Field Tests of Economic Value-Based Evaluation and Supervisory Method - 2018 Results and 2019 Direction -

June 2019

Financial Services Agency

1. Objectives and contents

Objectives	Contents
1. To comprehend insurance companies' preparedness for the economic value-based calculation, practical challenges and quantitative impacts based on the prescribed technical specifications	a. ESR(*1) calculation based on the MAV(*2) approach to the technical specifications for the ICS(*3) field tests in 2018 b. Responses to a questionnaire: i. Practical issues and challenges ii. How to improve the calculation method iii. Internal model governance, etc.
2. To comprehend financial conditions of insurance companies based on forward-looking analysis	a. Sensitivity analysis to economic assumption b. Comparative analysis between the standard and internal models

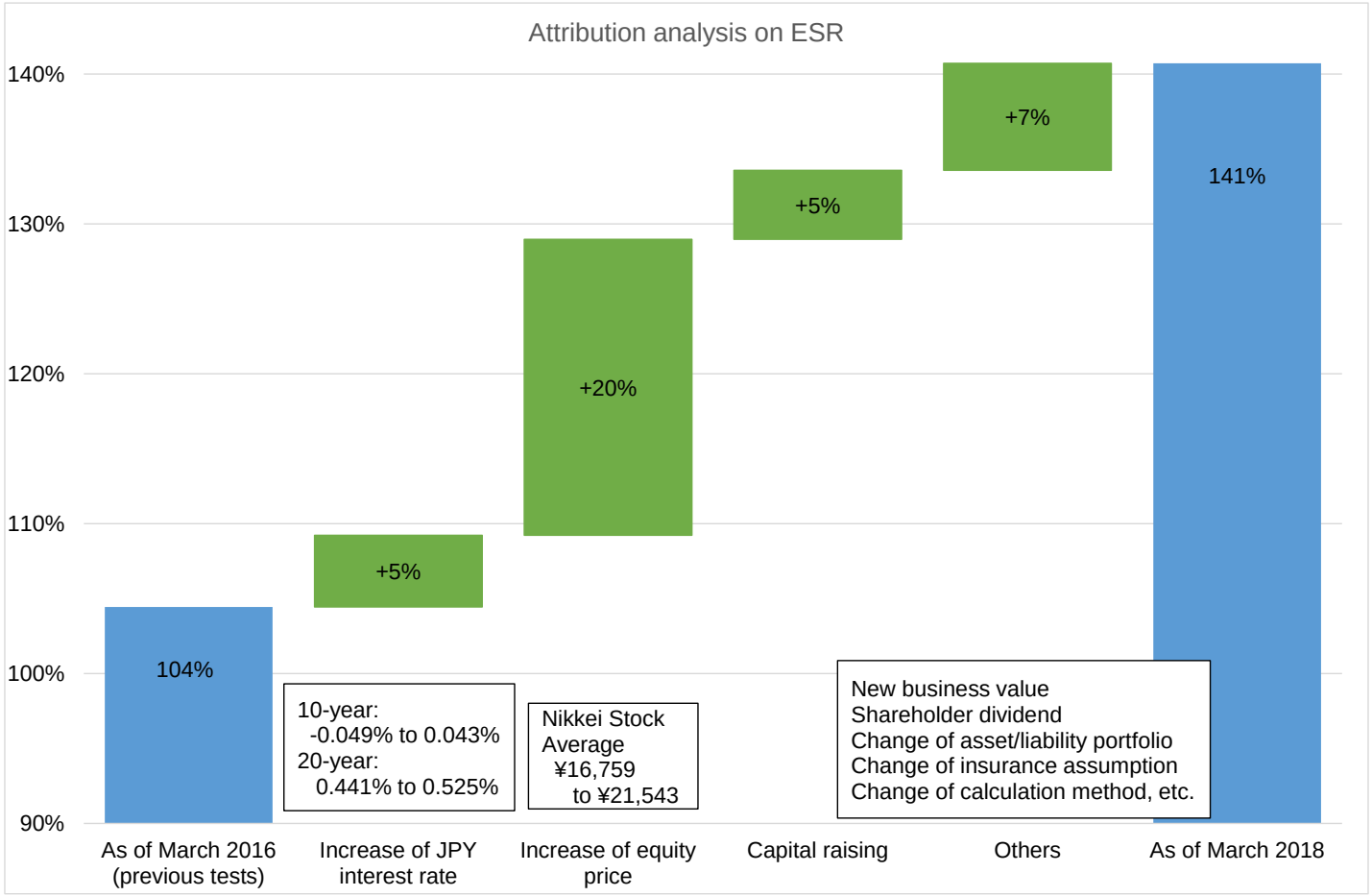
(*1) Economic Solvency Ratio = Economic qualifying capital resources / Economic capital requirements
(*2) Market Adjusted Valuation
(*3) Insurance Capital Standard

