



Risk Management of Life Insurance Liability reflecting Service Contract Aspect

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Contents

- Introduction
- Characteristics of life insurance
 - Financial product aspect
 - Service contract aspect
- Characteristics of life insurance liability
 - Existence of core deposit
- Risk management reflecting service contract aspect

1. Introduction

- Life insurance company
 - Financial institution

- Life insurance product
 - Financial product aspect
 - Service contract aspect

2. Characteristics of life insurance

2.1 Financial product aspect

- ❑ Exchange of future cashflow

- ❑ Derivative
 - Guarantee of surrender value
 - Dividend
 - Guarantee of interest rate

- ❑ Pricing method

2. Characteristics of life insurance

2.2 Service contract aspect

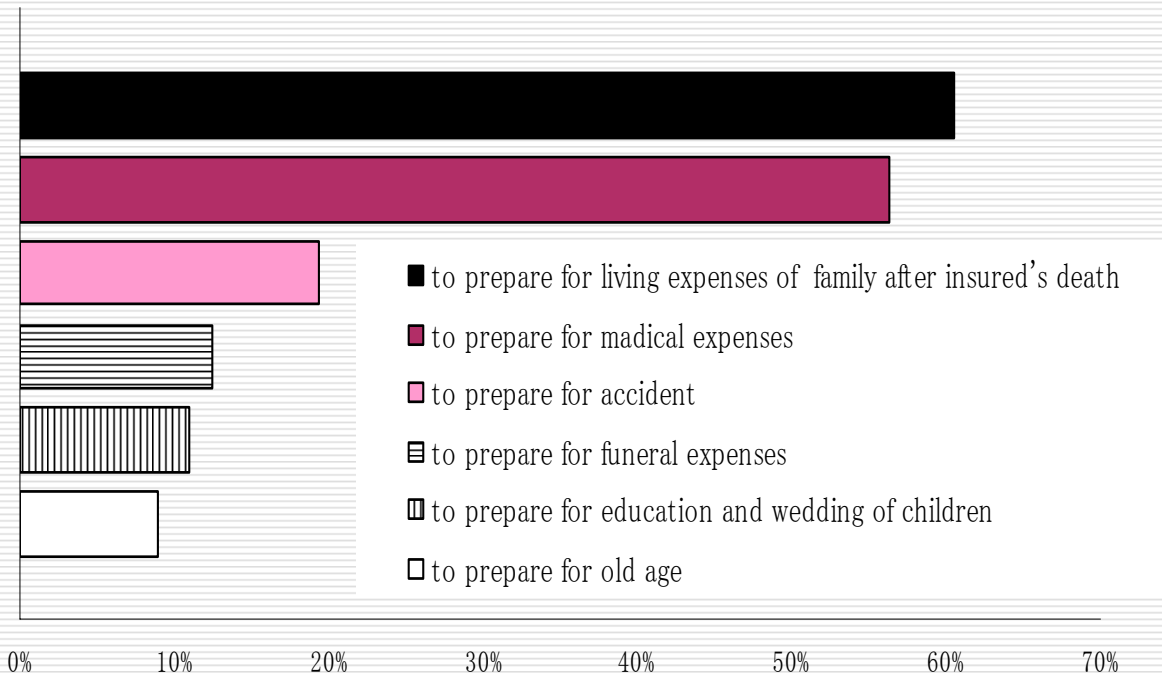
- Existence of utility for insurance protection
= a sense of relief

- Definition of insurance
 - Insurance is a set of management process to reduce risk, in which insurer accept enough amount of similar risk, pool it in terms of time and amount, and mitigate it.

