



Technical Practices Survey 2024

Solvency II Financial Services

—

September 2024

Welcome to the 2024 report

It is with the greatest pleasure that we present the 2024 edition of our annual Technical Practices Survey.

As ever, the focus of this survey is to enable UK life insurance firms to identify the key technical issues within the industry, and to present the range of methodologies and approaches that have been adopted by their peers.

We are incredibly pleased to see ongoing support for our survey, with 19 participants submitting responses this year, including full submissions from eight IM firms. We aim to continuously evolve the survey so that participants find it insightful and relevant to the issues faced within the industry today.

The executive summary dashboard overleaf provides an overview of how the key stresses and indicators of risk appetite compare to the median responses provided in this and the previous year's survey. As expected, the interest rates stresses have strengthened further to reflect the high interest rate environment. Whilst, the core market stresses, equity, currency and property have remained relatively stable, as seen in previous years.

On credit risk, there have been limited changes in the overall calibrations, although we have observed greater clustering of transition and default calibrations. We continue to refine our questions to give insight into the modelling methodologies. On underwriting risk, we observed minimal changes in lapse, mortality and longevity stresses.

Under respondents' capital management approaches, the coverage ratio risk appetites are higher this year. For the most part, these changes are due to sampling differences, however two firms have re-visited it in the last 12 months. This underlines the fact that the capital policies remain an area of active review within the industry.

On operational risk calibration, Cyber & Information security risks remain the most significant component of operational risk and we have included a detailed analysis on model risk management. In response to market developments, we selected thematic areas to explore in more detail in our report. In this year's report we have focused on the following areas:

- **Solvency UK Reform** – None of the firms that responded are planning to use the highly predictable assets at YE24, but three firms plans to use them by YE25. Most firms expect the introduction of notching the fundamental spread in the MA to be broadly neutral.
- **Funded Re** – We consider this is a focus area, for not only the insurers or reinsurers but also the regulator. For those who have responded, all firms have a metric that is equivalent to an immediate recapture metrics. Currently, none of the respondents apply a full look through on the collateral in their SCR calculation.

We trust that you will find the report insightful. Please contact a member of the team if you would like more information on any of the content.

How To Read The Report

For questions which are not included in the IM01, we have included median tables which provide a comparison between this year's responses and those in the 2023 report.

In the spirit of being transparent, particularly where firms can provide multiple responses to the same question, we have indicated the number of respondents included in a specific chart with a grey box, as illustrated below.

X

The box and whisker plots, shown illustratively below, have been used extensively within the report. This is read as:



- the minimum and maximum data points are shown by the outer grey vertical lines (whiskers);
- the inter-quartile range is shown by the box where the lower quartile is shown by the dark section and upper quartile is shown by the light section.

In order to provide insight on changes in calibrations from YE22 to YE23, across many areas in this report we have presented both sets of data in adjacent charts. Data represented by the blue charts (as shown above) corresponds to YE23 IM01 submissions, and data represented by the green charts (as shown below) corresponds to YE22 IM01 submissions for comparison.



The top left hand corner of each page also indicates whether the charts on that page include answers submitted by SF, IM/PIM firms, or both.



James Isden

Partner

Technical Practices Survey 2024

Executive Summary

The executive summary below provides an at a glance view of how the median responses for the key stresses compare to the median responses provided in the previous year's data. As expected, given the significant increase in risk-free rates over 2022, the majority of participants strengthened their interest rate "up" stresses. This is consistent with our expectations, as most companies indicated their plans to review their calibration during 2023. The core market stresses, equity, currency and property have remained relatively stable, as seen in previous years. We have observed a range of movements in credit risk calibrations compared to last year, however there has not been a significant movement in the median response. We note a third of companies increased their 1-200 longevity stress (overall) at YE23 for both male and female.

Business Profile Under Pillar I	Median Response (YE23)	Median Response (YE22)
TMTPs as a % of Technical Provisions (IM firms only)	1.0%	1.9%
Risk Margin as a % of Technical Provisions	0.4%	1.4%
Overall Matching Adjustment (bps)	105	137
Market Risk (99.5% stress)		
Equity Portfolio Total Annual Return Stress	-45%	-45%
Equity Implied Volatility Stress (10 Years)	12%	12%
Currency Stress – EUR	-21%	-21%
Currency Stress – USD	-26%	-27%
Commercial Property Total Annual Return Stress	-33%	-31%
Residential Property Total Annual Return Stress	-26%	-27%
Interest Rate Risk (10 Years, 99.5% Stress, in bps)		
Interest Rate – Total Stress Up	293	231
Interest Rate – Total Stress Down	-184	-204
Interest Rate Volatility Stress	36	19
Credit Risk – Average Credit Spread Stress (10 years, 99.5%)		
Financials – A	400	397
Financials – BBB	587	595
Non-Financials – A	246	252
Non-Financials – BBB	405	406
Longevity Risk (99.5% stress)		
Female (Age 65) – Stress (increase in EOL, years)	2.93	2.90
Male (Age 65) – Stress (increase in EOL, years)	3.02	2.83
Other Insurance Risks (99.5% stress)		
Expenses Level Stress as % of Best estimate	21%	21%
Mass Lapse Stress	28%	28%
Solvency Cover Ratio – Risk Appetite		
Red (Immediate action taken)	130%	120%
Amber (Trigger warning)	136%	135%

Technical Practices Survey 2024

1. Hot Topics

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

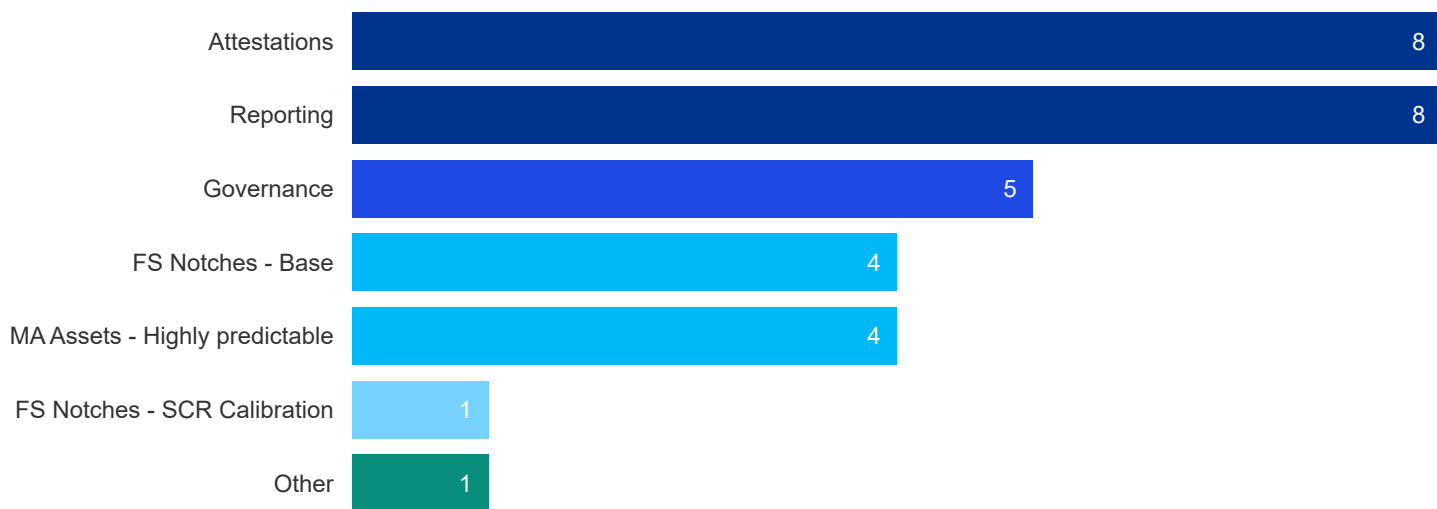
SF/IM

Solvency UK Reforms

A majority of the firms agree that attestations and reporting require the most work to achieve compliance. It is notable that several firms also consider that there is significant additional work on governance. For TMTP, none of the firms that responded are expecting to keep their old approach and are making a move to the new simplified approach.

None of the firms are planning to make use of the highly predictable (HP) assets for YE24 likely due to the complexity and requirement of PRA approval. However, 3 firms are planning to make use of them by YE25 with another in the following year. Of firms that know which HP assets they plan to use, they anticipate applying for callable bonds, with some planning to make use of infrastructure and property related assets.

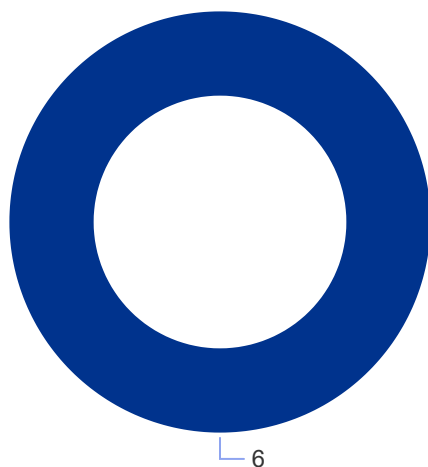
1.1 Which areas of the Solvency UK reforms require the most work to achieve compliance?



'Other' includes changes to the Risk Margin calculation.

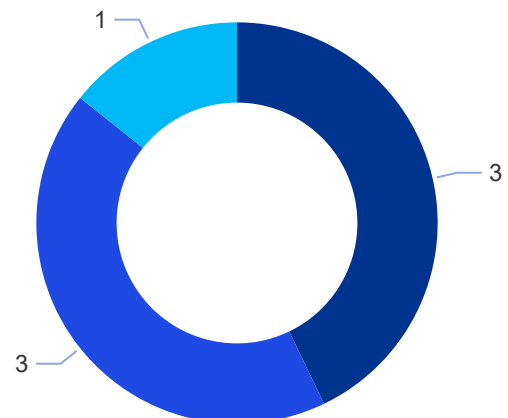
13

1.2 What do you plan to do for Solvency UK reforms on TMTP?



● Move to the new PRA approach

1.3 When do you expect to first make use of the highly predictable assets (ignoring any existing assets that will be reclassified as highly predictable)?



● No plans to make use of HPAs ● YE25 ● YE26

Technical Practices Survey 2024

1. Hot Topics

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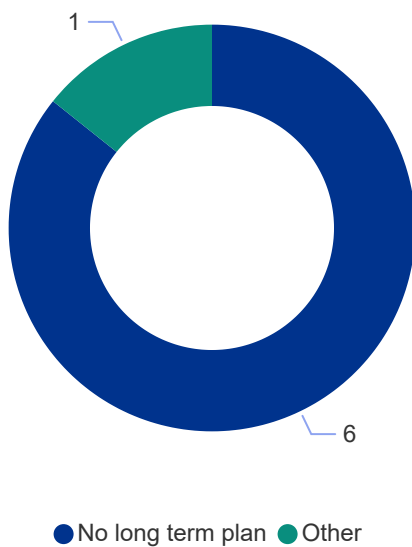
SF/IM

Solvency UK Reforms

For the firms planning to make use of HP assets most of them have not yet decided on how much they want to make use of, although one is planning to maximise the use of HP assets.

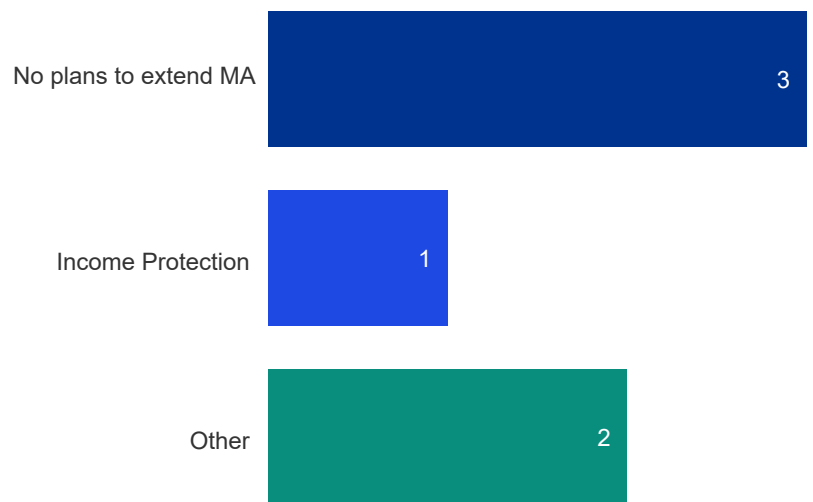
For most firms, the reduction in risk margin from Solvency UK did not result in any changes to their capital buffer risk appetite, but they are considering it as part of this year's review.

1.4 What is your long term target for making use of the 10% MA benefit from highly predictable assets?



'Other' includes a plan to use up to the full 10%, subject to availability of investment opportunities.

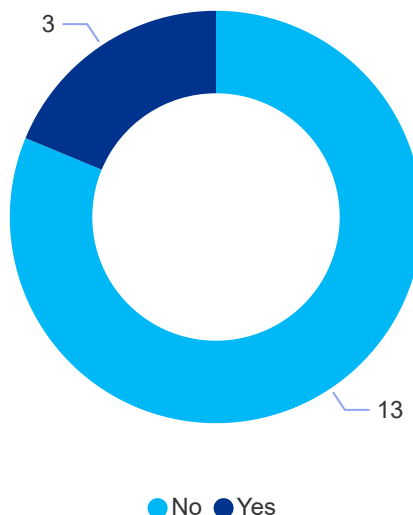
1.5 Which products are you planning to extend your MA to?



'Other' includes BPA's and dependant annuities.

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1.6 Did the reduction in Risk Margin result in changes to your capital buffer risk appetite?



Technical Practices Survey 2024

1. Hot Topics

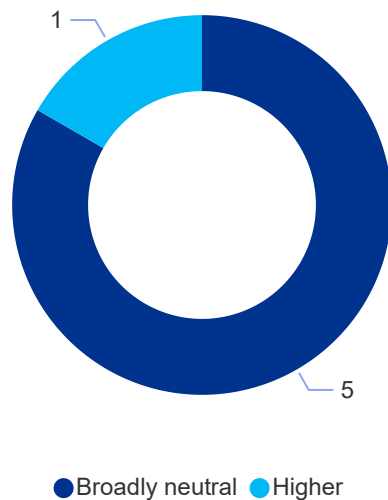
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SF/IM

Solvency UK Reforms

Most firms expect the introduction of notching the fundamental spread in the MA to be broadly neutral. When considering FS add-ons most firms consider them at an individual asset level and at a grouped level, although there was little consistency in how to group the assets for this analysis (homogeneous risk groups, asset classes or sectors). Restructured ground rent assets is the asset class where most firms expect to have FS add-ons for a significant proportion of their holdings.

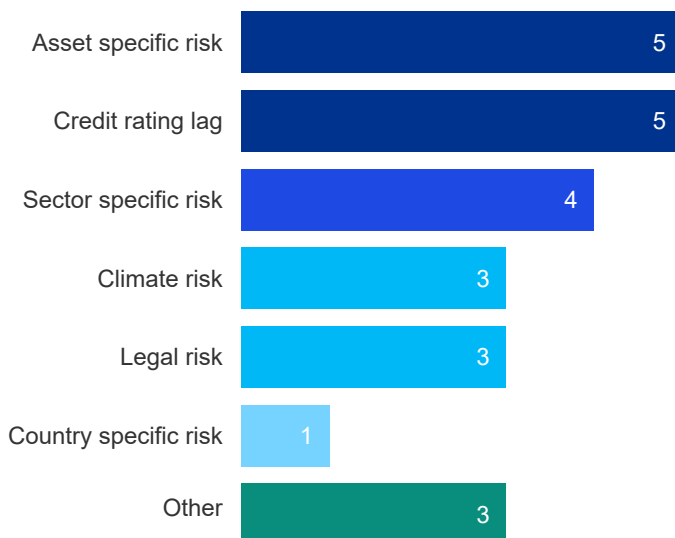
1.7 How do you expect notching to change the average FS in the base balance sheet?



1.8 At what level of granularity will the FS add-on be applied?

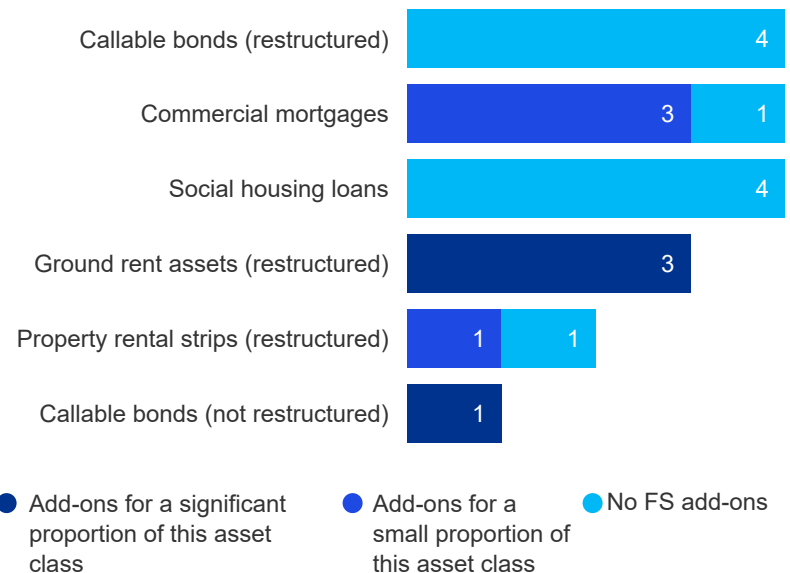


1.9 Which forward-looking risks do you consider to make allowance for?



'Other' includes Idiosyncratic Risk, Rating Inaccuracies, Notched Ratings, Concentration risk, Assets > 30 yrs.

1.10 How will the FS add-on affect each asset class?



We did not include any asset classes for which FS add-ons are applicable for no firms.

Technical Practices Survey 2024

2. Balance Sheet

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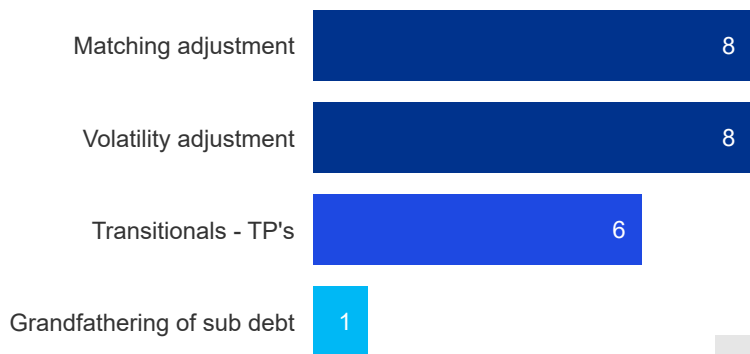
SF/IM

Balance Sheet Preparation

This section considers some of the key areas in the preparation of a company's base balance sheet. The use of Long Term Guarantee Measures (LTGM) continues to be widespread and consistent with last year. Only 3 out of 15 firms reported that they do not make use of any LTGM. While there are some sampling differences, there is a genuine reduction in TMTP, primarily driven by a reduction in risk margin from Solvency UK Reforms, as a percentage of Technical Provisions.

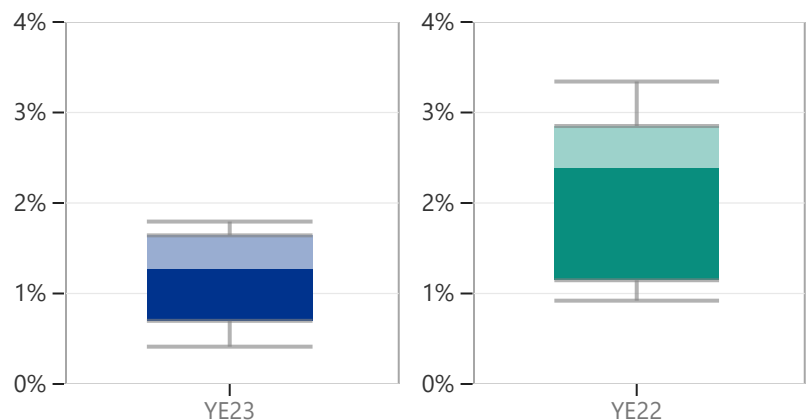
Key areas of model development remain broadly similar to previous years, with a greater focus now on speed of reporting, methodology improvements and model validation. Respondents included the necessary developments to implement Solvency UK reform.

2.1 Which of the following Long Term Guarantee Measures do you use in your balance sheet?

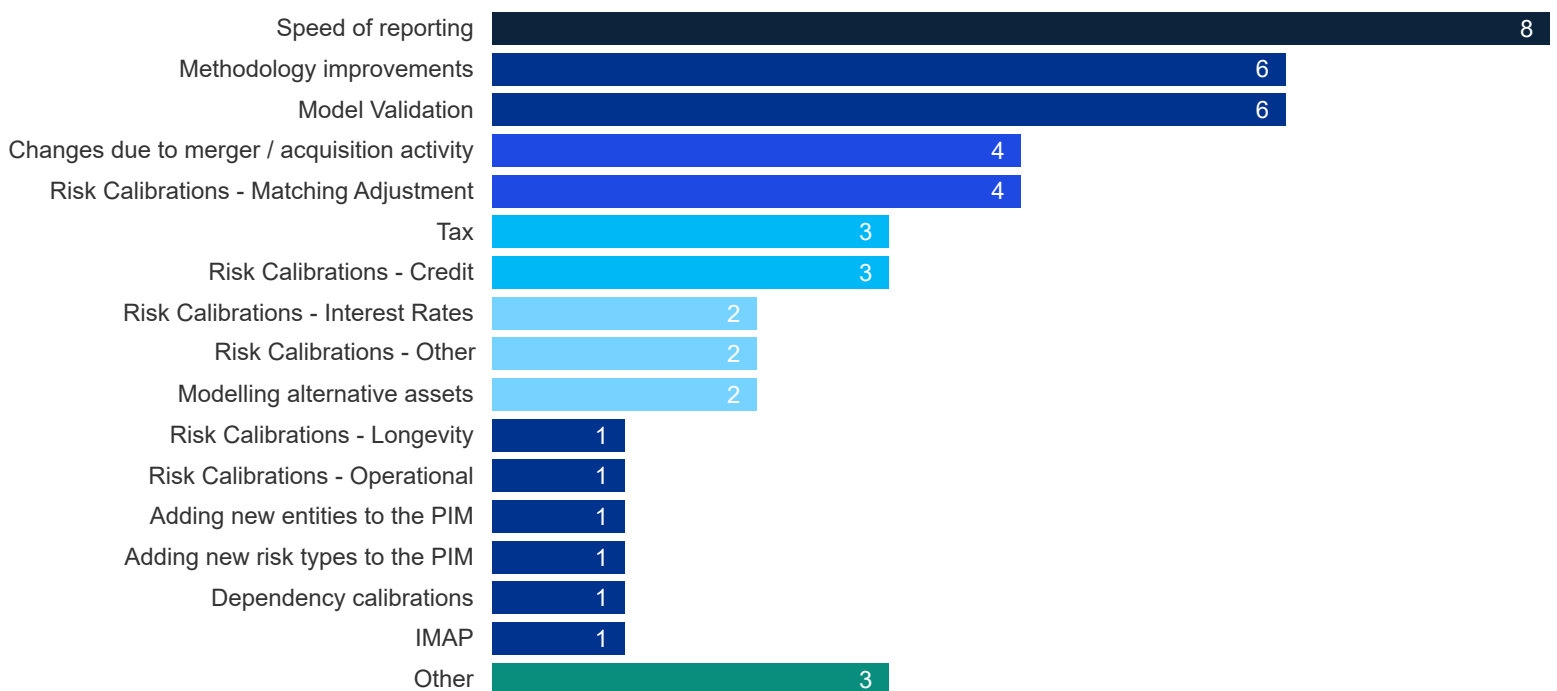


12

2.2 What are the Transitional Measures as a % of your Technical Provisions? (IM firms only)



2.3 What are the key developments or model changes that you will focus on in 2024 & 2025?



'Other' includes controls and automation, BPA Spouse Assumptions and Inflation Volatility, Solvency UK reform.

15

Technical Practices Survey 2024

2. Balance Sheet

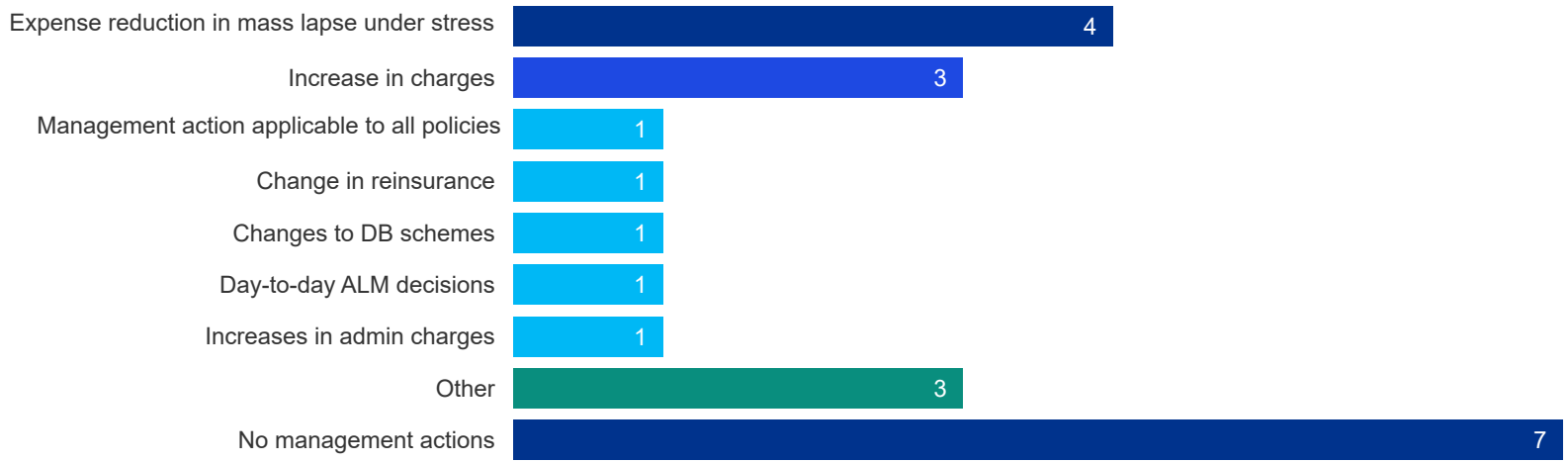
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SF/IM

Management Actions

We have observed that firms have well-established management actions for non-profit business, and there have been no significant changes compared to previous year's results. As expected for with-profits business, most companies use some combination of bonus setting, market value reductions, removal of miscellaneous surplus, planned enhancements, bonus distributions, and changes to the equity backing ratio. Firms also have implicit management actions, such as Matching Adjustment rebalancing, that are often not explicitly reported.

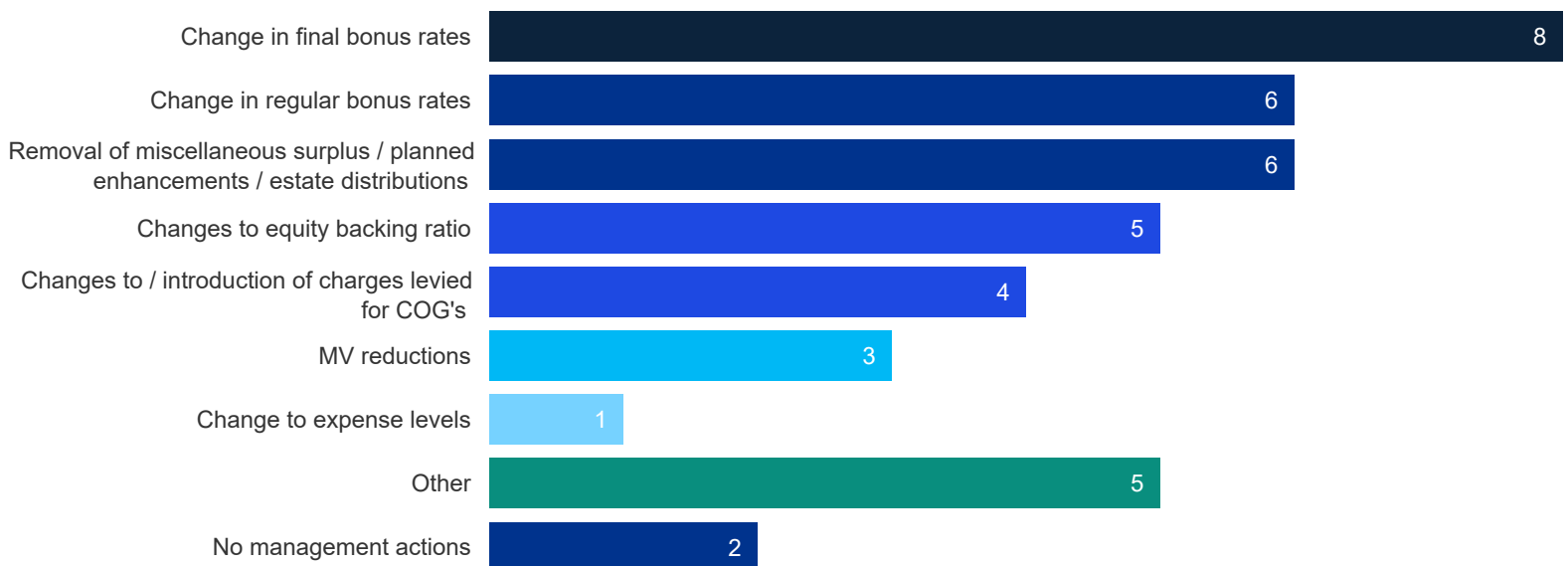
2.4a For non-profit business, which management actions are assumed in the capital measures listed at 31st December 2023?



'Other' includes restoring matching adjustment compliance and changes to DC pension scheme contributions.

17

2.4b For with-profit business, which management actions are assumed in the capital measures listed at 31 December 2023?



'Other' includes a reduction in level of corporate bonds held, changes in smoothing limits, and with respect to future discretionary benefits.

11

Technical Practices Survey 2024

2. Balance Sheet

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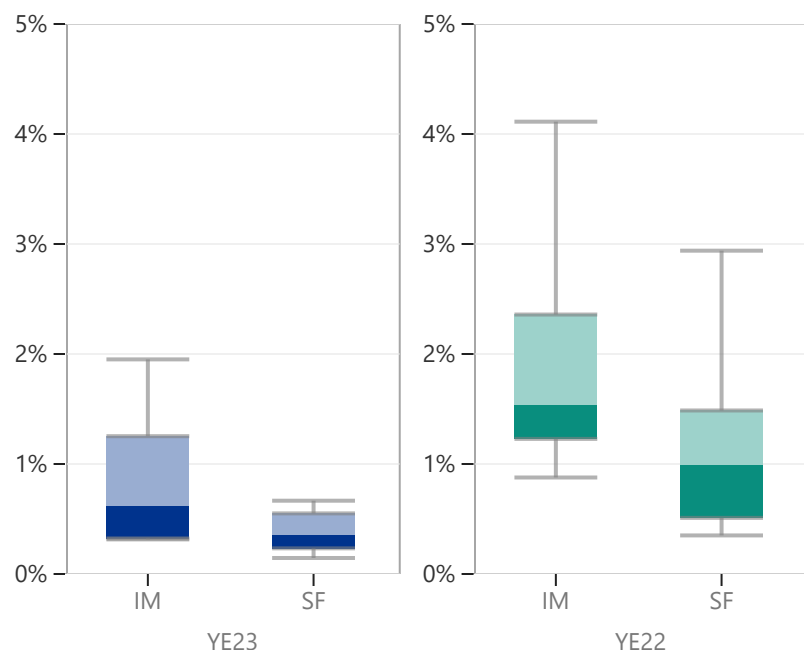
SF/IM

Risk Margin

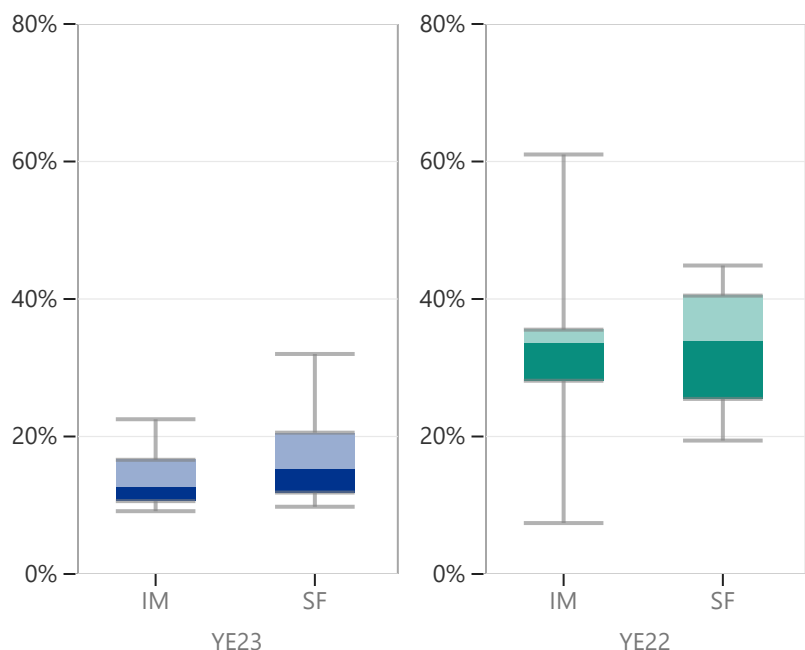
The only non-insurance risk to have been considered within the Risk Margin calculation continues to be counterparty default risk which is included by most respondents. Other than the changes due to Solvency UK reform, we have not observed any changes to Risk Margin projection methodology.

Risk Margin calculations have reduced considerably compared to previous years. This was expected as a result of Solvency UK reforms. The changes to the Risk Margin have led to a reduction of c.65% for firms.