Other information

- Coverage : All of the 41 life and 51 non-life insurance companies in Japan
- Solo and (ultimate) consolidated basis
- Base date : March 31, 2018
  - 2017 with only economic assumptions changed to 2018 for companies with practical difficulties
- Test period : June 29 through December 20

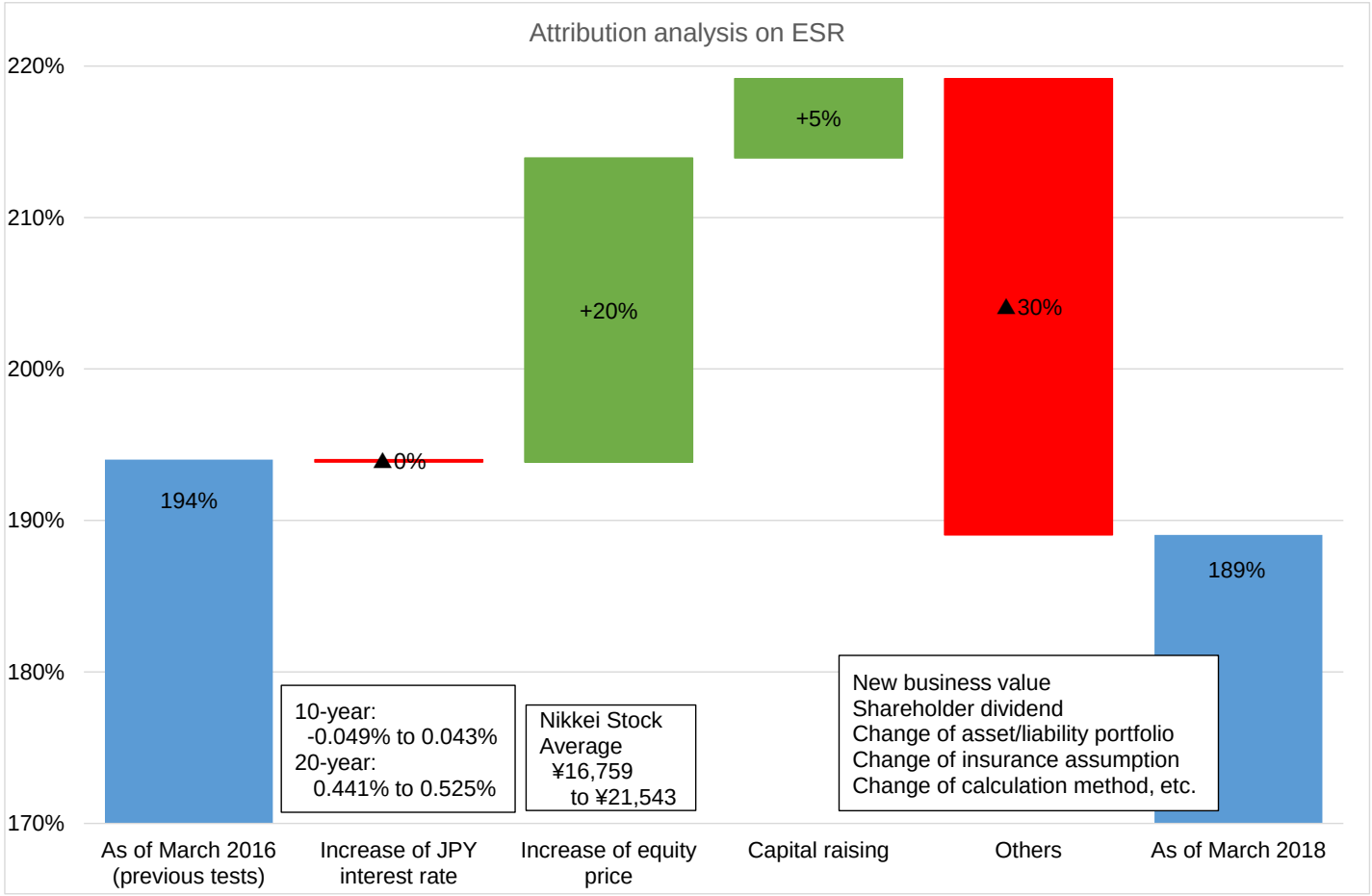
2. Summary - I. Life

- Solo average ESR (41 companies) was 141% (increased by 37pt).
  - Consolidated average ESR (13 groups mainly with life) was 169%.
- One of the main causes of variation is an increase of equity price.
  - Other causes might include new business value, etc. but the breakdown was unclear. The impacts of the increase in JPY interest rate and equity price were estimated using sensitivity in the previous tests.