2. Characteristics of life insurance

2.2 Service contract aspect (cont'd)

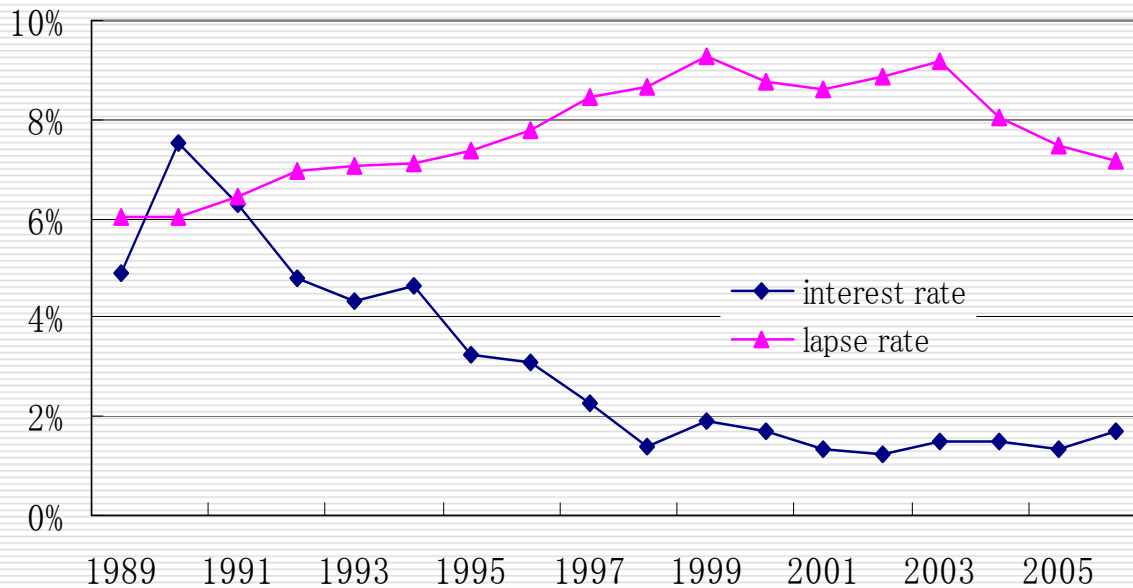
Purpose of buying insurance



2. Characteristics of life insurance

2.2 Service contract aspect (cont'd)

Historical lapse rate of certain company (D)
and market interest rate



2. Characteristics of life insurance

2.2 Service contract aspect (cont'd)

□ Other characteristics

- No existence of 2ndary market
- Existence of underwriting
- Relationship with sales people
- etc...

2. Characteristics of life insurance

2.3 Conclusion

- ❑ The decision of buying insurance is sometimes based on service contract aspect, unlike other financial products such as stocks and bonds.
- ❑ Policyholders' decision on whether they keep or cancel their policies is sometimes related to the utility of insurance, and not necessarily on financial environment.



Financially, policyholders do not necessarily behave rationally.

3. Characteristics of life insurance liability

3.1 Introduction

Policyholders keep their Policies, regardless of economic value.
(holding contracts)

Policyholders buy life insurance, though it is a bad deal to them.
(new contracts)



CF of insurance company is stable.



