



Institute
and Faculty
of Actuaries

D4: How to Operate in Low Interest Rate Environment - Japan Case Study

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21 October 2015

Agenda

- Introduction – Japan Life Insurance Overview
- Product Management
- Asset Management
- Risk Management
- Changes in Corporate Pension Plans

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- The views expressed in this presentation are those of the presenter
- This presentation is of a general nature and is not intended to address the circumstances of any particular individual or entity

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Japan Life Insurance Overview – Market Share

World's 2nd largest insurance market but declining population

Ranking	Country	Premium volume ^(*) (USD millions)	Share of world market (%)	Population ^(*) (millions)	GDP ^(*) (USD billions)
1	United States	528,221	19.90	319	17,430
2	Japan	371,588	14.00	127	4,440
3	United Kingdom	235,321	8.86	65	2,946
4	China	176,950	6.67	1,395	10,114
5	France	172,761	6.51	66	2,848

(*) As of 2014

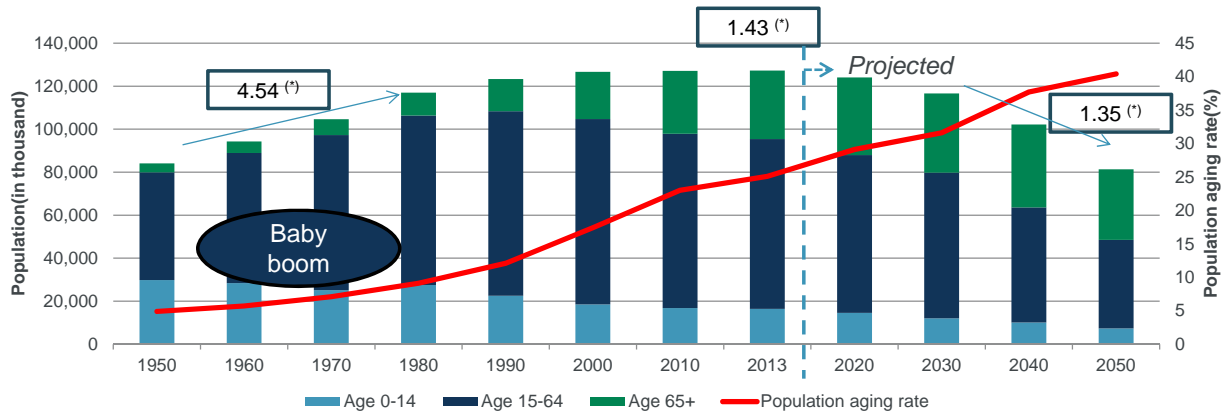
Source : Swiss Re, sigma

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Japan Life Insurance Overview – Demographics

Potential market shrinking due to declining birth rates and aging population



(*) Birth rate per female

Source : Statistics Bureau of Japan

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Japan Life Insurance Overview – Operating Environment