2. Summary - II. Non-life

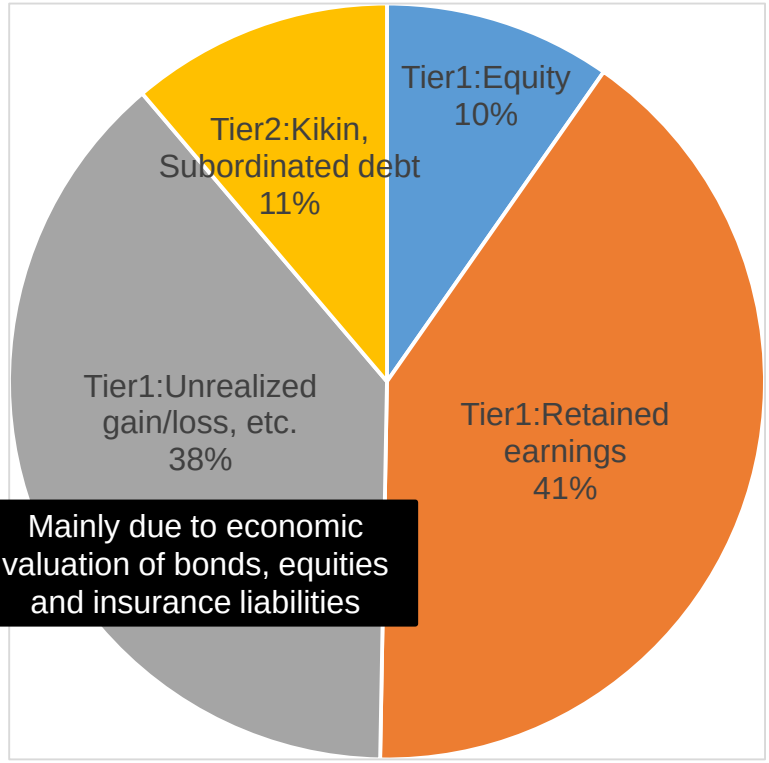
- Solo average ESR (51 companies) was 189% (decreased by 5pt).
  - Consolidated average ESR (8 groups mainly with non-life) was 277%.
- Some of the main causes of variation are increase of equity price and change of methods.
  - Main causes included in “Others” might be change of calculation methods (partial disallowance of tax effect on capital requirement) but the other breakdown was unclear. The impacts of increase in JPY interest rate and equity price were estimated using sensitivity in the previous tests.



