The responses to financial crisis and globalization of solvency supervision/financial reporting

Oriental Life Insurance Seminar (OLIS)

October 18, 2010

Masanori Sakasai

Gibraltar Life

Vice President, Chief Actuary

The responses to financial crisis and globalization of solvency supervision/financial reporting

1. What happened in global financial crisis
2. Revision of solvency margin
3. Financial crisis and life insurance products
4. Impact to Embedded Value (EV)
5. Financial crisis and risk management
6. Update on global solvency supervisory standard
7. Update on IFRS
8. Towards globalization of solvency supervision and financial reporting

1. What happened in global financial crisis

1-1 Movements of financial market

- Global financial crisis caused the following market movement which adversely influenced life insurance industry

① Deterioration in stock price

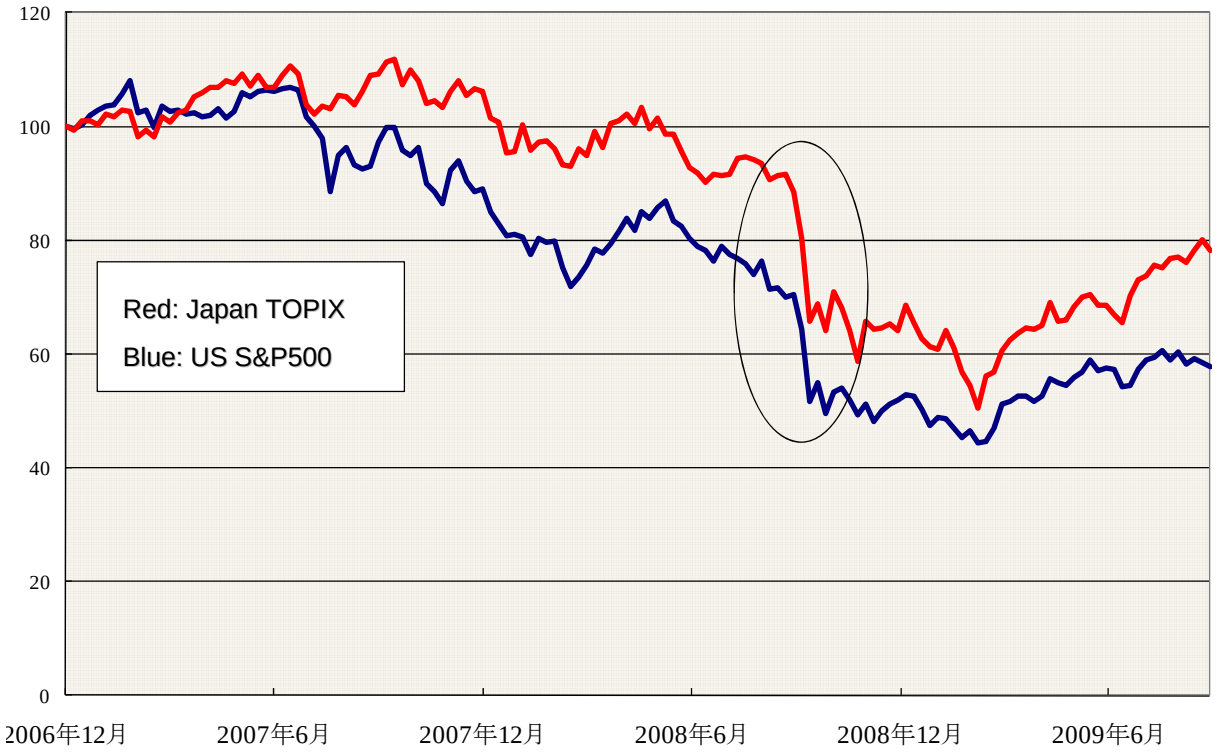
② Increase in volatility

③ Decrease in interest rates

④ Expansion of credit spread

1-2 Deterioration in stock price

Dec. 2006＝100

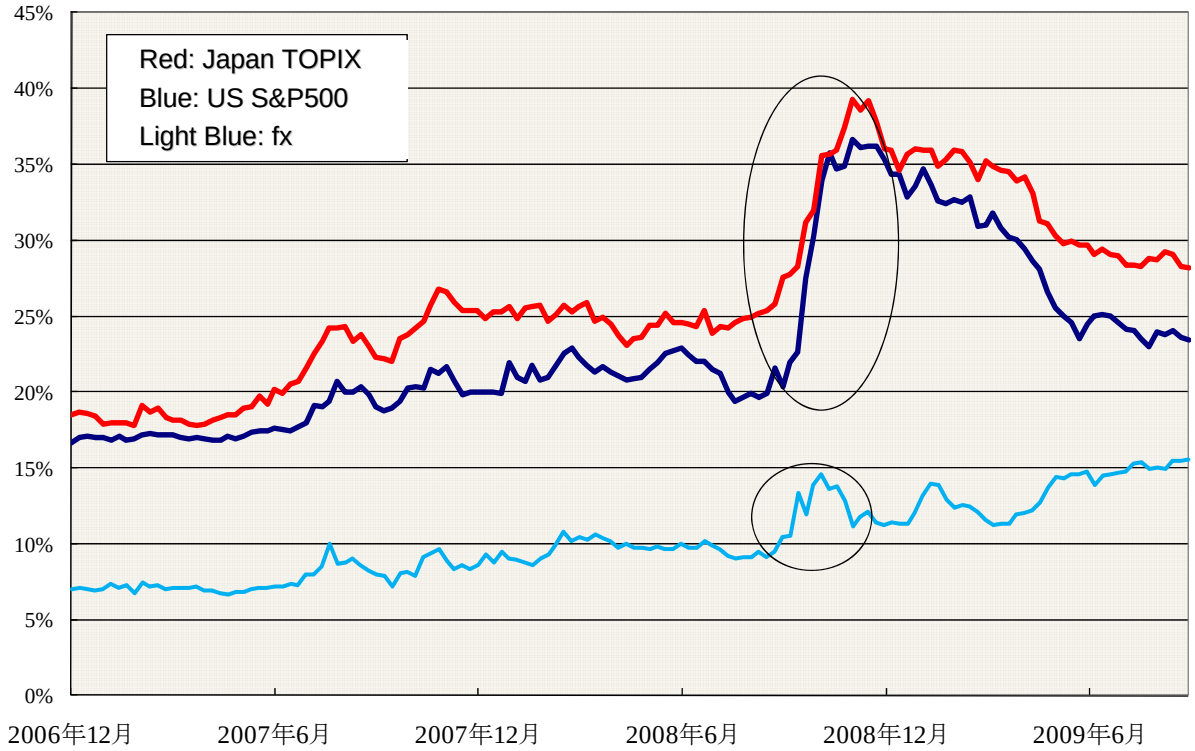


（Ref）Bloomberg

⇒ Decrease in asset value, Increase in VA liability, Decrease in capital, Decrease in EV

1-3 Increase in volatility

Implied volatility of stock and fx (5yr, ATM)