2.5 What is the Risk Margin as a % of your Technical Provisions?



2.6 What is the Risk Margin as a % of your SCR?



2.7 How do you project your capital requirements for the calculation of the Risk Margin?

Risk driver approach used with separate risk drivers per module	14
Actuarial model is able to perform stresses at future dates for each risk and capital is then aggregated	1
Different approaches used per block of business	1
Whole capital measure projected using single risk driver	1

Technical Practices Survey 2024

2. Balance Sheet

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SF/IM

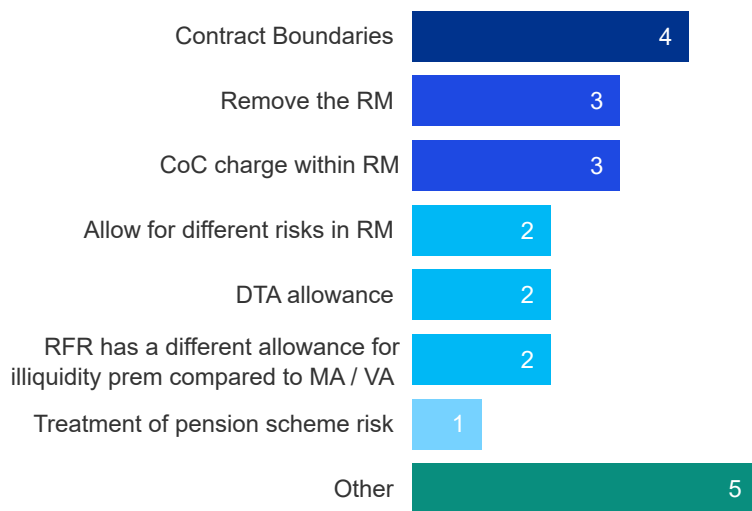
Pillar 2 and ORSA

The difference in Pillar 1 and Pillar 2 balance sheet and capital methodologies for respondents continue to demonstrate similar trends to previous years. A few of the IM firms commented that there was no difference in treatment between Pillar 1 vs 2.

The government's reforms to the Solvency II Risk Margin took effect on December 31, 2023, enabling insurers to maintain a lower level of Risk Margin. As a result, we anticipated that fewer companies would adjust their Risk Margin. Nevertheless, we continue to observe that most common differences relate to Risk Margin and contract boundaries, which remain consistent with the prior year.

Changes in the capital methodology are primarily driven by additional risks in scope for SF firms and a more tailored view of operational risks.

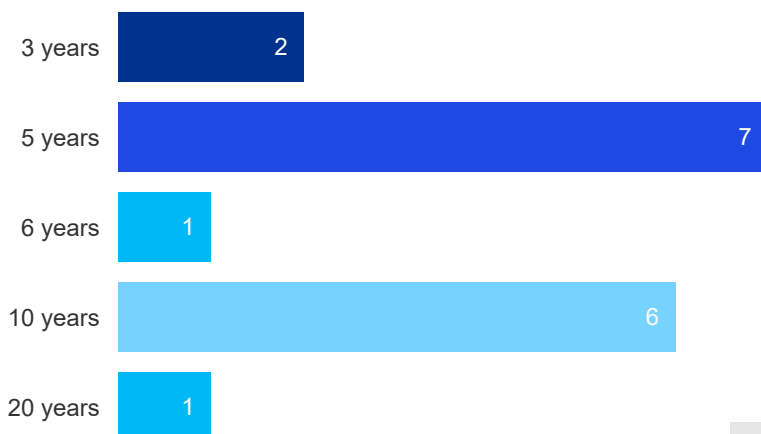
2.8a Which of the following areas do you treat differently when performing your Pillar 2 calculations vs Pillar 1 calculations, with regards to Best Estimate Liability / Technical Provisions?



'Other' includes profit enhancements / shareholder transfers, closure to new business reserve, dynamic TMTP for closed WP funds, allowance for pipeline model changes, and allowance for large amount of group recharges in addition to policy maintenance costs.

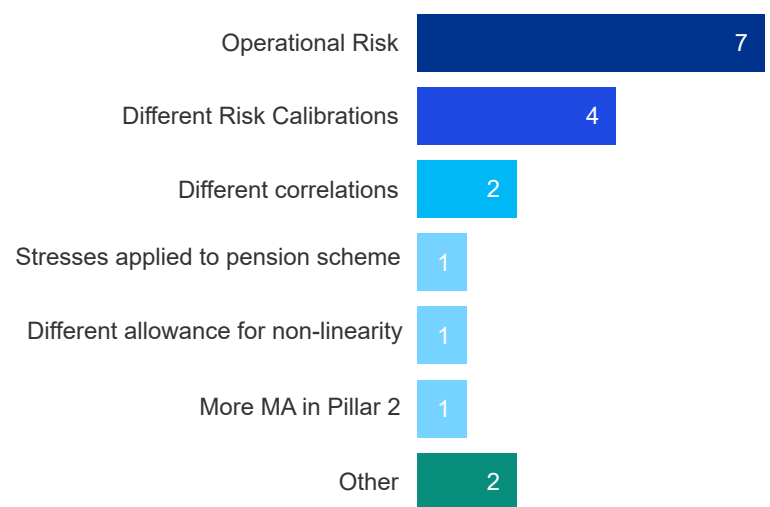
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2.9 For how many years do you project your Pillar 1 Balance Sheet as part of your ORSA?



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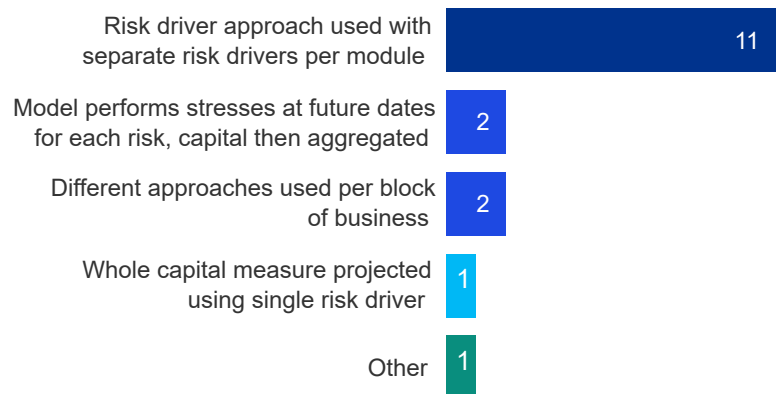
2.8b Which of the following areas do you treat differently when performing your Pillar 2 calculations vs Pillar 1 calculations, with regards to Pillar 2 - Capital?



'Other' includes VA and liquidity premium, and own view of Capital for DB pension scheme set using judgement.

8

2.10 How does your company project its future capital requirement in the ORSA?



'Other' is a combination of modelling and risk drivers for each risk.

17

Technical Practices Survey 2024

2. Balance Sheet

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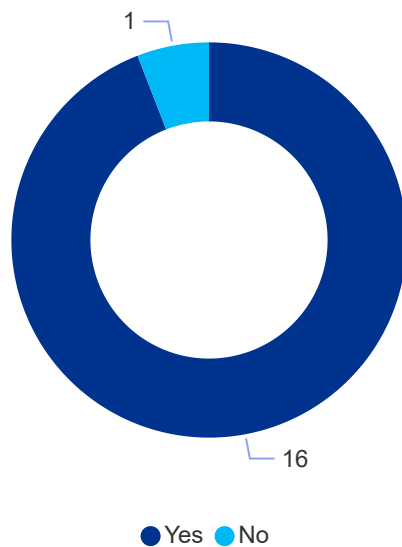
SF/IM

Pillar 2 and ORSA

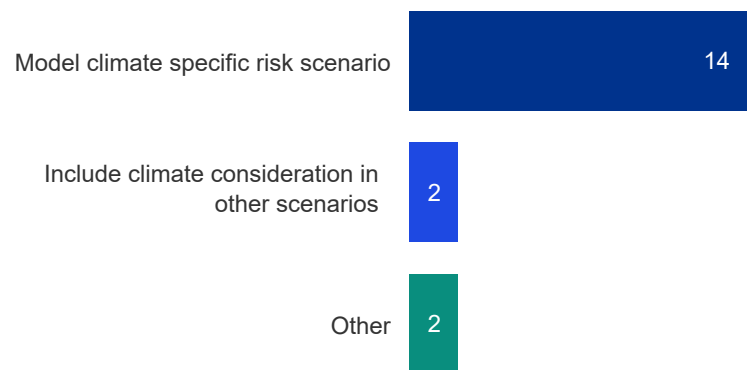
A few years after the release of Policy Statement 11/19 on climate change risk, which asked insurers to consider how climate risks might impact aspects of the risk profile, nearly all respondents are now incorporating climate risks into their Own Risk and Solvency Assessment (ORSA). The majority of firms are employing climate-specific scenarios for risk assessment. Two respondents noted that they are utilising a combination of climate-specific scenarios, integrating climate considerations into other risk scenarios, or combining these with qualitative physical climate scenarios.

In the forward-looking assessment of climate risk within the ORSA, climate-related scenarios are most frequently considered in market risk, credit risk, and counterparty risk. These risks are associated with shifts in investment conditions stemming from the transition to a low-carbon economy.

2.11 Do you consider climate risks within the ORSA?



2.12 How do you assess and reflect climate risks within the ORSA?



15

'Other' includes a consideration of a qualitative physical climate scenario, and a Reverse Stress Test.

2.13 For which of these risk modules do you consider climate related scenarios as part of the forward looking assessment of the risk in the ORSA?



12

Technical Practices Survey 2024

2. Balance Sheet

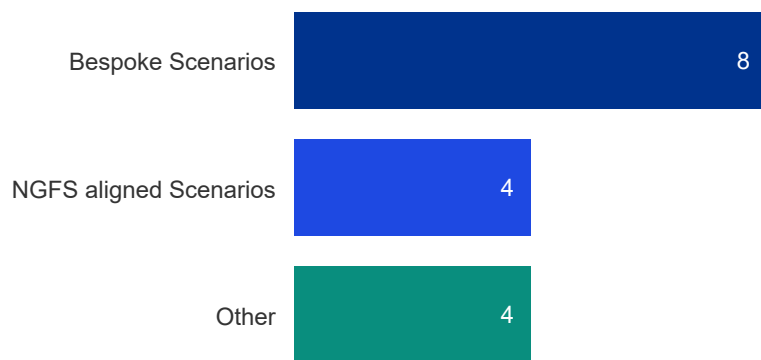
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SF/IM

Pillar 2 and ORSA

The most common climate scenarios used as part of the ORSA are bespoke. For those using NGFS aligned scenarios, delayed transition and current policies are the most commonly used scenarios. The respondents also commented the lack of credible data is the biggest challenge to incorporate climate scenarios into their forward looking assessment.

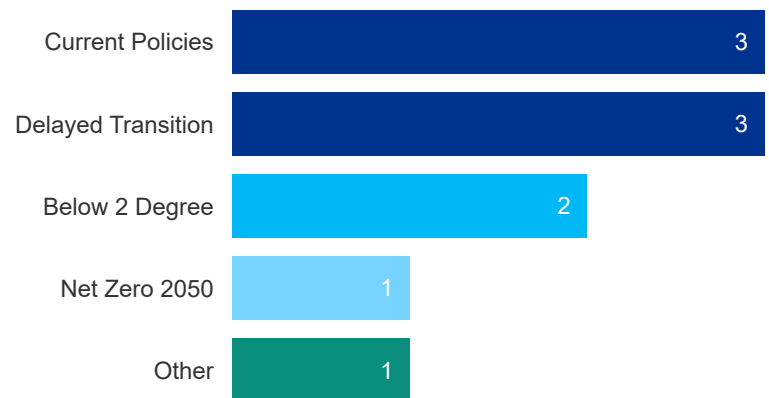
2.14 If you model climate specific scenarios as part of your ORSA, what scenarios do you run?



NGFS is Network for Greening the Financial System. 'Other' includes use of the Climate Biennial Exploratory Scenario (CBES), the Ortec climate risk scenario, and a combination of scenarios prescribed by the PRA.

14

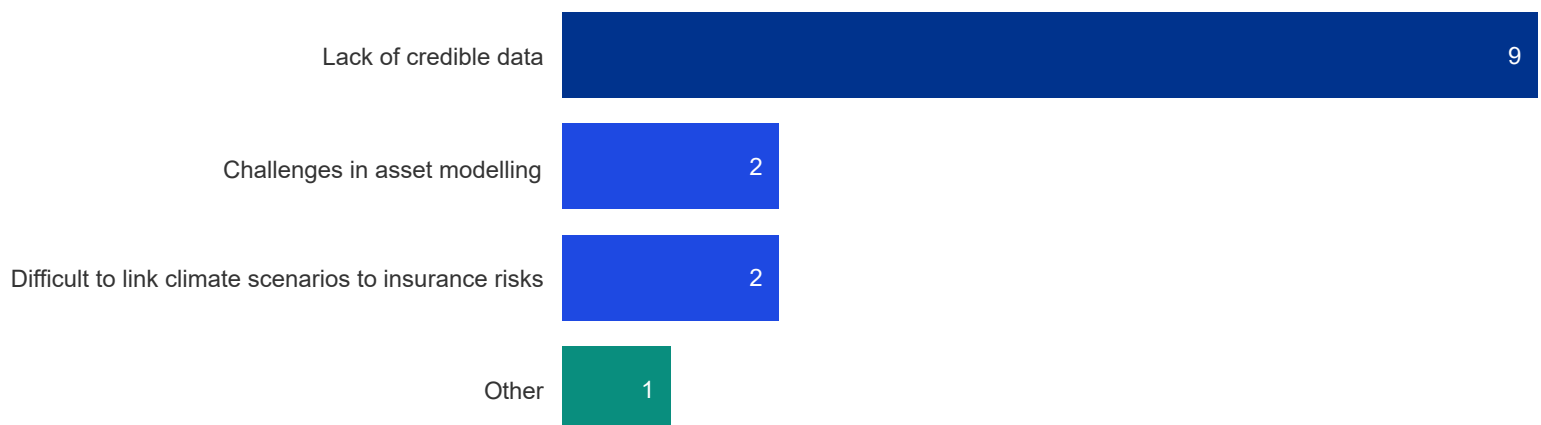
2.15 If you run NGFS (Network for Greening the Financial System) scenarios as part of your forward looking assessment, which of these scenarios do you use?



'Other' includes the use of the BoE CBES scenario, which is based on NGFS.

4

2.16 What do you consider the biggest challenges to incorporating climate scenarios into your forward looking assessment?



'Other' includes the difficulty in modelling the forward looking assessment beyond 10 years with accuracy.

14

Technical Practices Survey 2024

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SF/IM

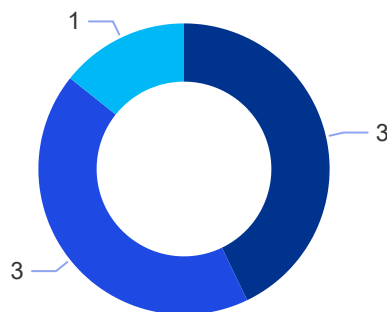
Matching Adjustment

Firms allocate assets to the Matching Adjustment Portfolio (MAP) either manually or using a more sophisticated approach through automation. All firms perform their allocation to achieve compliance with PRA Tests 1 & 3. The other objectives of firms range from optimising the size of the MA, the coverage ratio risk appetite, and additional internal matching tests.

Firms continue to expand the asset classes in their MA portfolios. Since last year, one firm has reported a change for property rental strips, ground rent assets, ERM's and educational loans from planning to apply MA to it or having no future plans to apply MA, into actually having it in the MAP. There continues to be a range of assets where firms plan to make use of them in the future but developing the required internal processes and achieving regulatory approval is a long process.

Responses are received based on Solvency UK reform consultations hence, respondents have changed their plans for matching adjustment portfolio to allow for assets which can apply for MA.

2.17 As part of the calculation of the matching adjustment, how are assets hypothecated within the MAP?



● Automatic allocation of assets ● Manual allocation of assets ● Other

Other includes model attempts to optimise MA rate whilst meeting the three PRA tests.

2.18 What is your objective when allocating assets to the MAP?

Compliance with PRA test 1 and 3

7

Maximising the MA through the allocation of assets to the MAP

5

Other

3

Other includes compliance with internal tests, DMT of assets and liabilities, impact of independent stresses on capital requirements, and maximisation of Solvency ratio.

7

2.19 Which of the following asset classes do you have approval to include in your Matching Adjustment portfolios or do you plan to apply for in the future?

The majority (≥50%) of respondents currently include the following asset classes in their MA portfolio	A few (minority) of the respondents also include the following asset classes in their MA portfolio
Cash	Educational loans
Commercial mortgages	FX forwards/futures (not restructured)
Cross currency swaps	FX forwards/futures (restructured)
IR swaps	FX options
Inflation linked bonds	Ground rent assets (not restructured)
Inflation swaps	IR swaptions
Infrastructure debt	Inflation options
Non-callable fixed interest	Property rental strips (not restructured)
Private Finance initiative loans	Property rental strips (restructured)
Reinsurance asset	Residential MBS
Social housing loans	Sale and leaseback
Supranational	Secured financing
Callable bonds (not restructured: using 'Fisher approach')	Uncollateralised inflation
	Collateralised Loan Obligations
	ERM's (restructured)
	Infrastructure
	Other Asset Backing Securities

Technical Practices Survey 2024

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SF/IM

Matching Adjustment

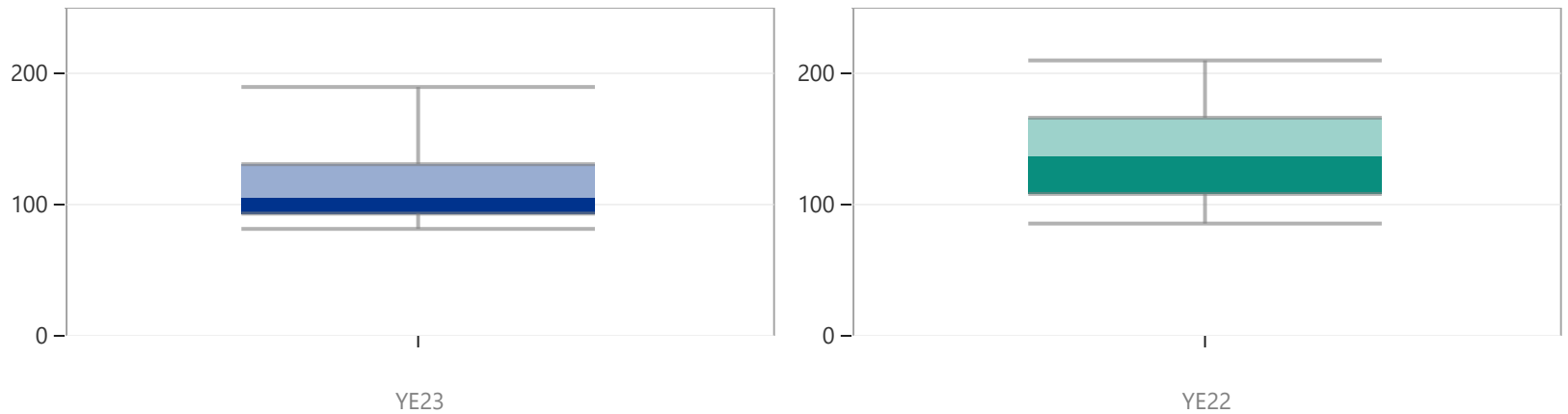
This section considers the calculation of the Matching Adjustment (MA). The first chart shows the overall MA achieved by firms. The majority of participants have seen a reduction in MA, reflecting the changes in spreads over 2023. The median MA drops to 105bps (YE22: 137bps). We can supplement this chart with additional publicly available benchmarks (SFCR and Annual reports) from some of the large Annuity providers who do not participate in the survey. Including this additional data raises the median MA by 18bps to 123bps (YE22: 143bps), which also shows a reduction in MA.

The following table shows the published MAs for the largest UK annuity providers for reference.

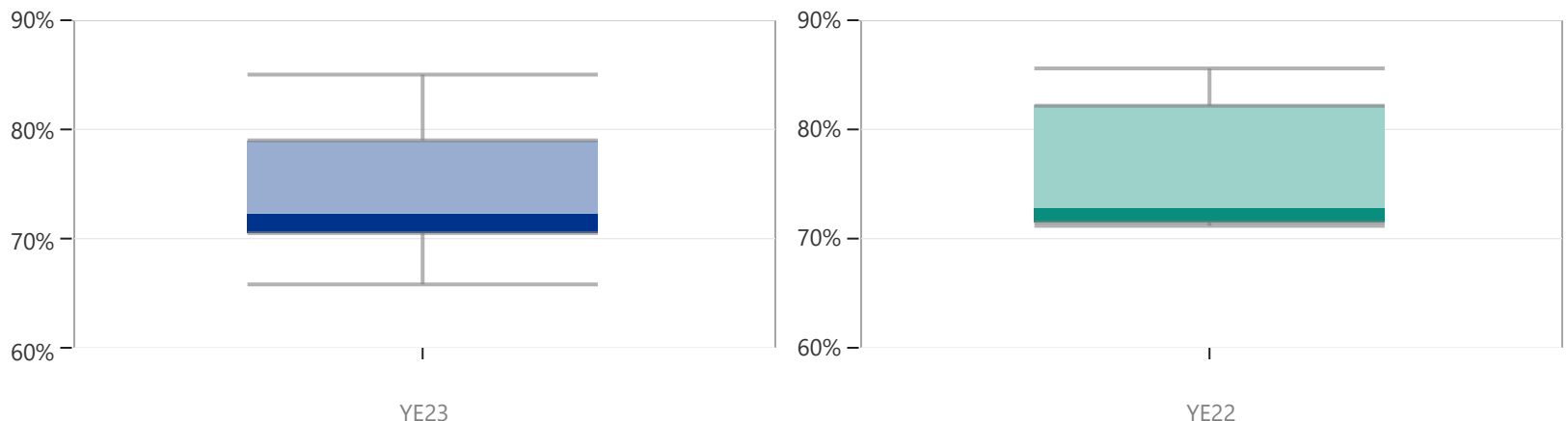
MA Comparisons		
Matching Adjustment (in bps)	2022	2023
M&G	176	166
Aviva	114	124
Rothesay	155	117
Just	210	190
LBG	162	128
PIC	164	159
L&G	141	122

The second chart shows the percentage of the annual effective rate which is achieved in the MA once deductions have been made for the Fundamental Spread. Excluding sampling differences, there are very minor movements in this percentage comparing responses between YE23 and YE22.

2.20 Matching Adjustment (bps)



2.21 Percentage of Total Spread Achieved in MA



Technical Practices Survey 2024

3. Standard Formula

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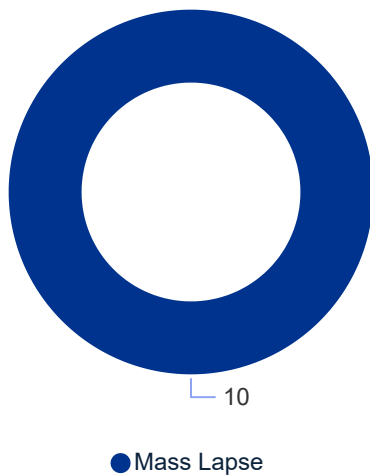
SF

Lapse and Expense Risk

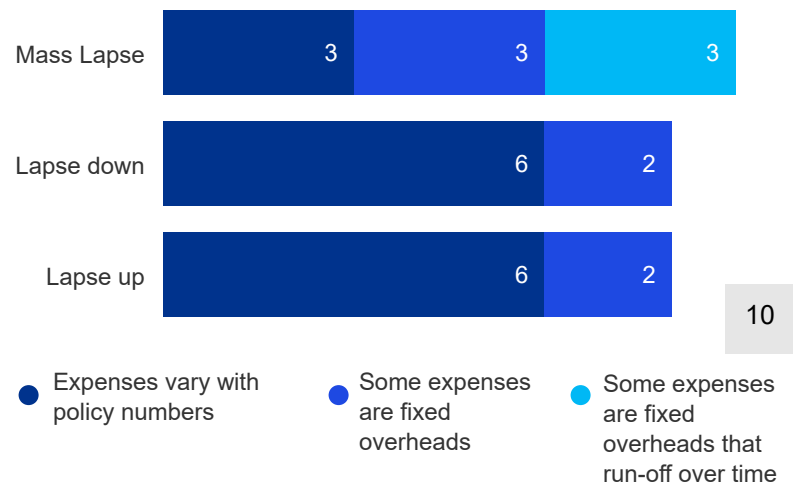
Mass lapse is the biting scenario out of the three lapse stresses for all our respondents. In the mass lapse scenario, some respondents continue to assume that expenses vary with policy numbers. Management actions provide the main justification for this assumption; other reasons include expense agreements and a combination of fixed expenses reducing in line with policy run off after a number of years.

The common management actions are direct actions on staff, like headcount reduction, and actions relating to other fixed expenditure, such as cost savings on property and equipment. Two respondents stated they assume it takes 2-3 years for the volume of business to recover after the management actions.

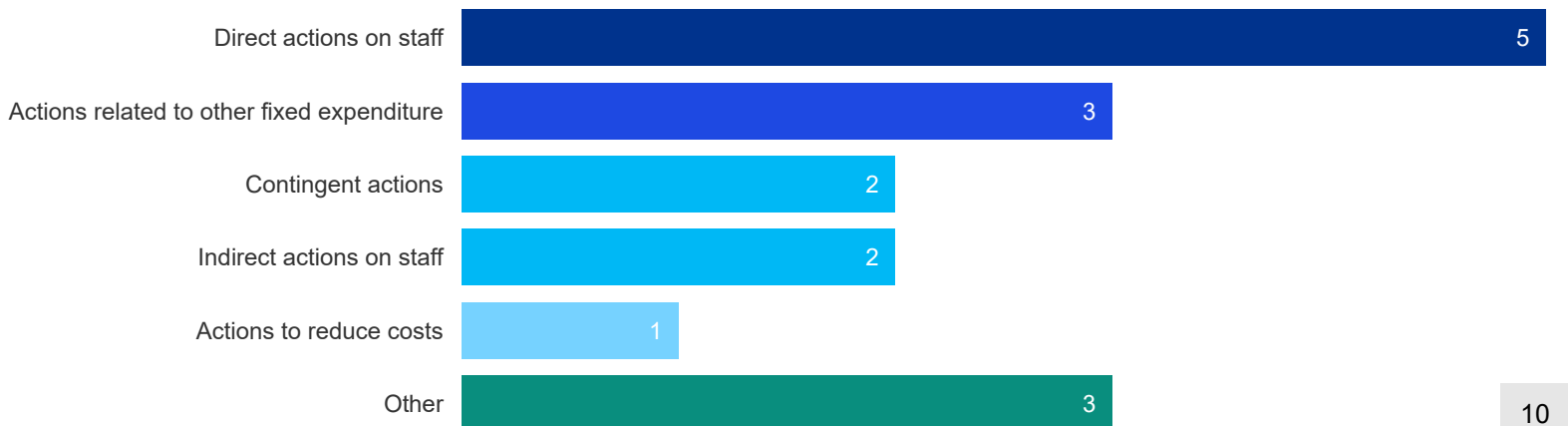
3.1 Which of the lapse stresses is the biting scenario for your capital requirement?



3.2 What assumption do you make about expenses in each of the lapse stresses?



3.3 Within the mass lapse stress do you assume any further management actions to reduce costs on a permanent basis or while volumes recover?



Direct actions on staff e.g. headcount reductions, actions relating to other fixed expenditure e.g. property/equipment costs, indirect actions on staff e.g. reward changes / headcount freezes, actions to reduce costs e.g. reduction in project spend, contingent actions e.g. change in strategy / sales plans etc, rebalance of costs e.g. outsourcing cost cut. "Other" includes the passing on of losses above a management action cap to policyholders, and the assumption of management actions on fixed expenses in the mass lapse stress.

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3. Standard Formula

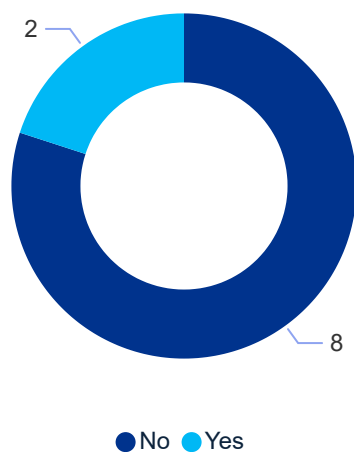
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF

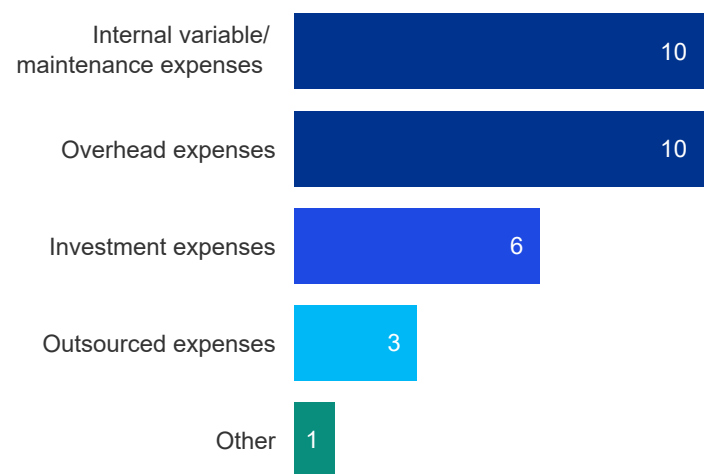
Lapse and Expense Risk

As seen in previous years, all respondents stress overhead and variable expenses, and the majority of the respondents also stress investment expenses. Where investment expenses are not stressed, they are generally defined as a percentage of funds under management. Furthermore, there is a variety of responses in respect of stressing fixed outsourcing expenses which depends on the contractual agreements in place. For example, some respondents do not stress the expenses for inflation while some only apply the stress at the end of the outsourcing term.

3.4 Are a substantial proportion (i.e. >60%) of your base expenses based on outsourced costs?



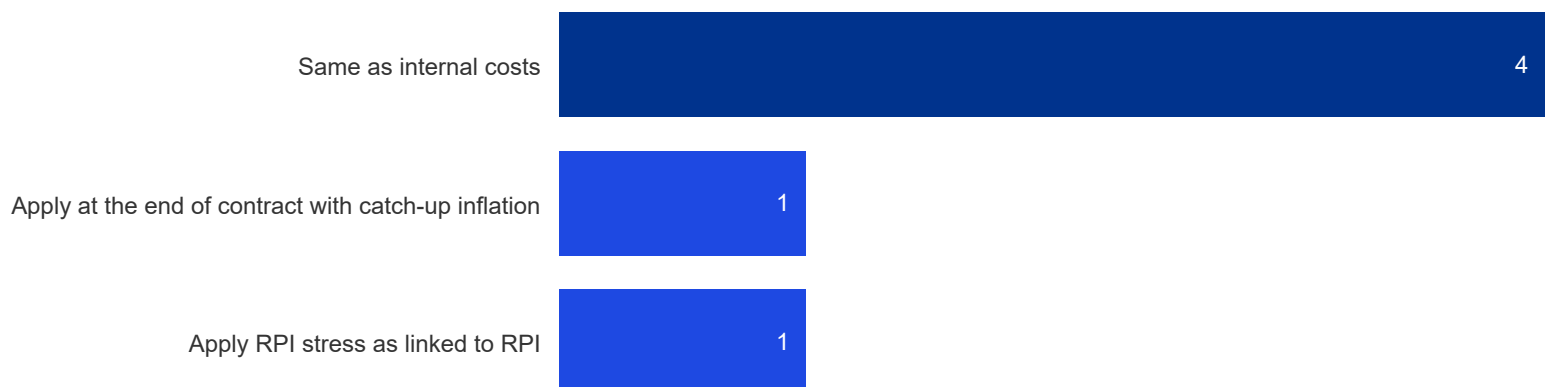
3.5 Which of your expenses are subject to the expense stress?



'Other' includes some investment expenses which are subject to the inflation element of the expense stress.

10

3.6 For outsourced expenses, how do you apply the stress?



One respondent chose two options, indicating a combined approach.

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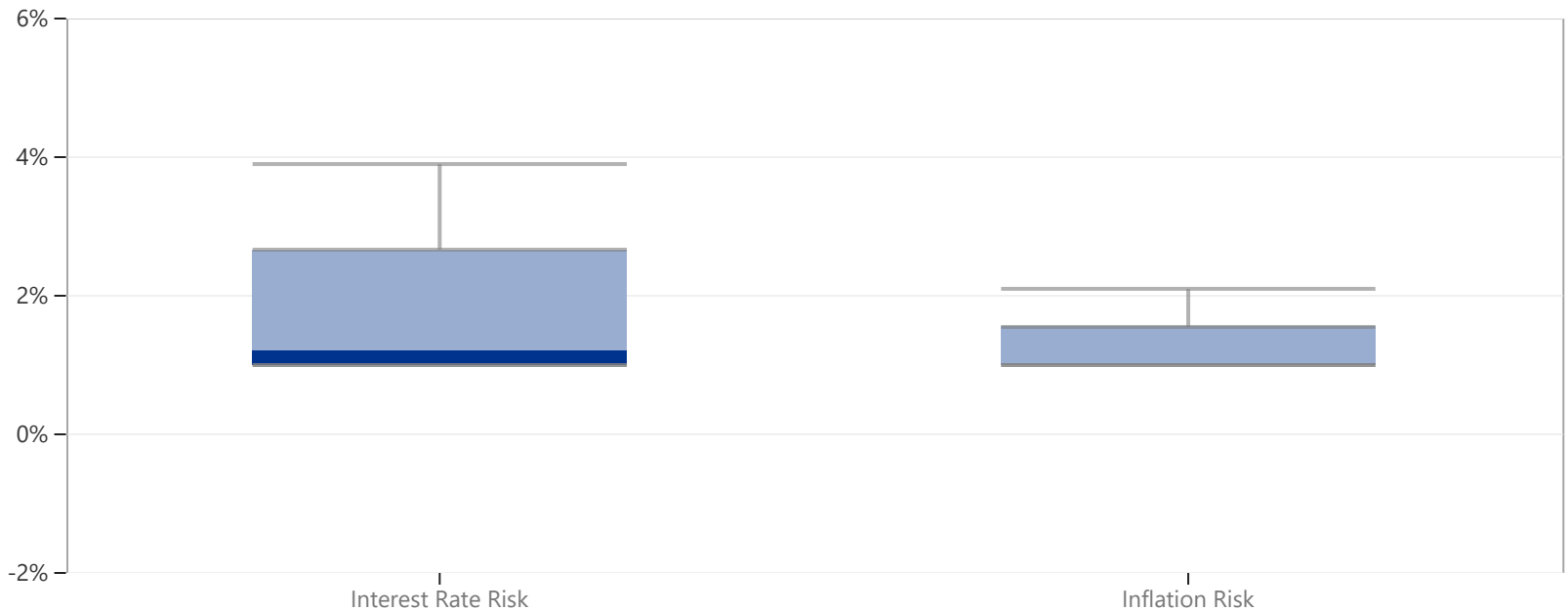
4. Market Risk (excl. Credit)

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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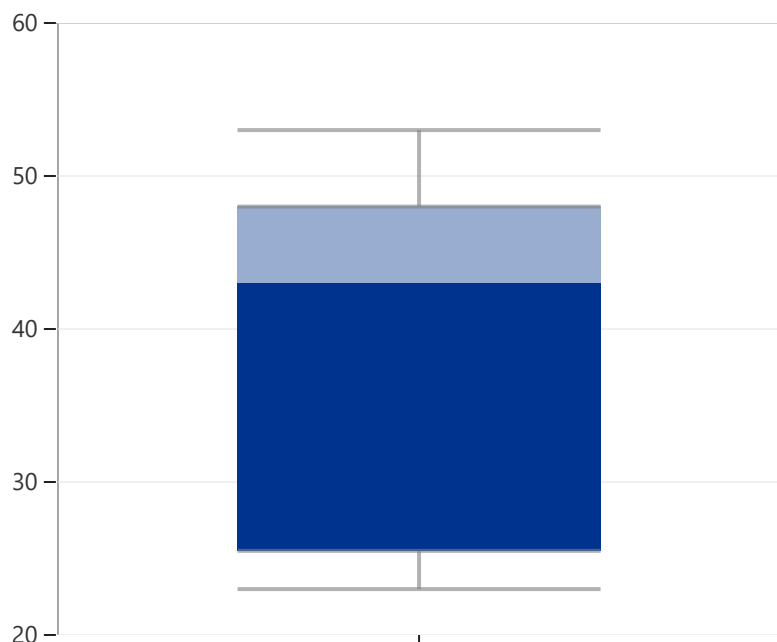
IM Interest Rate Risk

Inflation and interest rate risks are a relatively small proportion of post-diversification SCR for most participants given their matching/hedging strategy. Most respondents would use between 20-40 years of data to calibrate the interest rate risk. Participants use a range of methodologies to apply the stress. These include additive or hybrid models (which combined features of additive and multiplicative models).