3. Details - I. Composition of the qualifying capital resources

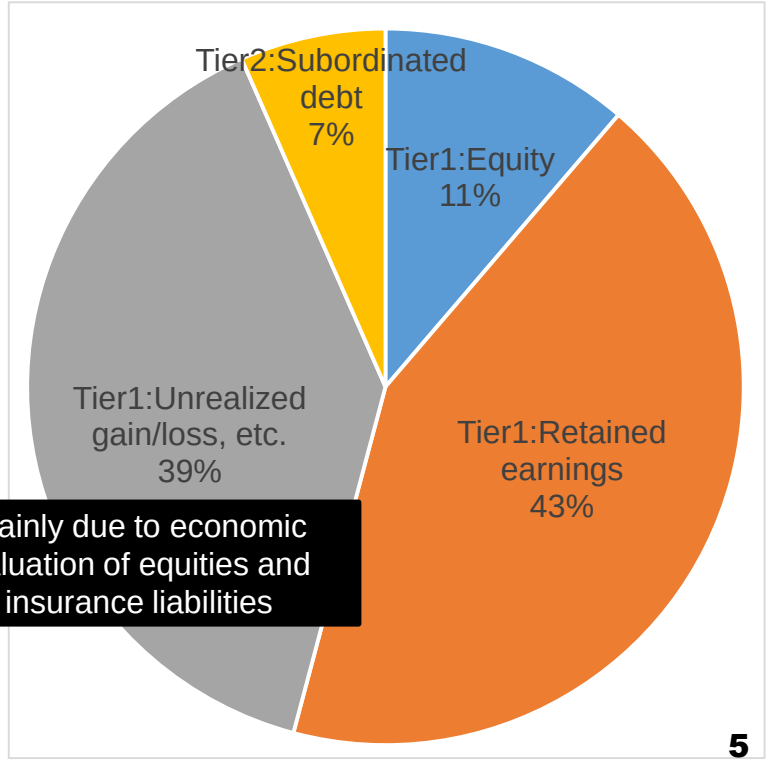
- Qualifying capital resources for life (41 companies, solo) increased by 26% mainly due to an increase of equity price, while the relative composition of capital stayed broadly the same.
- Qualifying capital resources for non-life (51 companies, solo) also increased by 20% mainly due to an increase of equity price, with the composition being similar to life.

Life (41 companies, solo)



Mainly due to economic valuation of bonds, equities and insurance liabilities

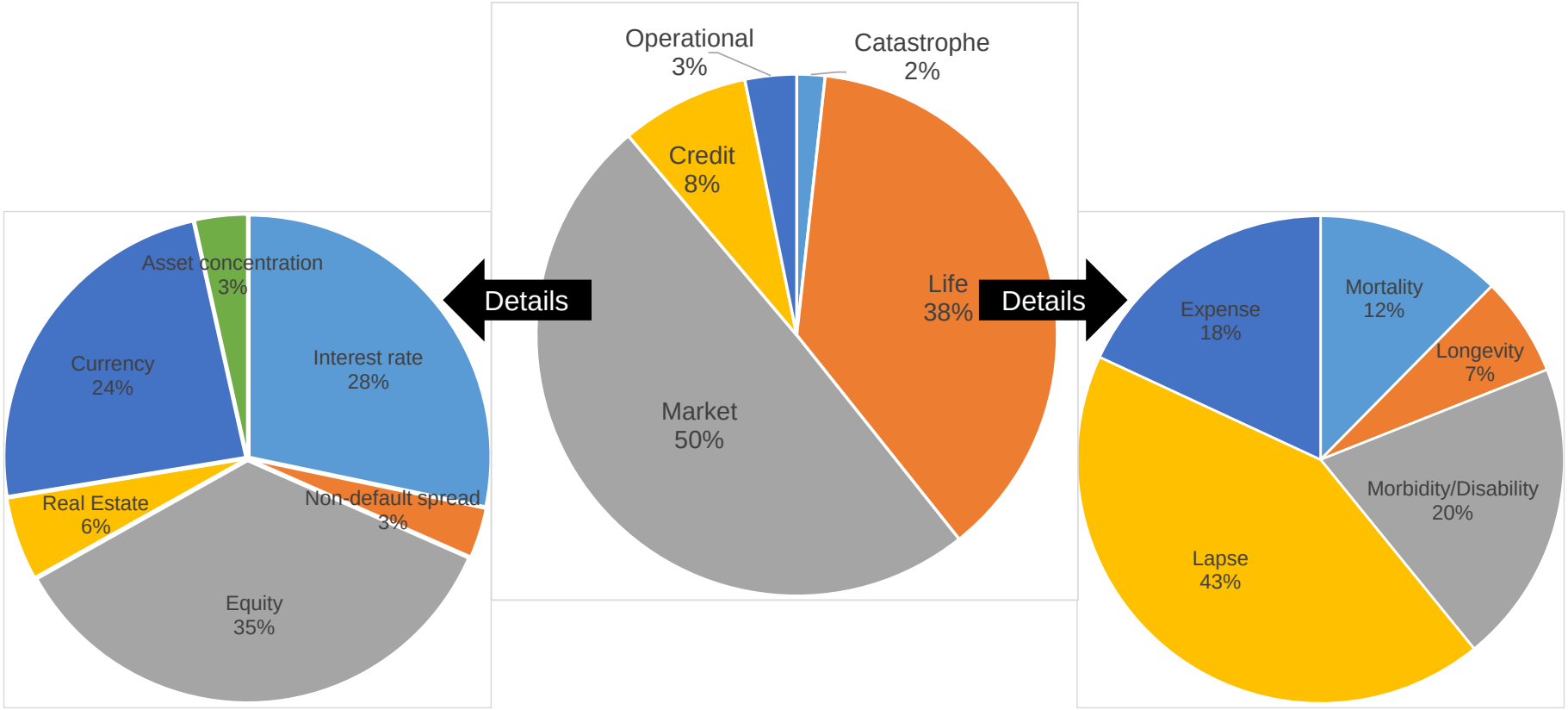
Non-life (51 companies, solo)