Japan and UK market comparison – products, assets and regulatory requirements

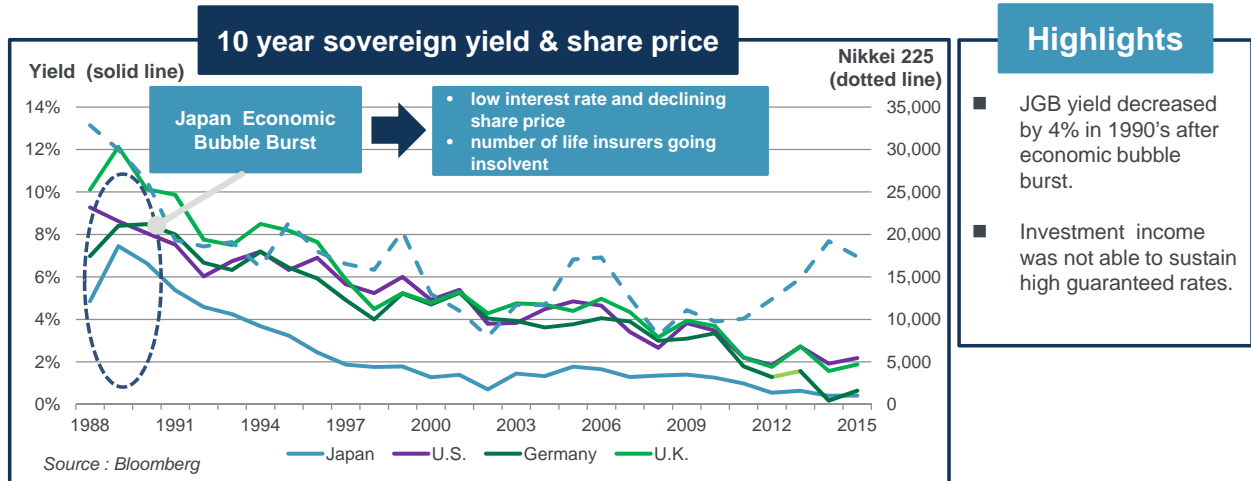
	Japan	UK
Product Mix	<ul style="list-style-type: none"> Guaranteed interest rate Complement Public Pension and Health Insurance 	<ul style="list-style-type: none"> Mostly Savings & Annuity products With profits-product traditionally been popular
Asset Mix	<ul style="list-style-type: none"> Switching to Investing in more bonds than equities Duration lengthening 	<ul style="list-style-type: none"> Switching to investing in more bonds than equities Duration lengthening
Regulatory Requirements	<ul style="list-style-type: none"> "Locked-in" Statutory Reserve Risk Based Solvency approach 	<ul style="list-style-type: none"> "Twin peaks" Statutory Reserve Solvency II implementation in 2016

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Historical Market Trend

Japan has been experiencing extremely low interest rates and sudden drops in share price



Highlights

- JGB yield decreased by 4% in 1990's after economic bubble burst.
- Investment income was not able to sustain high guaranteed rates.

“Insolvent” Life Insurers

High guaranteed interest rates before the burst of economic bubble forcing life insurers to invest in riskier assets, causing consecutive bankruptcies in late 90's and early 00's

Insolvent life insurers

(unit : JPY billions)

Year	Company	Asset at insolvency	Net Asset at insolvency
1997	Nissan	2,100	(303)
1999	Toho	2,800	(650)
2000	Daihyaku	2,100	(318)
2000	Taisho	200	(37)
2000	Chiyoda	3,500	(595)
2000	Kyoei	4,600	(690)
2001	Tokyo	690	(73)

Highlights

- The low interest rates and decreasing share prices caused significant problems for asset liability matching.
- Life insurers struggling with huge negative spread, where “Risk exceeds Capital”, led to bankruptcies.

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Drivers and Challenges

Insurers seeking optimization under constraints such as customer needs, volatile market environment, regulatory requirements etc.

Key Drivers	Challenges
Persistent low interest rates and saturated mature market	Attractive and profitable products within constraints Japanese traditional guaranteed rates preferences
Worsening investment environment	Achievement of excess return to sustain inforce business with risk reduction
Asset Liability Management	Strengthen ALM under uncertain interest rate environment
Pension System	Continue guaranteed products according to risk allowance. Ensuring soundness of pension plan finances under severe operating environment

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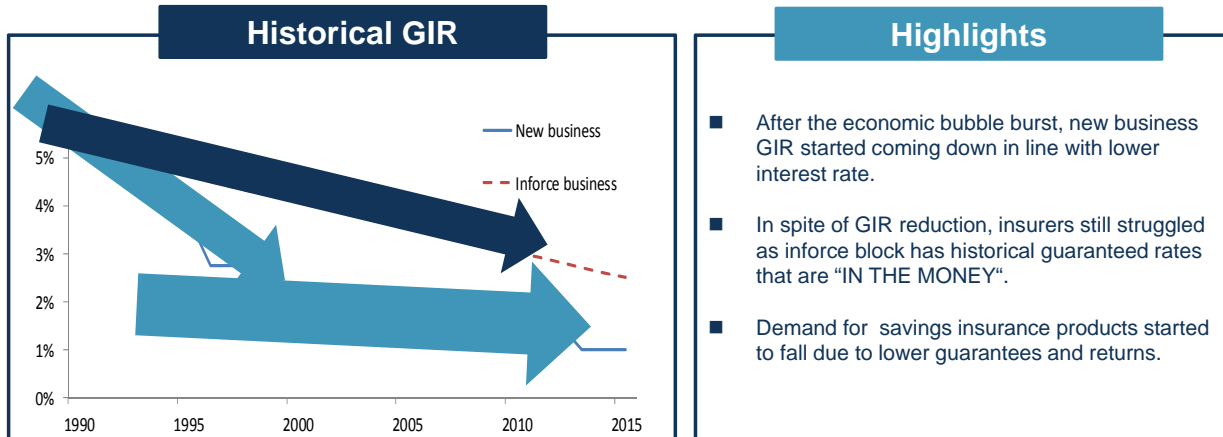
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Guaranteed Interest Rates