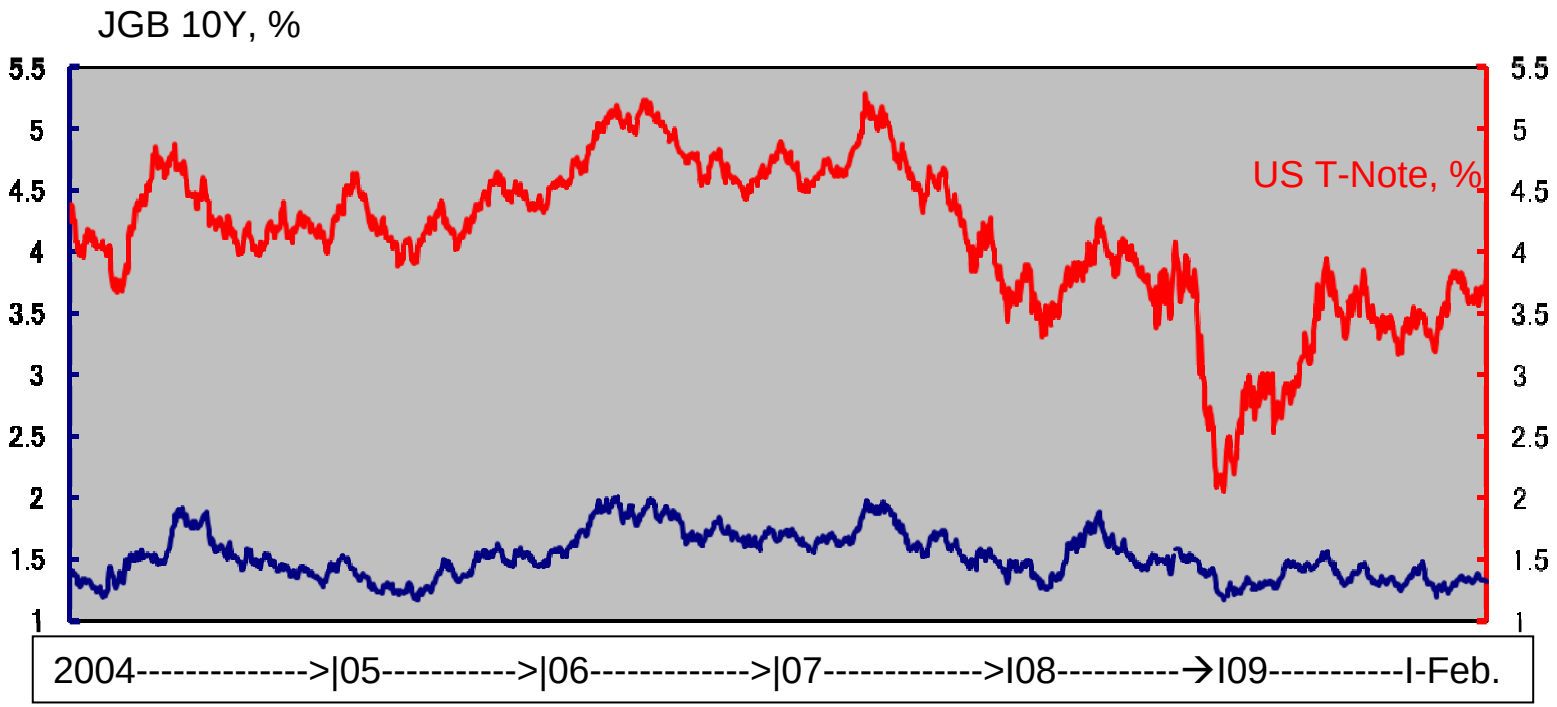


（Ref）Milliman Inc.

⇒ Increase in VA liability, increase in hedge cost, decrease in new business profitability, necessity of change in product strategies

1-4 Decrease in interest rates

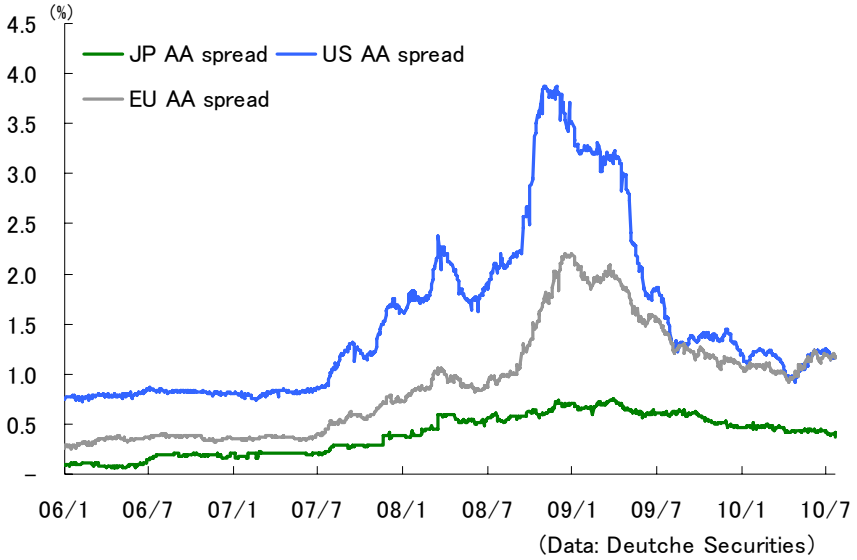
Movements of interest rates (US and Japan)

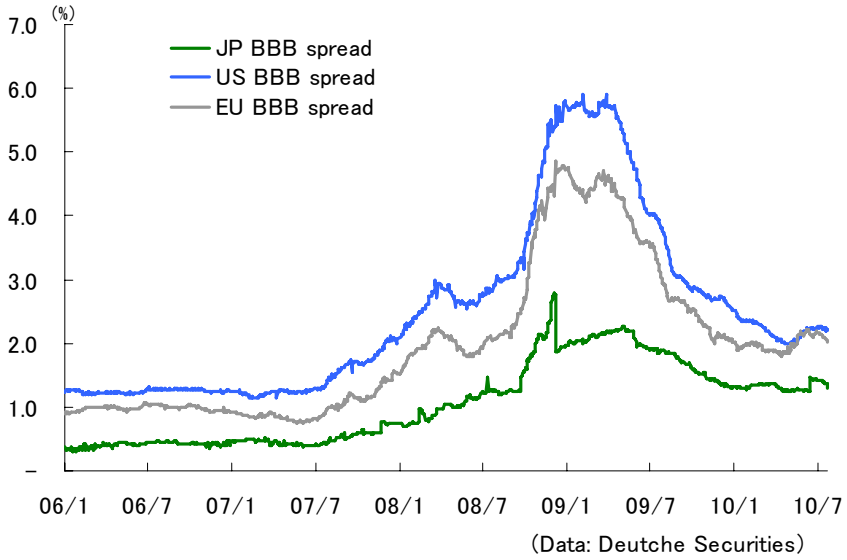


⇒ Increase in liability, decrease in new business profitability, decrease in EV

1-5 Expansion of credit spread

Credit spread of corporate bonds over gov. bonds (10yrs)