Mainly due to economic valuation of equities and insurance liabilities

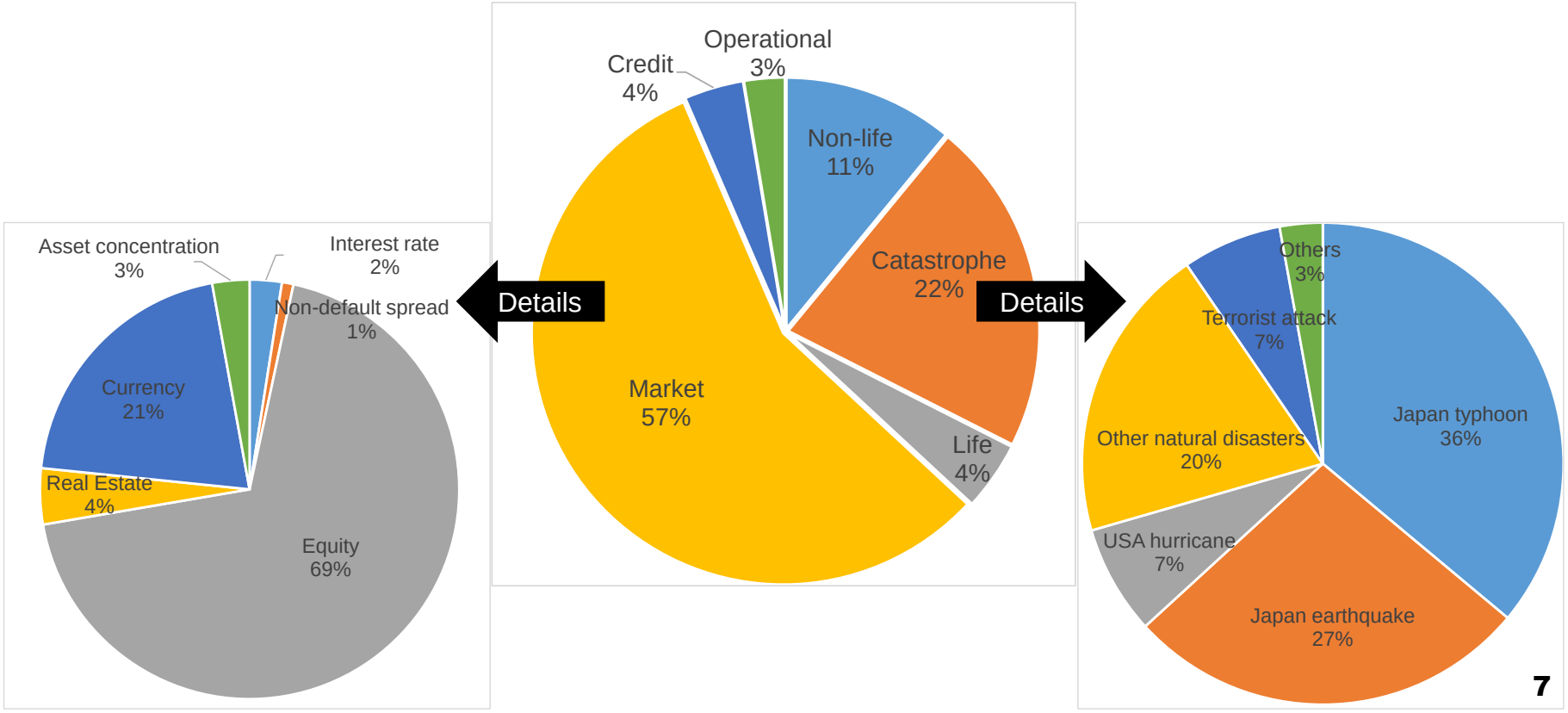
3. Details - II. Composition of the capital requirements (life)