Guaranteed Interest Rate (GIR) offered by Insurers reduced over the years following the economic bubble burst, driven by low interest rates



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Comprehensive Life Insurers' Solutions

Life Insurers came up with more attractive and profitable products

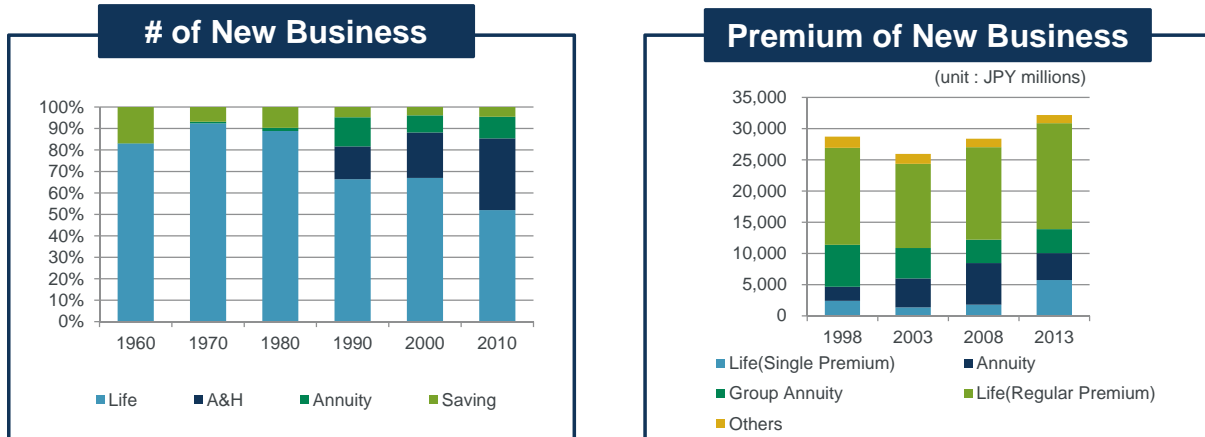


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Changes in Product Mix

Well diversified and balanced product portfolio to meet customer lifetime needs over years where A&H and saving products have been growing so strongly