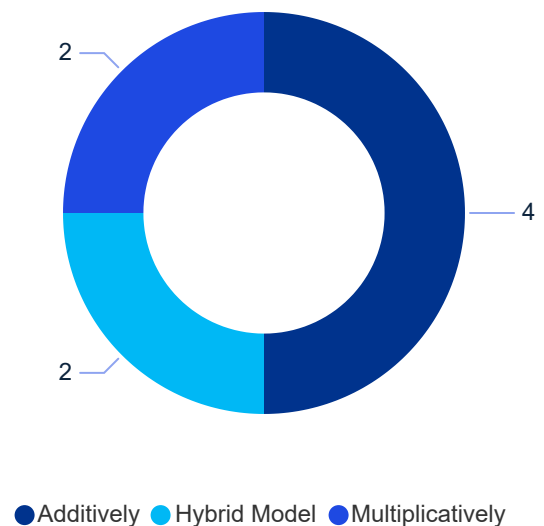
4.1 What is the % of diversified SCR for the following market risks?



4.2 How many years of data did you use to calibrate your interest rate stresses for YE23?



4.3 How are shocks applied to interest rates?



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4. Market Risk (excl. Credit)

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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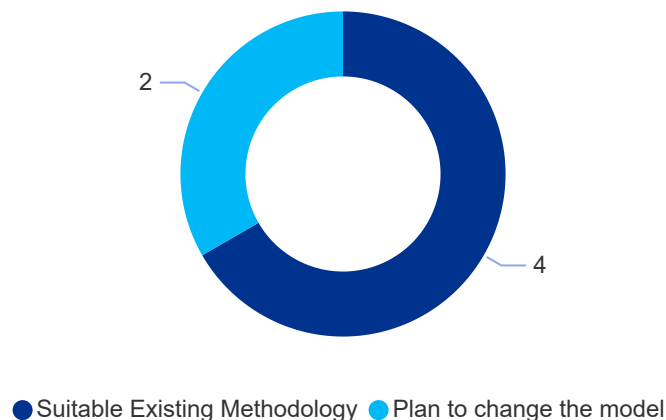
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Interest Rate Risk

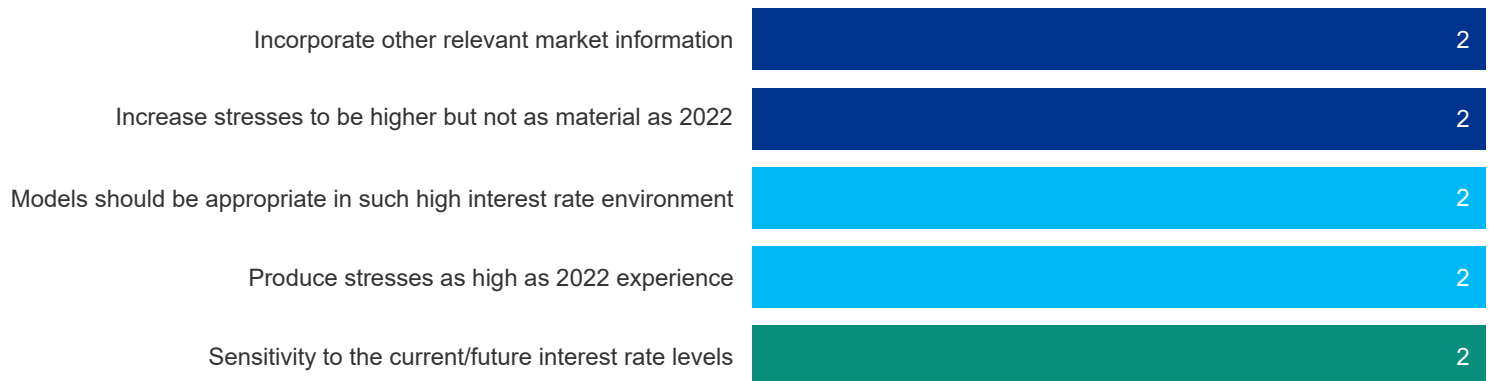
Compared to last year's survey, a larger proportion companies now consider their methodology for interest rate risk to be appropriate given the current higher interest rate environment. This reflects the developments to interest rate models that some firms have undertaken since the last survey. This year, two respondents expect to change their interest rate methodology to ensure they are appropriate for the high interest environment and reflect 2022 interest rate experience.

Where firms are considering model changes, the key drivers are to ensure that their models are appropriate in the higher interest rate environment, and also to ensure that the models were appropriately sensitive to the interest rate level. Companies are exploring various methods to achieve these aims, with most companies looking to review their expert judgments and consider alternative data choices for this purpose.

4.4 Do you consider your existing interest rate stress methodology to be suited to modelling interest rate risk in a high interest rate environment? Is there any plan for developments or changes to Interest Rate Risk calibration?



4.5a If you plan to change your model to reflect 2022 experience, what features do you consider to be important to reflect in your revised model?



4

4.5b What model changes are you considering as part of your interest rate model change?



4

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4. Market Risk (excl. Credit)

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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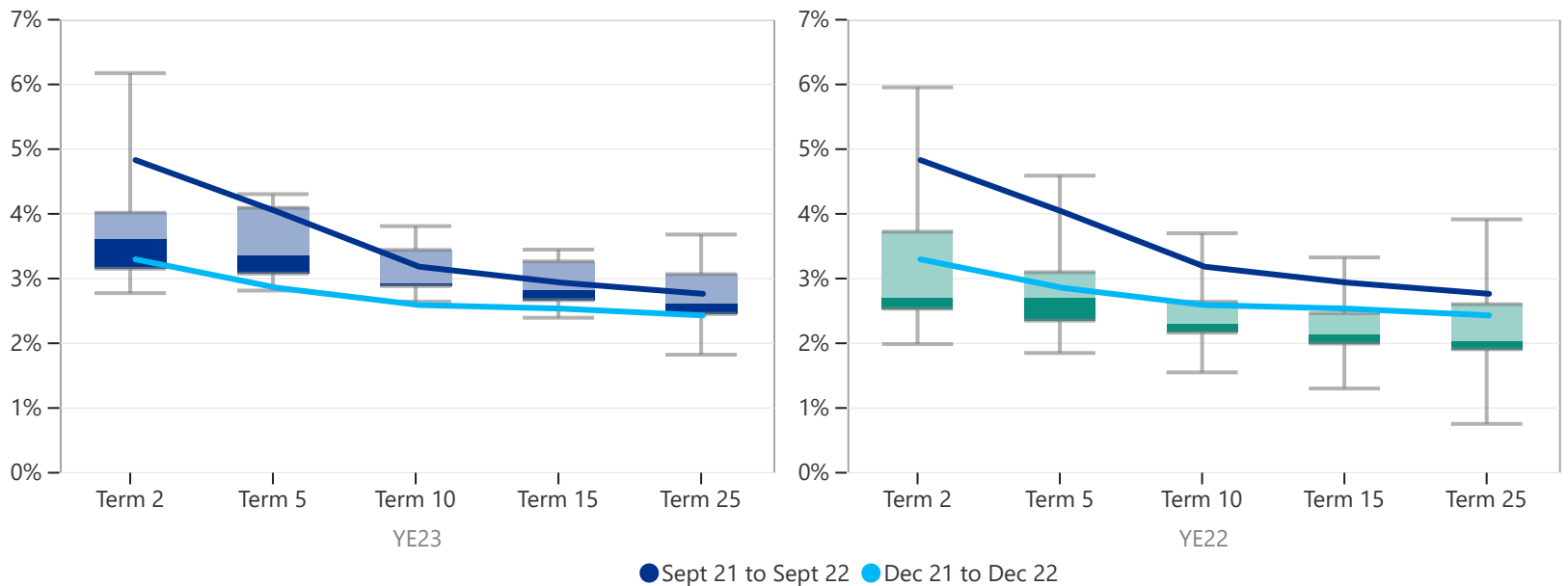
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Interest Rate Risk - Calibrations

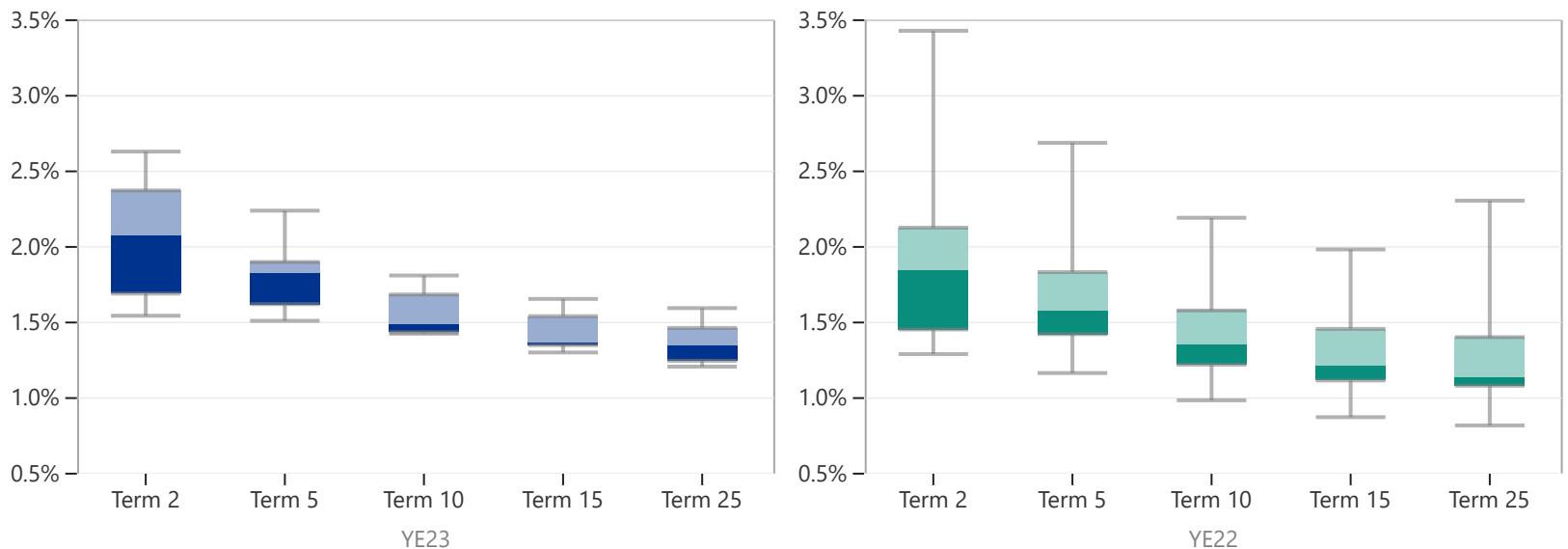
The majority of respondents showed a significant increase in "up" stress levels at YE23 compared to YE22. This aligns with companies adjusting their models to reflect the actual interest rate experience of 2022 and is consistent with the changes that companies indicated in last year's report. We observed a convergence in the "up" stresses across companies at YE23 compared to YE22, suggesting a more unified view on interest rate risk. We have also overlaid two lines representing the largest one year movement in interest rates (Sep 21 to Sep 22) as well the Dec 21 to Dec 22 interest rate movements for reference.

Notably, the 1-in-20 stress levels remained relatively stable, indicating that insurers' views on interest rate risk for capital and liquidity management in more "normal" business conditions have not changed significantly.

4.6a Interest Rate - 1-in-200 up shocks



4.6b Interest Rate - 1-in-20 up shocks



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4. Market Risk (excl. Credit)

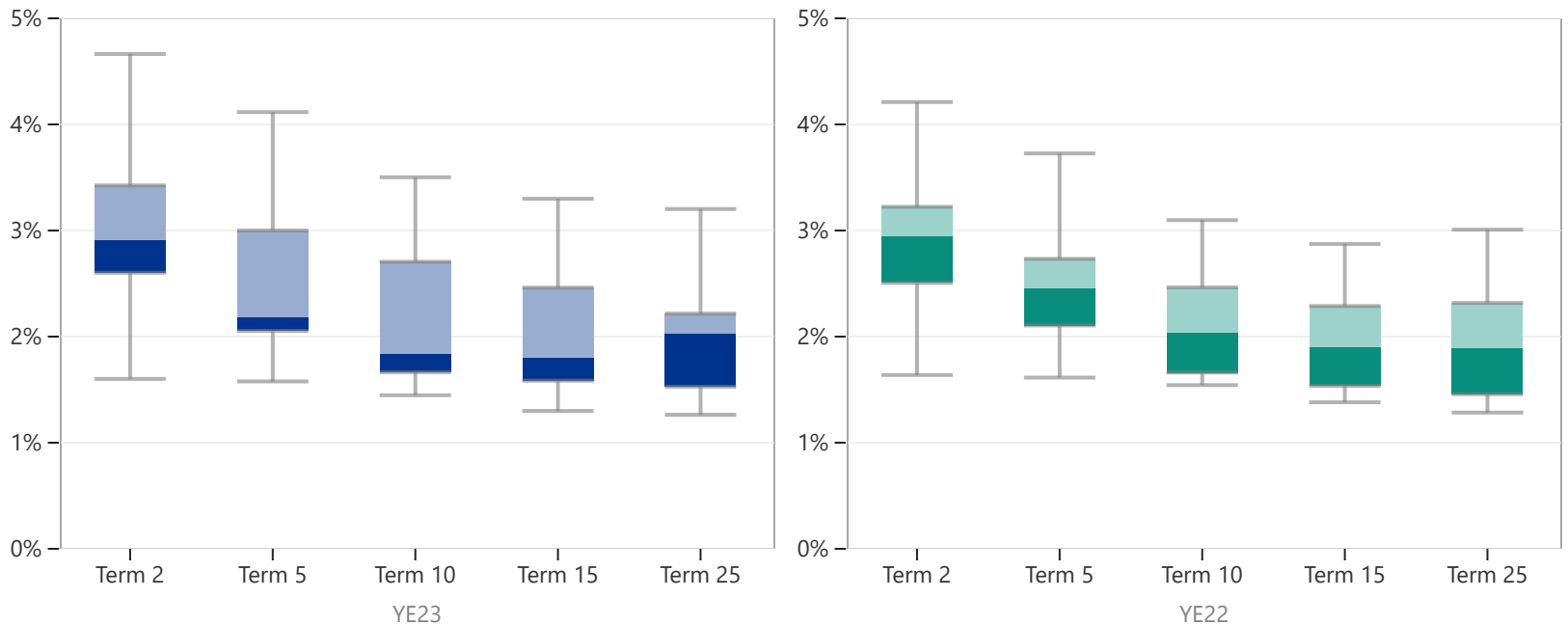
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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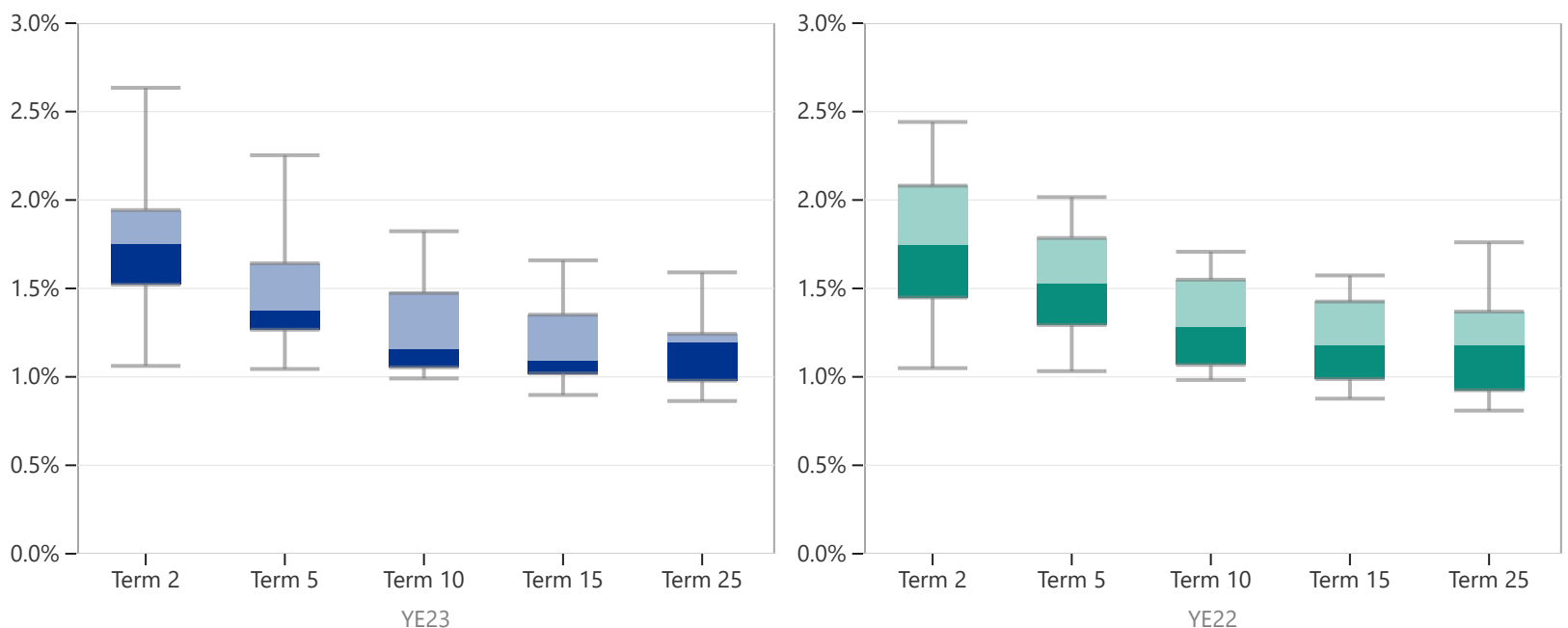
Interest Rate Risk - Calibrations

The majority of companies showed little to no change in their "down" stress levels from YE22 to YE23. This aligns with the plans they indicated in last year's survey. The median appears to have reduced slightly, however this is due to sampling differences. One company notably strengthened their interest rate down stress, likely reflecting a more cautious approach to downside risk. Another company primarily adjusted the shape of their down stress without significantly altering its strength.

4.6c Interest Rate - 1-in-200 down shocks



4.6d Interest Rate - 1-in-20 down shocks



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4. Market Risk (excl. Credit)

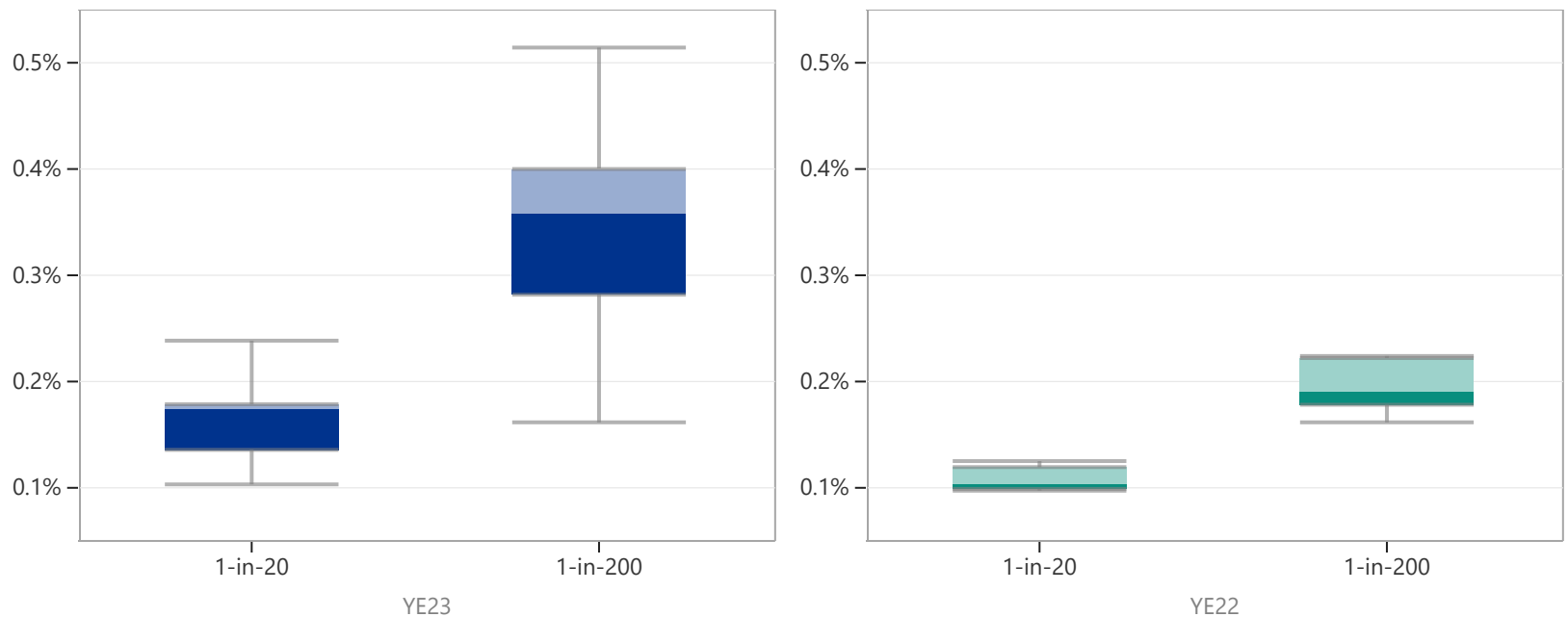
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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IM

Interest Rate Risk - Calibrations

All except one company in the survey increased their interest rate volatility stresses materially over the year, with the exception leaving their stresses unchanged compared to YE22. We note that the best estimate interest rate volatilities slightly increased from YE22 to YE23. However, the quantum of the increase does not explain the change in the stresses, suggesting additional drivers for the strengthening of the stresses.

4.6e Interest Rate Volatility



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4. Market Risk (excl. Credit)

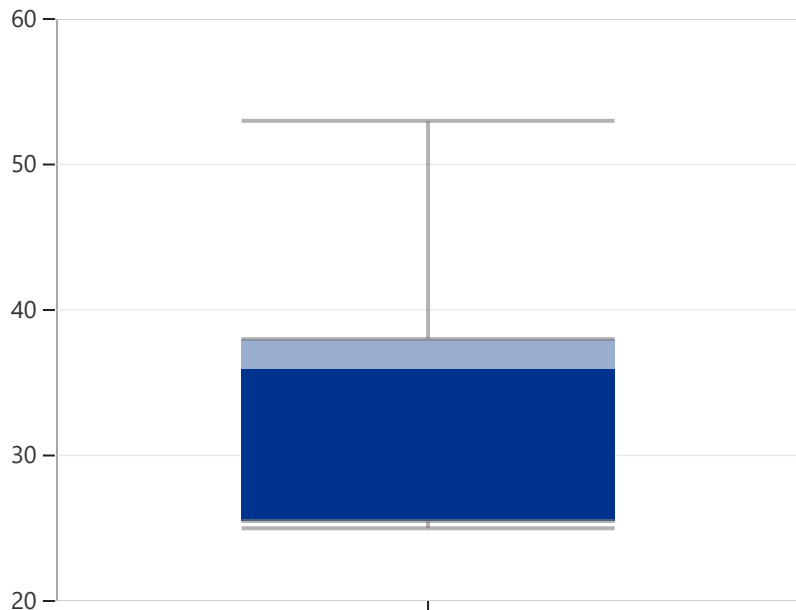
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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IM Inflation Risk

Most participants calibrated their inflation stresses using data from the past 30-40 years, providing a comprehensive historical perspective.

The majority of survey respondents are exposed to RPI, CPI and LPI inflation risks. RPI remains the primary inflation risk model for most companies. Two respondents are now modeling LPI inflation. While some respondents are modeling CPI inflation, their approach varies. The methods include the same methodology as RPI, additive stresses on a PCA model and calibrating the RPI - CPI wedge.

4.7 What historical period of data did you use to calibrate your inflation stresses for YE23? (years)



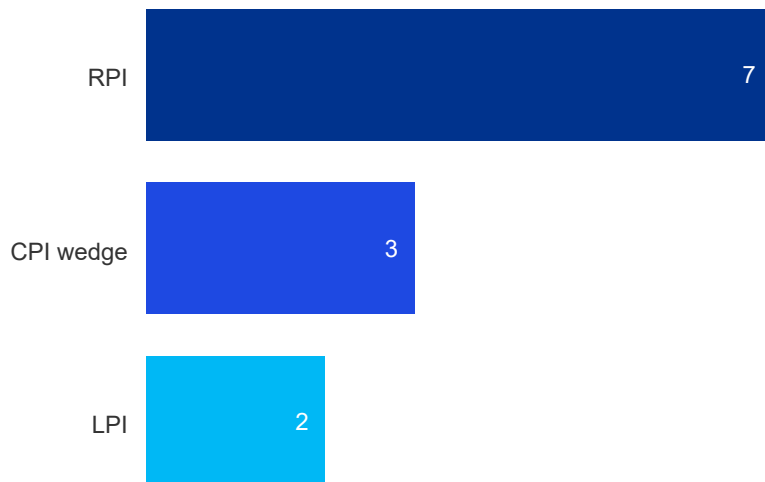
4.8 What is the nature of your inflation exposure?



Other includes salary/expenses.

7

4.9 What is the nature of your modelled inflation risk?



4.10 What is your approach to modelling inflation risks for measures other than RPI?

CPI



'Bespoke' includes additive stress calculated by a PCA approach, and performing a separate calibration for RPI-CPI wedge.

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4. Market Risk (excl. Credit)

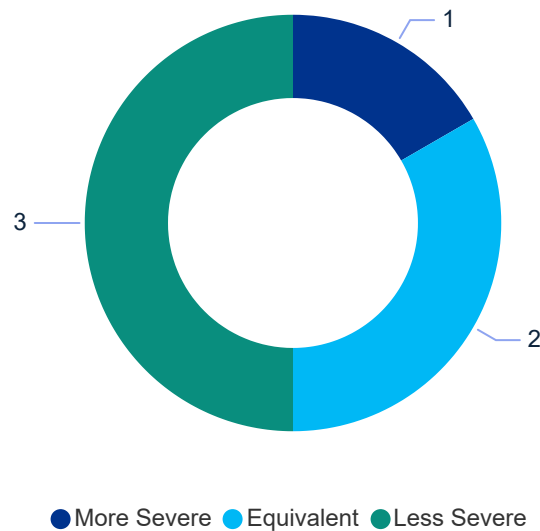
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IM Inflation Risk

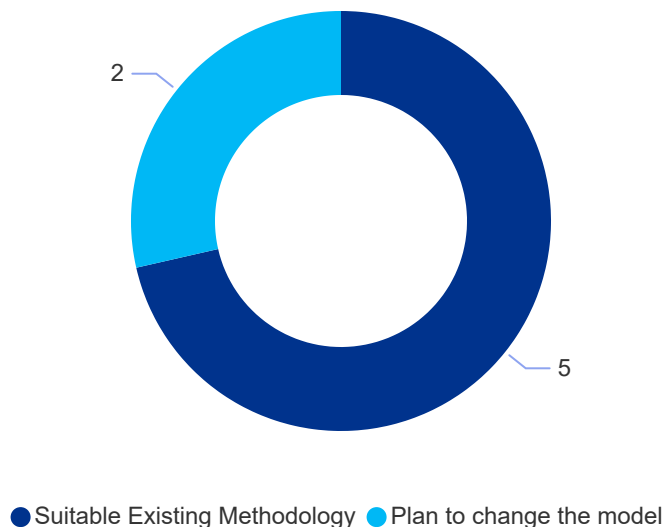
Respondents' views on the severity of the largest inflation spot rate changes observed in 2022 compared to the 1-in-200 stress were divided, half considered them less severe, half considered them equivalent or more severe.

A majority of respondents believe their existing inflation risk methodology is suitable for modeling inflation risk in a higher inflation environment. Two respondents plan to change their current inflation risk model in response to the 2022 experience whereas one company is considering introducing a separate inflation risk module due to the current model's integration with interest rate risk, which assumes perfect correlation.

4.11 Do you consider the largest inflation spot rate stresses observed over 2022 to be equivalent, less severe or more severe than a 1-in-200 stress?



4.12 Do you consider your existing inflation risk stress methodology to be suited to modelling inflation risk in a higher inflation environment, and is there any plan to change your current inflation risk model in response to 2022 experience?



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4. Market Risk (excl. Credit)

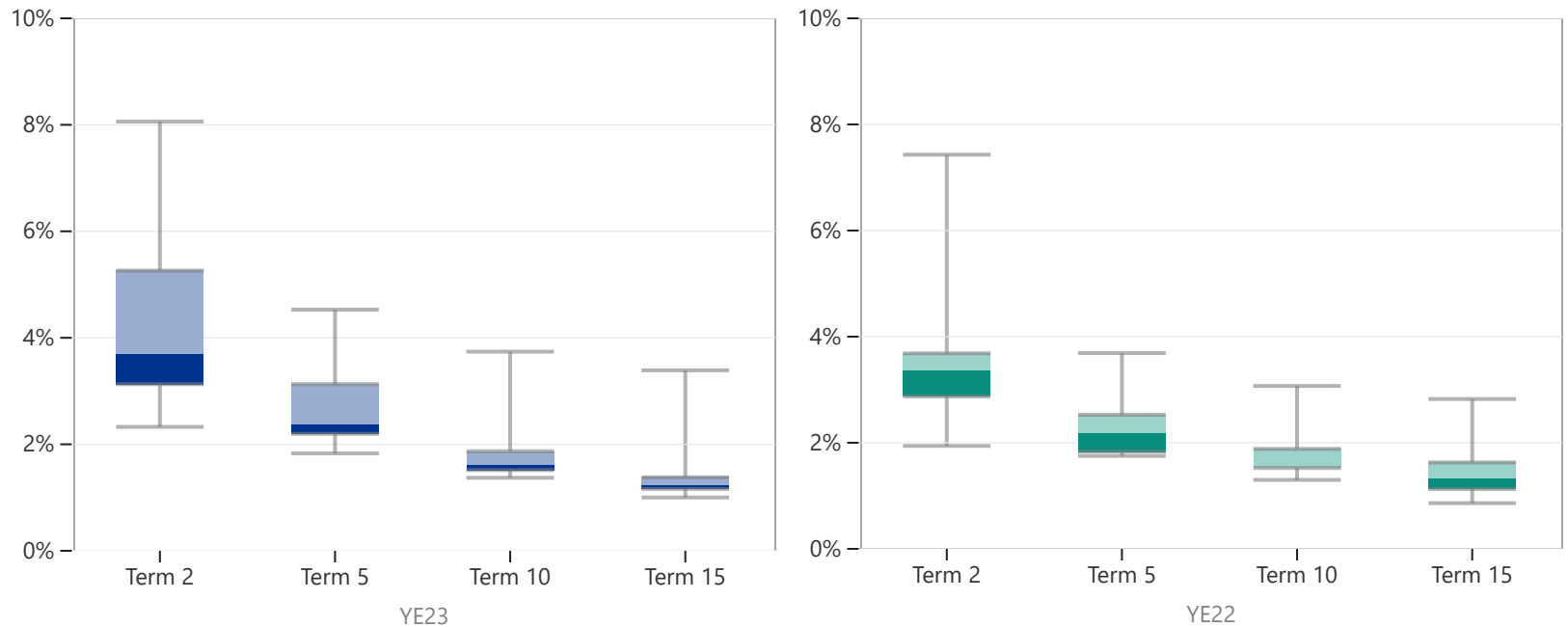
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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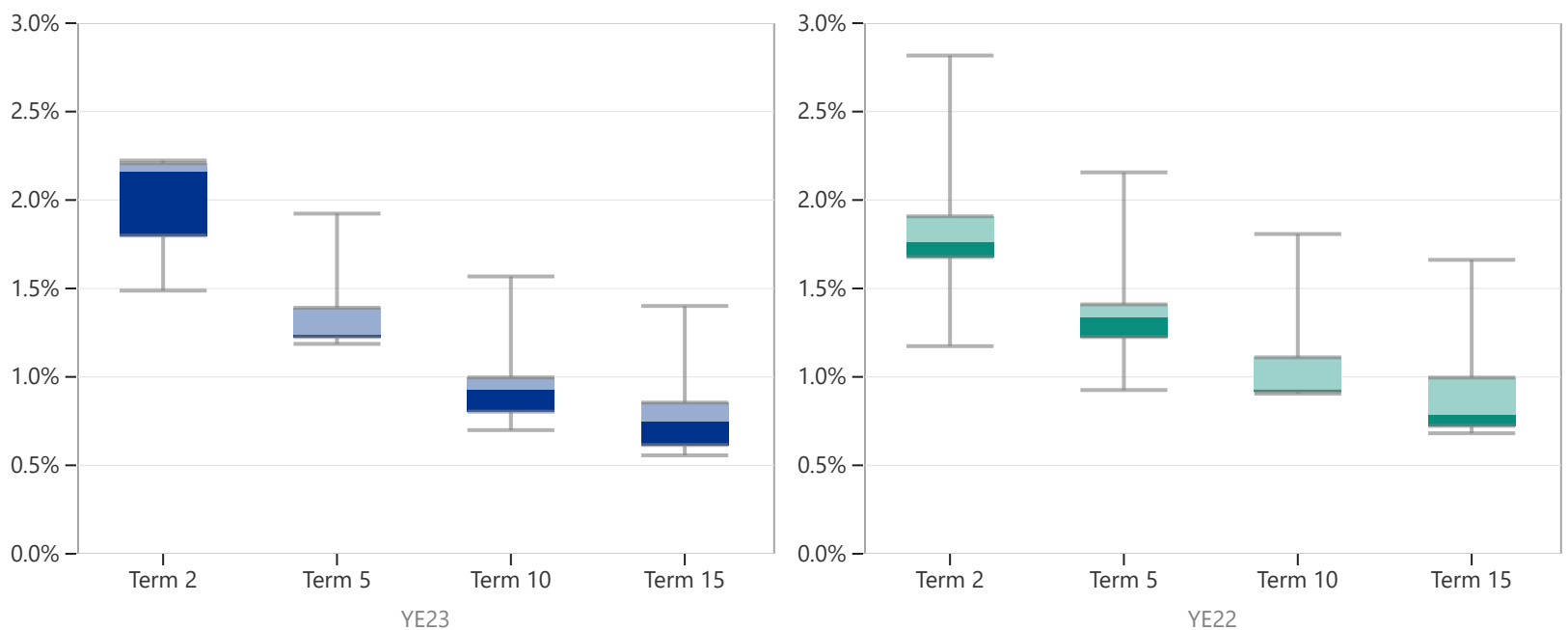
Inflation Risk - Calibrations

Companies' inflation risk calibrations are generally stronger at YE23 compared to YE22. While most companies have strengthened the calibration at the short-end, some companies have strengthened their calibrations across all terms.