Existence of core deposit

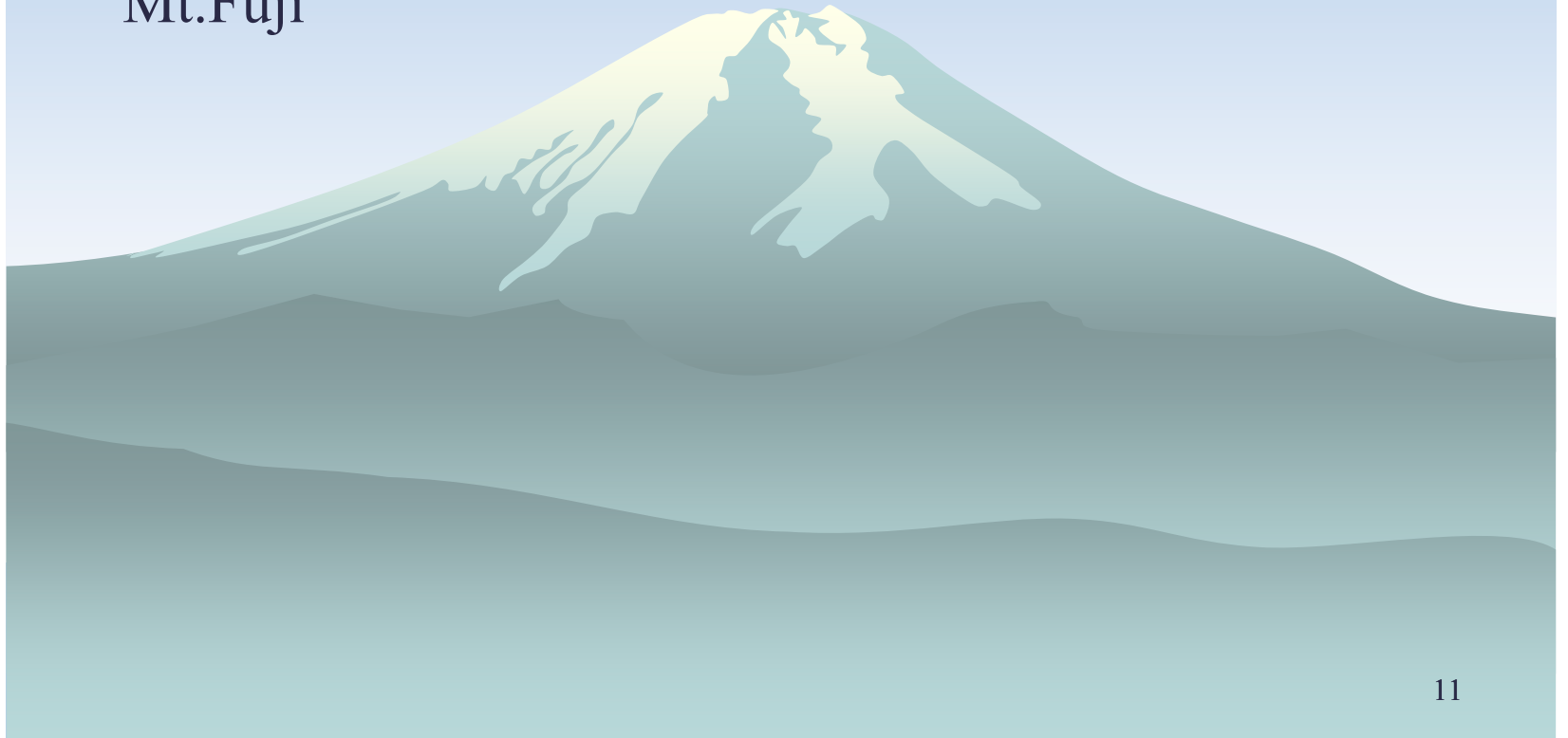
Other financial product

- Disintermediation
- New policy can not be acquired.

3. Characteristics of life insurance liability

3.2 Core deposit

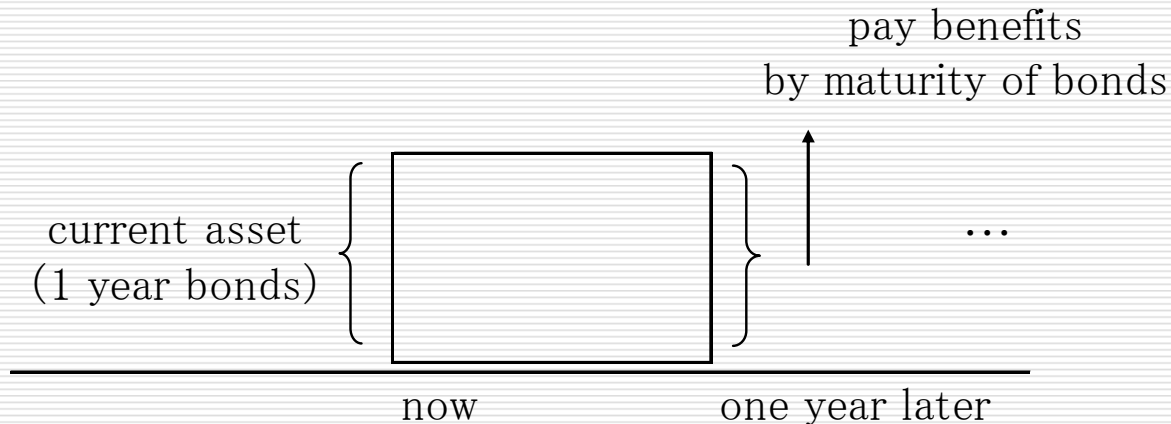
- ◆ What is core deposit?
- ◆ Similarity of core deposit and permanent snow on Mt.Fuji