⇒ Decrease in asset value, decrease in capital

1-6 Decrease in capital of life insurance companies

Decrease in solvency margin

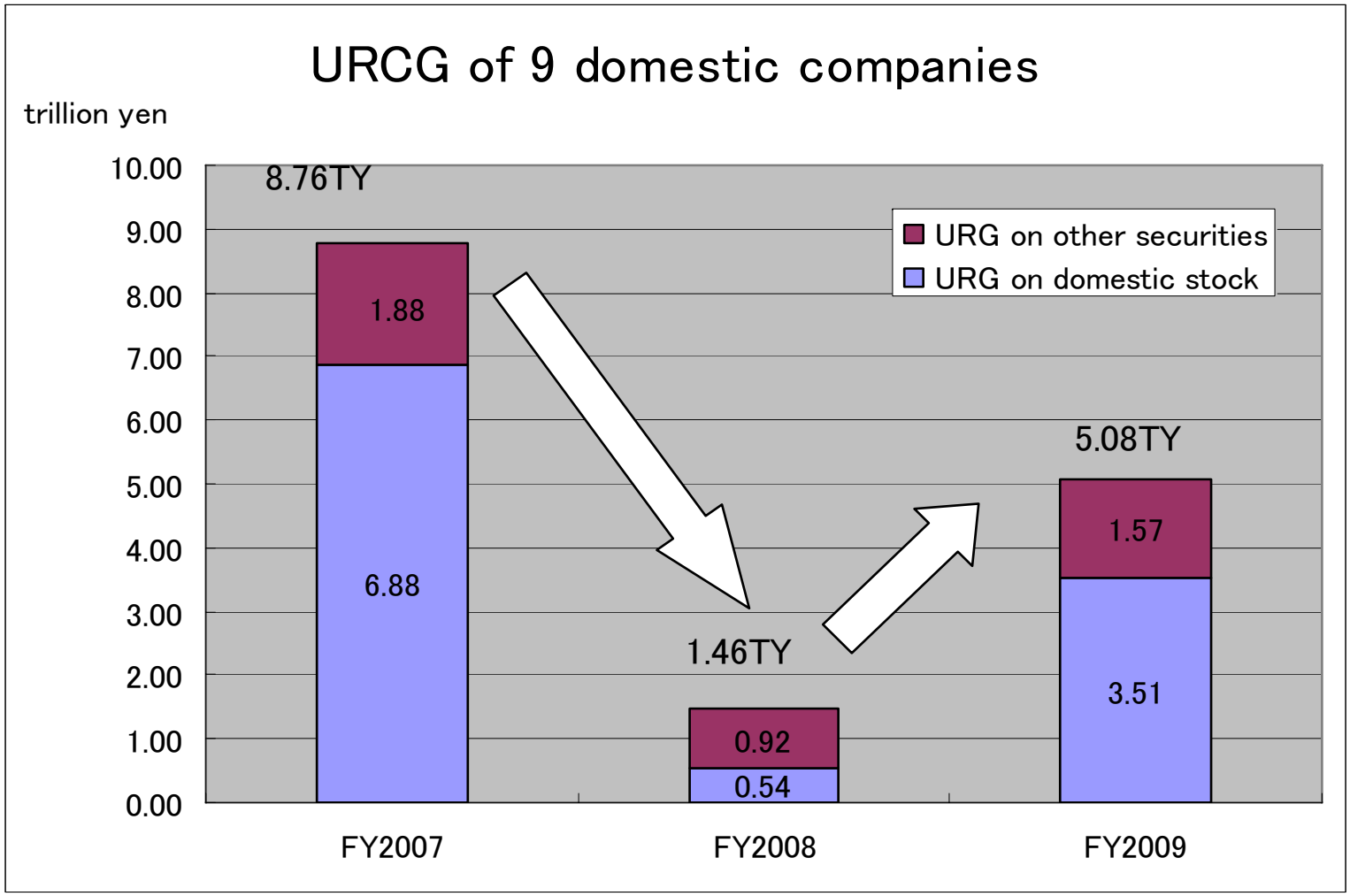
- SMR of life companies significantly decreased in FY2008

[SMR of domestic comanies]

(Unit : %)	FY2007	FY2008		FY2009	
	SMR	SMR	inc/dec	SMR	inc/dec
Nippon	1,156.8	904.4	-252.4	1,006.0	101.6
Dai-ichi	1,010.6	768.1	-242.5	953.5	185.4
Maiji-Yasuda	1,314.1	1,098.7	-215.4	1,187.5	88.8
Sumitomo	1,030.7	837.2	-193.5	955.1	117.9
Mitsui	696.1	602.0	-94.1	702.1	100.1
Asahi	674.1	583.1	-91.0	608.0	24.9
Fukoku	1,146.9	1,008.4	-138.5	1,127.6	119.2
Taiyo	1,000.6	866.4	-134.2	1,023.8	157.4
Daido	1,096.3	823.4	-272.9	1,120.6	297.2

1-6 Decrease in capital of life insurance companies (cont.)

- Decrease in unrealized capital gain in securities
  - Especially, URCG of stock significantly decreased



2. Revision of solvency margin

2-1 Planned revision of solvency margin

- Japanese regulator (FSA) is planning to revise solvency margin
  - More stringent system being adopted due to financial crisis and Yamato bankruptcy
  - Main focus is to enhance the quality of capital as well as to update the risk factors to reflect recent market conditions.
  - FSA intends to move to economic-based approach to solvency margin capital in the longer term.
  - FSA published detailed rules for new SMR on Apr.20, 2010.
  - Time line for the revision;
    - March 2011 : Trial calculation and submission to FSA
    - March 2012 : Implementation of the new rules

2-2 Outline of current SMR

- Calculation of current SMR is as follows

$$\text{Solvency Margin Ratio (\%)} = \frac{\text{Solvency Margin}}{\frac{1}{2}\text{Risk Amount}} \times 100$$

  - A ratio lower than 200% will trigger submission of reasonable improvement plan to FSA and its execution.
  - A ratio lower than 100% will trigger prohibition/restriction of SH dividend/PH dividend, pricing change, expense reduction, etc.
  - In reality, all of companies' SMR's well exceed 200%

2-2 Outline of current SMR (cont.)

- Components of SM capital (Numerator)
  - Capital, as adjusted (exc. OCI and the amount to be paid outside)
  - Price fluctuation reserve
  - Contingency reserve
  - General Reserves for Bad Debt
  - Net URCG/L on AFS securities (90% if gains; 100% if losses)
  - Net URCG/L on Land (85% if gains; 100% if losses)
  - Reserve excess CV
  - Subordinate Debt
  - Tax Effect Equivalent corresponding to surplus
  - Future profit (1/2 of credit for policy holder dividend）

2-2 Outline of current SMR (cont.)

Main Items of SM Risk (Denominator)

Risk Category	Case Assumed	Calculation
Insurance risks (R1)	Insurance claim payments are higher than expectation in reserves	Risk amount by risk type multiplied by risk factor
Insurance risks related to medical products (R8)	Insurance claims payments are higher than expectation in reserves	Risk amount by risk type multiplied by risk factor
Assumed interest risk (R2)	Investment income earned is lower than assumed in reserves	Reserve amount accumulating at interest times risk factor (risk factor increases as assumed interest rate increases)
Investment Risks (R3)*		
•Price fluctuation risk	Capital loss is higher than normal expectations	Fair value of assets multiplied by risk factor (based on asset class) adjusted for diversification effect
•Credit risk	Counterparty defaults	Carrying amount of loans, bonds and deposits multiplied by risk factor (based on ratings)
•Others	Reinsurance, derivative, subsidiaries, etc.	
Minimum Guarantee Risk (R7)	Minimum guarantee of variable life and variable annuity	Exposure for MG times risk factor
Business Management Risk (R4)	Provision for risk not directly addressed in other risk categories	2% of the total of the other risks (3% if cumulative loss)

2-3 New SMR capital

- Primary changes of SM capital

1. Limitation of DTA

- DTA amount other than those corresponding to price flux reserve, contingency reserve, etc. and AFS URCG/L is subject to the limit of 20% of the below and excessive amount is not allowed for as SM capital.
  a. Total of a. through e. in the below 2.
  b. Reserve excess CV