4.13a Change in Implied Inflation - 1-in-200



4.13b Change in Implied Inflation - 1-in-20



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4. Market Risk (excl. Credit)

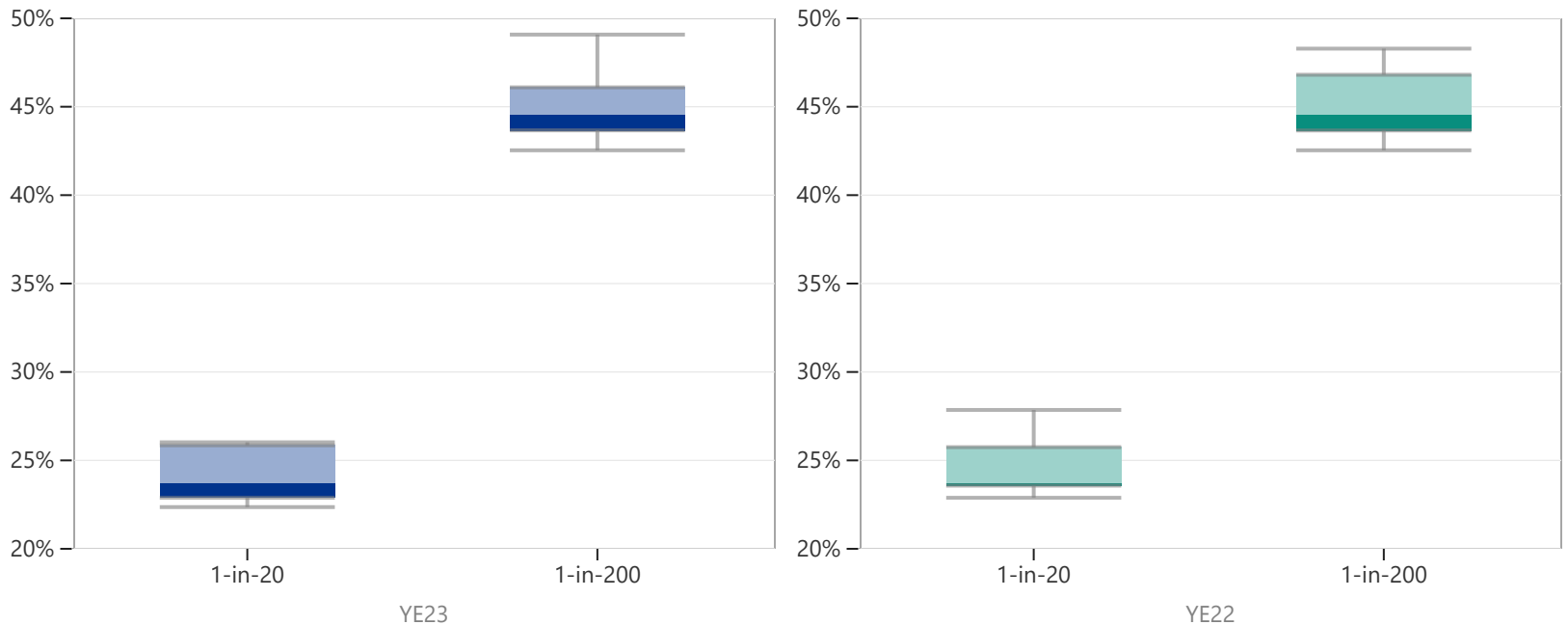
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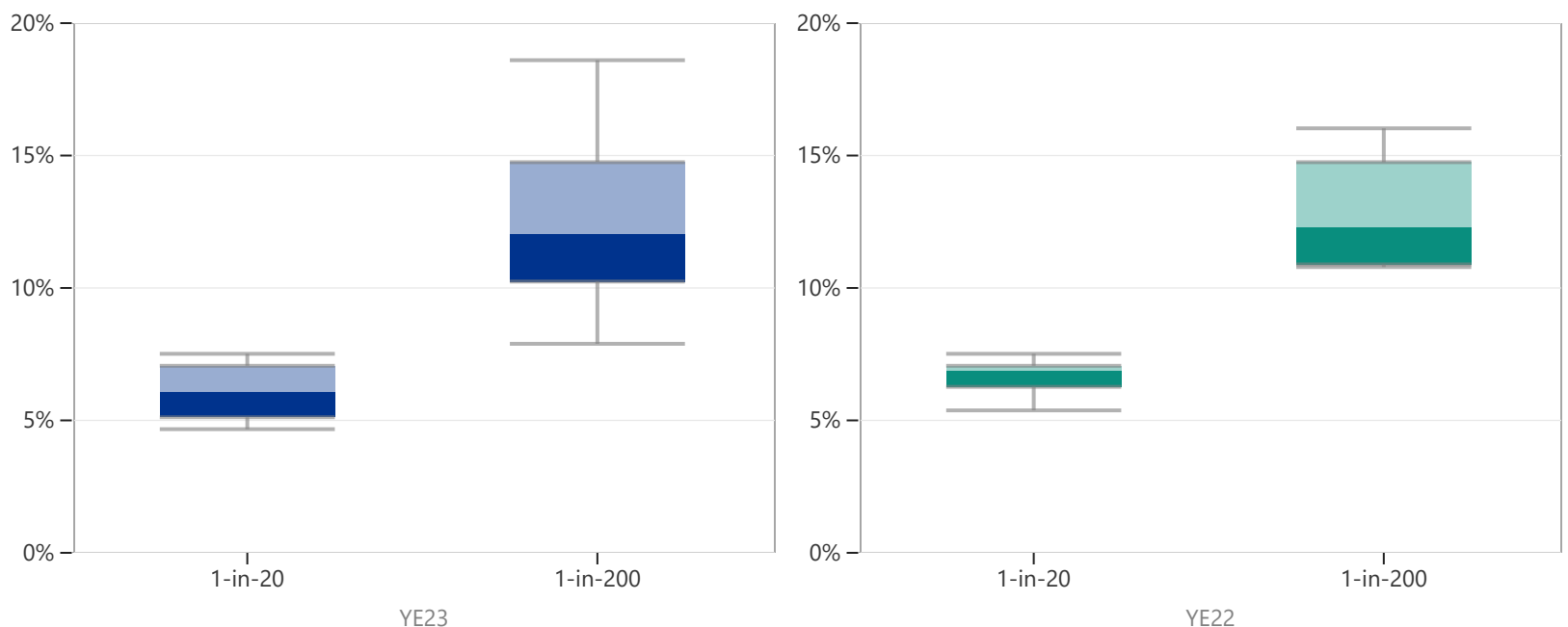
Equity Risk - Calibrations

The total equity stress charts display the magnitude of the 1-in-20 and 1-in-200 down shocks. Equity risk calibrations at YE23 are broadly similar to YE22, with one company increasing its individual equity volatility stress significantly.

4.14 Total Equity Stress



4.15 Equity Volatility Stress (Term 10)



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4. Market Risk (excl. Credit)

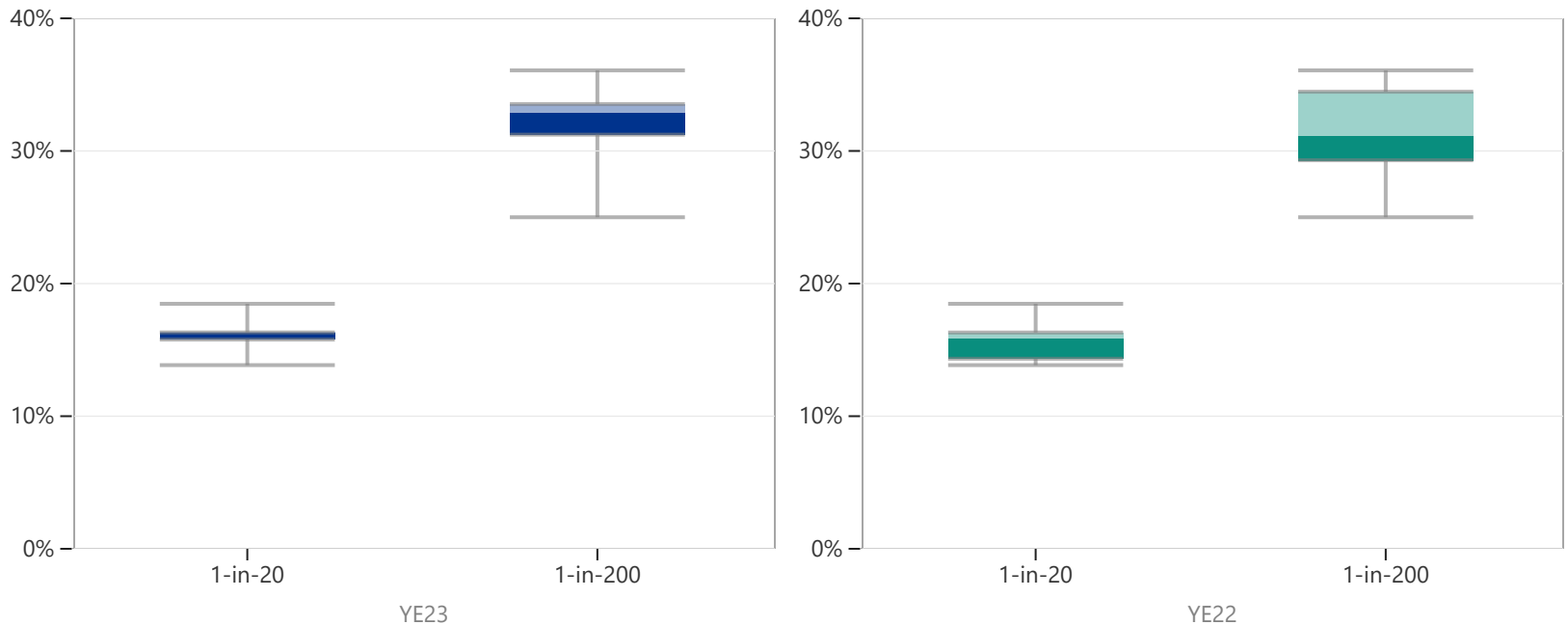
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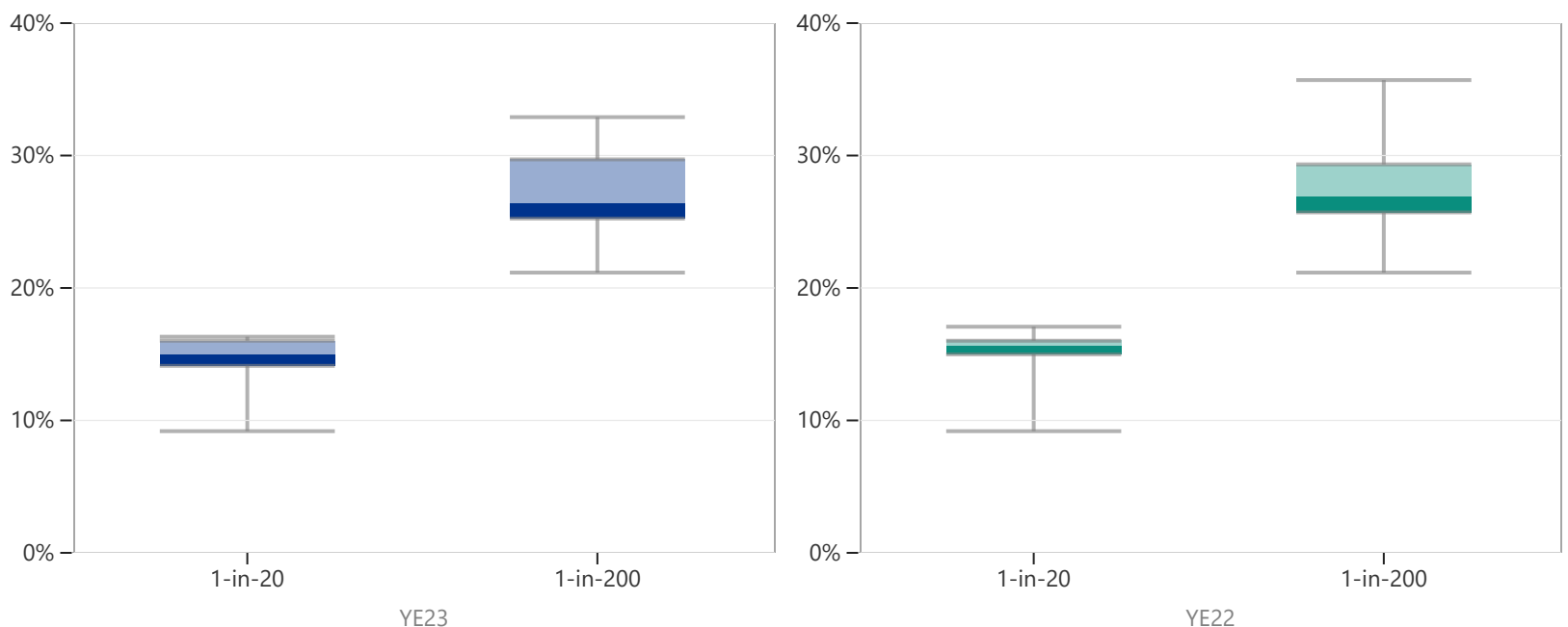
Property Risk - Calibrations

Property return stresses, in particular at the 1-in-200 level, are similar to the YE22 stresses. There have been marginal changes to most companies' individual calibration outcomes for both commercial and residential return stresses.

4.16a Total Property Annual Return Stress - Commercial



4.16b Total Property Annual Return Stress - Residential



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4. Market Risk (excl. Credit)

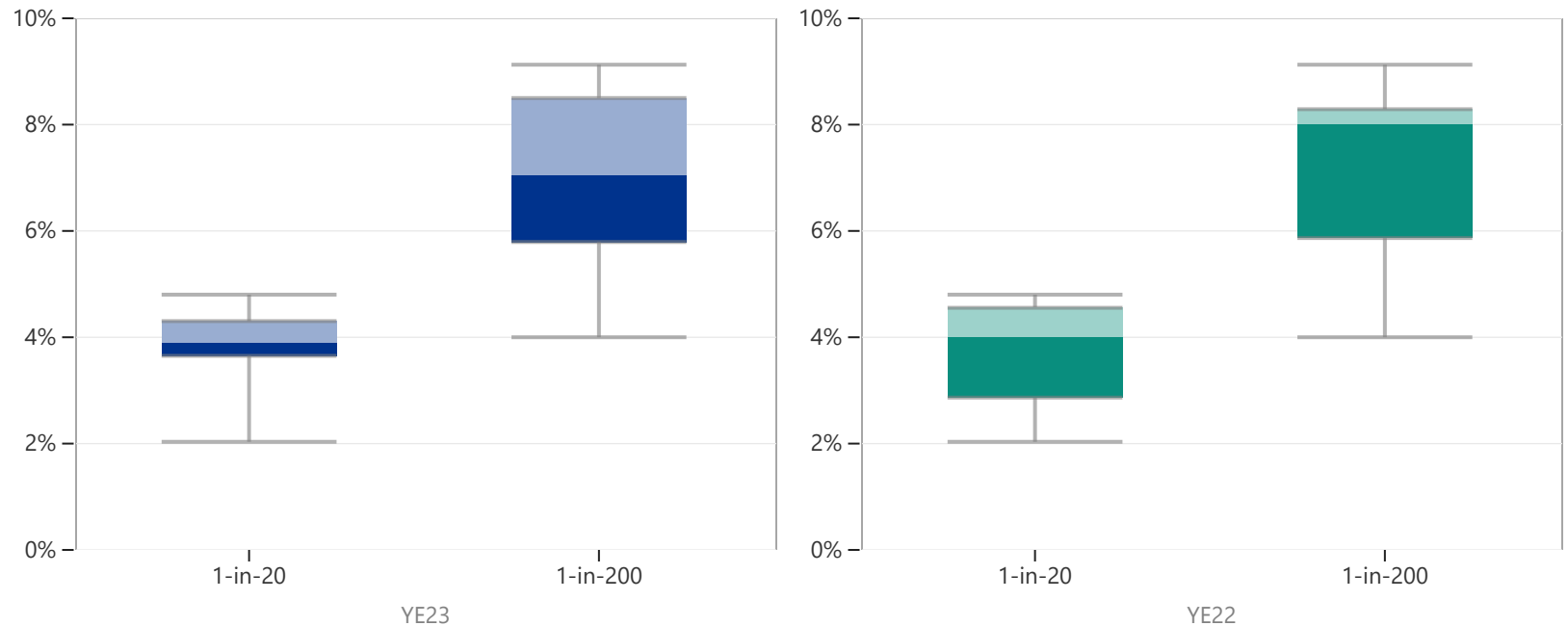
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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IM

Property Risk - Calibrations

Property volatility stresses, in particular at the 1-in-200 level, are similar to the YE22 stresses. There have been minimal changes to companies' individual calibration outcomes for property volatility stresses.

4.17 Property Rate Volatility Stress (Term 10)



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4. Market Risk (excl. Credit)

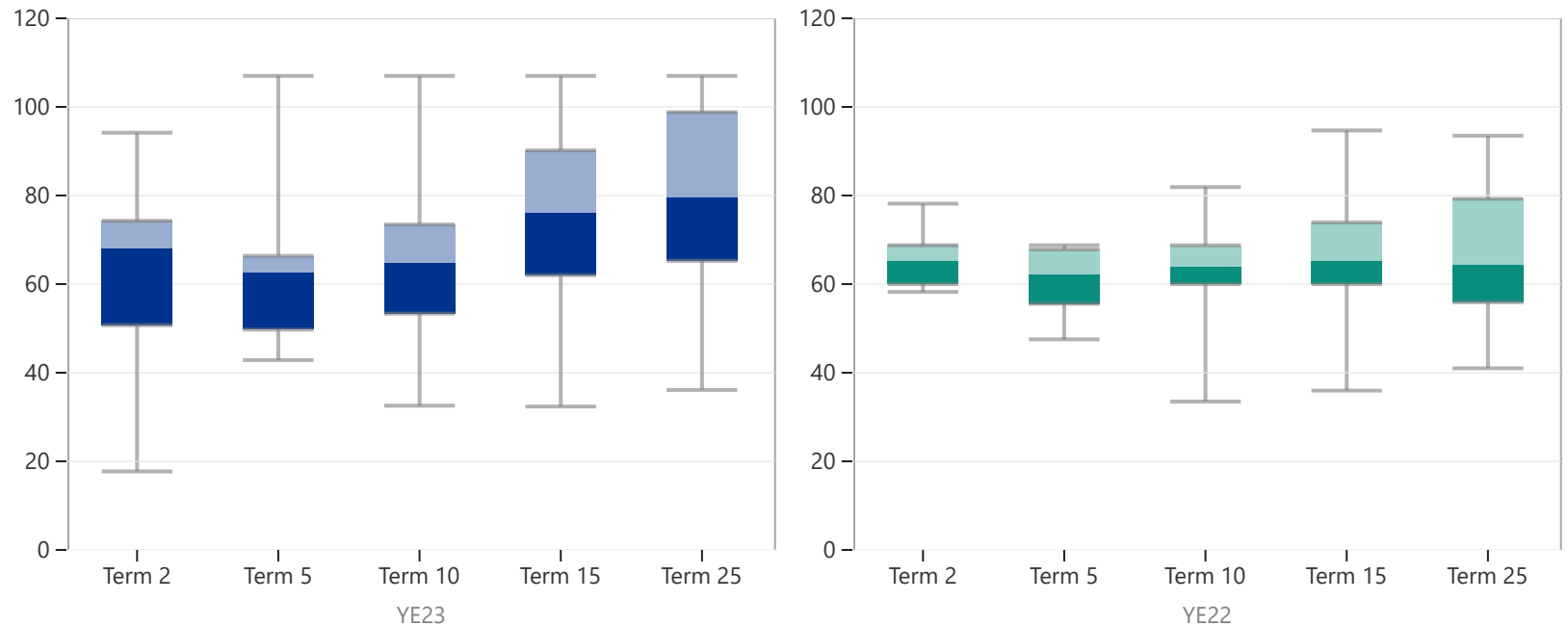
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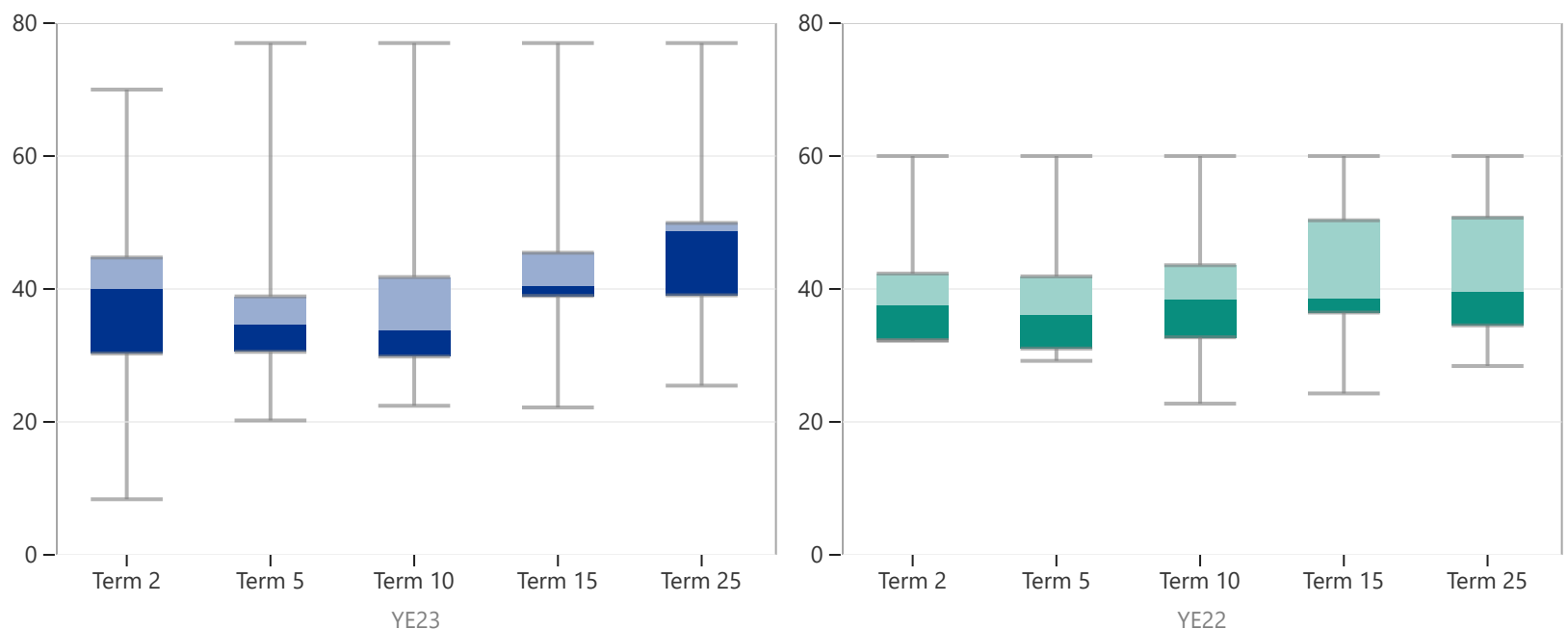
Sovereign Swap Spread - Calibrations

Most companies have similar stresses to YE22. For 1-in-200 stresses, one company has strengthened its stresses which increase the maximum, whereas the change in minimum is due to sampling. It is a similar story for the 1-in-20 stresses.

4.18a Sovereign Swap Spreads - 1-in-200 (bps)



4.18b Sovereign Swap Spreads - 1-in-20 (bps)



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4. Market Risk (excl. Credit)

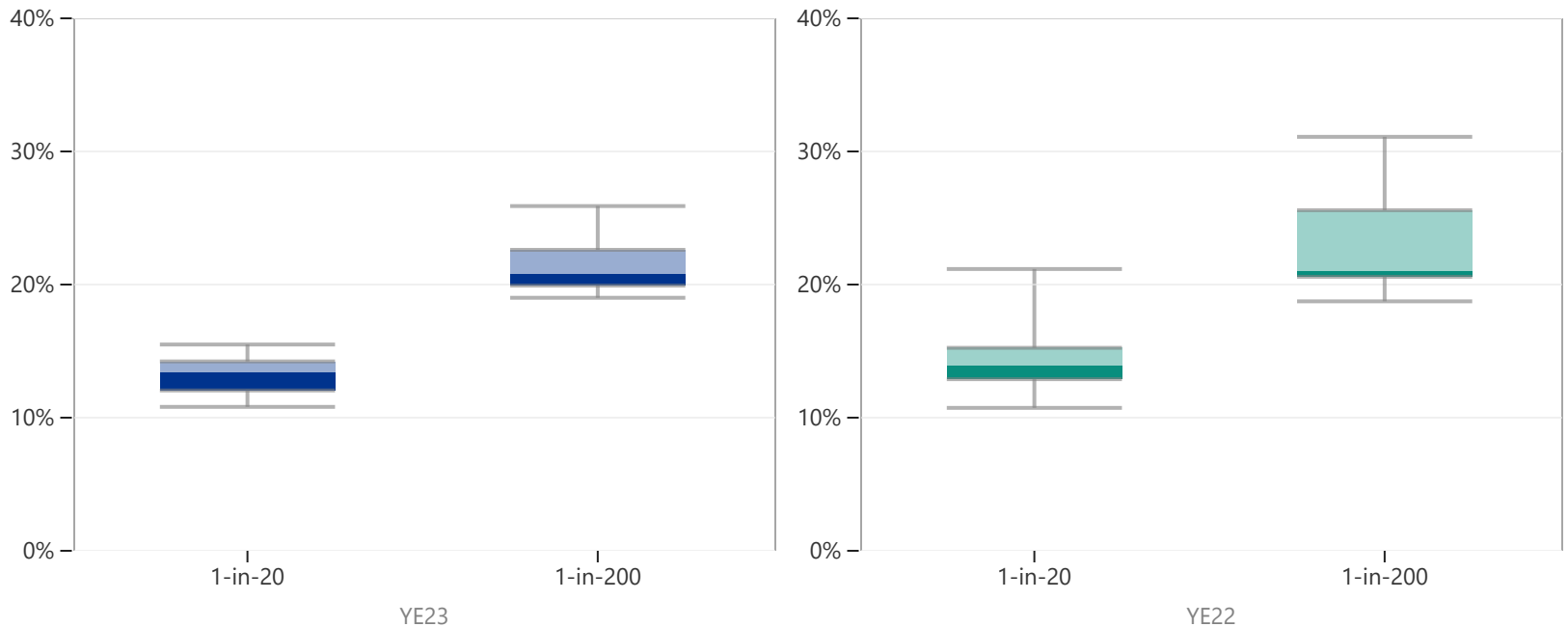
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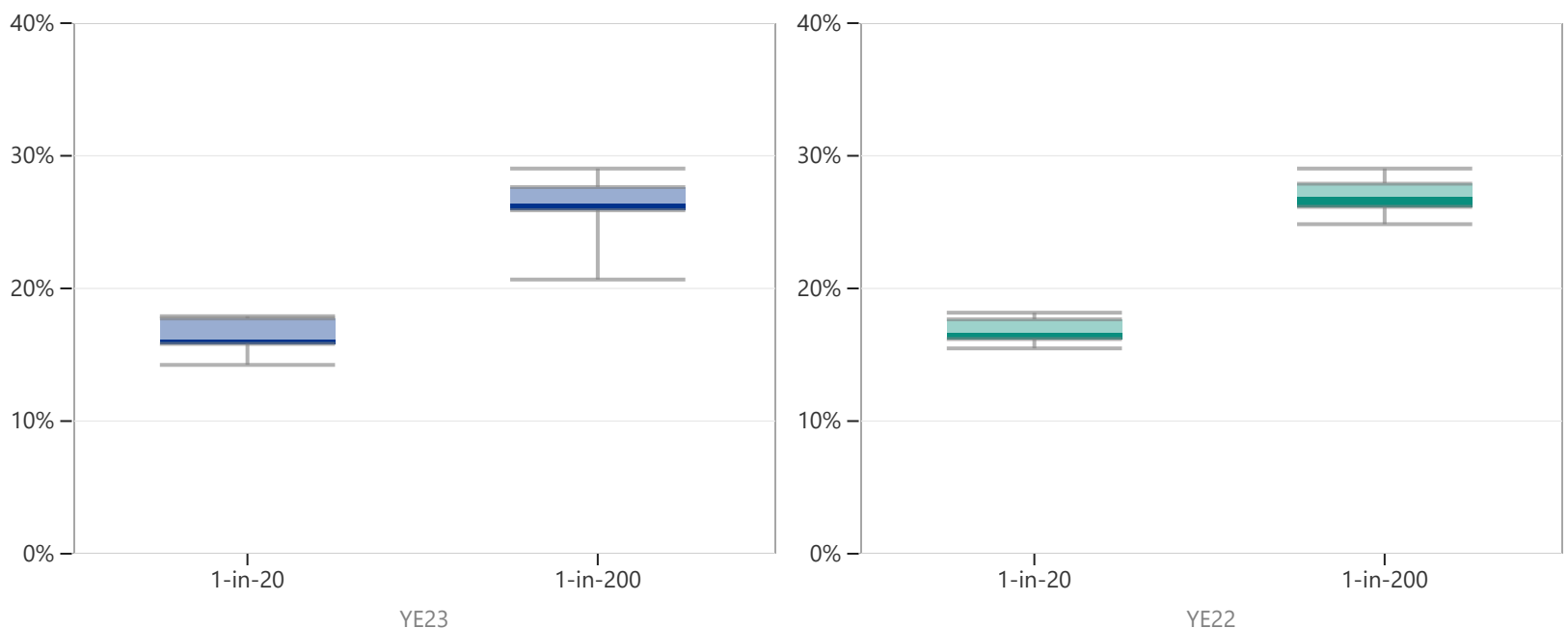
Currency Risk - Calibrations

Most companies' stresses are largely unchanged compared to YE22. However, one company has materially weakened their stresses at YE23 compared to YE22.

4.19a EUR- GBP Currency Stress



4.19b USD- GBP Currency Stress



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5. Credit Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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IM Overall Approach

Most respondents use a relatively granular approach to credit drivers and split out Transition and Default risk from Spread risk either as two separate drivers or as a single driver covering both. There is also some use of additional drivers. The majority have a single set of drivers across all asset types.

5.1 What specific credit components have a risk driver in your calibration?

	1	2	3	4	5	6	7	8
Net credit risk								
Gross credit risk		✓						
Total MA offset				✓	✓			
Spread risk	✓	✓	✓	✓	✓	✓	✓	✓
T&D risk as a single driver		✓			✓			✓
Transition risk	✓		✓	✓			✓	
Default risk	✓		✓	✓			✓	
Fundamental spread		✓				✓		
Other	✓							
Common to all in scope asset classes?	✓	✓	✓		✓	✓	✓	✓

The company that does not have a common driver structure across all asset types uses a different approach for property-backed assets based on a detailed cashflow model.

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5. Credit Risk

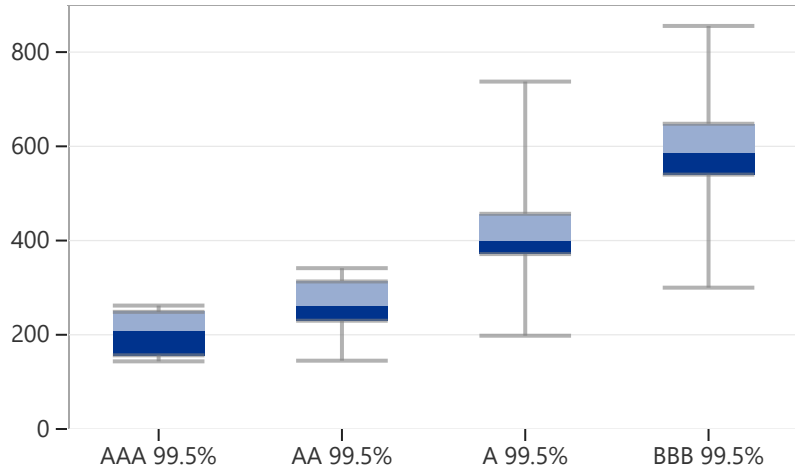
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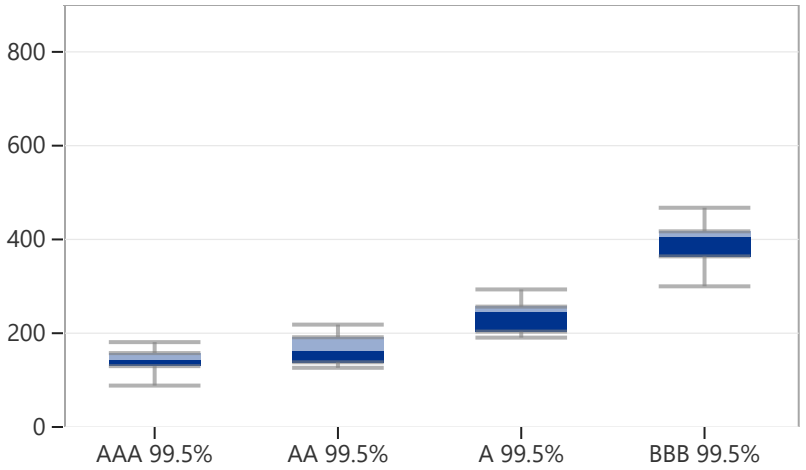
Asset-side calibration - Credit Stress

The following charts show total credit risk capital expressed as a spread widening under a 1-in-200 stress. We have observed a range of movements in calibrations compared to last year, however there has not been a significant movement in median response.

