and a DB plan
- Lump sum plan as an investment class that isn't easily available for individuals in the financial market

Is an annuity better than a lump sum?

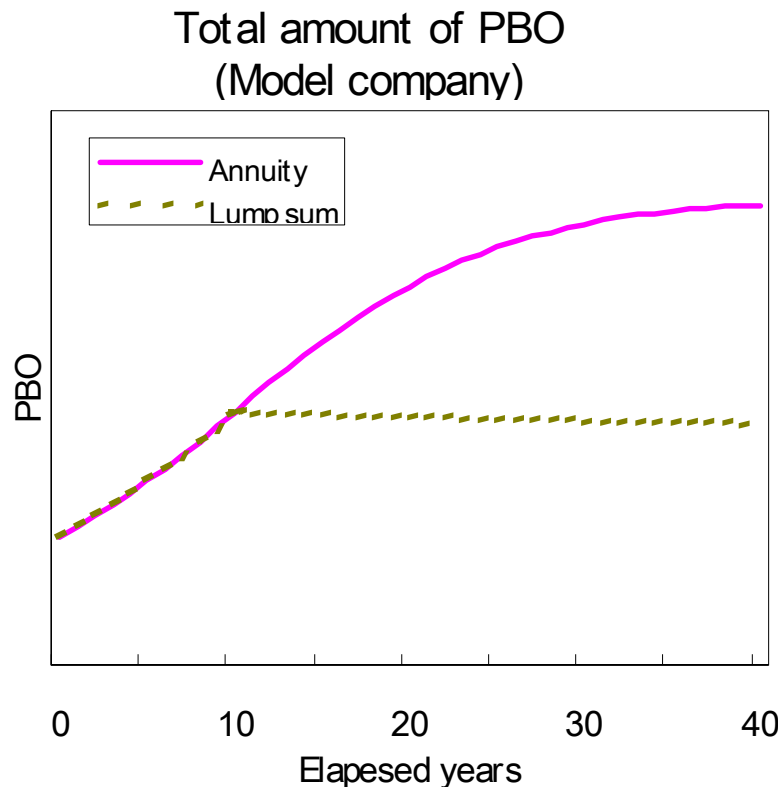
Lump sum vs. life annuity

Annuity or lump sum?

- Annuity benefit provides a stable income stream during retirement till the time of death
- Annuitants can shift their longevity risk to the pension funds and plan sponsors
- However,
 - Employers abandon DB
 - Individual do not prefer life annuity
 - i.e. “Annuity puzzle”