2. Limitation of reserve excess CV and sub-debt

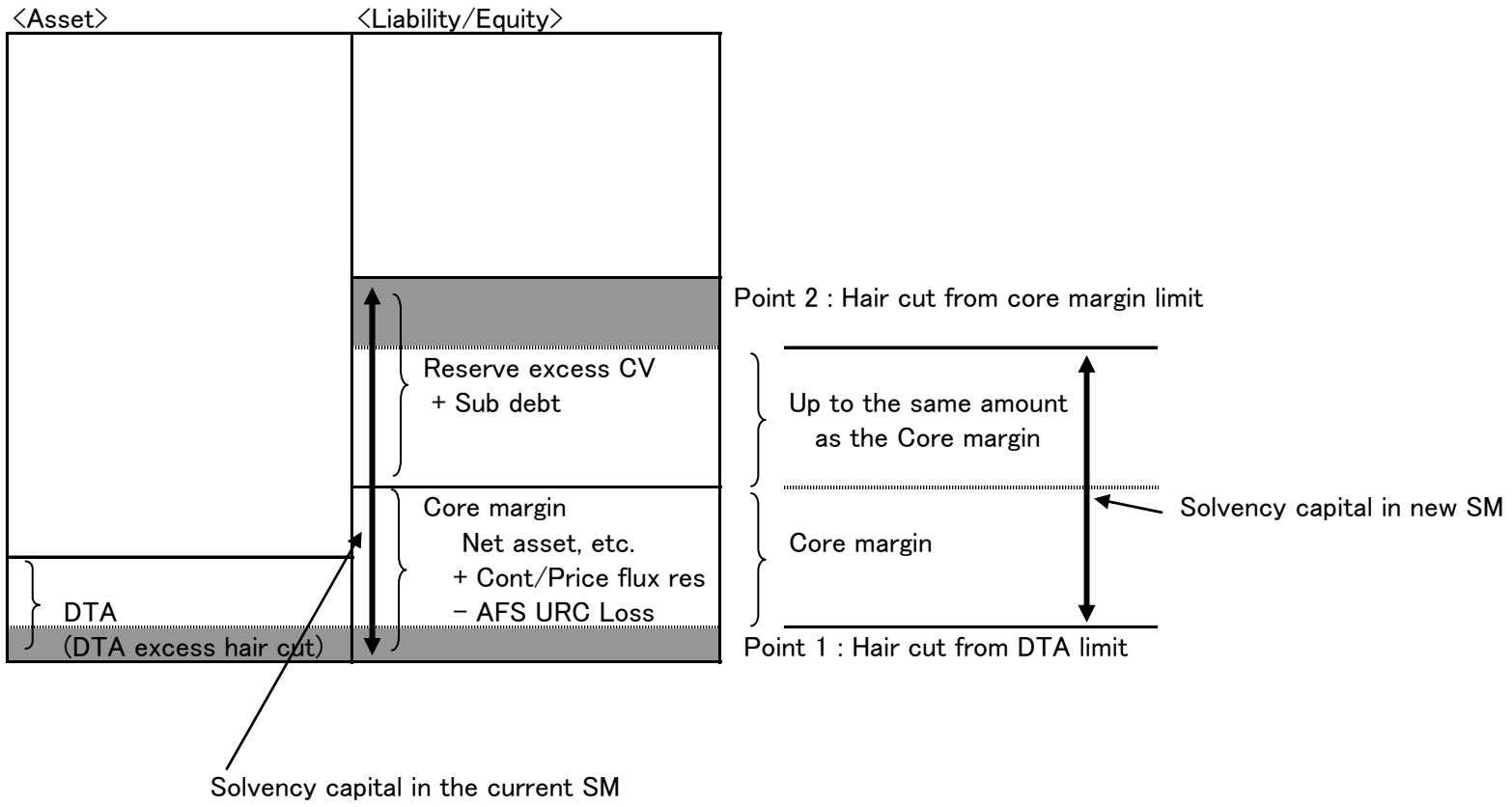
- Core margin is defined as the aggregation of below and excessive amount is not allowed for as SM capital for the total of reserve excess CV and sub-debt
  a. Net asset other than OCI and amount to be paid outside
  b. Price fluctuation reserve
  c. Contingency reserve
  d. Unallocated amount in PHD reserve
  e. (Less) AFS unrealized capital loss (if loss)
  f. (Less) DTA amount cut by (1) above (if any)

3. Elimination of future profit

- Formerly defined as 50% of credited amount for PHD reserve but it will not be regarded as solvency capital under new rules

Illustration of new SMR capital

[Balance Sheet]



2-4 New SMR risk

- Primary changes of SM risks

① Assumed interest rate risk

- Risk factors are updated reflecting the most recent 10 years
  - ✓ Factors increased by low market interest rates

② Minimum guarantee risk (VL/VA)

- J GAAP MG reserve based on stress scenario instead of current simple factor method

③ Investment risk

- Investment risk is composed of several risk items and will be significantly changed (details continued in next page)

2-4 New SMR risk (cont.)

- Changes in new SMR investment risk

① **Price fluctuation risk:** Significant change as below

a. Risk factor updated with VaR95% (from VaR90%)

b. Company portfolio specific diversification effect from uniform 30%

c. The new rule lowers price flux risk for HFR (ALM) bond to 1% as opposed to 2% of AFR bond.

② **Credit risk:** Securitized assets considered

③ **Credit spread risk:** Newly developed risk for CDS spread

④ **Subsidiaries risk:** Change in line with Price fluctuation risk

⑤ **Derivative risk:** Change in line with Price fluctuation risk

2-5 Impact and response to new SMR

- SMR of most companies will significantly decrease
  - Particularly for those companies which largely depend on reserve excess CV and sub-debt
- Increase in fluctuation of SMR due to limitation from core margin
  - It is necessary to heighten the quality of capitals
- Risk reduction like investment risk will be needed as well
- Need to respond to new SMR taking into account the further move to economic based solvency regime

3. Financial crisis and Life Insurance Products

3-1 Impact on Variable Annuity

- Financial crisis caused large burden of MG liability increase regarding minimum guarantee of VA
  - Realization of MG by decrease in stock price
- Also financial crisis significantly impacted the profitability and risk valuated of VA new business
  - Increase in risk premium due to increase in volatility and decrease in interest rates
- In response to the above, various measures were taken including;
  - Sales stop of all or part of VA products
    - ✓ Approximately 10 companies stopped sales of VA
  - Setting of sales limit
  - Product change like lowering stock portion, raising policy fee
    - ✓ Some companies introduced volatility control scheme
  - Lowering the sales commission