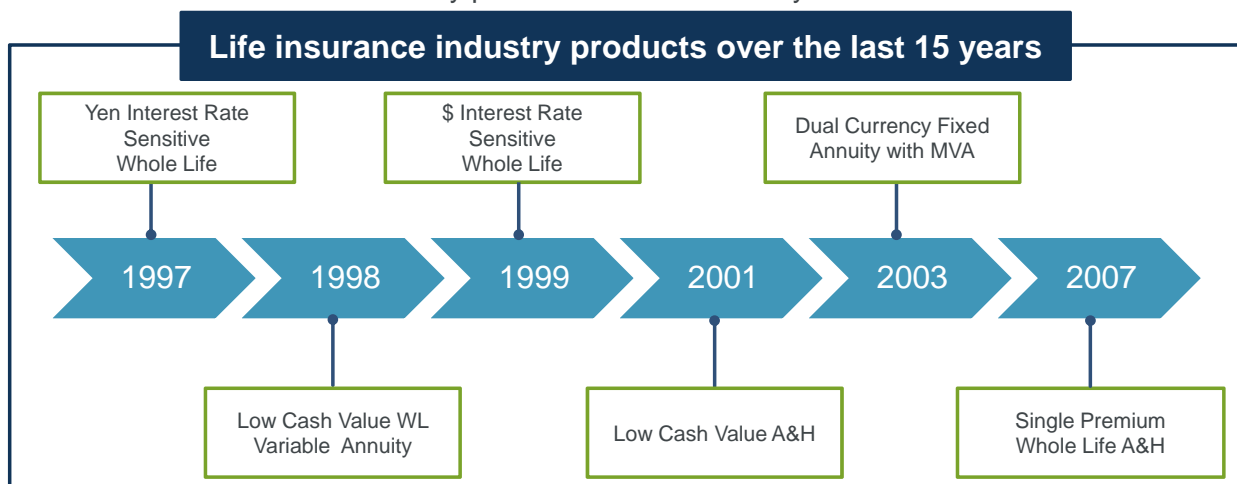


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Products Innovation

Innovative life insurance industry products over the last 15 years



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The Dilemma of Japanese Insurers

Japanese insurers need to reduce risk and keep substantial return at the same time

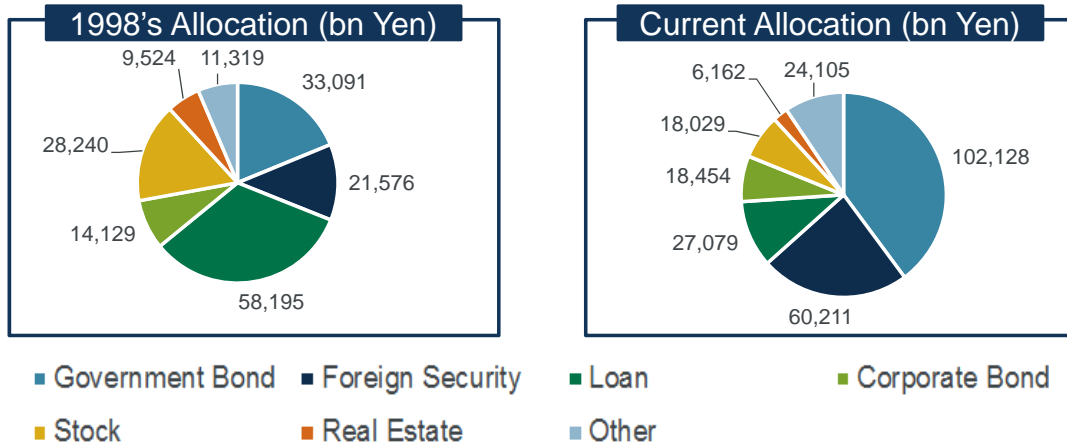


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Change in Asset Allocation

Equity and loan has been replaced by bonds

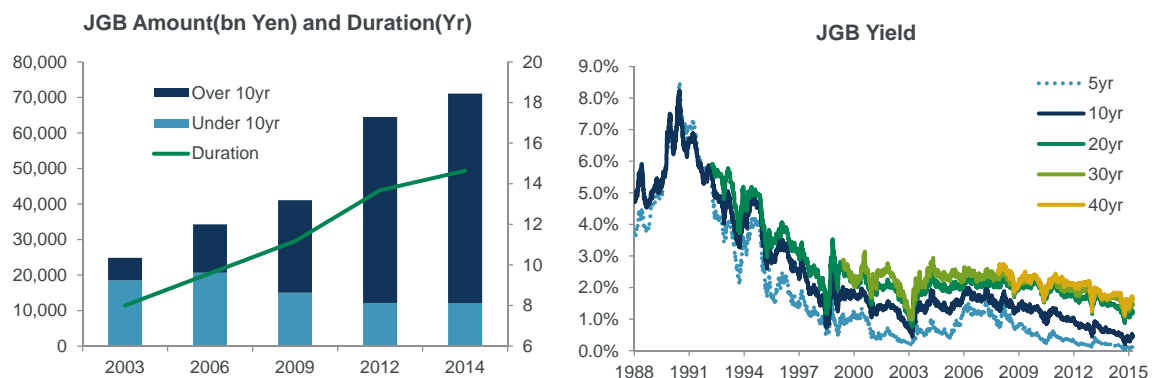


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Increase of the Duration of Bonds