Employers' standpoints

- Lump sum plans has relatively less financial risk because liability is half



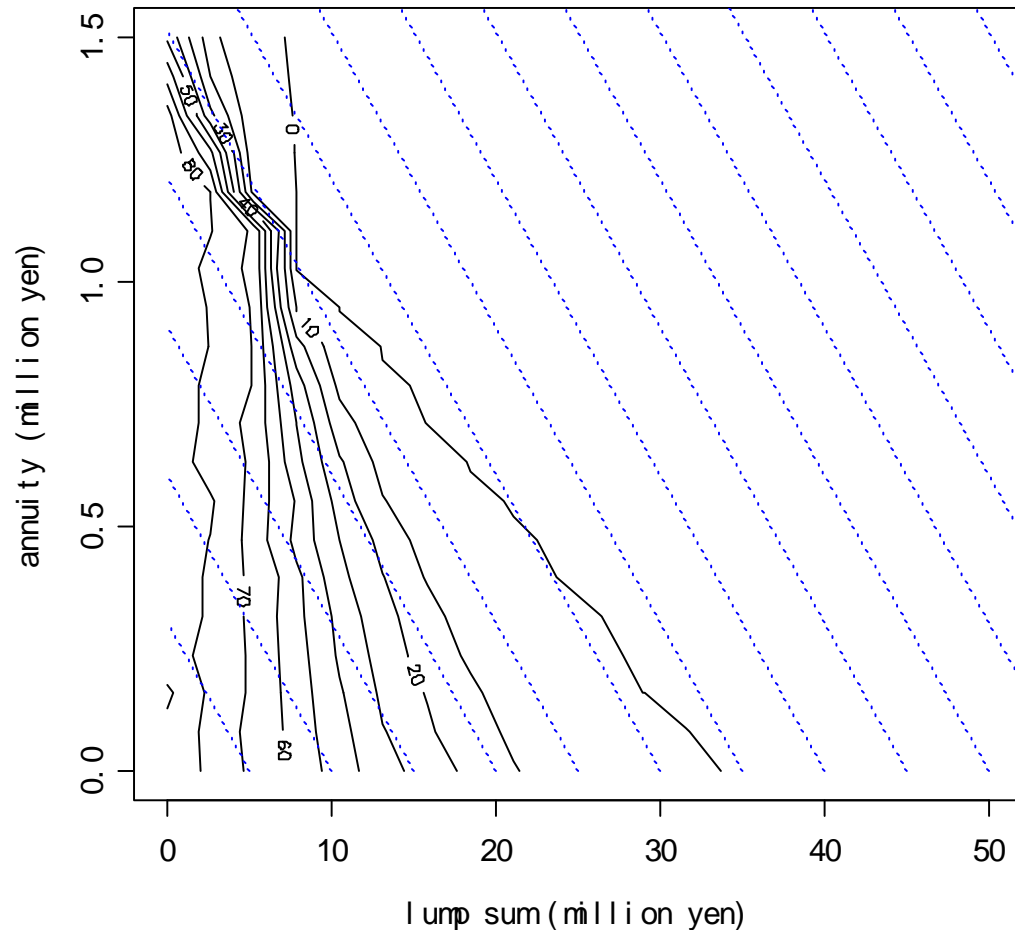
Note: Calculated on a model company

Employees' standpoints

- Lump sum is a realistic way of retirement income when resource is short and life annuity is very expensive
- To show that,
 - Optimal allocation between annuity and lump sum, with budget constraint, and numerical illustrations for benefit design

Example - Expected Loss for each of benefit allocation

- *Dotted lines express the equal cost lines
- * Numbers in the contour map express values of Expected Loss (million yen)



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: $L(y) = K y^2$
 - The quantity of monetary shortage does not influence the loss function L , because lack of money to cover the cost of living during old age means that they must borrow money, without any reasonable prospect of repayment, or decide to get public assistance and despair of their future

Example

- 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 node
- (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: 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.

Findings

- **Threshold amount of pension wealth**
 - Lump sum only benefit can be an optimum allocation when funding is short
- **Although pensionable age delaying will cause retirement resource deficient, continuous employment program may work for its solution**

Lump sum plans for workers in Japan

Coverage of traditional lump sum plans

- Lump sum plans cover a large proportion of workers

Survey of employers which provide retirement benefit

Number of employees	Retirement benefit			
	Available			N/A
	LS only	Pension only	Both	
1000 and more	11.0%	19.1%	69.9%	2.9%
100 - 999	31.6%	22.9%	45.5%	9.0%
Less than 100	54.1%	18.3%	27.7%	15.3%
Total	46.5%	19.6%	33.9%	13.3%