5.2a Change in Total Corporate Bond Spreads - Financials 10 years (YE23, bps)



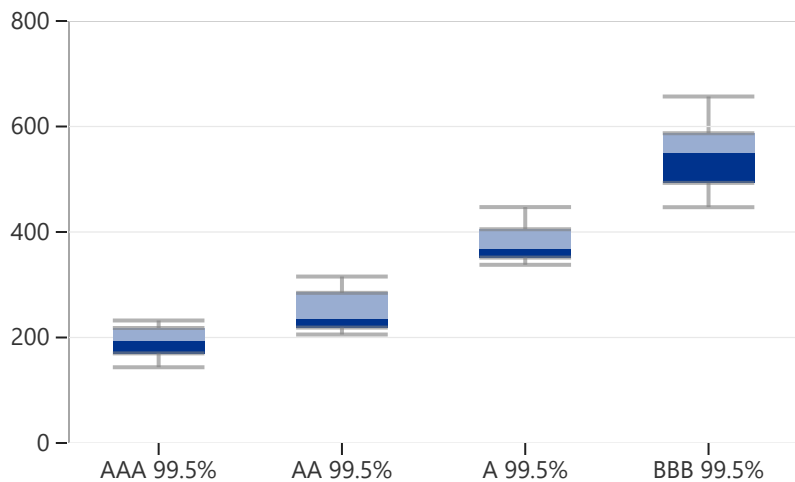
5.2b Change in Total Corporate Bond Spreads - Non-Financials 10 years (YE23, bps)



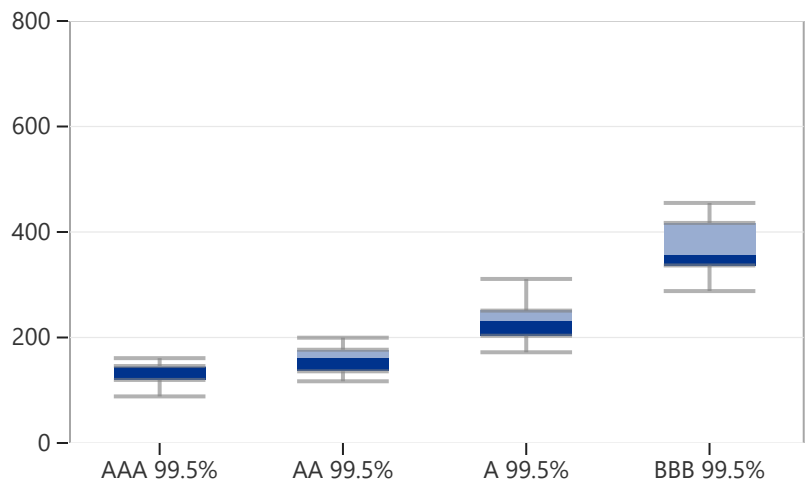
Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	208	260	400	587
YE22	216	261	397	595

Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	145	162	246	405
YE22	144	162	252	406

5.2c Change in Total Corporate Bond Spreads - Financials 15 years (YE23, bps)



5.2d Change in Total Corporate Bond Spreads - Non-Financials 15 years (YE23, bps)



Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	195	235	367	551
YE22	197	233	374	530

Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	144	162	232	358
YE22	135	154	225	362

Technical Practices Survey 2024

5. Credit Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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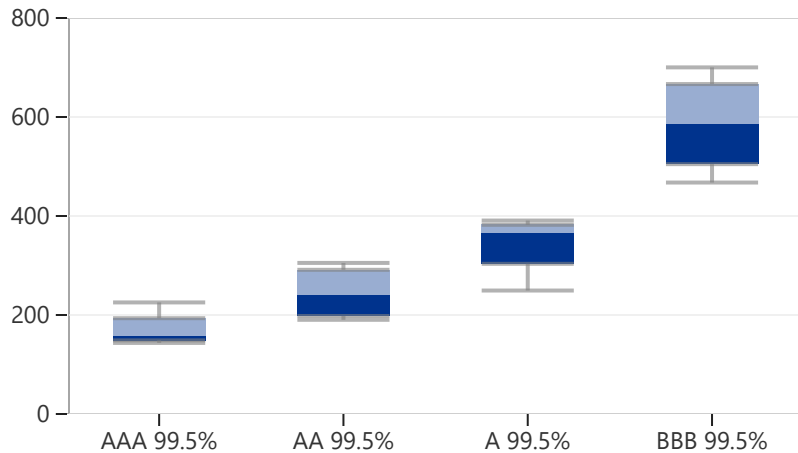
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Asset-side calibration - Credit Stress

The following charts show total credit risk capital expressed as a spread widening under a 1-in-200 stress. The range of responses for Commercial Real Estate Lending (CREL) has narrowed this year.

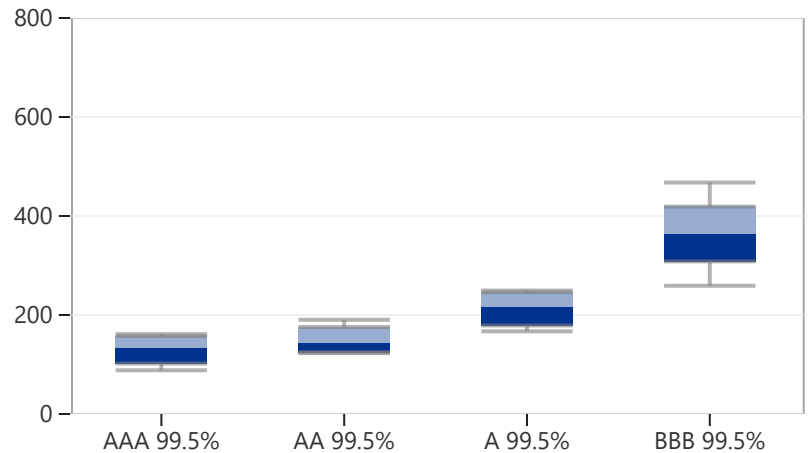
There appears to be some increase in the spread widening for Infrastructure Lending (Infra) across all ratings and both durations, although this is likely to be due to a refinement rather than a recalibration given the movements are fairly modest.

5.3a Change in Total Credit Spreads - Commercial Real Estate Lending 10 years (YE23, bps)



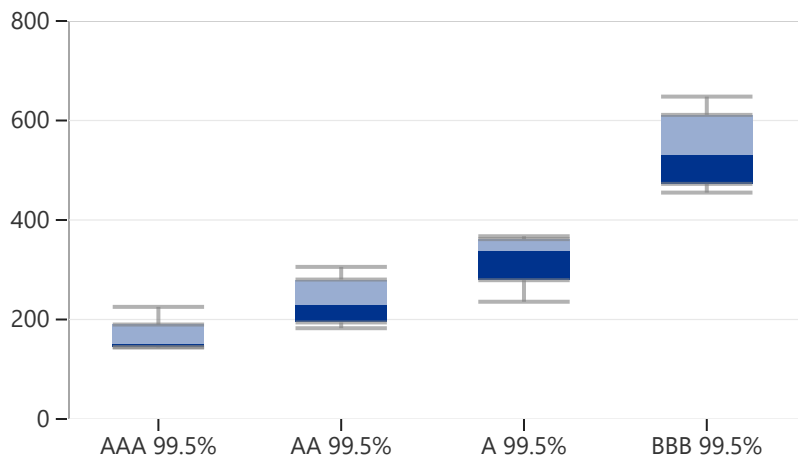
Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	158	242	365	587
YE22	160	251	377	623

5.3b Change in Total Credit Spreads - Infrastructure Lending 10 years (YE23, bps)



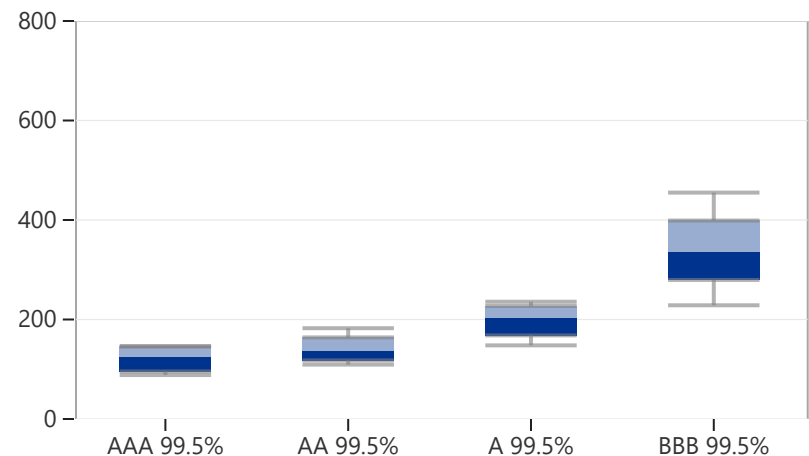
Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	135	144	217	364
YE22	118	137	193	333

5.3c Change in Total Credit Spreads - Commercial Real Estate Lending 15 years (YE23, bps)



Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	150	230	339	532
YE22	156	240	344	567

5.3d Change in Total Credit Spreads - Infrastructure Lending 15 years (YE23, bps)



Market Median	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%
YE23	124	136	203	337
YE22	109	135	188	314

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5. Credit Risk

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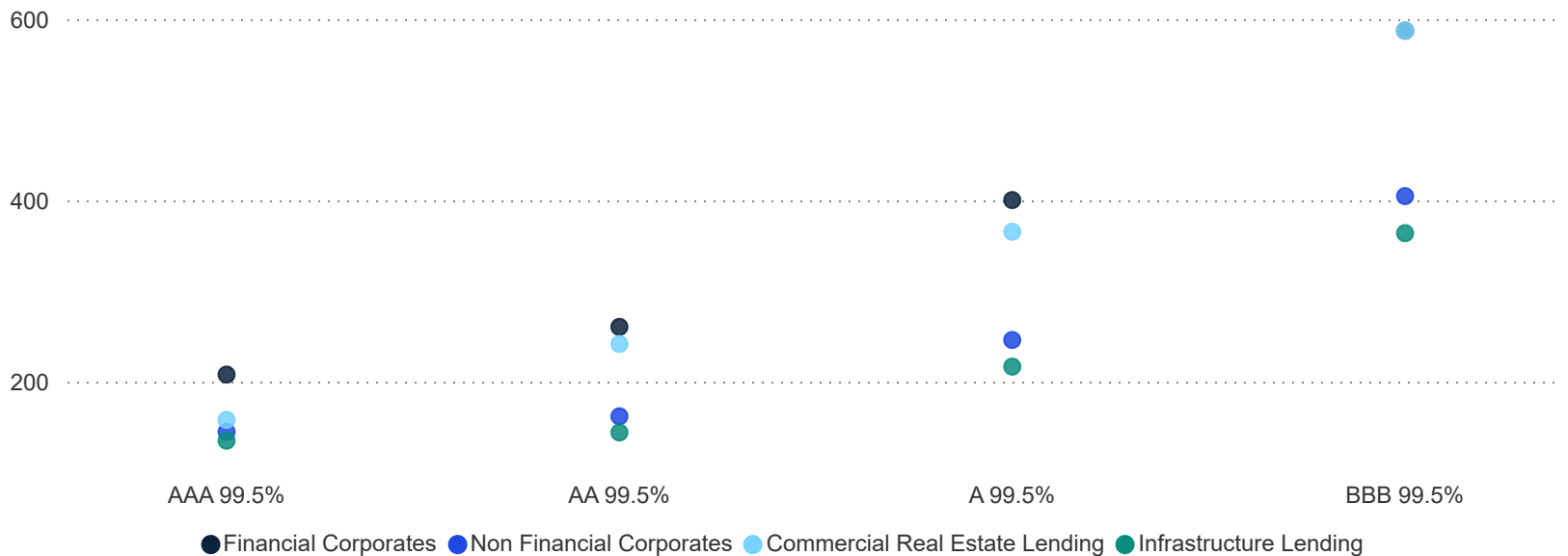
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Asset-side calibration - Credit Stress

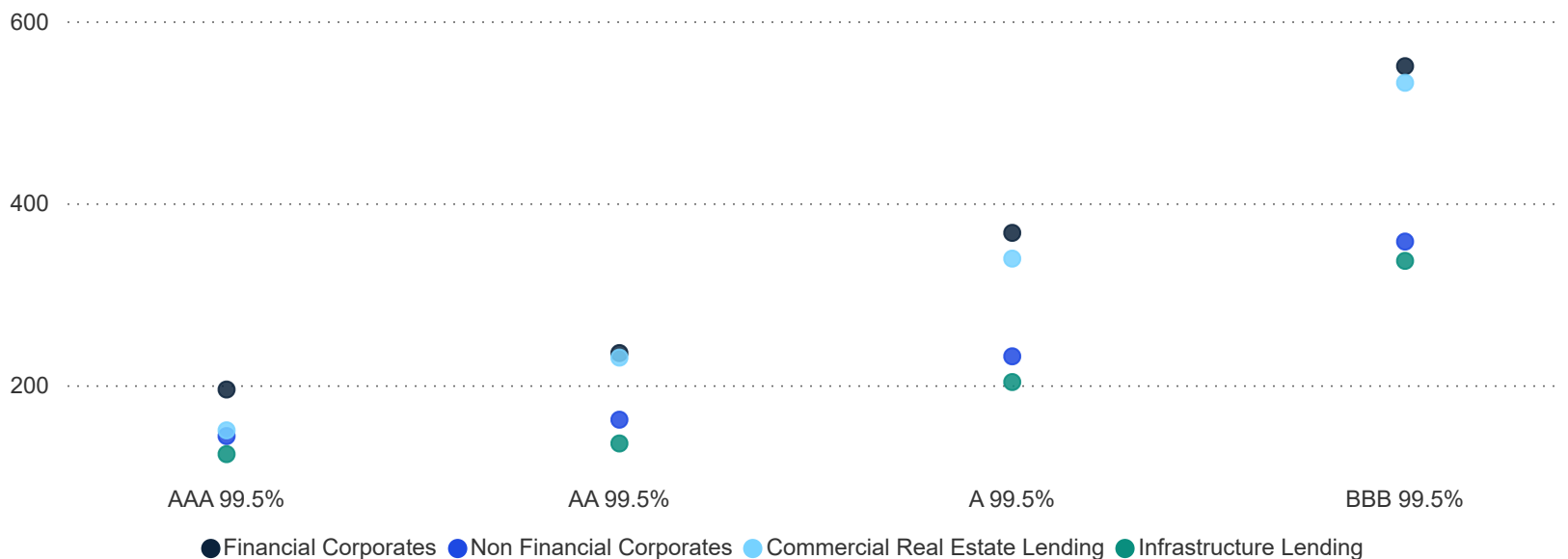
The charts below show a comparison of the change in total credit capital spreads for investment grade assets for terms 10 and 15 years, where each dot represents the median response. It should be noted that there are fewer responses to CREL and Infra compared to Corporate Bonds, although removing any sampling effects does not change the overall message shown below.

Out of the firms who have exposure to CREL and Corporate Bonds, the median change in spreads for Financials is higher than, or equal to, that for CREL at each credit rating. Some firms perform unique calibrations, although one firm maps its calibration for Financials and one firm maps its calibration for Non-Financials onto CREL. Most firms map calibrations for Non-Financials onto Infra. Only one firm uses a bespoke calibration for Infra, which is the reason that we observe separation between Non-Fin and Infra average results below.

5.4a Comparison of median change in total credit capital spreads across different asset classes - 10 years (YE23, bps)



5.4b Comparison of median change in total credit capital spreads across different asset classes - 15 years (YE23, bps)



Technical Practices Survey 2024

5. Credit Risk

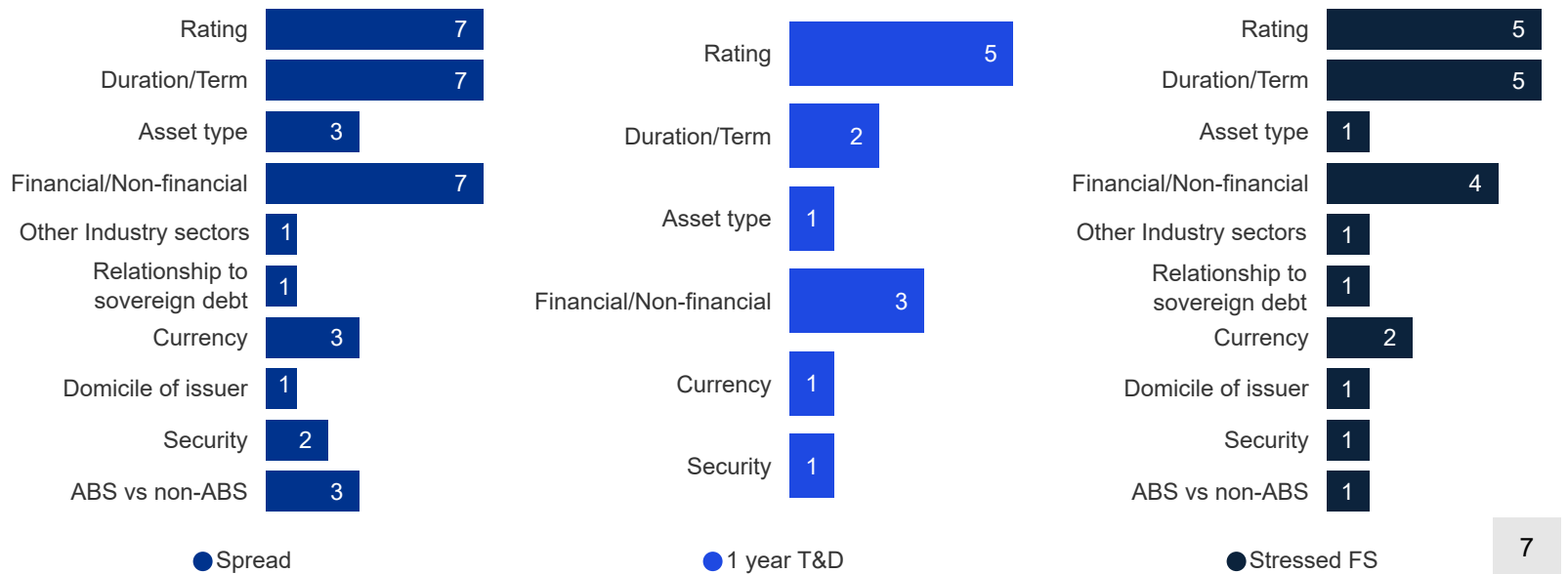
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

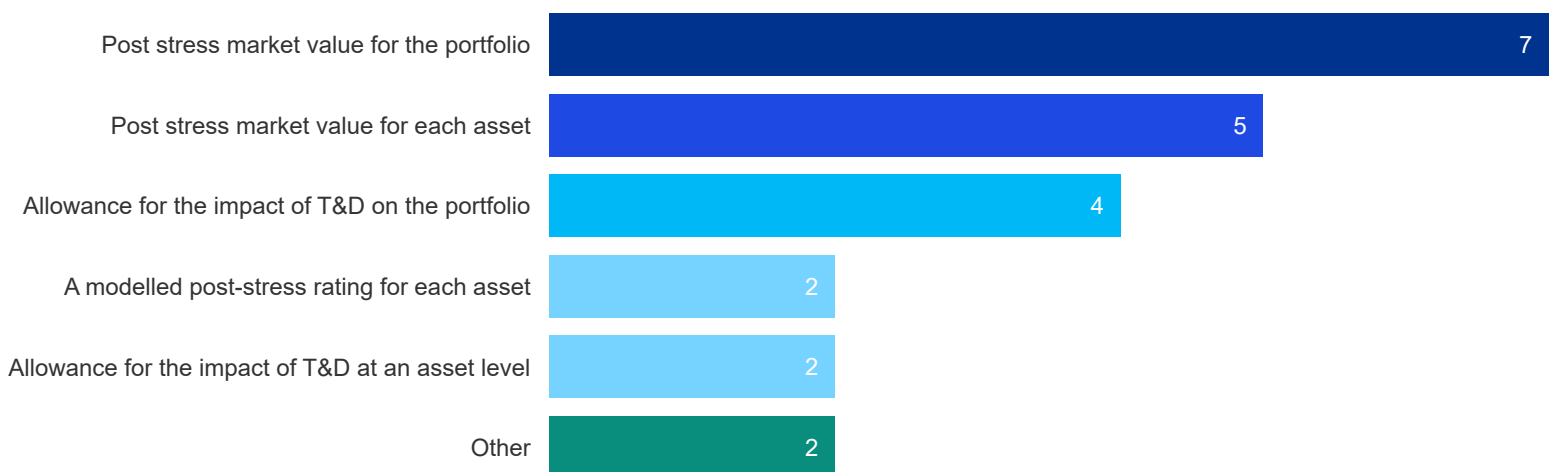
Asset-side calibration - Credit Stress

Rating, term and Financial/Non-Financial split are the most common factors that feed into the credit stress calibration. Use of other factors is less common but it is clear that some respondents do use more granular models. Most respondents are able to achieve the post stress market value for the portfolio for the largest asset class when modelling assets in each simulation. We also asked companies if they adopt a methodology to cap losses based on an assumption that the asset value will not fall below the stressed recovery value. No respondents adopt such methodology.

5.5 In relation to an individual holding in credit, for which of the following factors would a change in the input result in a change in the resulting credit calibration?



5.6 What level of information do you achieve on your largest asset class in your modelling of assets in each simulation?



'Other' includes post stress market value by currency/rating/portfolio/indexation and another respondent models a spread stress based on annual changes in credit spread index data.

Technical Practices Survey 2024

5. Credit Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

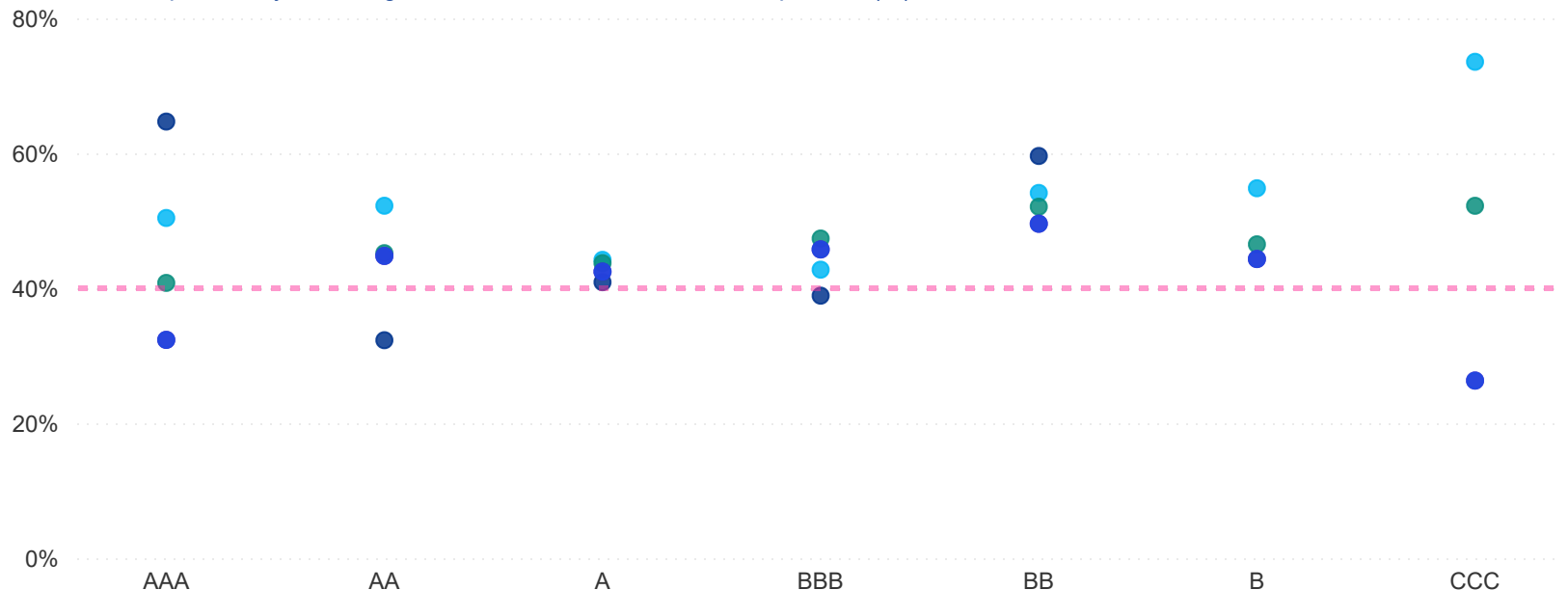
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Asset-side calibration - Transition and Default Stress

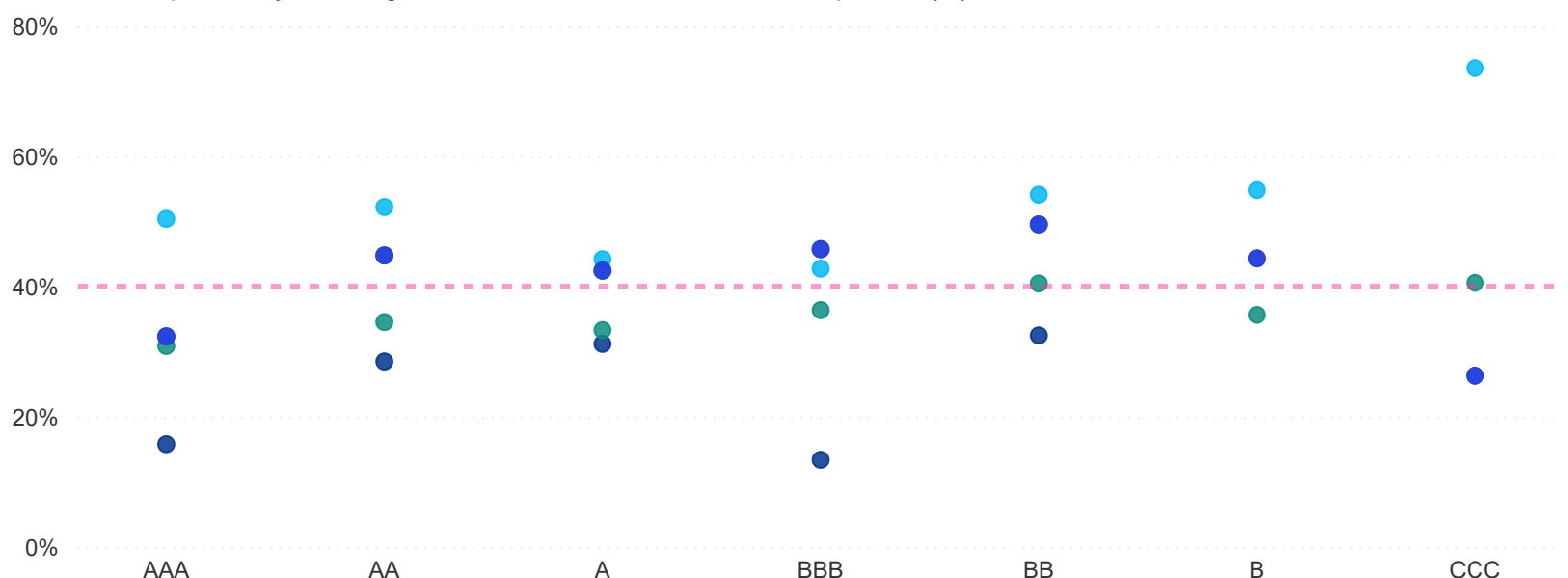
The charts below show each respondent's 1-in-200 probability of downgrade and default by credit rating for both Financials and Non-Financials, which can be compared against 40% rate of transition and default which is shown by the red dotted line below. This is broadly comparable to the most severe historic events that insurers consider in their assessment. Each dot colour in the chart below represents the response of a particular firm, however two of the respondents use the same correlation matrix and are shown as a single dot.

Two out of the five respondents differentiate between Financial and Non-Financial Corporate Bonds. Most portfolios have significant proportions of A and BBB ratings, therefore any portfolio level comparison to an industry standard will be heavily dependent on these points, which may explain the slight clustering round the indicative industry level for these ratings. This is a feature we observed last year.

5.7a 1-in-200 probability of downgrade and default for Financial Corporates (%)



5.7b 1-in-200 probability of downgrade and default for Non-Financial Corporates (%)



Technical Practices Survey 2024

5. Credit Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

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Asset Side Calibration - Credit Stress

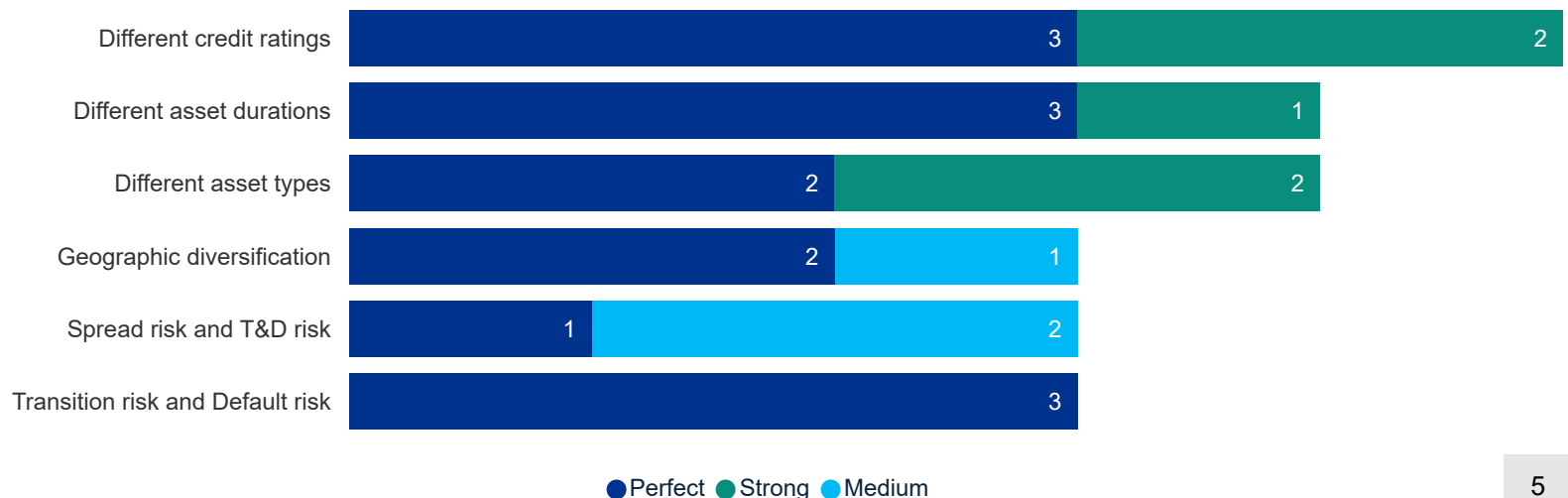
Whilst there is some use of diversification between components of credit risk, take up is relatively limited. Given how common splitting out Transition and Default (T&D) risk from Spread risk is (see Question 5.1), we were interested in the extent to which respondents were using these different drivers to achieve diversification. Two of the three respondents to this question diversify between T&D risk and Spread risk allowing them to achieve some financial benefit from separation of the drivers.

We also asked firms to detail their average assumed 1-in-200 recovery rate within different parts of the modelling. Typically respondents use a rate of 30%, for both 1 year cost of default and stressed FS.

5.8 What diversification do you allow for in calculating the credit spreads SCR?

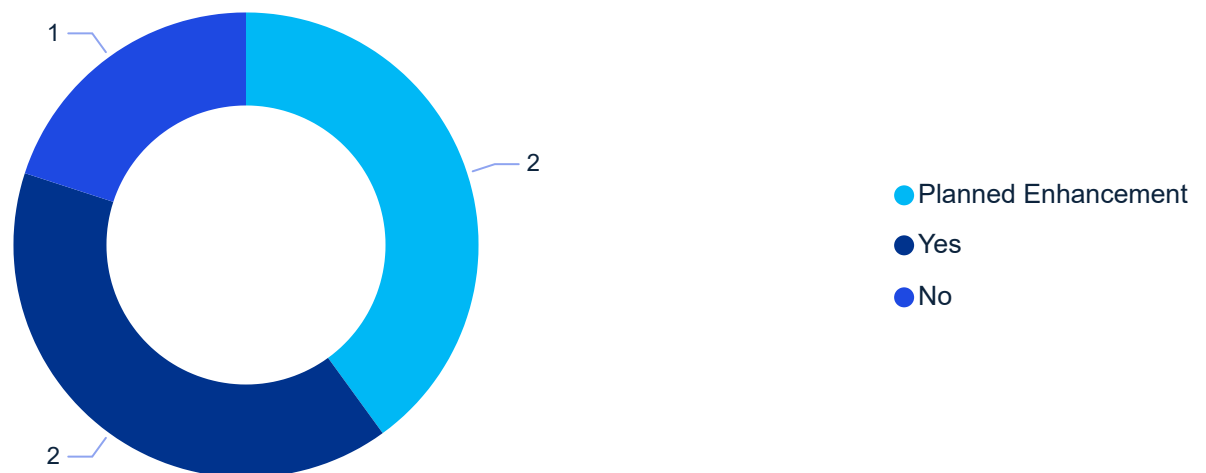
For the purpose of this question we consider:

- Perfect correlation: +/-100%
- Strong correlation: absolute value of correlation is greater than 70%
- Medium correlation: absolute value of correlation between 30 and 70%
- Weak correlations: absolute value of correlation is less than 30%.