Japanese insurers hugely Invested in long term bonds to seek higher return

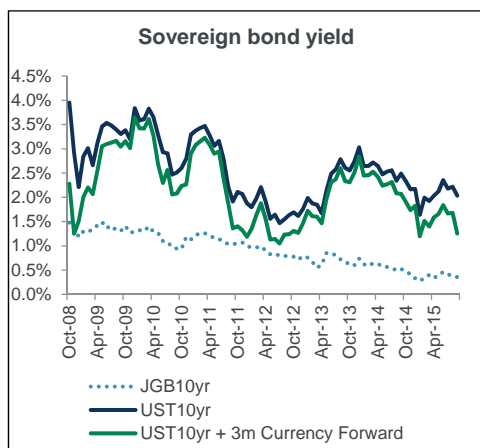


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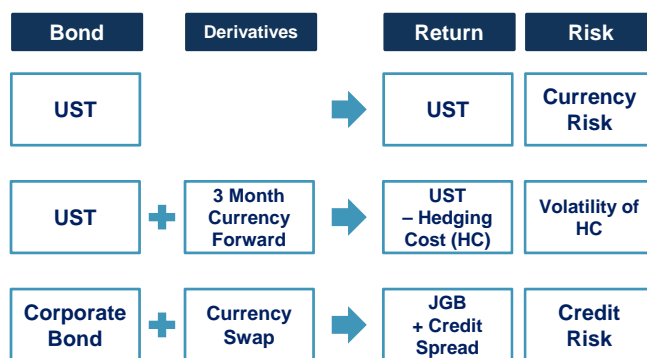
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Further Yield Enhancement

Foreign Bonds show attractive return



Return and Risk (*) of Foreign Bonds by Strategy



* Ignoring swap spread and counterparty risk of derivatives

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Changes in Risk Management

Japanese insurers reduced the market risks through various approaches

Key Changes

- Reduction of risky assets
- Asset Liability Management
- Market Value Adjustment
- Control the volume of saving products

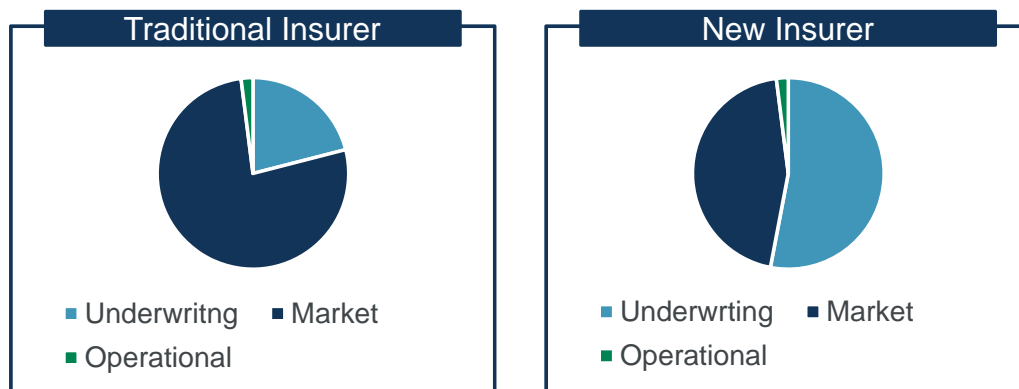
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Economic Risk Portfolio

The changes lead to the significant exposure to underwriting risk

Risk Split for two typical insurance companies(*)



*Our estimation

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Current Asset Liability Management in Japan

Asset duration is gradually aligning with Liability duration, but its gap remains due to current environment

The duration gap is reducing

- The asset duration is extending every year.

But, the gap remains because

- **Liability Duration of New Business**
New business which has a long policy term such as whole life accidental and health product is acquired.
- **Regulation**
Shorter asset duration is preferable to the stability of current local solvency margin ratio.
- **Low Interest Rate**
The down side risk would be limited under low interest rate environment and interest rate increase is expected.