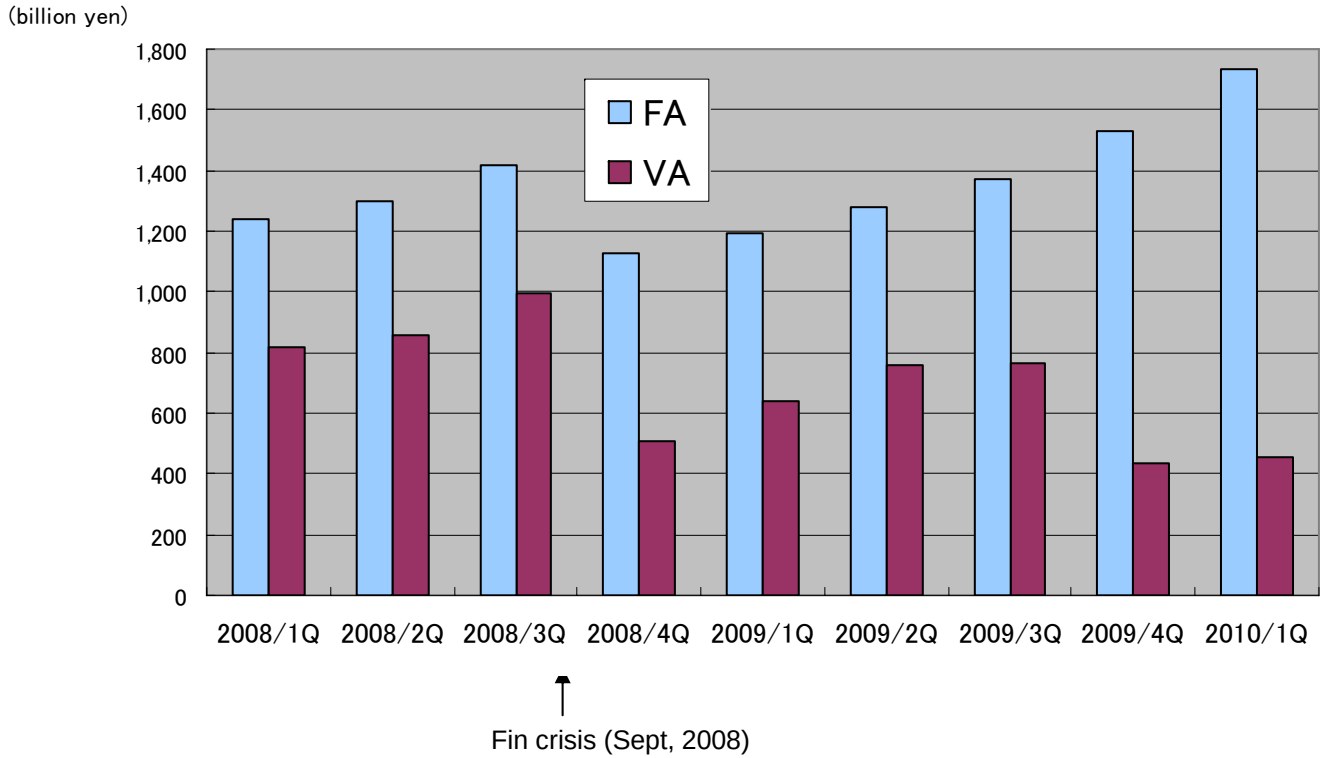
※A few companies newly launched VA business

3-2 Trend of annuity sales

Trend of sales of FA/VA

- After financial crisis, sales in VA was decreased. New business shifted to other companies as some companies stopped VA sales.
- After that, as most companies changed VA strategies, overall sales in VA has been very low.
- On the other hand, FA sales is in increasing trend.

FA/VA Sales in Japan (from LIAJ data; Annuity Fund)



3-3 Product shift in bank channel

- After financial crisis, the shift to other products has been seen in the market while most companies changed VA strategies.
  - Fixed annuity
    - ✓ No minimum guarantee. However low credit rate under low interest circumstances in Japan and with low profitability
  - Foreign currency denominated fixed annuity
    - ✓ Relatively attractive credit rate with high interest circumstances. PH's bear fx risk.
  - Single premium whole life
    - ✓ Provide stable return with long term investment
  - Life products
    - ✓ Increasing sales of high-saving feature life products like endowment

4. Impact to Embedded Value (EV)

4-1 EV types

- EV is basically assessed as shown below:
  EV = Adjusted Net Worth + Inforce Value
- The valuation method of Inforce Value has been heading toward the following directions:
  - Traditional EV(TEV): The traditional valuation method. The value is evaluated by discounting the best estimate future profit at risk discount rate.
  - European EV(EEV): Method in accordance with EEV principle developed by CFO forum took place in May 2004 in an aim to ensure consistent and transparent EV report to investors.
  - Market Consistent EV(MCEV): Method in accordance with MCEV principle developed by CFO forum in June 2008 in order to lead to more solid answers which could not be solved by EEV principle.

4-2 MCEV

- EEV principle still cannot remove subjectivity and flexibility. ⇒ The purpose is to lead to more solid answer by utilizing the market consistent method against traditional criticism about EV.
- Approach to MCEV

Major criticisms about the traditional EV	MCEV approach
Risk discount rate is set subjectively.	Risk neutral valuation is applied.
The option cost for participating type policies, etc, is not appropriately valuated.	The option cost is stochastically evaluated based on the consistent method with the financial market.
The cost of capital calculation is performed subjectively.	The non-hedgeable risk and frictional cost (cost required to maintain capital of the organization and structure of life insurance company) is only reflected.

- In practice, the risk neutral valuation is the method to generate cash flows assuming investment return and discounting them at risk free rate (swap rate as much as possible). This is to figure out the basic policy value.
- The option cost is valuated in a market consistent method unlike EEV principle.
- The risks surrounding the company are separated either hedgeable or non-hedgeable risk so that the company can understand objective and subjective factors as much as possible. （Under the conventional EV method, consideration for all risks are included in the risk premium of the risk discount rate intensively.）
  - ✓ Reflect the hedgeable risk by the market consistent valuation
  - ✓ Reflect the non-hedgeable risk to the capital cost

4-3 EV in Japanese life insurers

- 17 insurers (13 groups) have disclosed their EV now in Japan. Disclosed EV by major insurers is as follows:

Embedded Value of Japanese Life Inusrance

(billion yen)

		Daiichi Life Grp (EEV)	Sumitomo Life Pls refer to *note	T&D Grp (EEV)	Sony Life (MCEV)	Mitsui Life (EEV)	TMN Anshin Life (TEV)
Adjusted net wort	FY2007	2,701	922	1,057	249	404	109
	FY2008	1,297	403	535	195	191	118
	FY2009	1,864	626	835	206	260	106
Inforce value	FY2007	948	1,414	564	568	191	256
	FY2008	462	1,399	331	205	133	240
	FY2009	973	1,462	540	688	258	284
EV	FY2007	3,649	2,335	1,622	817	594	364
	FY2008	1,758	1,801	867	401	324	358
	FY2009	2,836	2,088	1,375	894	518	391
	(FY08/07)	48%	77%	53%	49%	55%	98%
	(FY09/07)	78%	89%	85%	109%	87%	107%
NB value	FY2007	115	74	62	48	26	4
	FY2008	84	71	29	15	21	0
	FY2009	119	86	51	56	28	5

- Inforce Value of Sumitomo Life is before deduction of the capital cost. Adjusted net worth were disclosed as a reference data.
- EV by insurers was calculated based on the calculation method and assumptions set forth by each insurer. We have to keep this difference in mind when comparing the aforementioned data among insurers.

4-4 EV arguments by the financial crisis

- Because of extraordinary situation in the financial environment in 2008, EEV/MCEV has been impacted and thrown into confusion greatly.
  - Implied volatility:
    Many companies valuated the option value based on the implied volatility as of the date other than December end 2008.
  - Swap rate:
    The swap rate has been lower than the yield of national bond over mid-long term. Under this circumstance, some companies have used the yield of national bond as a MCEV reference interest rate instead of the swap rate.
  - Liquidity premium:
    Some insurers added the liquidity premium to the reference rate, which is applied to liabilities, in order to supplement the non-liquidity portion.
    - ✓ "Premium for the credit risk alone cannot explain fully about the observed spread of corporate bond since other premiums for non-liquidity portion should be included too. Thus, we should consider the liquidity premium when valuating liabilities."