5

5.9 Have you developed a cashflow model for illiquid assets?



Technical Practices Survey 2024

5. Credit Risk

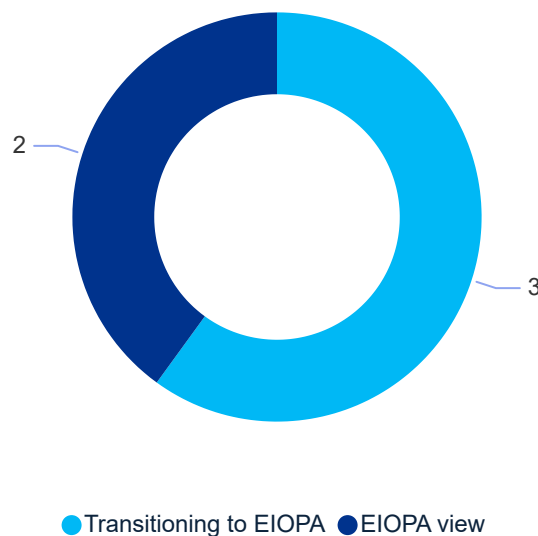
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

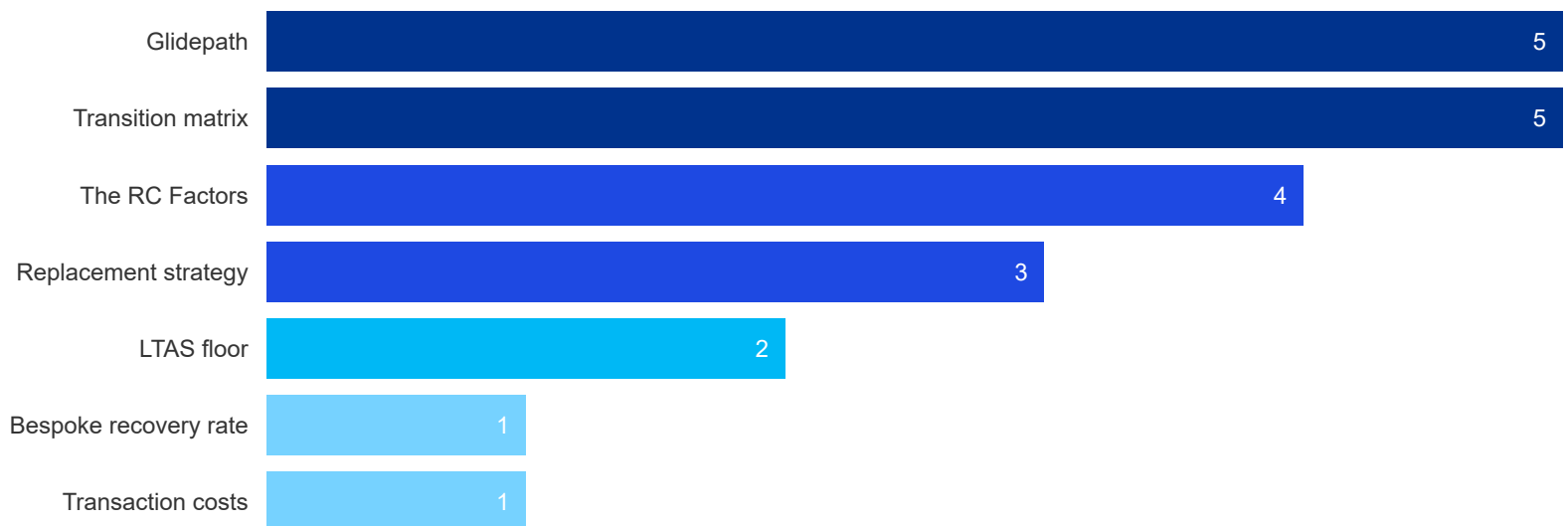
Liability Side Credit Risk - Fundamental Spreads under stress

We were interested in the way that respondents modelled the stressed Fundamental Spread (FS) and the charts below set out information about some key methodology points. We asked firms if their modelling of the FS is based on a multi-year version of their one-year T&D approach performed with the same level of sophistication. All five respondents stated that this is the approach taken.

5.10 Which of the following most closely explains your overall philosophy to the stressed Fundamental Spread?



5.11 Compared to the EIOPA methodology what changes are made in your internal methodology for the stressed FS?



Technical Practices Survey 2024

5. Credit Risk

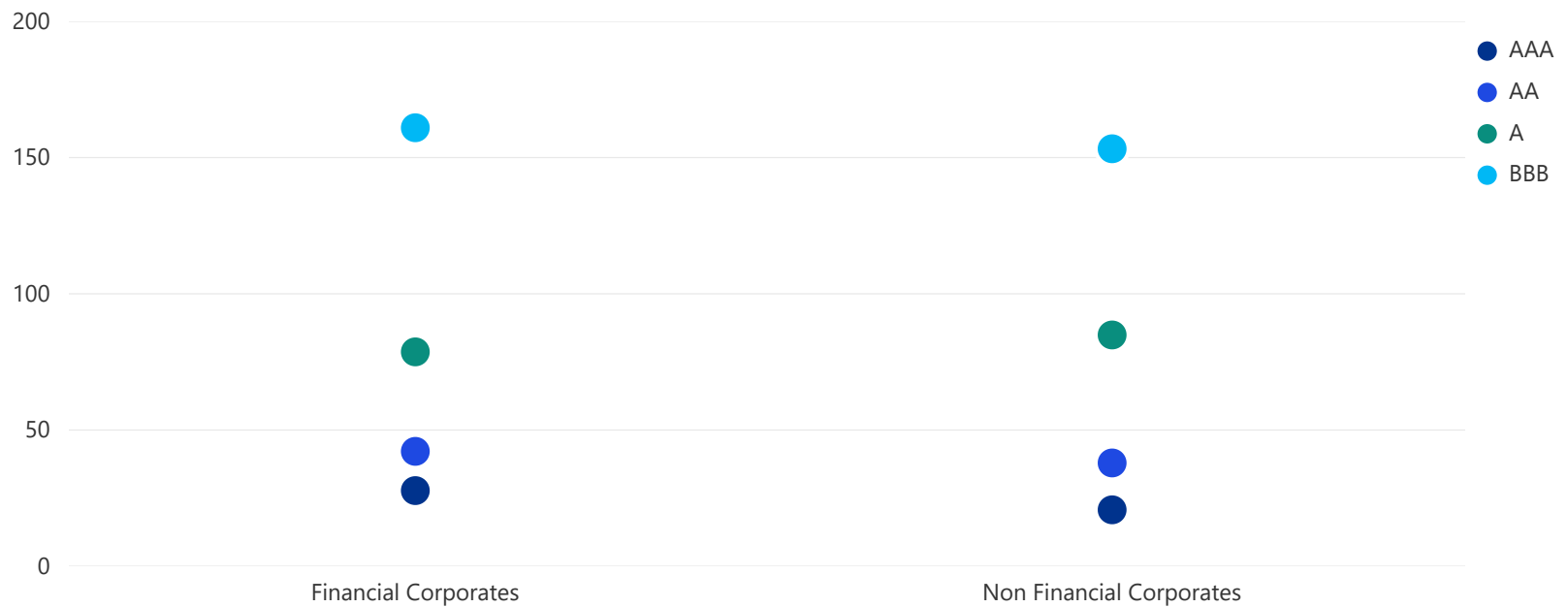
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

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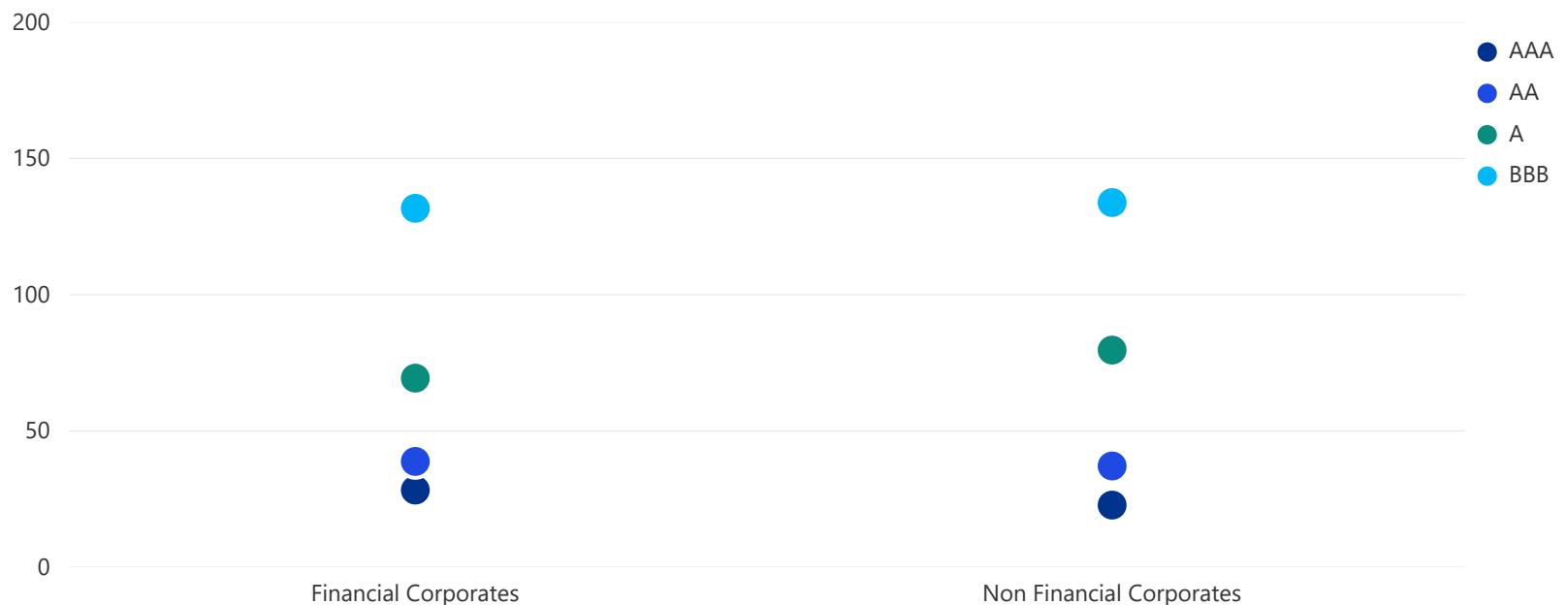
Liability Side Credit Risk - Calibration

The following charts show the change in Fundamental Spreads (FS) prior to rebalancing, under a 1-in-200 stress for Financial and Non-Financial Corporates. We have observed a wide range of responses due to firms using different methodologies and assumptions. However, each of the models used have been approved and therefore produce outputs that meet an accepted standard. The chart shows that there is not much distinction between the stress applied to the FS for Financial and Non-Financial assets even though the base FS is different.

5.12a Average change in Fundamental Spreads prior to rebalancing, 1-in-200 stress for 10 years (GBP) (bps)



5.12b Average change in Fundamental Spreads prior to rebalancing, 1-in-200 stress for 15 years (GBP) (bps)



Technical Practices Survey 2024

5. Credit Risk

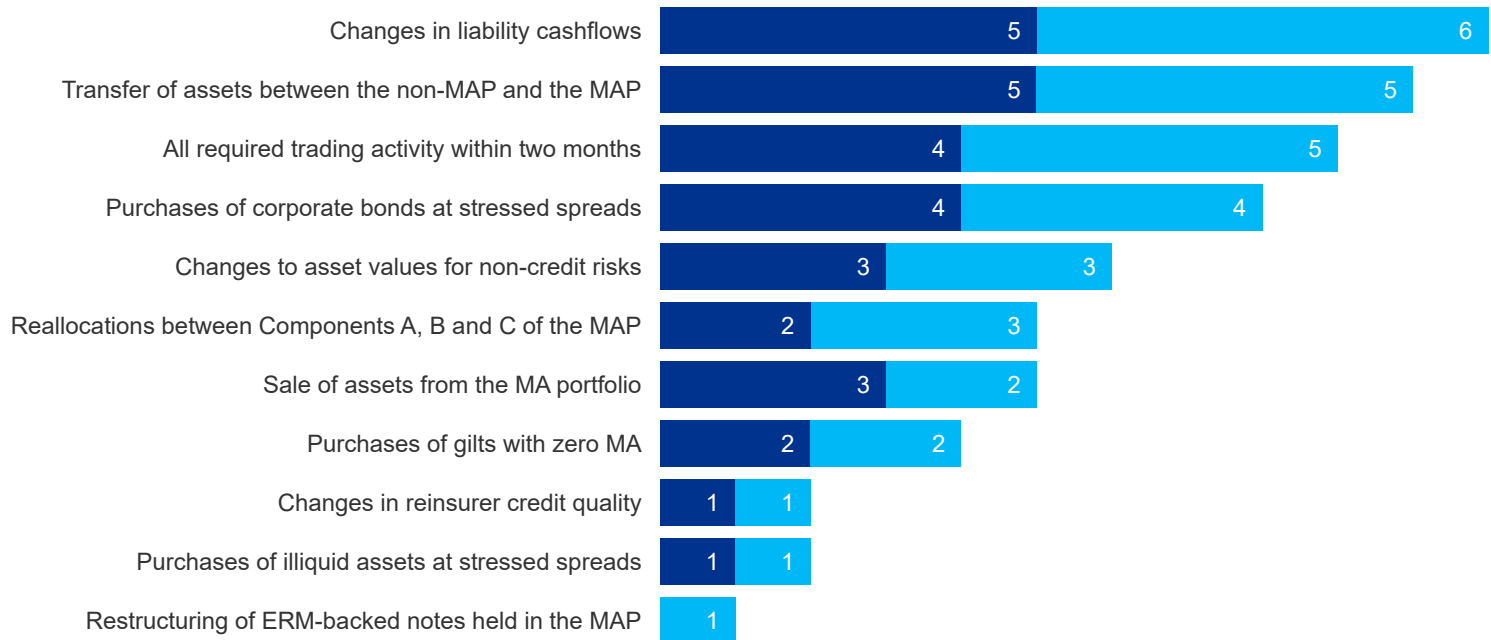
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

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Matching Adjustment under Stress

In demonstrating compliance with the Matching Adjustment regulations under Stress (MAuS), all respondents allow for transfer of assets between the non-MA Portfolio and the MA Portfolio, and changes in liability cashflows. We note that more respondents are now allowing for all of the required trading activity within two months.

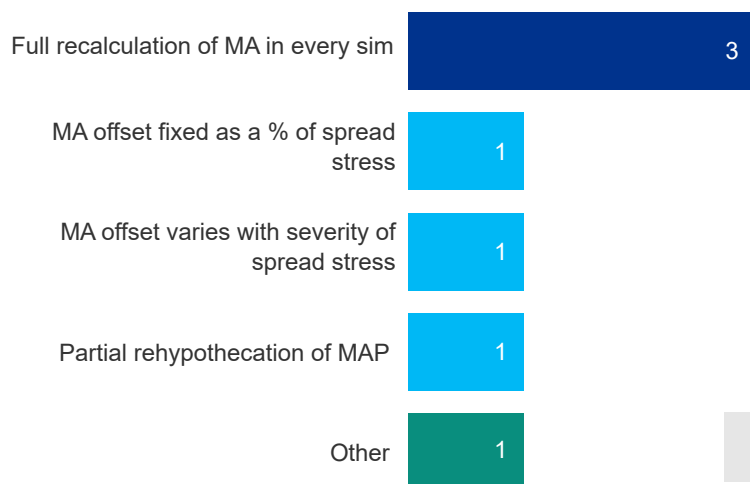
5.13 In modelling the Matching Adjustment regulations under stress, which of the following do you allow for?



● In each individual simulation ● In the overall calibration

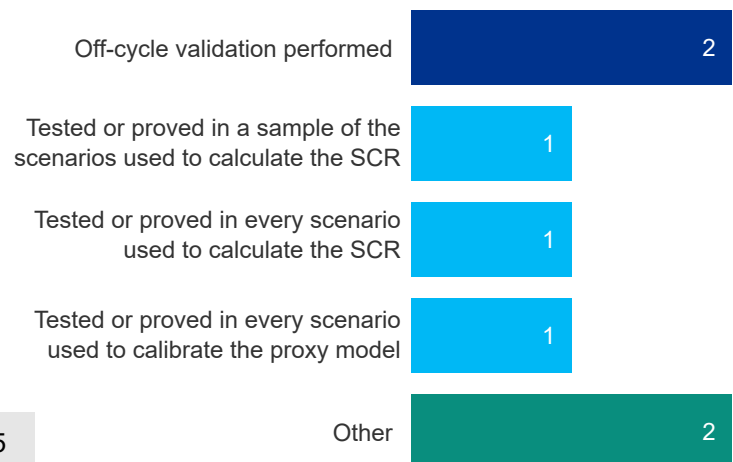
7

5.14 What is your approach to modelling Matching Adjustment under stress in calculating your SCR?



'Other' refers to a full recalculation of all MA components with the MAuS being the same for every simulation.

5.15 When calculating your SCR, how do you validate that the Matching Adjustment under stress passes the PRA tests?



'Other' refers to methodology constructed to ensure that tests are always passed post stress provided they were passed pre-test. One company uses a separate model for the MA and tests the scenarios used in that model rather than the SCR model.

6

Technical Practices Survey 2024

5. Credit Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

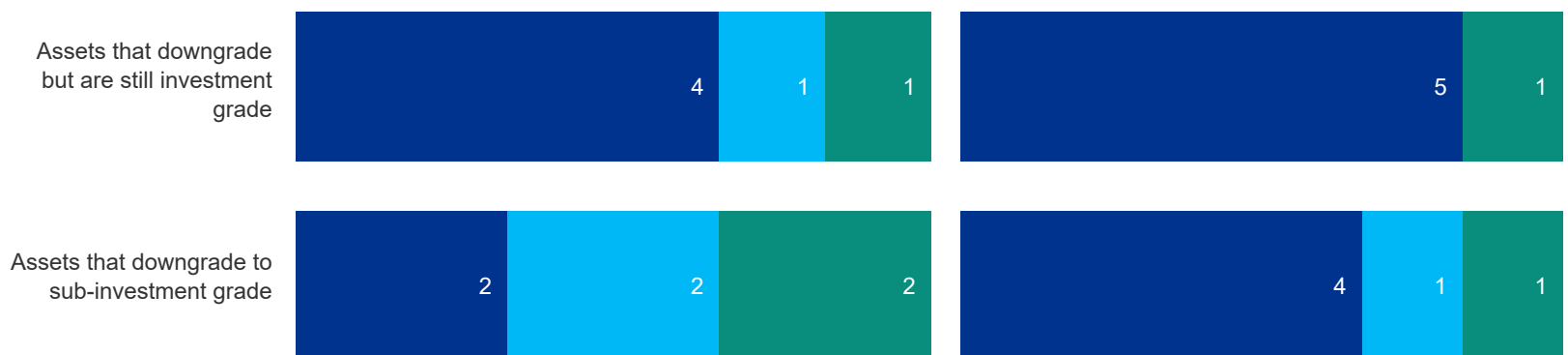
Matching Adjustment under Stress - Rebalancing Strategy

The following charts show the approach taken to rebalancing the portfolio i.e. replacing defaulted assets, or value lost due to transitions. There are a variety of approaches, with buy-and-hold strategy is most common approach for those assets which remain investment grade, but less common for downgrades to sub-investment grade where respondents may be meeting other requirements such as investment limits on sub-investment grade assets. For illiquid assets where sales are harder to achieve, holding onto downgraded assets is more common.

5.16 Rebalancing strategy - how are downgrades treated within the stressed Matching Adjustment portfolio?

Liquid Assets

Illiquid Assets



● No action: use buy-and-hold strategy ● Replace: pre-stress rating of asset ● Other

'Other' covers a variety of approaches to topping up the value lost due to transitions.

6

5.17 Rebalancing strategy - how are defaults treated within the stressed Matching Adjustment portfolio?



5

Technical Practices Survey 2024

5. Credit Risk

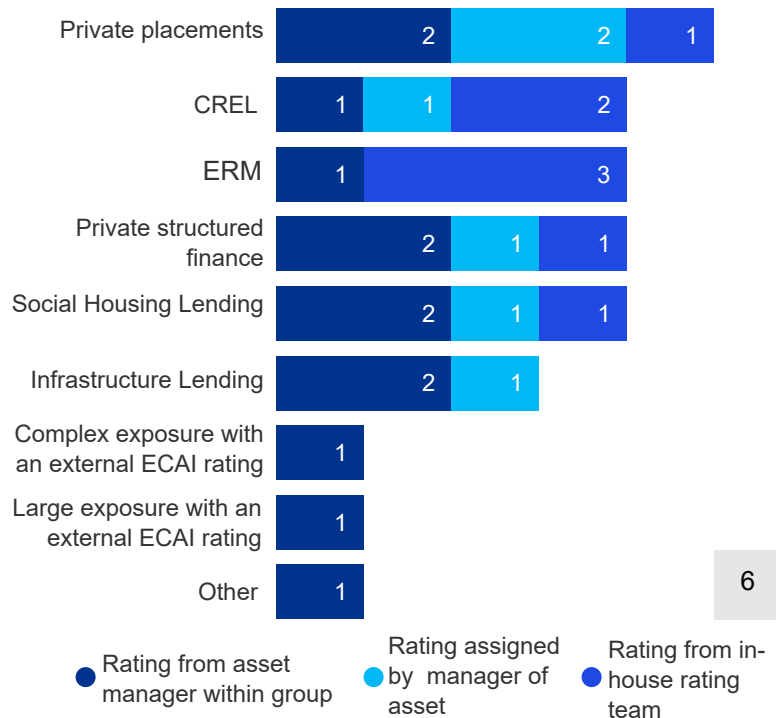
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM Internal Ratings

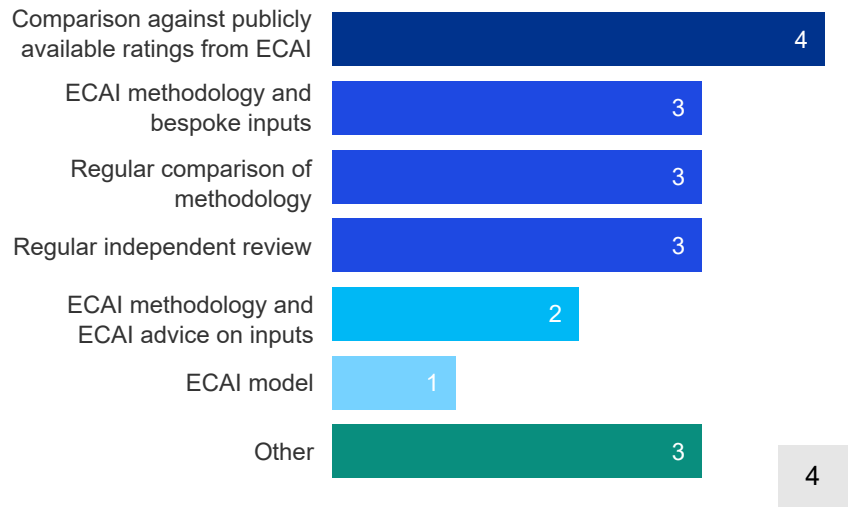
We asked about how companies used internal ratings. There is reliance on associated asset managers and the managers of particular assets but some assets are internally rated within the insurer. We noted the majority of respondents rely on a rating agency methodology to rate different asset classes. This is either directly applied or adjusted in some way.

The Solvency UK reforms require firms to introduce some external assurance over the internal ratings frameworks. Most respondents already have this in place but there was one firm that stated it would change the frequency of assessments performed.

5.18 For which of the following asset types do you use either internal ratings supplied by your asset manager, internal ratings derived in-house, or not use internal ratings?

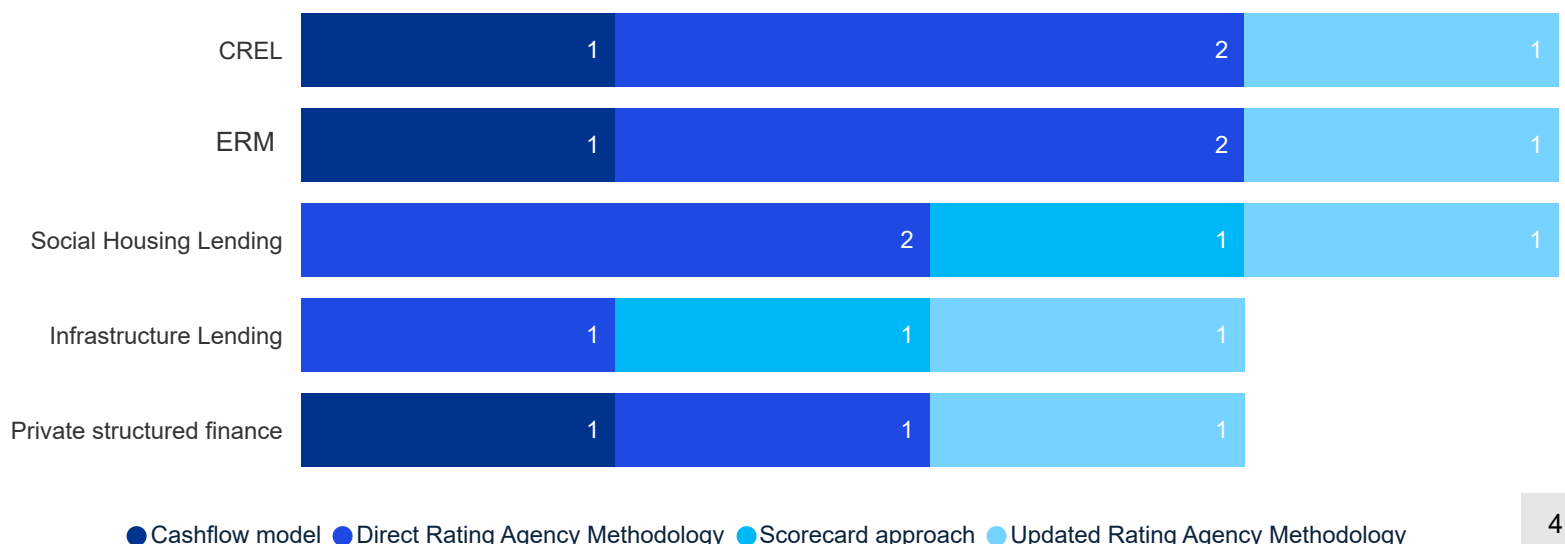


5.19 How do you maintain broad consistency between the CQSs of internal ratings and those which could have resulted from a rating given by an ECAI as referenced in SS3/17 (April 2020 update)?



Multiple 'Other' responses include comparing internal ratings for a sample of assets to their external rating. Other responses include validation of methodology using a variety of techniques, and checking ratings against those from other regulatory regimes.

5.20 Which of the following approaches do you use for internal ratings?



Technical Practices Survey 2024

5. Credit Risk

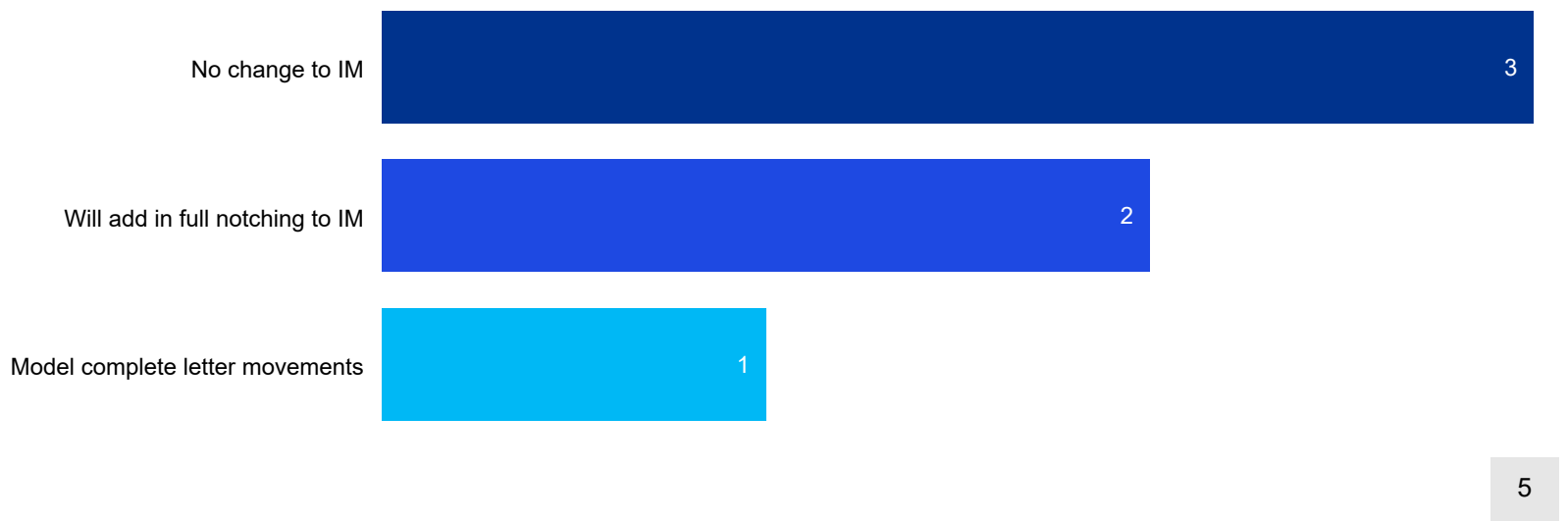
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

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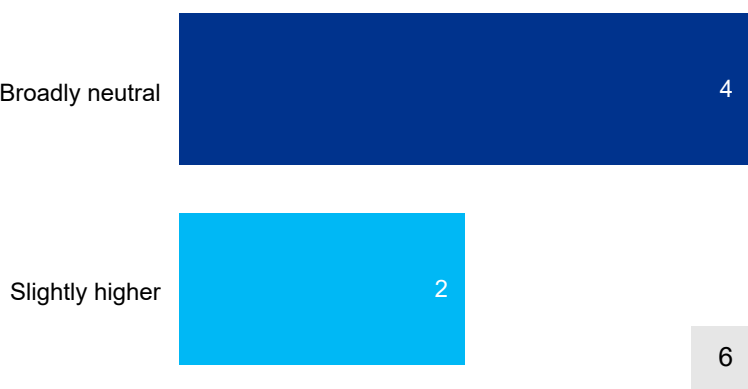
Solvency UK Reforms

This year we have asked a few additional questions on the impact of the Solvency UK reform proposal to add ratings notches to credit risk modelling. Most respondents expect the impact of this to be broadly neutral but there is still some development work progressing.

5.21 What approach will be taken to allowing for notching in the FS calculation in the internal model?



5.22 How do you expect notching in FS calculation impact on pre-diversification Credit SCR?



5.23 How will FS add-ons be treated under stress?



'Other' here represents one respondent who will allow for FS add-ons under stress, however the approach has not been finalised at the time of completing the survey.

Technical Practices Survey 2024

6. Life Underwriting Risk

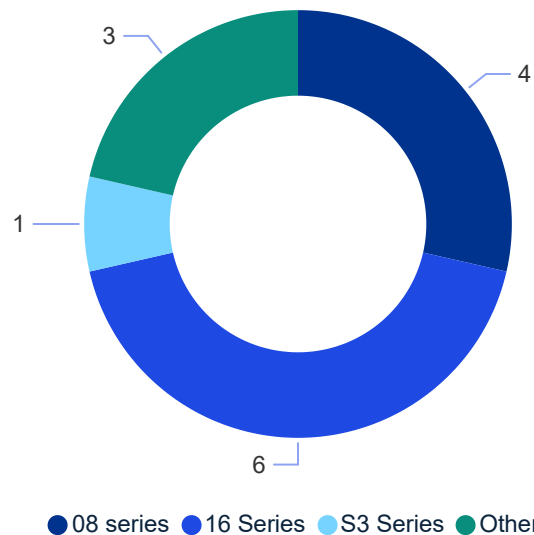
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

Annuitant Base Mortality

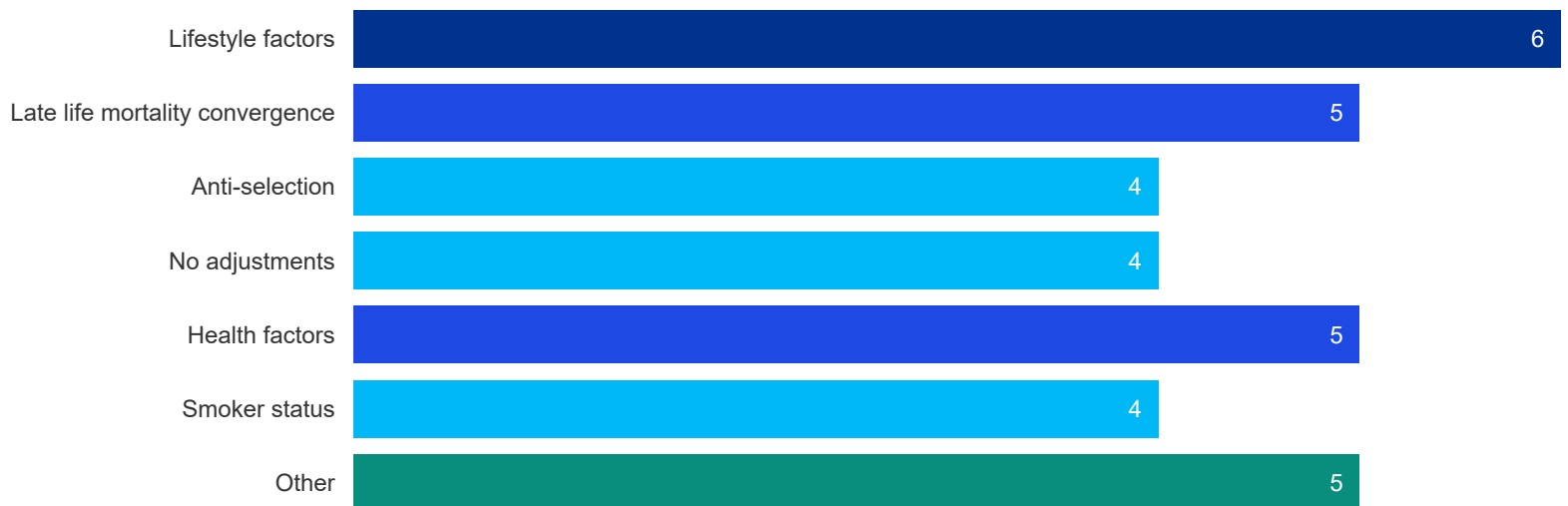
More than half of the respondents use 08 series and 16 series base mortality tables and we have seen more firms move to 16 series. A significant proportion of companies also apply adjustments to their base mortality assumptions to reflect risk features relevant to their portfolios, such as lifestyle factors, late life mortality convergence and health factors.

6.1 Which base mortality tables are your annuitant mortality assumptions based on?



'Other' includes use of the E&W population mortality from CMI_2017 projections model and PCXA16.

6.2 Which adjustments do you allow for in your base mortality assumptions?



'Other' includes adjustments based on socioeconomic factors, temporary selection loadings, IBNR adjustments, and credibility adjustments.