3. Characteristics of life insurance liability

3.2 Core deposit (cont'd)

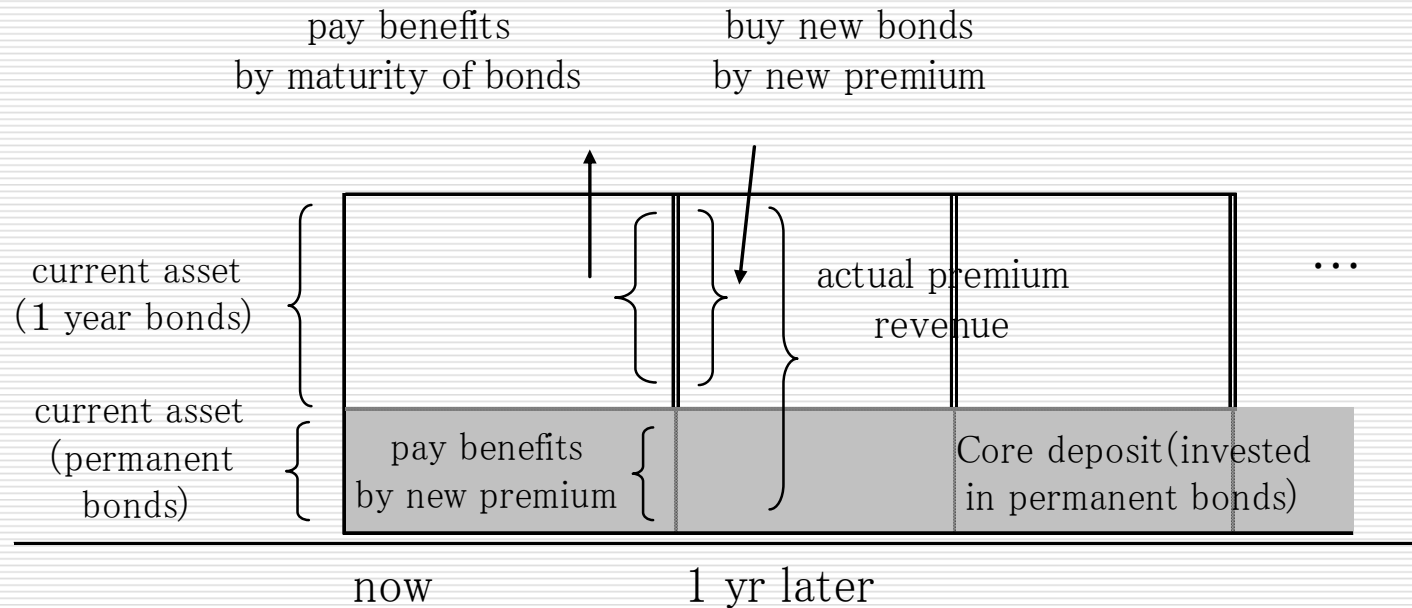
(a) when core deposit does not exist



3. Characteristics of life insurance liability

3.2 Core deposit (cont'd)

(b) when core deposit exists



3. Characteristics of life insurance liability

3.2 Core deposit (cont'd)

Condition of existence of core deposit

- Future CF is stable.
 - Not every policy will be canceled in environmental changes.
 - Acquiring new policies is expected.
- Future premium includes margin.

3. Characteristics of life insurance liability

3.2 Core deposit (cont'd)

(Simple example)

- ❑ Current interest rate: 2.0%(1yr), 2.5%(per)
- ❑ Future maximum interest rate
 - market interest rate: 5.0%(1yr)
 - Interest rate of policies: market $i \times 0.8 (=4.0\%)$
- ❑ By investing 40 in permanent bonds, interest of future policies will be satisfied.