4-5 Revision of MCEV Principle

- CFO Forum revised MCEV Principle in Oct 2009.
  - The reference interest rate (risk free rate), which is applied to liabilities with liquidity, should adopt the SWAP rate appropriate to the cash-flow currency as much as possible.
  - Liquidity premium should be added to the SWAP rate for non-liquid liabilities if it is judged as appropriate.
  - Liabilities with liquidity (Liquid liability) points out the case when the liability cash flow cannot be projected reasonably.
  - If the liquidity premium is included in the reference rate, the level of the liquidity premium, method of deciding the said premium as well as liability categories which are under scope should be disclosed.

5. Financial crisis and risk management

5-1 “Insurance Risk Management Response to the Financial Crisis” released by CRO Forum

- The financial crisis caused a large confusion in the risk management area.
- CRO Forum released ”Insurance Risk Management Response to the Financial Crisis” in Apr 2009.

Integrated risk governance	• To respond to changing market environment effectively, sound and comprehensive internal risk governance is required. • The risk tolerance should be clarified and monitored. Risk Management should be authorized as an independent body taking an anticipatory approach. • Compensation should be based on the performance after risk adjustment.
Risk model	• This is an indispensable tool for business management and there are increasing opportunities of using this for regulation controls. • Although it is highly practical, it has inherent limitation greatly. • It requires continuous improvement based on experience. It should be supplemented by sound management judgment to ensure effectiveness.
Liquidity risk management	• It relies on scenario testing different from the risk of capital sufficiency. • This is fundamentally different from the liquidity risk of banks.
Valuation and risk disclosure	• The market demands accurate valuation and swift disclosure of related information. • The market consistent valuation for asset liability is the basis. • Use of credit rating by financial supervisory agencies should be restrained.
Group supervision	• Cooperation among supervisory bodies is necessary internationally. • The principle for group supervision and the economic risk based approach are needed. • By fortifying measures of IAIS, the binding standards should be implemented in order to promote regulation convergence.

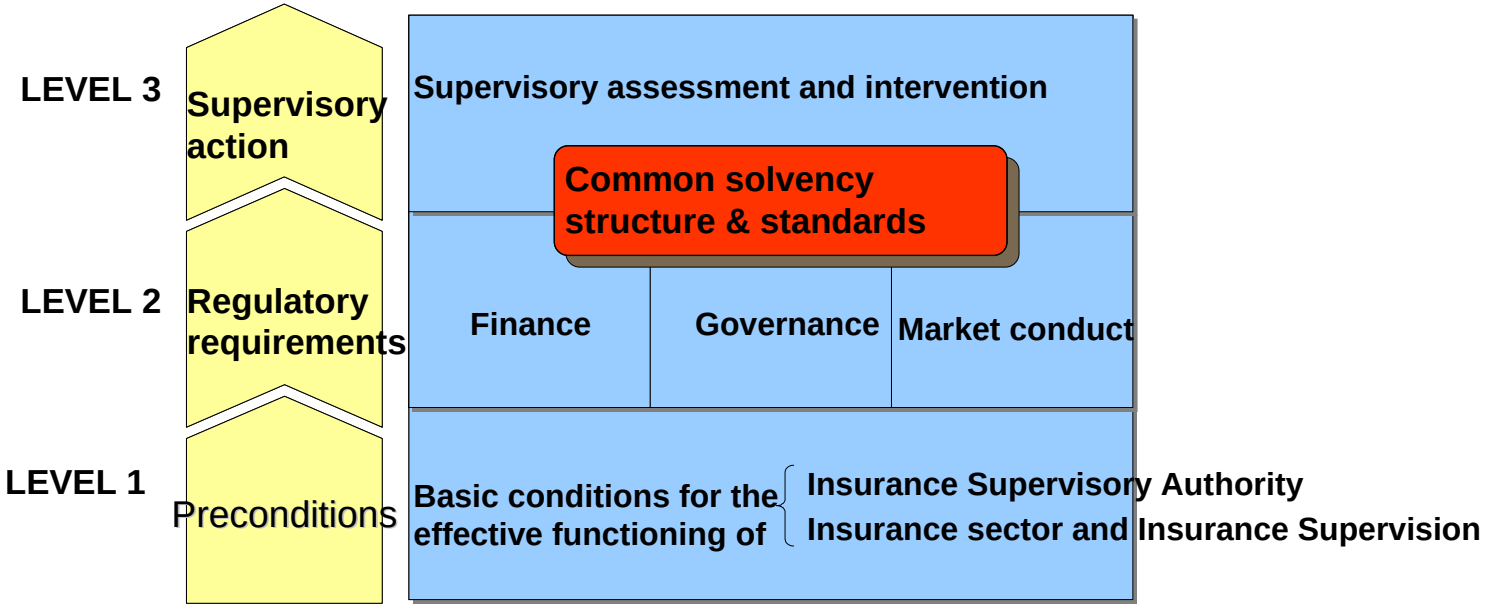
5-2 Risk model

- Following perspectives are important when using the risk model.
  - Clarify the risk which is subject to quantification.
    - ✓ Not necessarily to cover all risks.
    - ✓ Need proper process mgmt for risks that are not covered by the model.
  - Understand limitation of the model
    - ✓ Correlation of the tail part
    - ✓ Understand the relation with assumptions (input).
  - Importance of setting assumptions
    - ✓ Experience analysis
    - ✓ Understand the market environment appropriately
    - ✓ Sensitivity analyses
  - Interpret the result and the usage purpose
    - ✓ Risky to rely too much