Technical Practices Survey 2024

6. Life Underwriting Risk

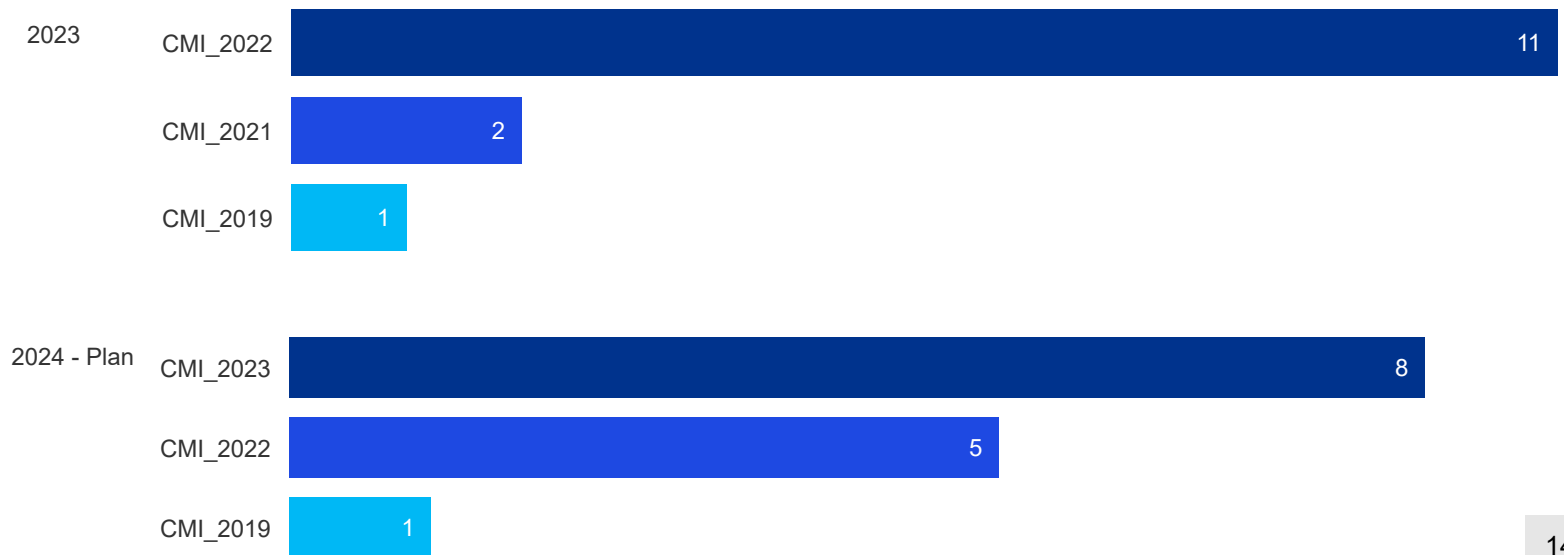
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF/IM

Longevity - Annuitant Mortality Improvements

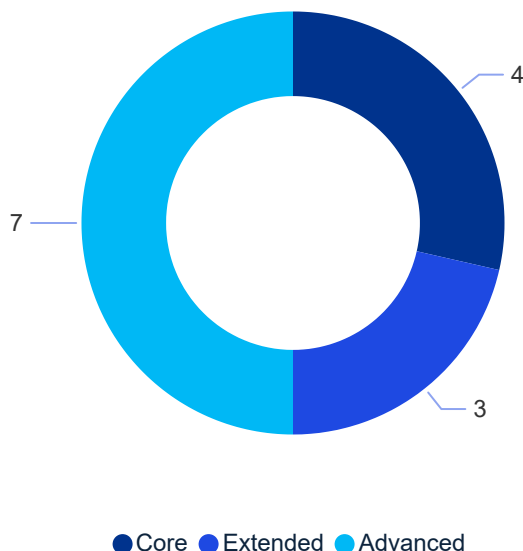
Most companies adopted the CMI_2022 model for reporting at YE23, which is consistent with what we expected. Most companies responded that they plan to adopt the CMI 2023 model for YE24 reporting. We note that the Core calibration of the CMI 2023 model does not allow for 2020 or 2021 experience, but allows for 15% of 2022 and 2023 data, which has slightly lowered cohort life expectancies compared with CMI_2022 (with other parameters held constant). Most respondents use an advanced calibration for the CMI model with the median of the period smoothing parameter (S_k) being 7, which is same as last year.

6.3 Which version of the CMI model do you currently use (and plan to use for YE24) for best estimate mortality improvements?

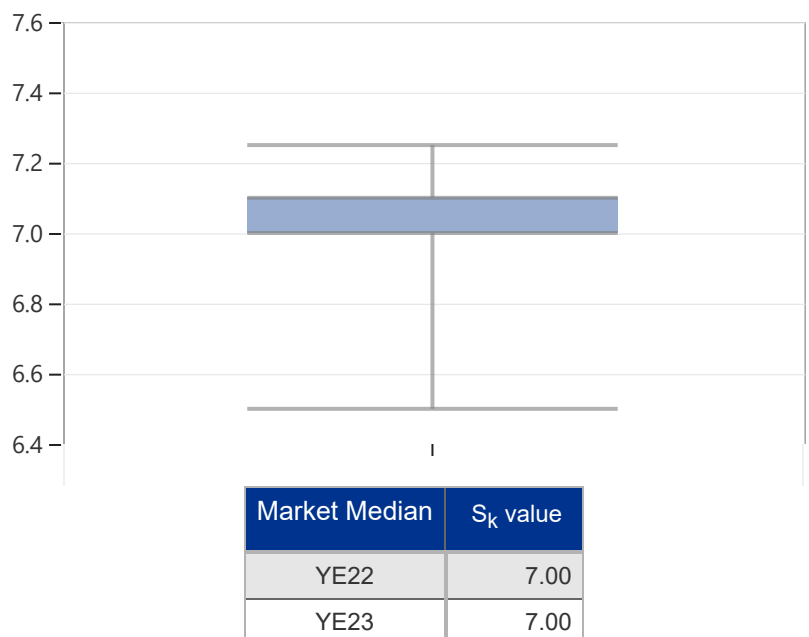


14

6.4a Do you use core, extended or advanced calibration in your longevity improvement basis?



6.4b If you use the Extended or Advanced parameterisation of the CMI 2016 model or later, what value of the period smoothing parameter do you use?



Technical Practices Survey 2024

6. Life Underwriting Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

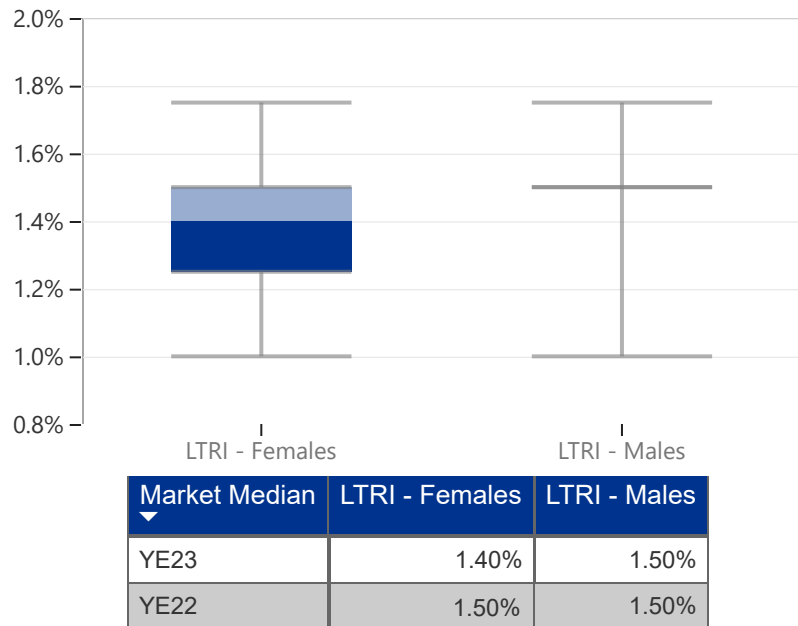
SF/IM

Longevity - Annuitant Mortality Improvements

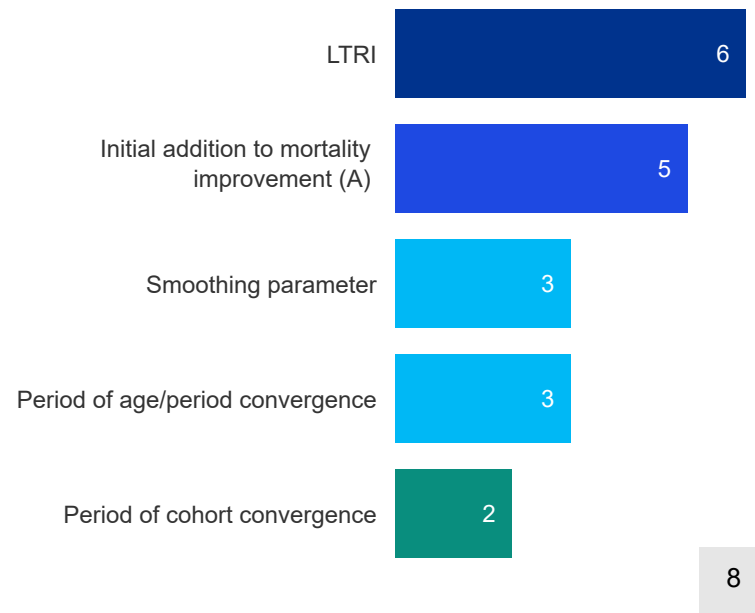
The long-term rates of mortality improvement assumptions are generally higher for males than for females, however this year we have seen a trend of converging the long-term rate between male and female.

The most common adjustments from the CMI Core calibration is to adjust the long-term rates, the A parameter (initial addition to improvements) and the Sk (smoothing parameter). No firm has allowed for any weightings on the 2020 and 2021 data. Some firms have allowed for 15-25% weighting in the 2022 data. There is one firm that plans to allow a 100% weighting on the 2023 data. A few firms commented that they propose to use the core weightings published by the CMI in 2023.

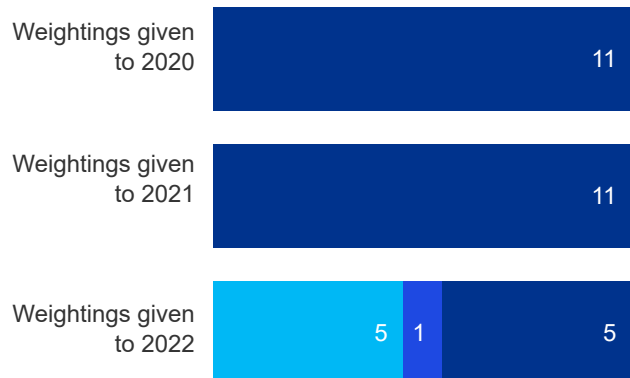
6.4c What long term rates of mortality improvements (LTTRI) do you use?



6.4d If you use an Extended or Advanced calibration for the CMI model, what calibration changes do you make?

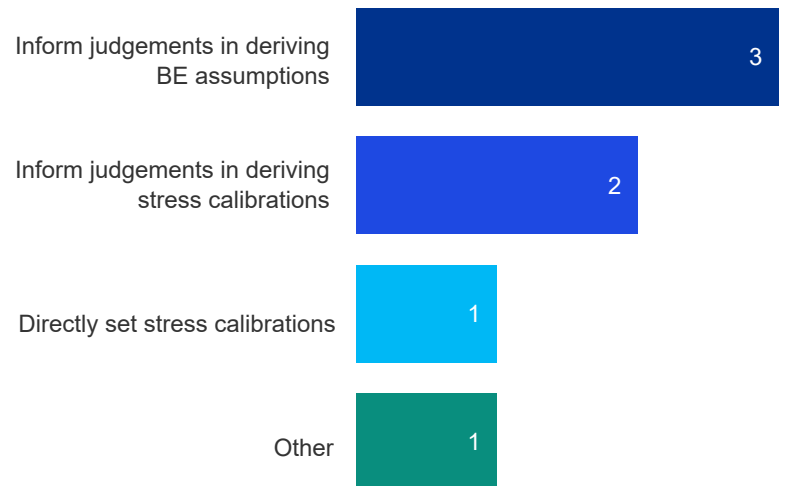


6.5 If you use the CMI 2020 or later models, what weighting do you apply to 2020, 2021, 2022 and 2023 data?



● 25% Weighting ● 15% Weighting ● 0% Weighting

6.6 If you use cause of death models, what do you use them for?



Other include use of cause of death model but purpose is not specified.

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Technical Practices Survey 2024

6. Life Underwriting Risk

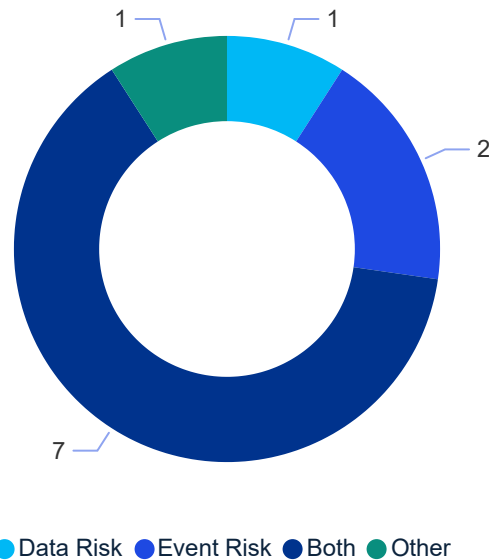
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF/IM

Impact of Covid-19 - Risk Capital

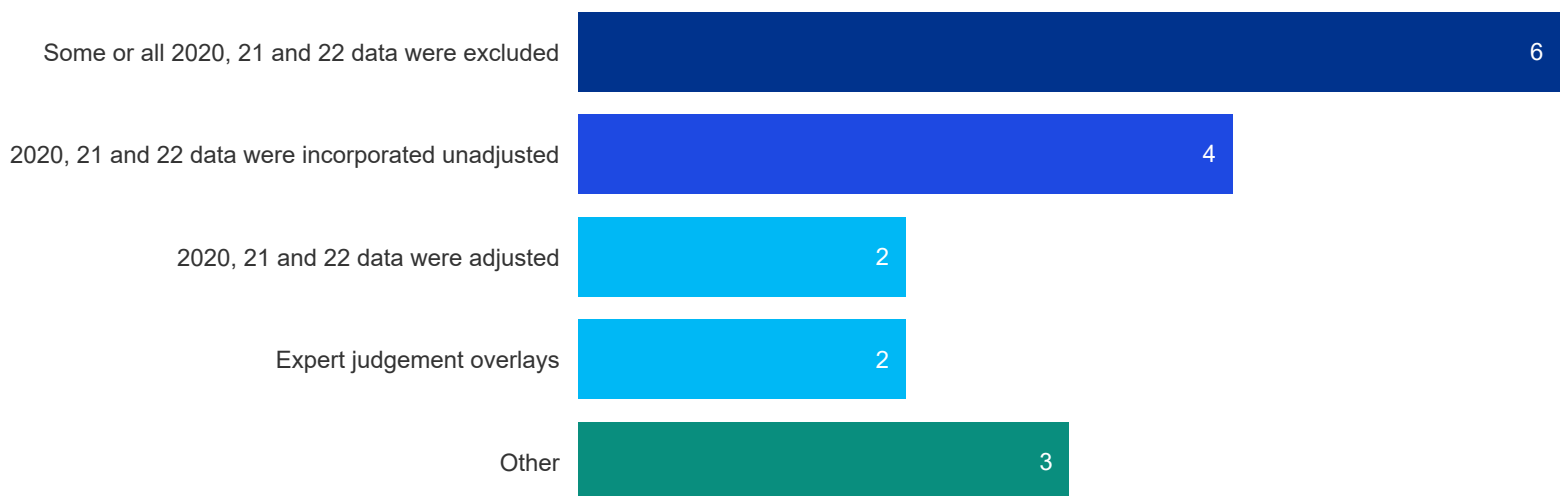
When comparing with last year, more companies considered COVID-19 to be both a data and an event risk. Majority of respondents excluded some or all 2020, 2021 and 2022 data.

6.7 Do you consider Covid-19 to be a data risk, an event risk, or both?



Other includes Covid-19 risk has allowed for outside longevity calibration.

6.8 What changes have you made in respect of the impacts of Covid-19 from a risk capital calibration perspective?



'Other' includes no explicit adjustment to the risk calibrations for Covid-19, and noting that judgements are made with regard to the applicability of 2020 experience within each of the underlying risk behaviours.

Technical Practices Survey 2024

6. Life Underwriting Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF/IM

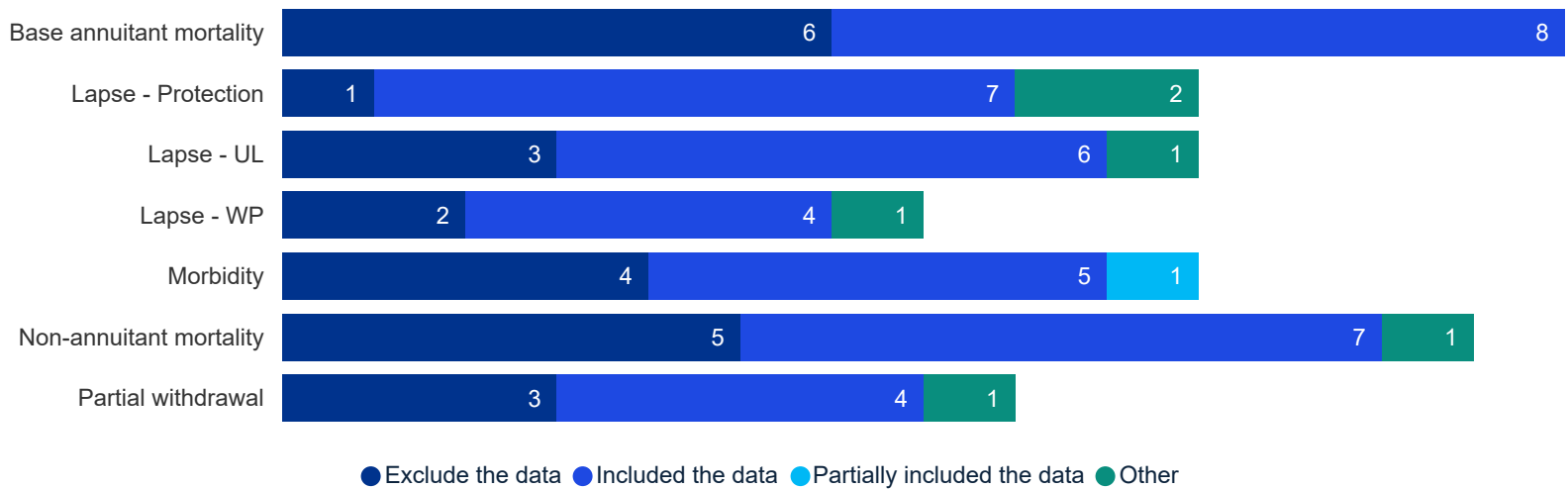
Impact of Covid-19 - Underwriting Assumptions

Most companies include 2022 data and more than half of them include 2020 and 2021 data in their underwriting assumption setting, which is the same finding as last year's survey. Only one company has changed their approach in annuitant mortality assumption setting compared to prior year, from excluding 2020 and 2021 data to including them.

6.9 Considering experience data from the years 2020, 2021 and 2022, what was your approach to using this "Covid-19 affected" data in your assumption setting process at YE23?

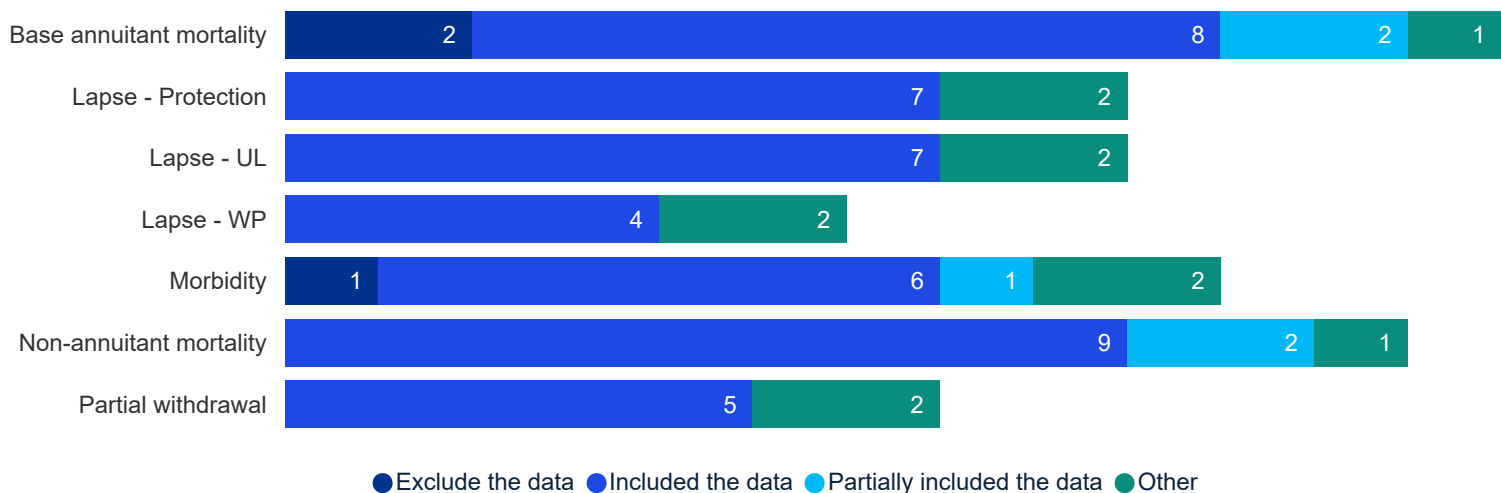
Responses showed that firms applied consistent approaches for data from 2020 and 2021, hence the top chart shows the approach for these years combined.

2020 and 2021 data



'Other' includes excluding data that showed evidence of material impacts from Covid-19 but including data where experience was less impacted. 'Other' also includes apply weightings to 2020 data or assumed equal to 2015-2019 experience.

2022 data



'Other' includes using all data but weighted in some cases eg. use of CMI 22 model, and separate provision held for higher long-term claims than expected.

Technical Practices Survey 2024

6. Life Underwriting Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

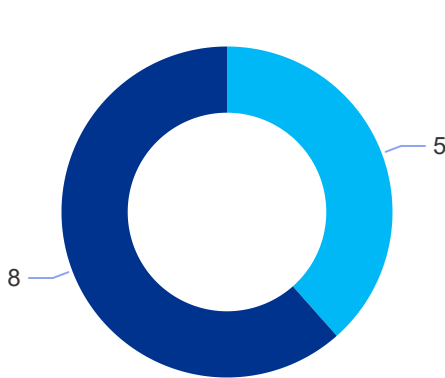
SF/IM

Impact of Covid-19 - Underwriting Assumptions

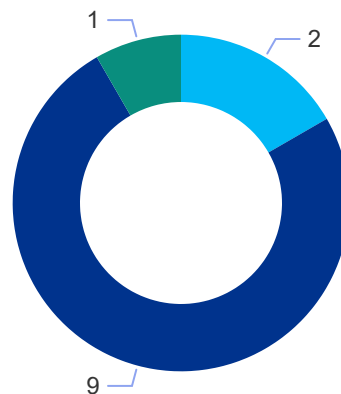
All firms who provided responses for question 6.10 below noted that no allowance was made for excess deaths evident at YE23 for the purposes of partial withdrawal assumptions and lapse assumptions on any of protection, with-profits, or unit-linked business. Most companies indicated they did not hold any additional provisions in respect of Covid-19 for the purposes of YE23 reporting.

6.10 In respect of your assumption setting process at YE23, how have you allowed for the excess deaths evident in 2023?

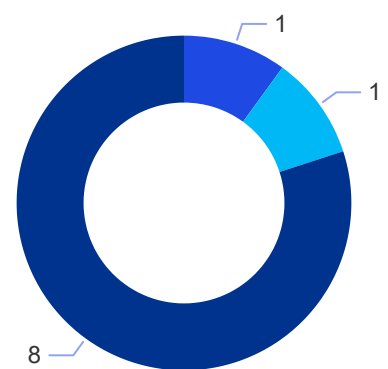
Mortality



Longevity - Base



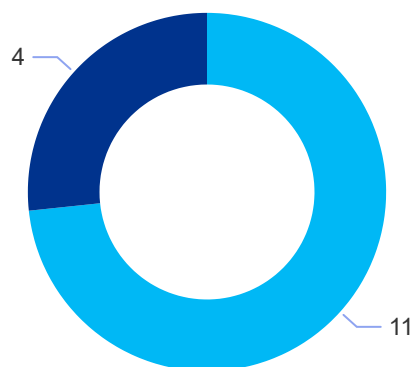
Morbidity



● LT allowance for higher expected ● ST allowance for higher expected ● No allowance made ● Other

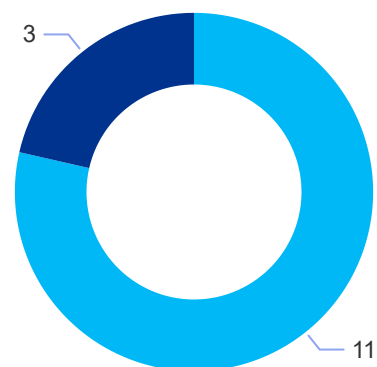
'Other' include no allowance made other than allowed for in CMI2022.

6.11 Did you include any adjustment to reflect the impact of the Covid-19 pandemic in your YE23 improvement assumptions?



● No ● Yes

6.12 Did you hold an additional provision in respect of Covid-19 for the purpose of YE23 reporting?



● No ● Yes

Of those who responded 'Yes' to 6.11, two firms noted they applied a reduction in short term mortality improvements, while one firm noted they applied an increase in short term mortality improvements. No firms included any long term adjustments.

Technical Practices Survey 2024

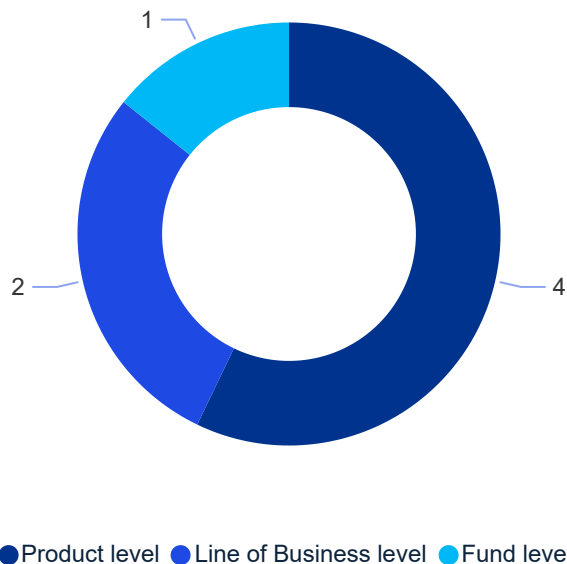
6. Life Underwriting Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

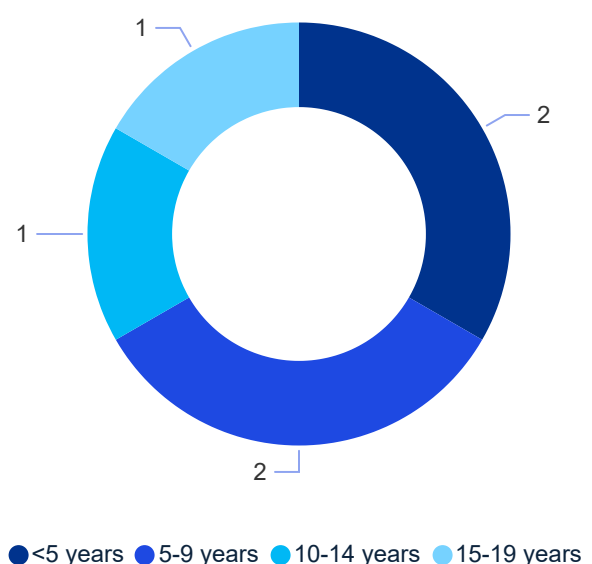
IM Persistency

The majority of firms perform persistency risk calibrations at product level and a third of respondents use less than five years of experience. Most firms have considered the cost of living crisis from a risk calibration perspective, however three firms have not made any adjustments to their calibration.

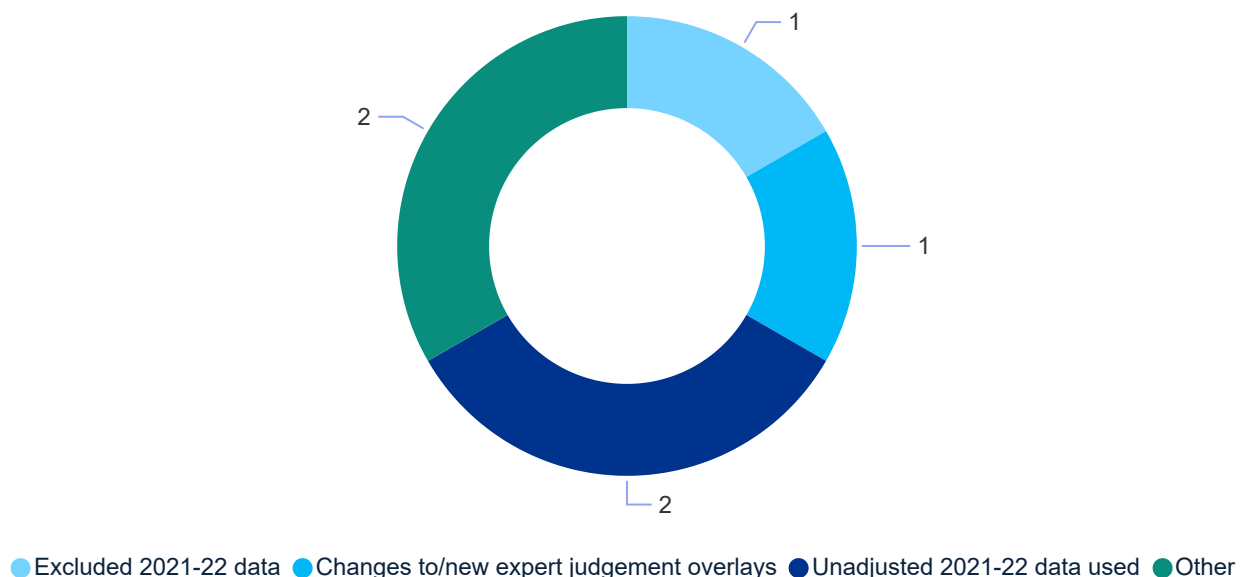
6.13 At what level of granularity do you perform persistency risk calibrations?



6.14 What period does your persistency experience investigation cover?



6.15 What changes have you made in respect of the impacts of the Cost of Living Crisis from a risk capital calibration perspective?



'Other' includes no changes made as of yet but consideration of this ongoing.

Technical Practices Survey 2024

6. Life Underwriting Risk

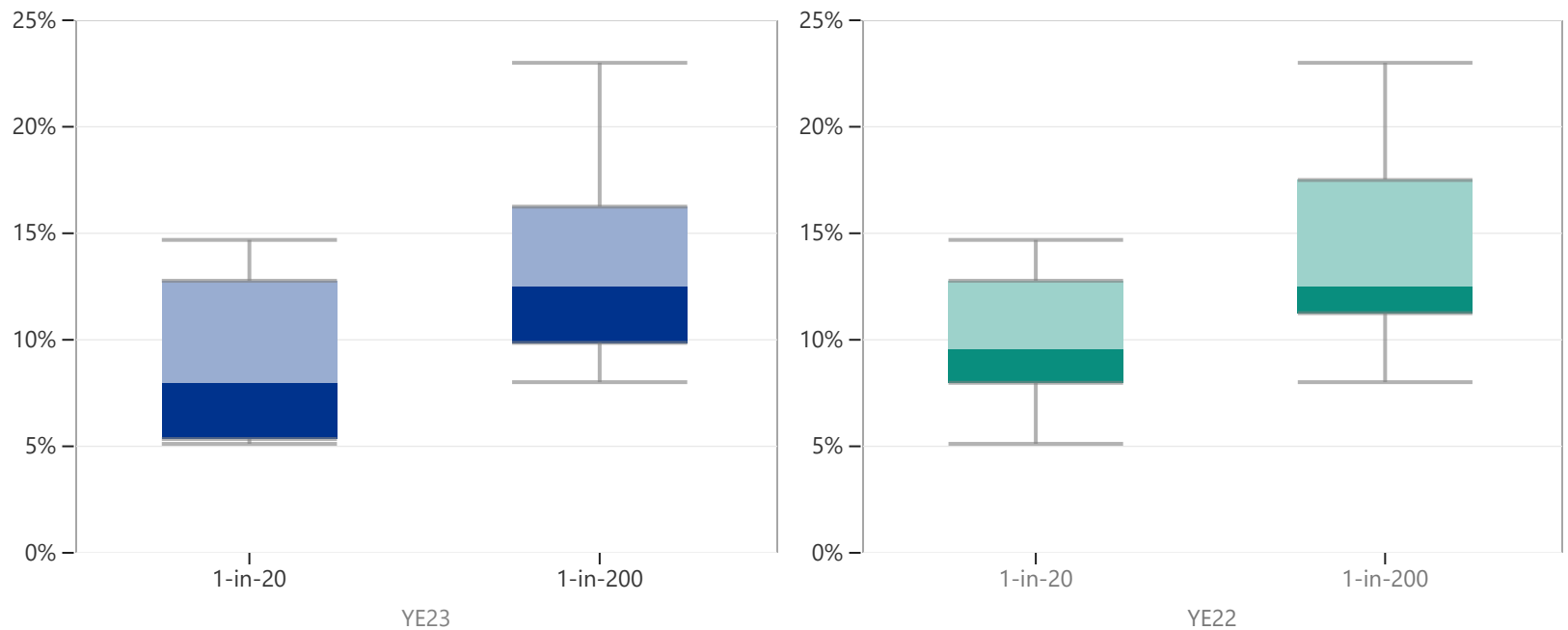
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

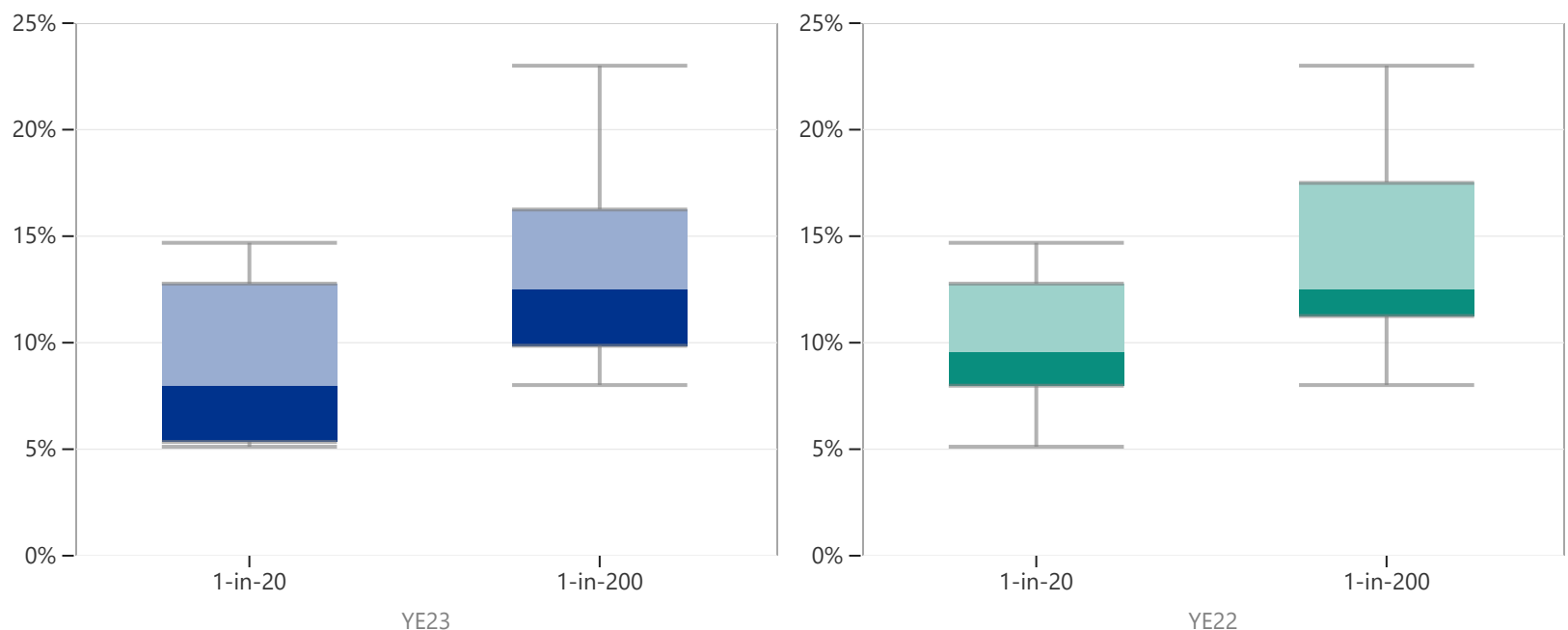
Base Mortality Risk - Calibrations

The charts below show the percentage change in best estimate mortality rate for males and females at ages 25, 40 and 55. Excluding sampling differences, there are no material changes to companies' calibrations at YE23 compared to YE22.