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Possibility of Interest Rate Hike

The increase of interest rate could make more impacts



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Possibility of Interest Rate Hike

The optimal solution would be different by company

The pros and cons of solutions for interest rate hike

Solutions	Pros	Cons
Keep Duration Gap open	<ul style="list-style-type: none"> Simple and feasible 	<ul style="list-style-type: none"> Potential Downside Risk Basis Risk
Payer Swaption	<ul style="list-style-type: none"> Limited downside risk 	<ul style="list-style-type: none"> High premium Reinvestment cost Illiquid market Basis Risk

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Pension System Comparison – Japan vs UK

As in the U.K. Corporate pension plans are established in Japan in order to supplement the National Pension



Pension age	60-65 → 65	62-65 → 68												
Replacement rate	35.6%(NP)	32.6%(SP)												
Topics	Adjust through indexation	New State Pension												
	<table><tr><td>DB</td><td>DC</td></tr><tr><td colspan="2">EPI</td></tr><tr><td colspan="2">N P</td></tr></table>	DB	DC	EPI		N P		<table><tr><td>DB</td><td>DC</td></tr><tr><td colspan="2">SP2</td></tr><tr><td colspan="2">SP</td></tr></table>	DB	DC	SP2		SP	
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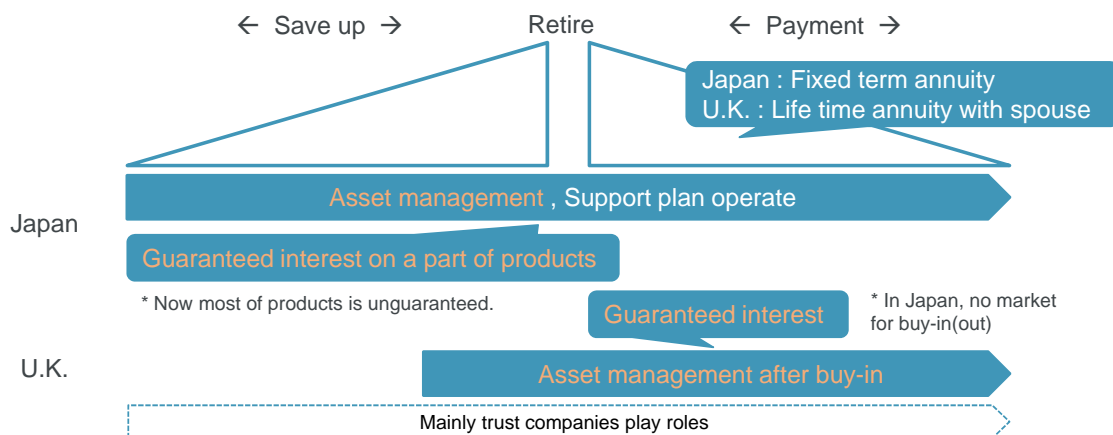
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NP: National Pension, EPI: Employees' Pension Insurances, DB: Defined Benefit Corporate Plan
DC: Defined Contribution Pension Plan, SP: State Pension, S2P: State 2nd Pension

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Business Characteristics – DB type

Interest rate risk is very important for insurance companies entrusted with DB* plans.
In Japan, involvements in pension plans can be particularly long

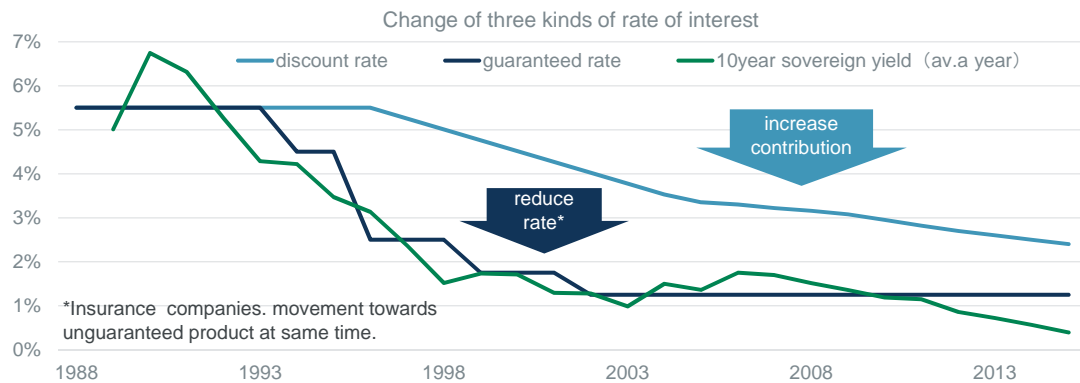


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*Under DC plans, only employee take interest risk. 28