6. Update on global solvency supervisory standard

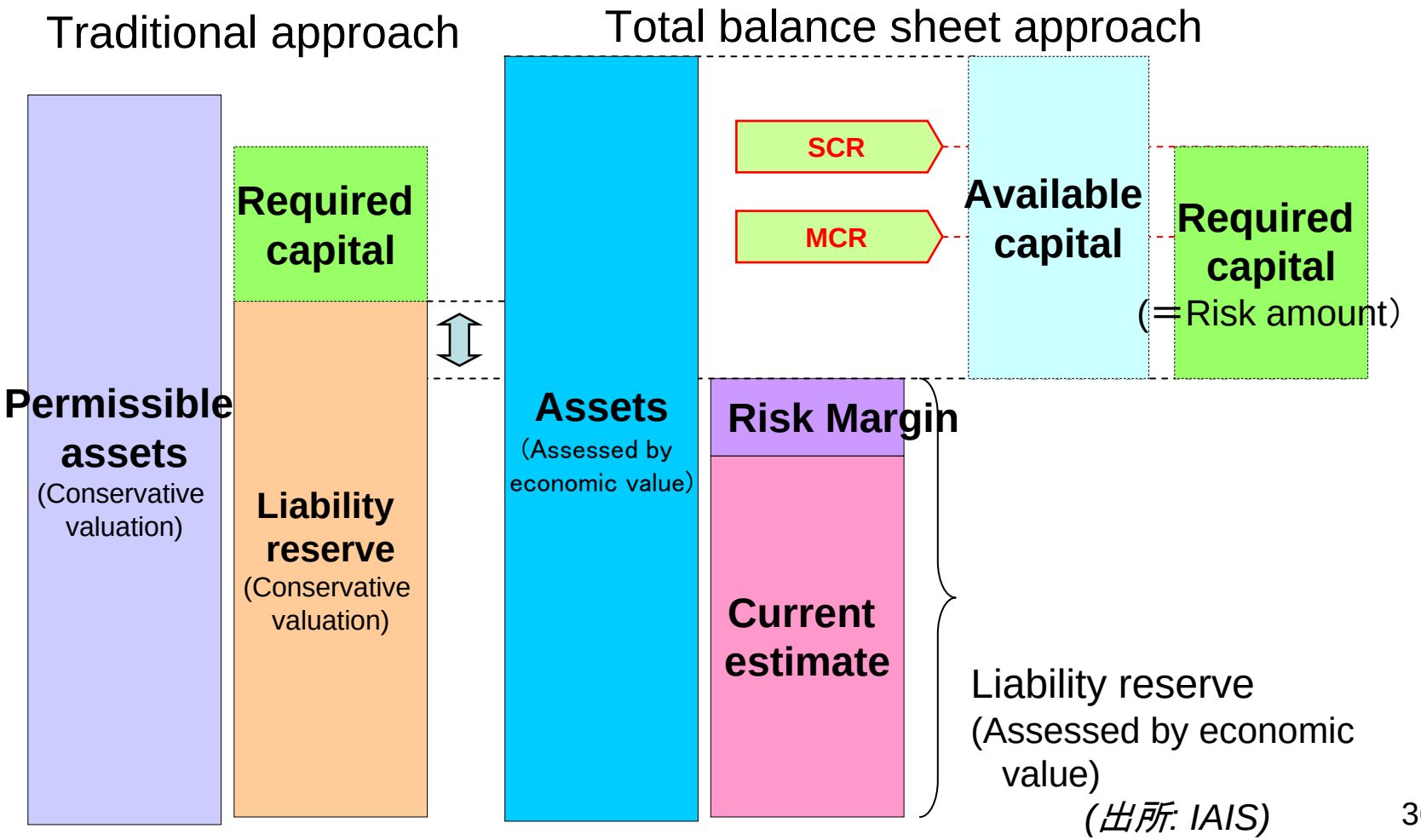
6-1 Framework of IAIS Solvency Supervision

- Significance and purpose of consideration
  - The purpose is to establish the principle of the common framework for insurance supervision.
    - ✓ The major stream is to set forth standards of supervisory actions using indices by stipulating the common principle of Solvency valuation.
  - Even though there is no binding power to each country, there is a trend that each country's supervisory authority is moving to IAIS principle.
- Framework of insurance supervision consists of 3 levels: ① Preconditions for effective supervision② Regulatory requirements and ③Supervisory action



6-1 Framework of IAIS Solvency Supervision (Continued)

- Valuation according to principle and economic value basis
- Total balance sheet approach



(出所: IAIS)

6-2 Solvency II movements in Europe

- Concept of Solvency II：3 pillars approach

1. 1st pillar（Capital required）
   - ✓ The capital level is introduced at 2 levels; Solvency capital requirement (SCR) & Minimum capital requirement (MCR).
   - ✓ For calculation of SCR, companies are permitted to use their internal models assuming the relevant authority's approval.（The approval standards also should be considered at EU level.）
   - ✓ The MCR is going to be simpler and more objective calculation like the current one.
2. 2nd pillar（Verification process for supervision）
   - ✓ The principle of internal control for insurers should be set forth.
   - ✓ The authority and responsibility of the authority's intervention should be defined strictly.
   - ✓ In order to improve transparency of the government, the general standards as well as valuation method should be disclosed.
3. 3rd pillar（Market discipline by disclosure）
   - ✓ The disclosure standards should be consistent with requirements of IASB・IAIS・BIS, etc.

6-2 Solvency II movements in Europe (Continued)

- Solvency II Roadmap

  - Apr 2009: The EU adopted framework directives (Level 1).

    - ✓ Advice by CEIOPS
    - ✓ Detailed rules（Level 2）= Study the execution standards
    - ✓ QIS5 execution Aug – Nov 2010 ⇒ Result announcement in Apr 2011

  - Within 2011: Adopt implementing measures（Level 2）and supervisory guidance（Level 3）

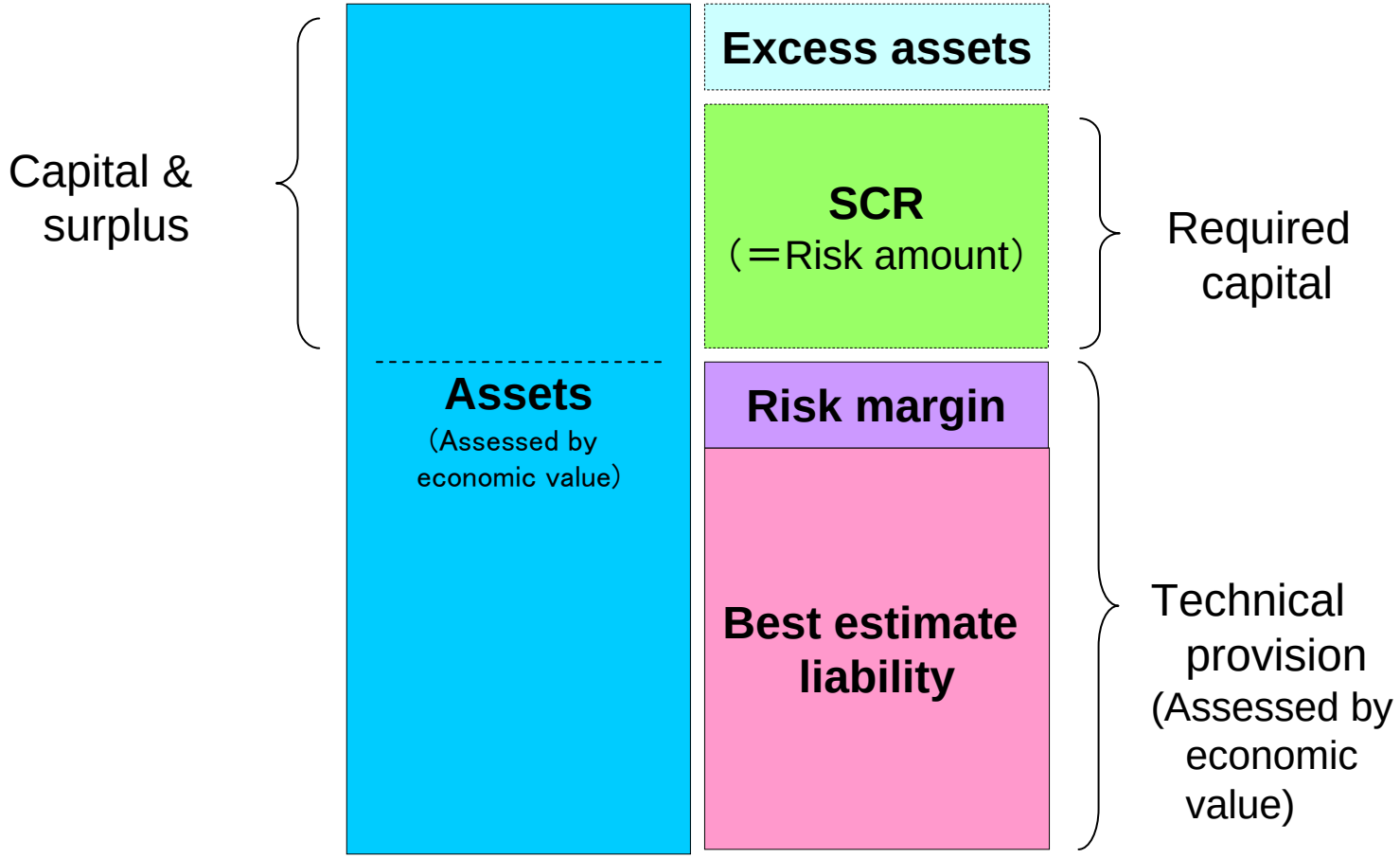
    - ✓ Response and preparation by each company（including development of the internal model）
    - ✓ Adoption process and preparation by the supervisory authority of each country

  - Oct 2012: Implement and execute Solvency II

    - ✓ Will be adopted by many insures from the term of Dec 2012.