$$40 \cdot 2.5\% + 60 \cdot 5.0\% = 4 (= 100 \cdot 4.0\%)$$

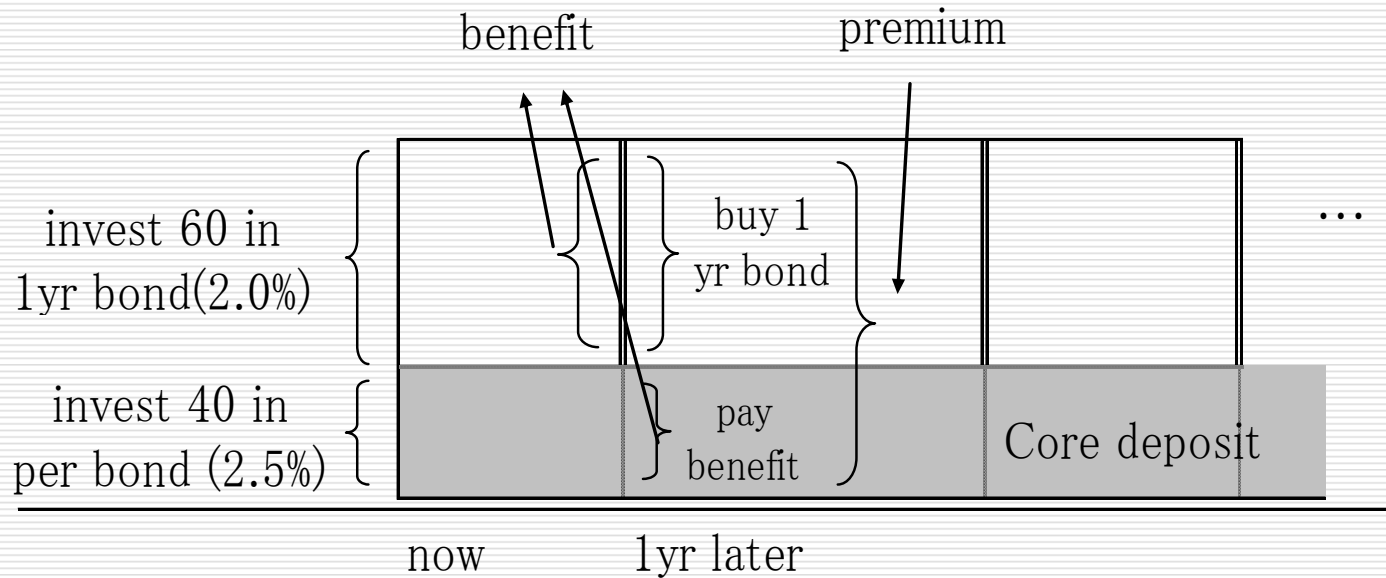
Interest from
permanent bond

Interest from
future investment

Interest which have
to be satisfied

3. Characteristics of life insurance liability

3.2 Core deposit (cont'd)



3. Characteristics of life insurance liability

3.2 Core deposit (cont'd)

Future investment return of the company

	return of company		interest rate of policy		profit	
	1st yr	2nd yr	1st yr	2nd yr	1st yr	2nd yr
best estimate scenario						
① 1yr bond(100)	2.0%	2.0%	1.6%	1.6%	0.4%	0.4%
② 1yr bond(60) + per bond(40)	2.2%	2.2%	1.6%	1.6%	0.6%	0.6%
high interest scenario						
① 1yr bond(100)	2.0%	5.0%	1.6%	4.0%	0.4%	1.0%
② 1yr bond(60) + per bond(40)	2.2%	4.0%	1.6%	4.0%	0.6%	0.0%
low interest scenario						
① 1yr bond(100)	2.0%	1.0%	1.6%	0.8%	0.4%	0.2%
② 1yr bond(60) + per bond(40)	2.2%	1.6%	1.6%	0.8%	0.6%	0.8%

return of ② is calculated by " $(① \cdot 60 + 2.5\% \times 40) / 100$ "

interest rate of policy is calculated by "1yr bond interest rate \times 80%"

4. Risk management reflecting service contract aspect

- Existence of core deposit



- It is reasonable to invest in
 - bonds of longer duration.
 - bonds with less liquidity.
 - risk asset such as stocks and real estates.

4. Risk management reflecting service contract aspect (cont'd)

- ❑ To satisfy policyholders' satisfaction, insurance companies which sell with-profit products plan their investment strategy with long term prospect, utilizing core deposit.
- ❑ Insurance companies diversify investment risk in terms of time, and pay stable dividends each year.

4. Risk management reflecting service contract aspect (cont'd)

(conclusion)

- When we think risk management of insurance companies, consideration of existence of core deposit is important, to reflect the feature of insurance liability.

Questions?

For further information, please contact

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Thank you!