Transfer Interest Rate Risk to Sponsor Companies

Action to maintain Insurance companies' financial health. However, guaranteed products hold a prominent position because of price certainty

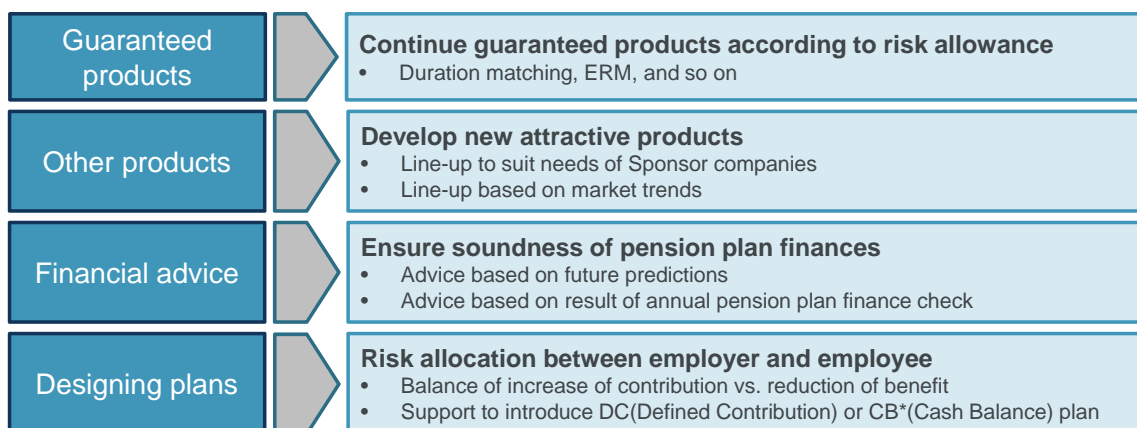


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Action to Protect Corporate Pension Plans

To protect plans, Insurance companies, Trust Bank and Consulting firms in Japan have taken measures with Sponsor companies

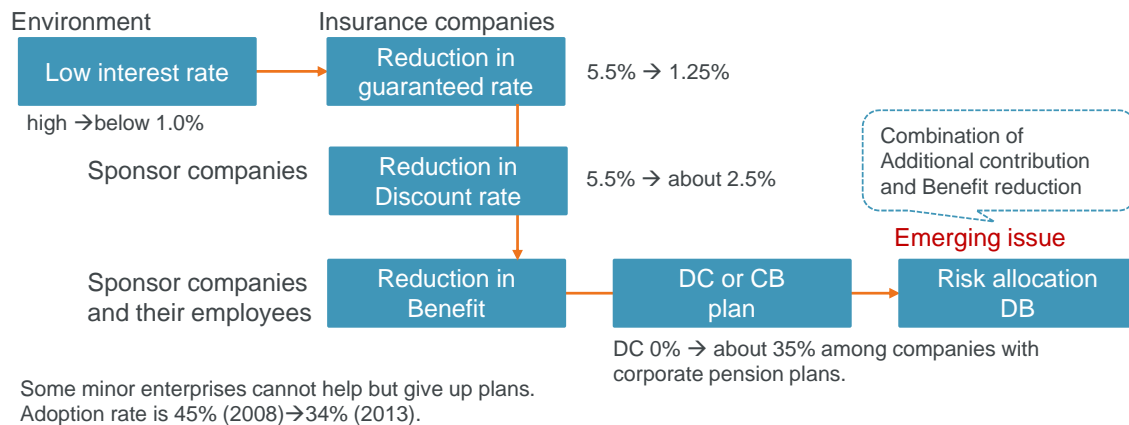


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*CB is an intermediate plan between DB and DC. The benefit is affected by yield or performance. 30

Changes in Corporate Pension Plans

We think the measures to tackle the low interest rate can be seen as risk sharing and are still developing



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Key Takeaways



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Thank you for your attention



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Questions

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