- Capital requirements (41 companies, solo) decreased by 6% mainly due to change of calculation methods.
- Regarding individual risk categories, market risk (interest rate and currency) decreased by 24%.
  - Interest rate and credit risk accounted for dominant components for some companies.
  - Life risk (especially lapse) accounted for a dominant component for some companies mainly with protection type products.



3. Details - III. Composition of the capital requirements (non-life)

- Capital requirements (51 companies, solo) increased by 23% mainly due to change of calculation method.
- Regarding individual risk categories, non-life risk decreased by 31%, while market risk (equity and currency) increased by 26%.
  - Non-life and asset concentration risk accounted for dominant components for some companies.
  - Overseas natural catastrophe risk was not identified adequately on solo-based data for some companies of which overseas risk is underwritten through foreign subsidiaries.



3. Details - IV. Sensitivity analysis to economic assumptions

- Stress levels that would bring the average ESR down to 100% were calculated for JPY interest rate, equity price, exchange rate (Life) and equity price (Non-life).
  - Average ESR for non-life was not brought down to 100% even in severe stress scenario.
- The result suggests that scenarios with combined stresses (e.g. simultaneous changes in interest rate, equity price and exchange rate) should also be considered for life.

Life (41 companies, solo)

Level of ESR=100%

Scenario	Average ESR	Interest rate (JPY)	
		10-year	20-year
As of March 2018	141%	0.043%	0.525%
Stress scenario	100%	-0.431%	0.051%

Scenario	Average ESR	Nikkei Stock Average
As of March 2018	141%	¥21,454
Stress scenario	100%	¥13,142

Scenario	Average ESR	Exchange rate (USD)
As of March 2018	141%	¥106
Stress scenario	100%	¥52

Non-life (51 companies, solo)

Level of ESR=100%

Scenario	Average ESR	Interest rate (JPY)	
		10-year	20-year
As of March 2018	189%	0.043%	0.525%
Stress scenario	100%	N/A	N/A

Scenario	Average ESR	Nikkei Stock Average
As of March 2018	189%	¥21,454
Stress scenario	100%	¥6,576

Scenario	Average ESR	Exchange rate (USD)
As of March 2018	189%	¥106
Stress scenario	100%	N/A

3. Details - V. Comparative analysis between the standard and internal models

Life

- Life risk by internal models was generally more optimistic due to difference in stress scenarios.
  - Some companies excluded mass lapse and expense risk from internal models.
- Market and credit risk by internal models was generally more conservative due to difference in interest rate stress scenarios, etc.
  - Some companies calculated credit, non-default spread and asset concentration risk by internal models as follows:
    - ✓ To use internal ratings for non-rated exposures
    - ✓ To include sovereign exposures
    - ✓ To exclude intra-group reinsurance exposures