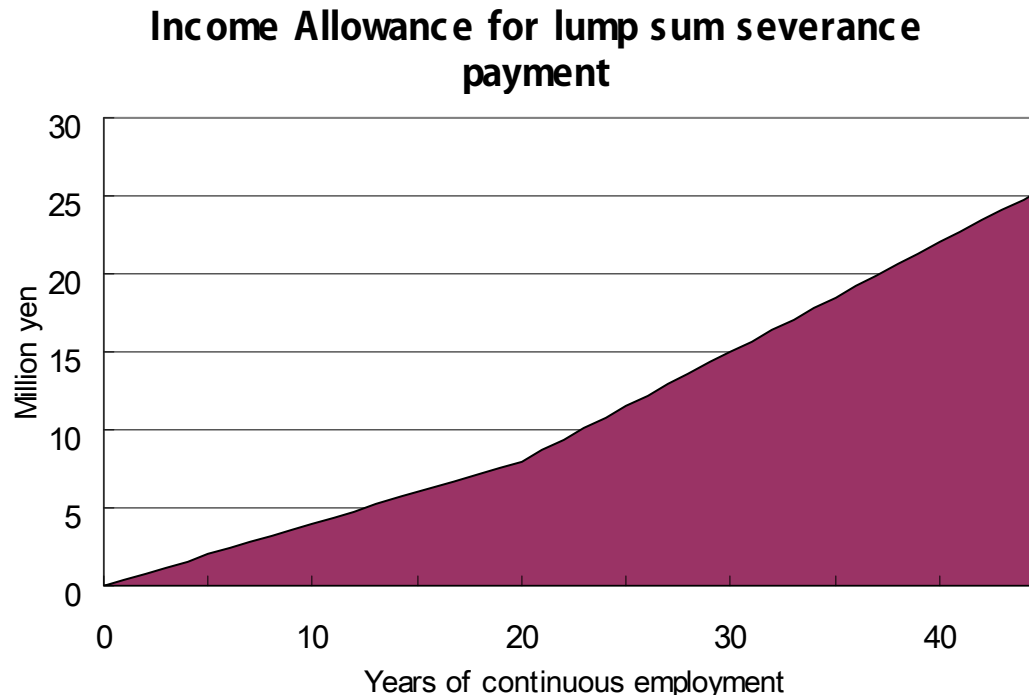
86.7% coverage

Source: Ministry of Labour, Health and Welfare, General Survey on Working Conditions, 2003,

(<http://www.dbtk.mhlw.go.jp/toukei/kouhyo/data-rou8/data15/24.xls>)

Tax break

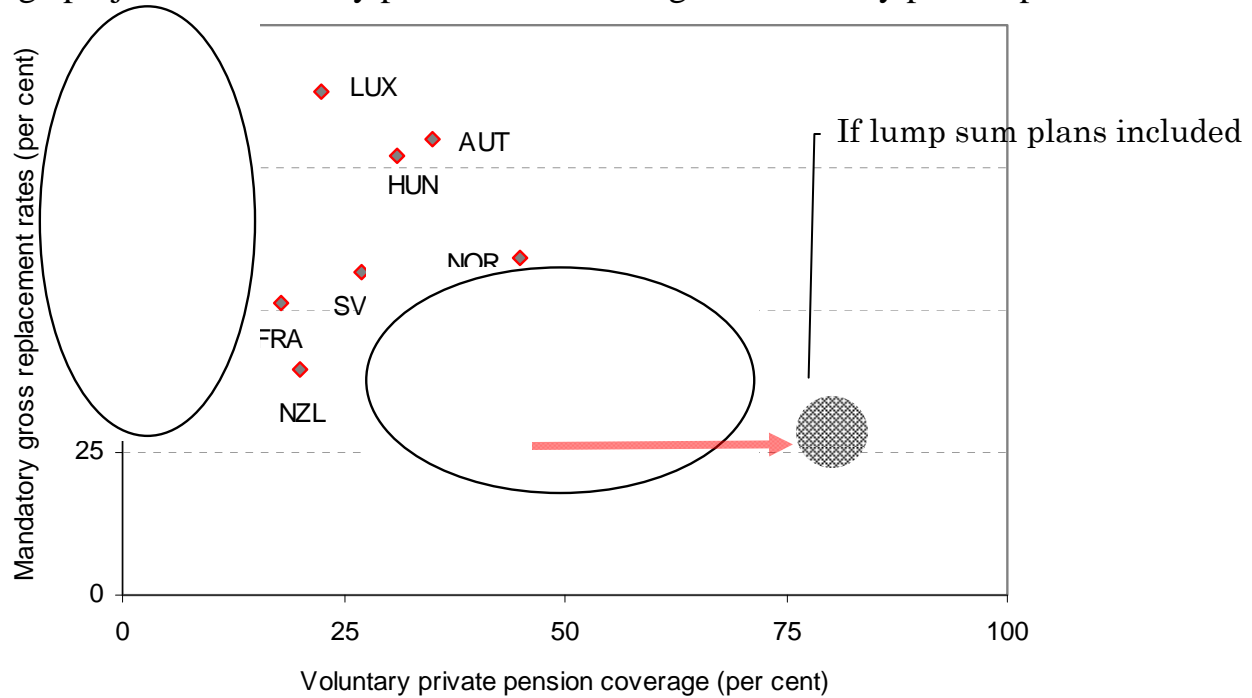
- Government grants substantial income allowance for lump sum