6-2 Solvency II movements in Europe (Continued)

- Structure of required capital under Solvency II



6-2 Solvency II movements in Europe (Continued)

- Technical provision
  - Best estimate liability
    - ✓ Including financial value of option and guarantee
    - ✓ Discount rate by adjusting the credit risk from the SWAP rate
    - ✓ Considering the liquidity premium
  - Risk margin
    - ✓ Margin for the risks which are non-hedgeable.
    - ✓ Reflection of the diversified effect among product lines.
    - ✓ Capital cost rate over 6%.
- SCR (Solvency Capital Required)
  - Market risk（Equity, interest rate, FX, spread, concentration）
  - Credit risk（Default）
  - Insurance UW risk（Death, living (survivor), accidental disease, surrender, contingency risk）
  - Operation risk

Evaluate SCR with reflecting diversification effect

6-3 Update on Solvency Supervision based on Economic Value in Japan

- New SMR Standards will be applied from the term of Mar 2012. In addition, the direction is to pursue Solvency supervision based on the economic value basis over mid-long term.
- Field testing is underway for all insurers under the scope.
  - Purpose
    - ✓ It is necessary to understand practical issues of each company in order to examine feasibility of introduction of the system.
  - Outline
    - ✓ Calculation for the best estimate liability, risk margin and risk amount
    - ✓ Various assumptions such as calculation method, interest rate level and others were designated by the authority.
    - ✓ Questionnaire concerning the internal model
  - Valuation date：Mar end, 2009 & Mar end, 2010
  - Schedule
    - ✓ Dec 2010: Deadline to submit the results to FSA
    - ✓ Mar 2011: Disclose the result outline by FSA

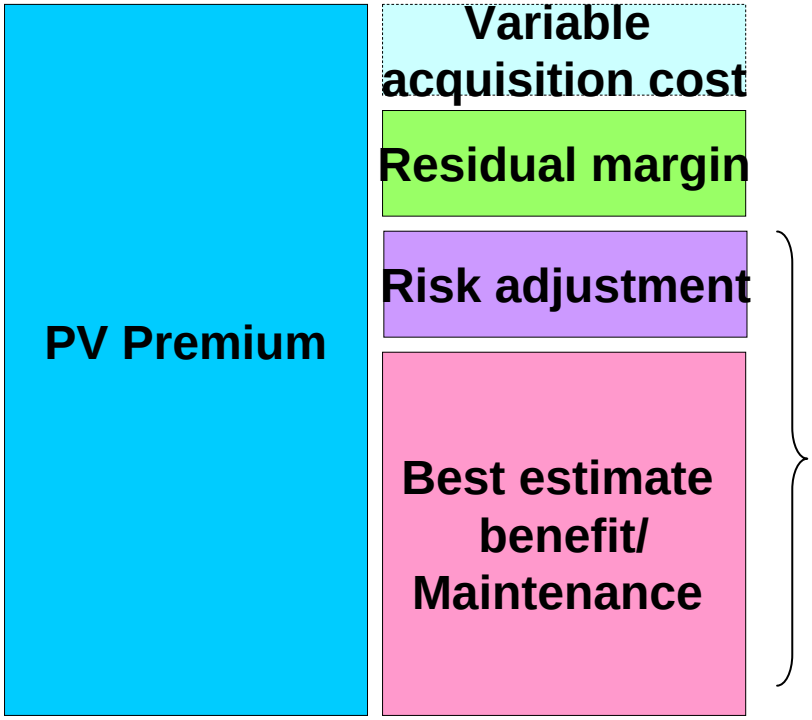
7. Update on the IFRS

7-1 Movements of the IFRS (Insurance Contract)

- Progress on IFRS of insurance contracts（IASB）
  - Apr 1997: Established the IASC（current IASB）Insurance Project
  - Mar 2004: Issued IFRS4（Insurance contract）
    - ✓ As EU decided to adopt IFRS in 2005, introduction was divided into 2 phases. It was decided to move up Phase I for those issues which could be realized over a short term while Phase II would have serious consideration including the fair value assessment of insurance contracts.
  - Sep 2004: Established the Insurance WG, Started studies toward Phase II
  - May 2007: Disclosed the discussion paper (DP)
    - ✓ Gathered a wide range of opinions through public comments
  - Oct 2008: FASB participated in the study officially
  - Jul 2010: Announced the exposure draft of “insurance contract”
  - First half of 2011 (Plan): Announce the final standards of “insurance contract”
- US SEC plans to decide in 2011 as to whether IFRS will be adopted on a mandatory basis or not. If adopted, it is expected to implement it in phases starting around 2014.
- FSA in Japan plans to decide around 2012 as to whether IFRS will be adopted on a mandatory basis or not. If adopted, it is expected to implement in 2015 or 2016.

7-2 Evaluation approach of IFRS (Insurance Contract)

[Valuation at issuance of the policy]



[Valuation after issuance]

The equivalent to variable acquisition cost is deducted from the residual margin liability.

Booking liability and systematically depreciated（No unlocking by changing assumptions）

Booking liability and change in the amount goes through P/L.
（Unlocking by changing assumptions）

- Since the residual margin is booked as liability, no profit is generated provisionally at the time of policy issuance. If it is in a negative range, losses are to be recognized at issuance.
- The discount rate is the risk free rate＋Liquidity premium
- NB acquisition cost is not booked to assets（DAC）.
- The best estimate of PH dividends is to be included in liabilities.

7-3 Difference from the approach envisioned by FASB

- Followings are major differences between the valuation approach based on the IASB exposure draft and the approach envisioned by FASB at present.

	IASB approach	FASB approach
Risk adjustment and residual margin	Risk adjustment is reassessed every term separately. The residual margin is booked separately and depreciated systematically.	By combining the risk adjustment and residual margin, they are depreciated systematically. （Composite margin）
Treatment of acquisition cost	By deducting variable acquisition cost from the residual margin, it is possible to mitigate the burden on PL at the time of issuance.	Acquisition cost is not deducted from Composite margin.
PH dividends	Regarding PH dividends, the best estimate value is booked to liabilities.	Among PH dividends, only legal obligations are booked to liabilities.

8. Towards globalization of solvency supervision and financial reporting

8 Towards globalization of solvency supervision and financial reporting

- Evolution of the IFRS, Solvency II, MCEV and others are related each other. Thus, it is necessary to understand them comprehensively. We have to study them continuously.
- In order to benefit from advantages by incorporating them into our practical business as soon as they are decided for implementation, we should prepare for modeling where doable.
  - Establish the principle based risk management system responding to new accounting and supervisory framework.
  - Study how the market communication (IR, etc) should be in order to respond to new accounting and supervisory framework.
- Study measures related to products
  - Change the product strategies responding to changes of profitability and evaluation of capital efficiency
  - Product feature, pricing, commission, etc