Non-life

- Non-life risk by internal models was generally more optimistic due to differences in risk factors.
- Catastrophe risk by internal models was almost the same due to allowance of internal models for natural disaster risk.
- Market / credit risk by internal models was more conservative due to differences in equity and interest rate stress scenarios, etc.
  - Some companies calculated some risk by internal models as follows:
    - ✓ To calculate equity risk of a subsidiary on its consolidated basis, not as equity risk
    - ✓ To exclude intra-group exposures for asset concentration risk

3. Details - VI. Comments on ESR regulation

- General comments on ESR regulation were as follows:
  - Unintended impacts should be avoided.
  - Supervisory intervention based on ESR should be flexible.
  - Transitional measures should be considered.
  - International and domestic regulation should be consistent.
- Many companies advocated that life and non-life risk factors / stress scenarios need to be adjusted to take into account for business practices in Japan.
- Many companies viewed that use of internal models should be accepted for calculation of capital requirements.
  - Some companies suggested that standard models for natural catastrophe risk in Japan should be prepared for companies not using internal models.

3. Details - VII. Internal model governance

Life

- Various methods were used for calculating insurance liabilities, of which assumptions and formula are prescribed in principle-based approach.
- Validation framework for insurance liabilities is essential especially for life insurance companies which underwrite long-term risk, and most companies had validation procedure conducted independently from calculation departments by utilizing external experts.
- However, details of the validation procedure and methodologies were unclear.

Non-life

- Validation framework for natural catastrophe risk is essential for non-life insurance companies which need to use risk models.
- Some companies have developed in-house models with enhanced validation framework, while others used external vendor models and are still preparing validation framework.

4. Direction in 2019 field tests

- Field tests for all insurance companies in Japan based on the ICS field tests will be conducted again in 2019
- Additional reporting and analyses, to address key findings from 2018 tests

Findings in 2018 tests	Direction in 2019 tests
1. Regarding attribution analysis, detailed impact on each cause was unclear.	● Attribution analysis performed by insurance companies based on the prescribed format
2. Many companies advocated that life and non-life risk factors / stress scenarios need to be adjusted for business practices in Japan.	● Historical data collection for calibration of life and non-life risk factors / stress scenarios
3. Regarding validation framework for insurance liabilities, details of validation methods and how reasonability was justified were unclear.	● A validation report for insurance liabilities prepared by insurance companies based on the prescribed contents