Coverage of traditional lump sum plans

- Lump sum plans cover a large proportion of workers

Average projected mandatory pension and coverage of voluntary private pensions



*JPN shows the total covered by tax-qualified pension plans, employees' pension fund or both

Source: OECD

Point-system as benefit formula in lump sum plans

- Point-system is an implementation of the “pile-up formula”
 - Get popular thanks to flexibility on design

Survey on employers which provide lump sum plan

Number of employees	Benefit basis		
	Final Pay	Point	Other
1000 and more	45.9%	35.9%	18.2%
100 - 999	65.0%	15.6%	19.4%
Less than 100	73.9%	6.9%	19.2%
Total	69.6%	11.2%	19.2%

Source: Ministry of Labour, Health and Welfare, General Survey on Working Conditions, 2003,

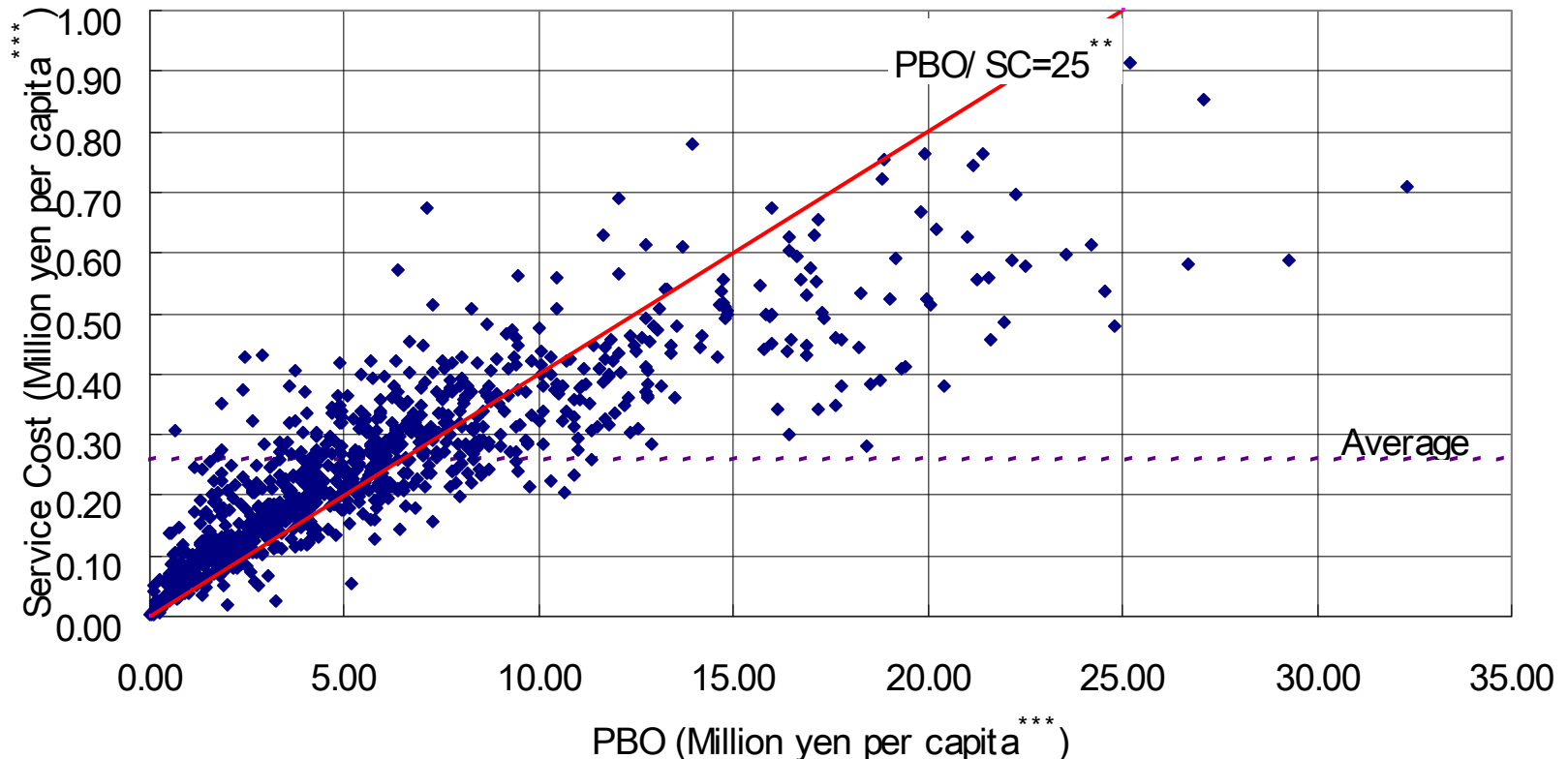
(<http://www.dbtk.mhlw.go.jp/toukei/kouhyo/data-rou8/data15/26.xls>)

Statutory change

- Tax-qualified pension plan (TQPP) being scraped
 - TQPP has contributed to popularization of funded plan for retirement benefit plan
- New DB pension law enacted in 2001
 - ‘Annuity for elderly’ oriented
 - But, life annuity not mandated
 - Employers seek for vehicles for existing lump sum plan

Pension liability and service cost

Pension liability and service cost of listed companies*



* (894) companies included in TOPIX (FY March 2007) with 1000 or more employees

** (25) is a future value of 20-year annuity with 2% per annum

*** "per capita" over the number of active employees

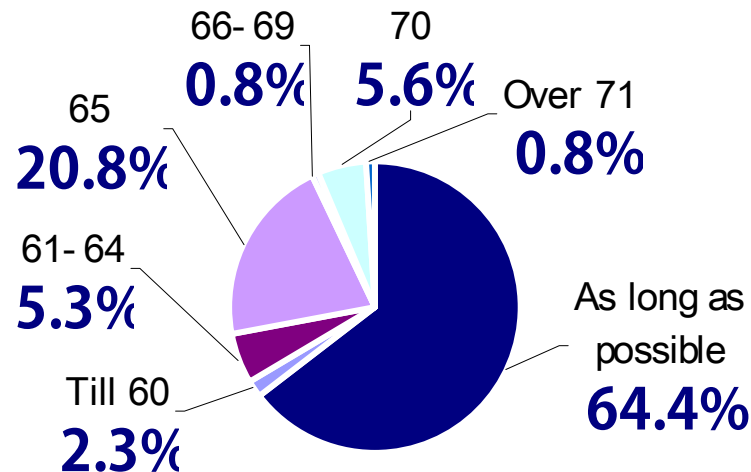
Mandatory employment extension; another measure for retirement planning

- 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 due to labor practice
 - Mandatory retirement age is more generally still 60 years old
- Affect retirement benefit design

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,

“Lump sum first, annuity second” strategy for filling the gap

- We face strict budgetary constraints
 - Neither the government nor employers have the capability to grant them enough amount of annuity
- Most employers must have their employees plan their retirement by assuming inadequate amount of annuity, Counting on:
 - Savings
 - DC plan
 - Lump-sum benefit
 - Continuous employment program (delay retirement)

Another Challenge

- Retirement resources are inadequate for average workers
- For planning purposes, benefit plans should be more transparent for employees as well as for future employees in the labor market
 - Employees sometimes don't understand their retirement benefit very well until they are reaching retirement age.
- We need targeted information in order to choose expected benefits and risk of retirement benefits to bridge the information gap between employers and (future) employees

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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