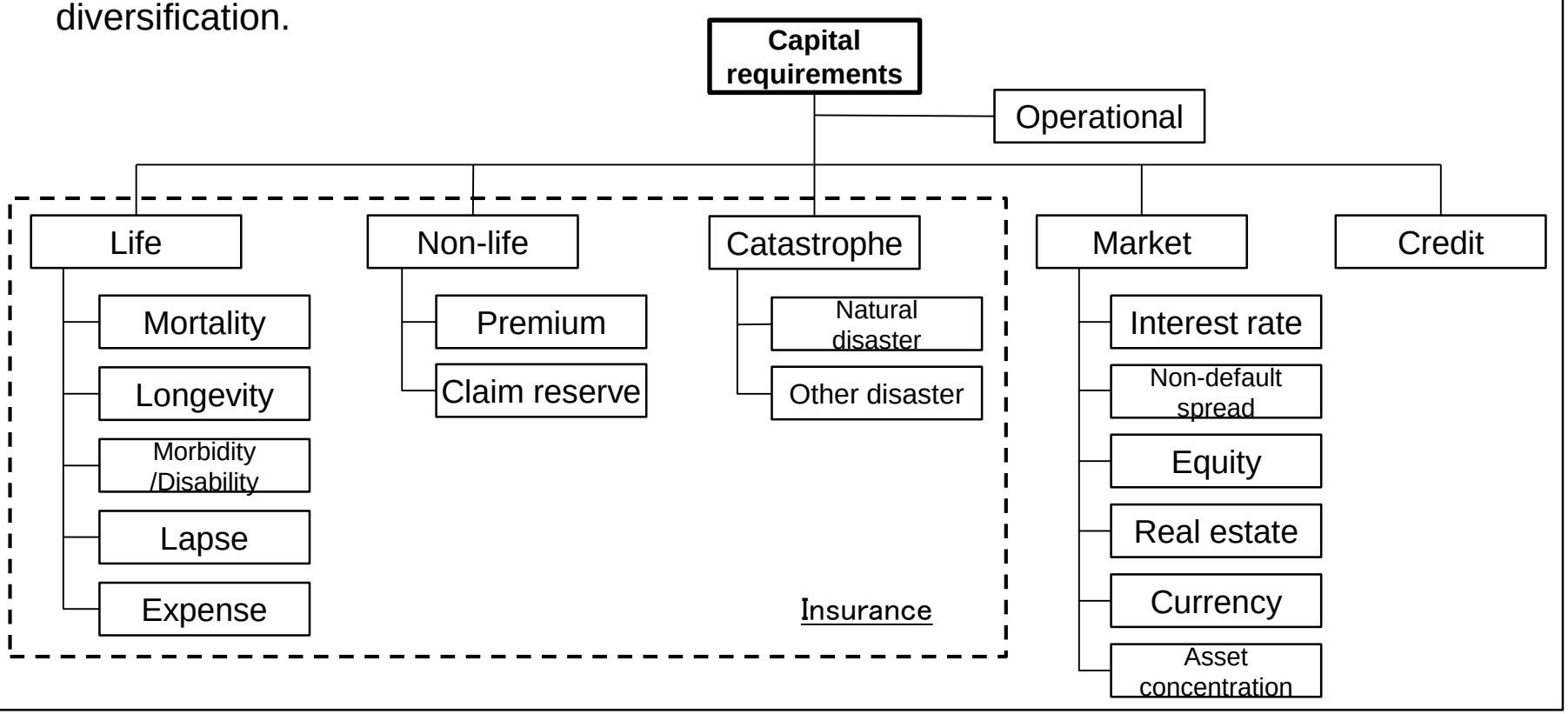
(Appendix) Overview of the qualifying capital resources and capital requirements

Qualifying capital resources (ESR numerator)

- Qualifying capital resources are classified into Tier 1 and Tier 2 based on a number of qualifying criteria.

Capital requirements (ESR denominator)

- Capital requirements are calculated by combining individual risks to recognize risk diversification.



(Appendix) Definitions of the capital requirements

Risk category		Definition: Risk of adverse change in the value of capital resources due to
Life	Mortality	Unexpected changes in the level, trend or volatility of mortality rates
	Longevity	Unexpected changes in the level, trend or volatility of mortality rates
	Morbidity/Disability	Unexpected changes in the level, trend or volatility of disability, sickness and morbidity rates
	Lapse	Unexpected changes in the level or volatility of policy lapses, terminations, renewals and surrenders
	Expense	Unexpected changes in liability cash flows due to the incidence of expenses incurred
Non-life	Premium	Unexpected changes in the timing, frequency and severity of future insured events
	Claim reserve	Unexpected changes in the expected future payments for claims
Catastrophe		Unexpected changes in the occurrence of low frequency and high severity events
Market	Interest rate	Unexpected changes in the level or volatility of interest rates
	Non-default spread	Unexpected changes in the level or volatility of spreads over the risk free interest rates
	Equity	Unexpected changes in the level or volatility of market prices of equities
	Real estate	Unexpected changes in the level or volatility of market prices of real estate or from the amount and timing of cash flows from investments in real estate
	Currency	Unexpected changes in the level or volatility of currency exchange rates
	Asset concentration	The lack of diversification in the asset portfolio
Credit		Unexpected changes in actual defaults, as well as in the deterioration of an obligor's creditworthiness short of default
Operational		Operational events including inadequate or failed internal processes, people and systems, or from external events