6.16a Change in Mortality Rate - Males



6.16b Change in Mortality Rate - Females



Technical Practices Survey 2024

6. Life Underwriting Risk

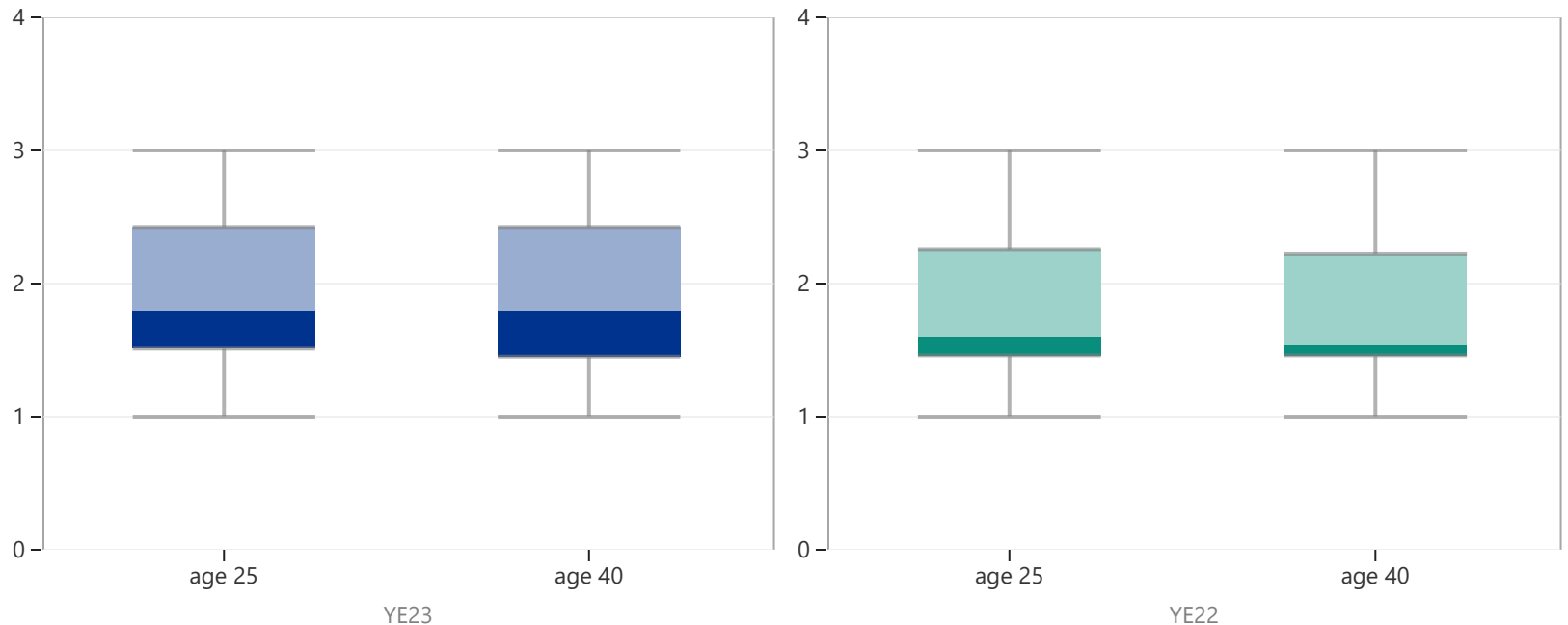
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

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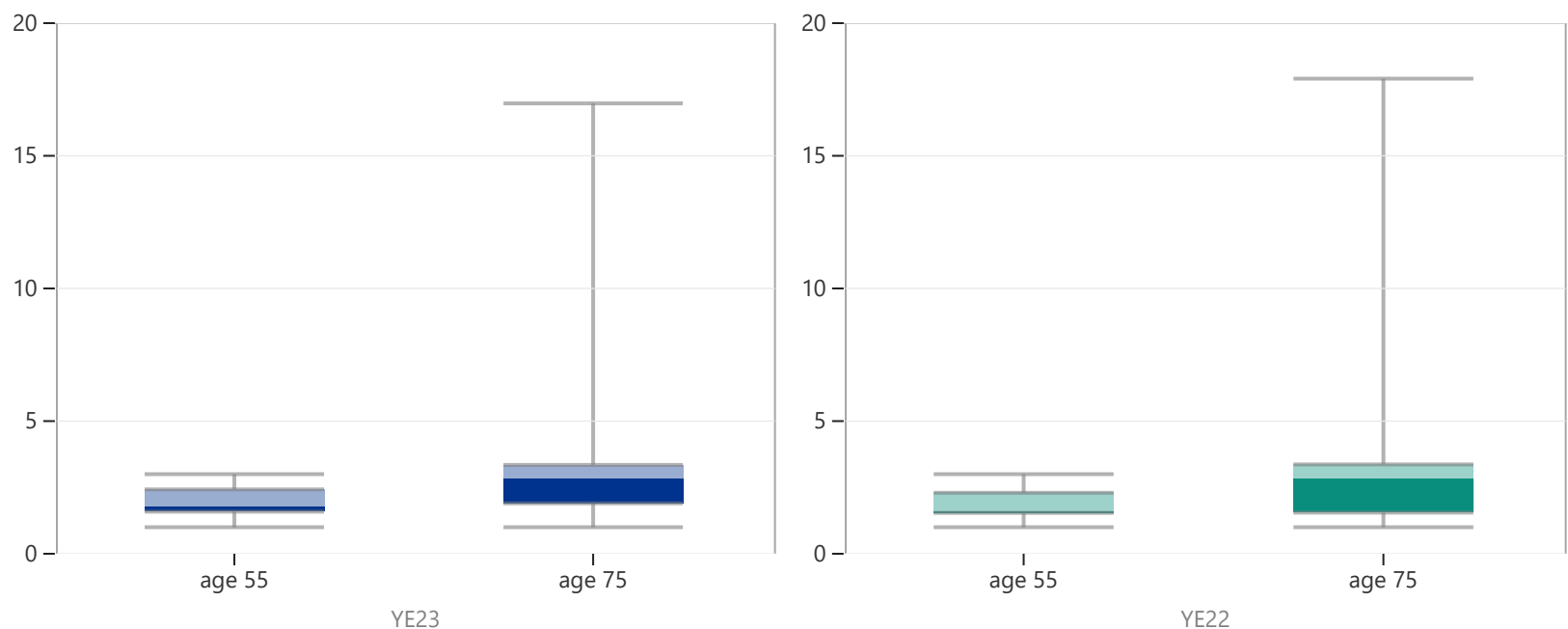
Mortality Catastrophe Risk - Calibrations

The charts below show mortality catastrophe stresses for males and females at ages 25, 40, 55 and 75. Most companies have retained their calibrations from YE22. However, a minority of companies have changed their stresses at YE23, especially at higher ages resulting in distributions skewed towards larger stresses.

6.17a Mortality Catastrophe for Age 25 (Overall) and Age 40 (Overall) (deaths per 1000)



6.17b Mortality Catastrophe for Age 55 (Overall) and Age 75 (Overall) (deaths per 1000)



Technical Practices Survey 2024

6. Life Underwriting Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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IM Longevity Calibrations – Internal Model

The table below sets out, for each age and gender:

- Best Estimate (BE) Base Expectation of Life (EoL) with no mortality improvements
- BE EoL with mortality improvements, as an addition to the Base EoL
- Overall 1-in-200 stresses, as an addition to the BE EoL with mortality improvements
- Percentage increase in BE EoLs under 1-in-200 overall stress

The reduction in the average EoL and 1-in-200 stress impacts for males at age 50 is largely driven by differences in the YE22 and YE23 samples. On a like for like basis, we have seen a third of the participants have increased their overall 1-200 longevity stresses, which are shown in the next two pages. We note that the stress impact for males is generally larger than for females.

Age 50

Male

Female

	Market Average EoL (YE23)	Market Average EoL (YE22)	Market Average EoL (YE23)	Market Average EoL (YE22)
Base Mortality	33.1	33.3	36.3	36.5
BE Improvements	2.3	2.5	2.5	2.6
1-in-200 Stress Impact	4.7	4.8	4.5	4.7
1-in-200 Stress Impact (%) *	13.2%	13.4%	11.5%	11.9%

Age 65

Male

Female

Base Mortality	20.0	20.2	22.6	22.8
BE Improvements	1.0	1.2	1.2	1.4
1-in-200 Stress Impact	3.0	3.0	3.0	3.0
1-in-200 Stress Impact (%) *	14.2%	13.9%	12.6%	12.6%

Age 80

Male

Female

Base Mortality	9.1	9.2	10.6	10.7
BE Improvements	0.3	0.4	0.4	0.5
1-in-200 Stress Impact	1.5	1.4	1.5	1.6
1-in-200 Stress Impact (%) *	15.6%	15.3%	14.0%	14.1%

*Increase in EoL under a 1-in-200 Stress as a % of BE EoL with improvements



Technical Practices Survey 2024

6. Life Underwriting Risk

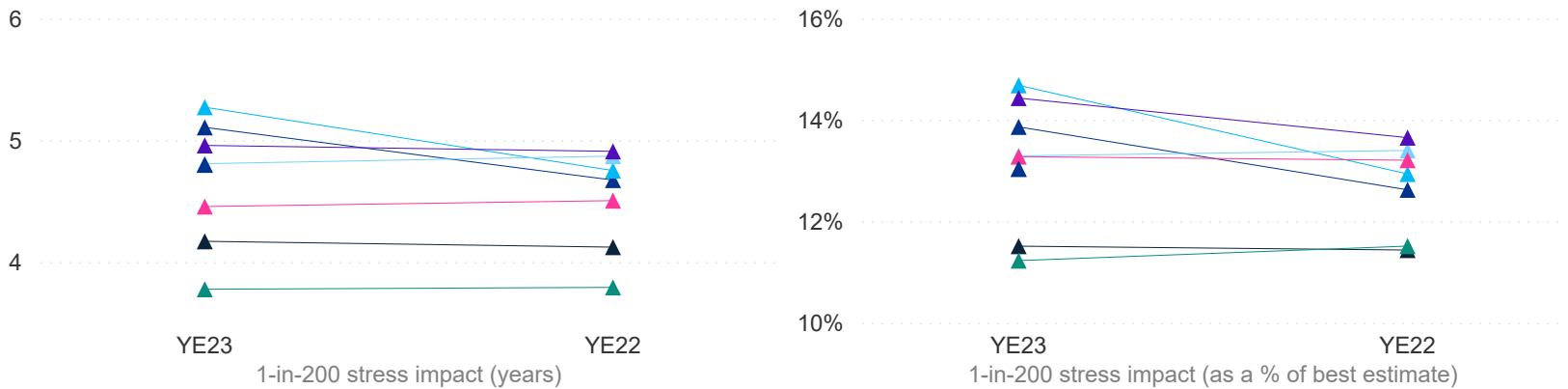
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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IM

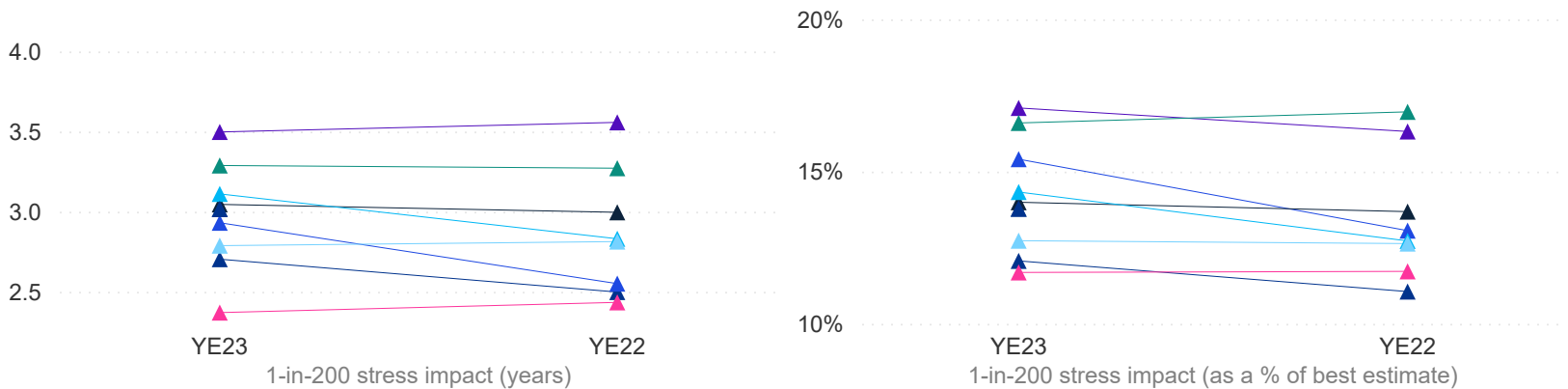
Longevity Risk - Calibrations

The charts below show each participant's response on Expectation of Lives (EoL) for males under 1-200 overall stress, i.e. combined mis-estimation and trend stresses. Each colour point represents a different participant. The charts on the left show absolute differences between the Best Estimate (BE) and the 1-in-200 EoL, while the charts on the right show the difference between the BE EoL and the stressed EoL as a % of the BE EoL. Overall, we can see that some companies have increased their longevity risk at YE23 compared to YE22 whereas others have remained the same. The increase in longevity risk is broadly consistent between Males and Females.

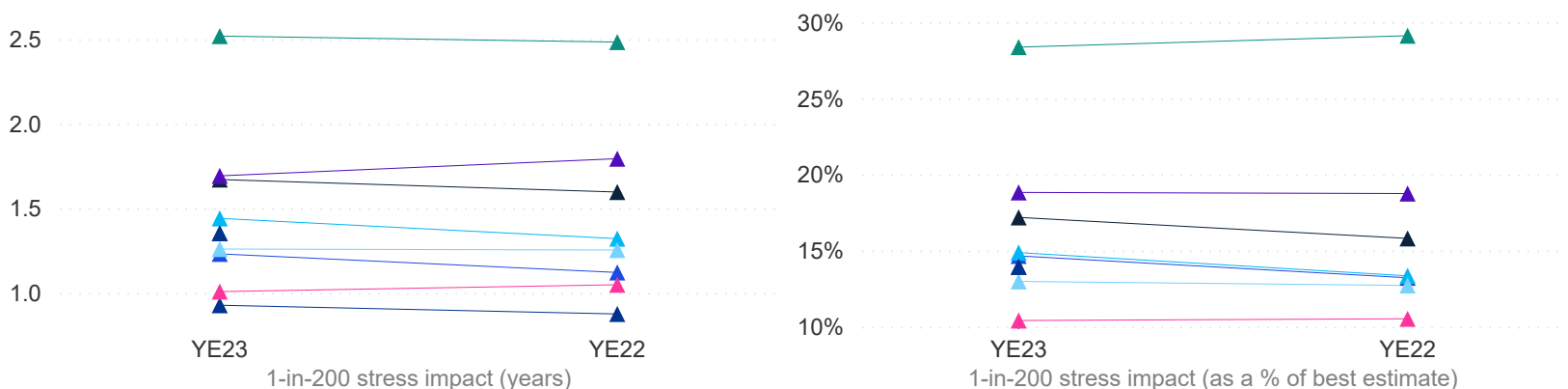
6.18a Expectation of Life - Male Aged 50 (overall)



6.18b Expectation of Life - Male Aged 65 (overall)



6.18c Expectation of Life - Male Aged 80 (overall)



Technical Practices Survey 2024

6. Life Underwriting Risk

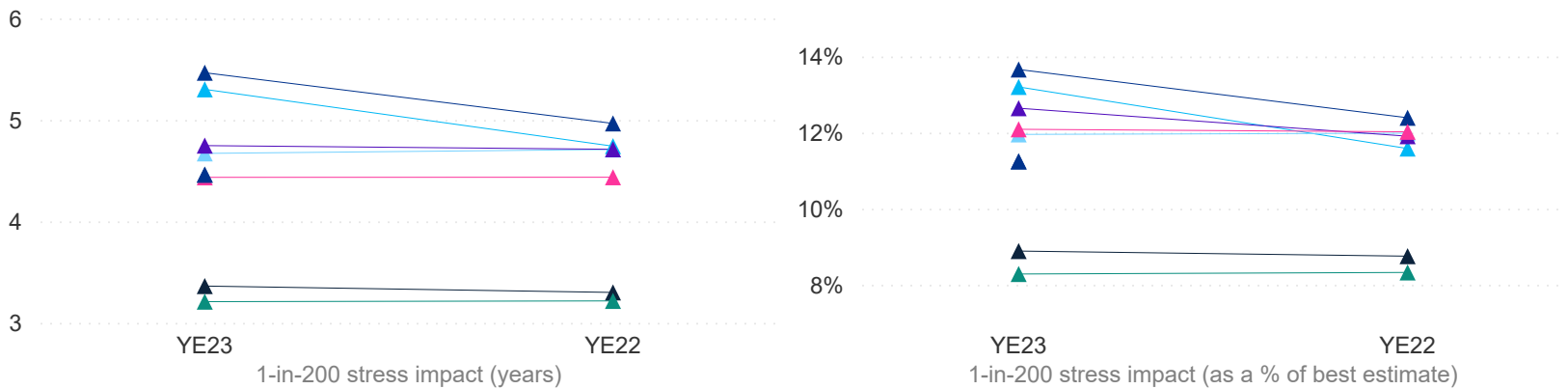
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

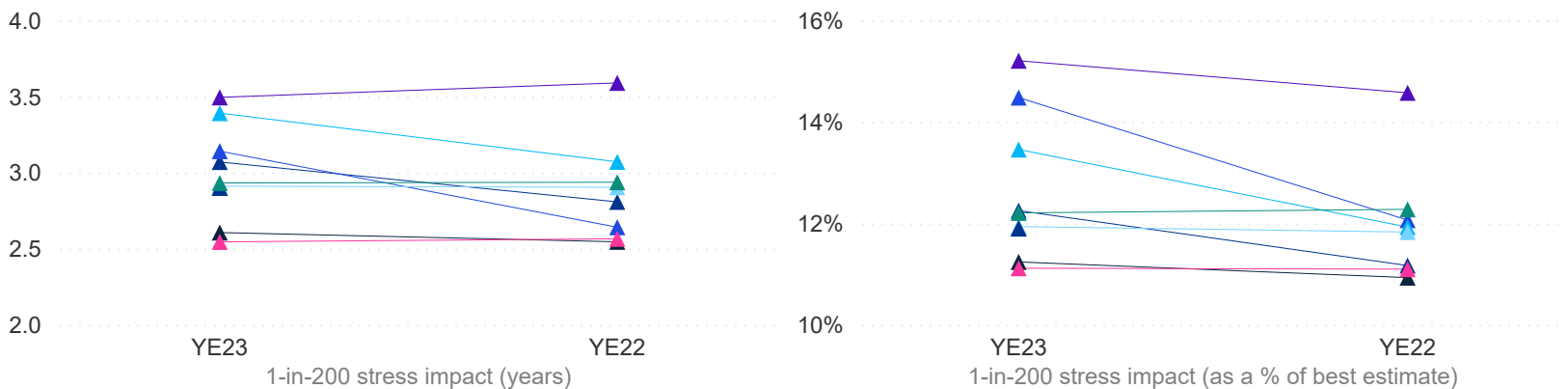
Longevity Risk - Calibrations

The charts below show each participant's response on EoLs for females under 1-200 overall stress, i.e. combined mis-estimation and trend stresses. Each colour point represents a different participant. The charts on the left show the absolute differences between the BE and the 1-in-200 EoL, while the charts on the right show the % difference between the BE EoL and the stressed EoLs. Overall, we can see that some of the companies have increased their longevity risk at YE23 compared to YE22 whereas others have remained the same. The increase in longevity risk is broadly consistent between male and Female.

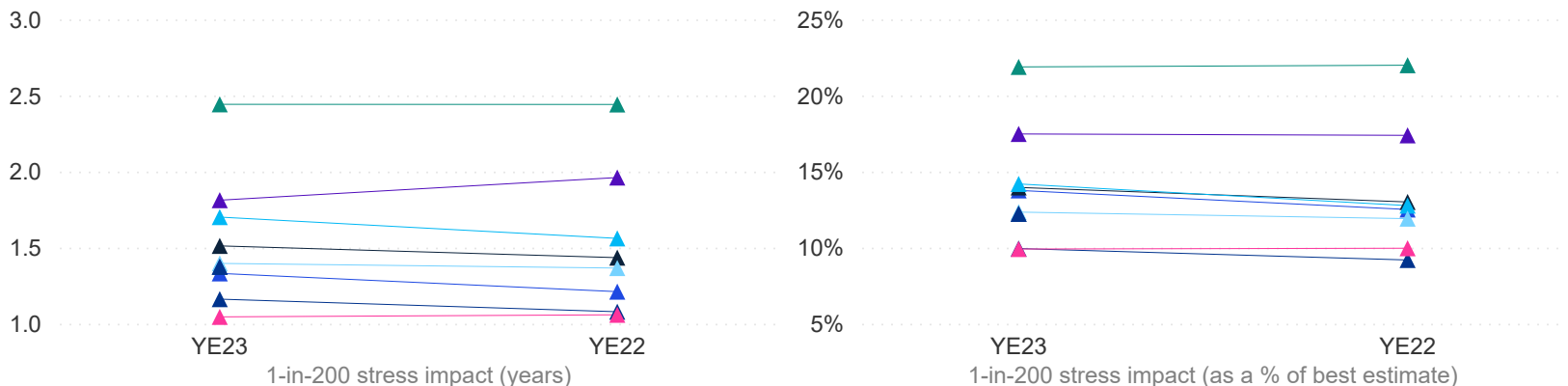
6.18d Expectation of Life - Female Aged 50 (overall)



6.18e Expectation of Life - Female Aged 65 (overall)



6.18f Expectation of Life - Female Aged 80 (overall)



Technical Practices Survey 2024

6. Life Underwriting Risk

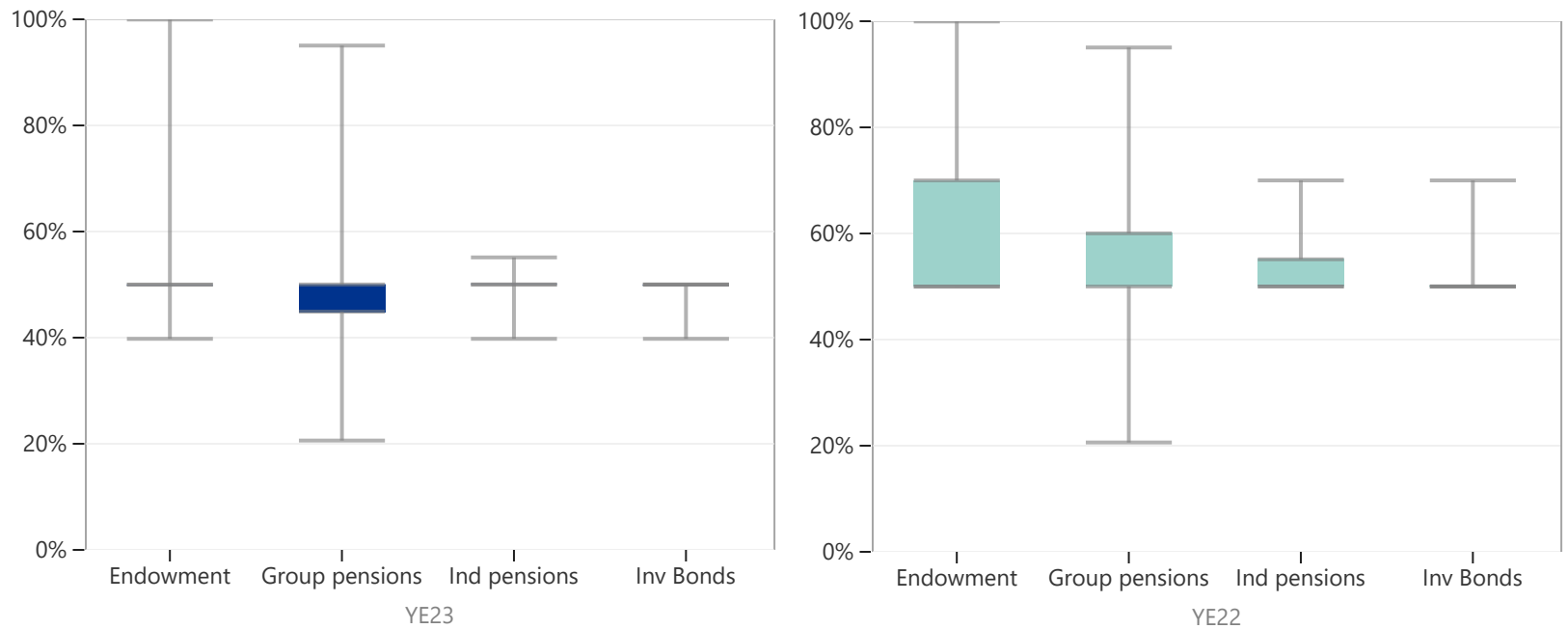
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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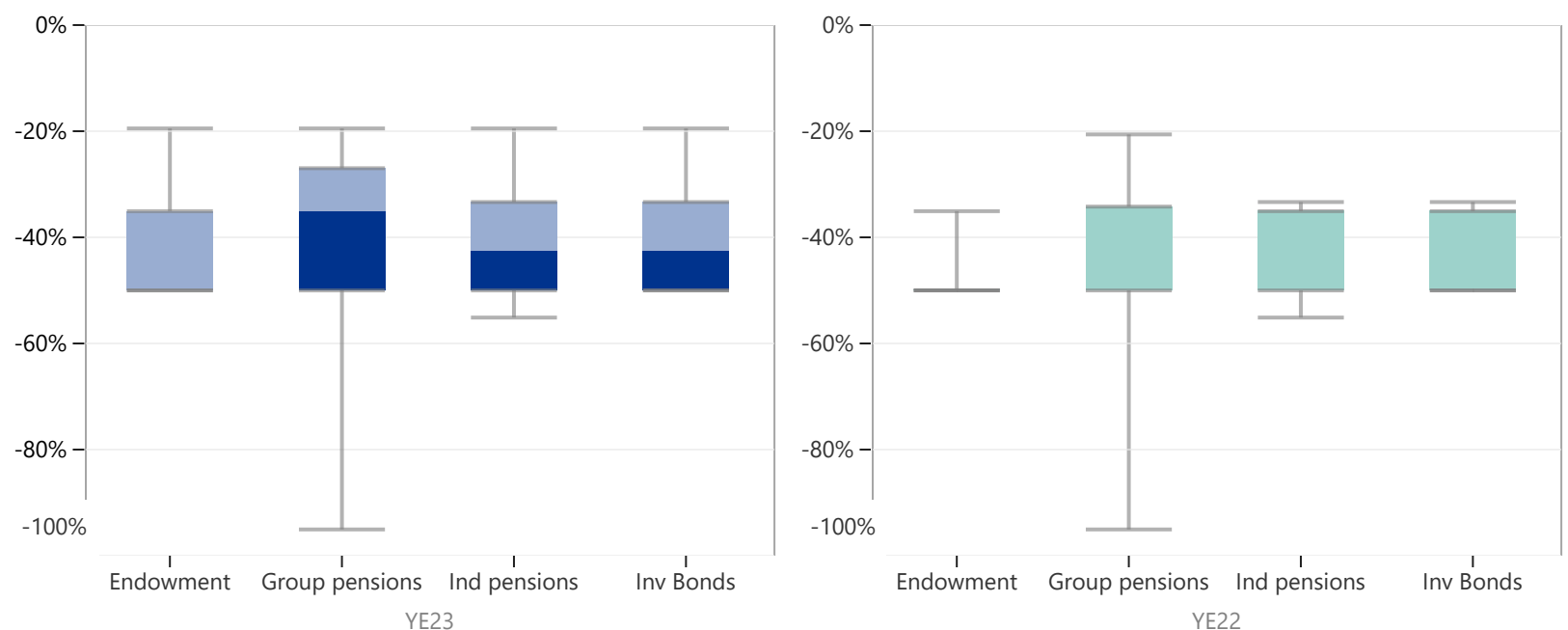
Lapse Risk - Calibrations

The charts below show the lapse up and lapse down stresses for unit linked contracts only. Most of the companies have the same response (majority choosing 50% for 1-200 stress). The movements in the graph for lapse risks are mainly driven by sampling differences.

6.19a Change in Lapse Rates - 1-in-200 Up Stress (Unit-linked Products Only)



6.19b Change in Lapse Rates - 1-in-200 Down Stress (Unit-linked Products Only)



Technical Practices Survey 2024

6. Life Underwriting Risk

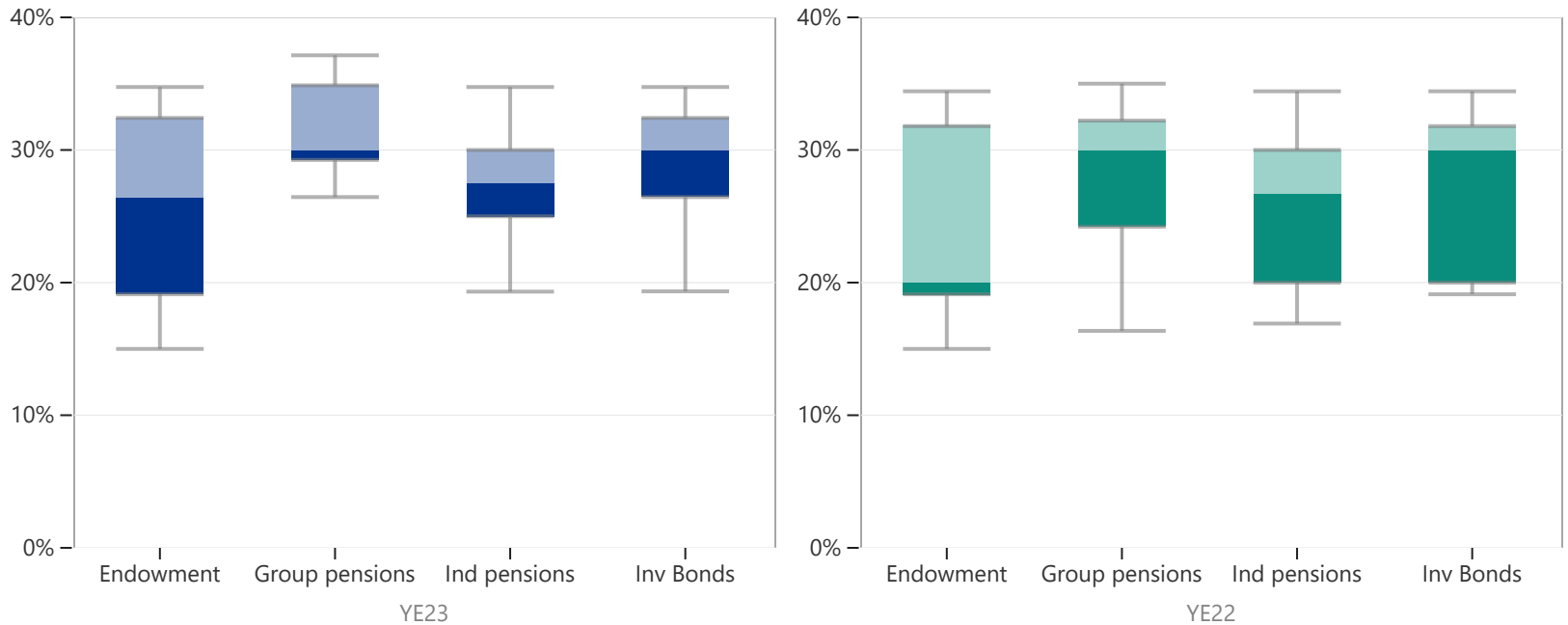
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

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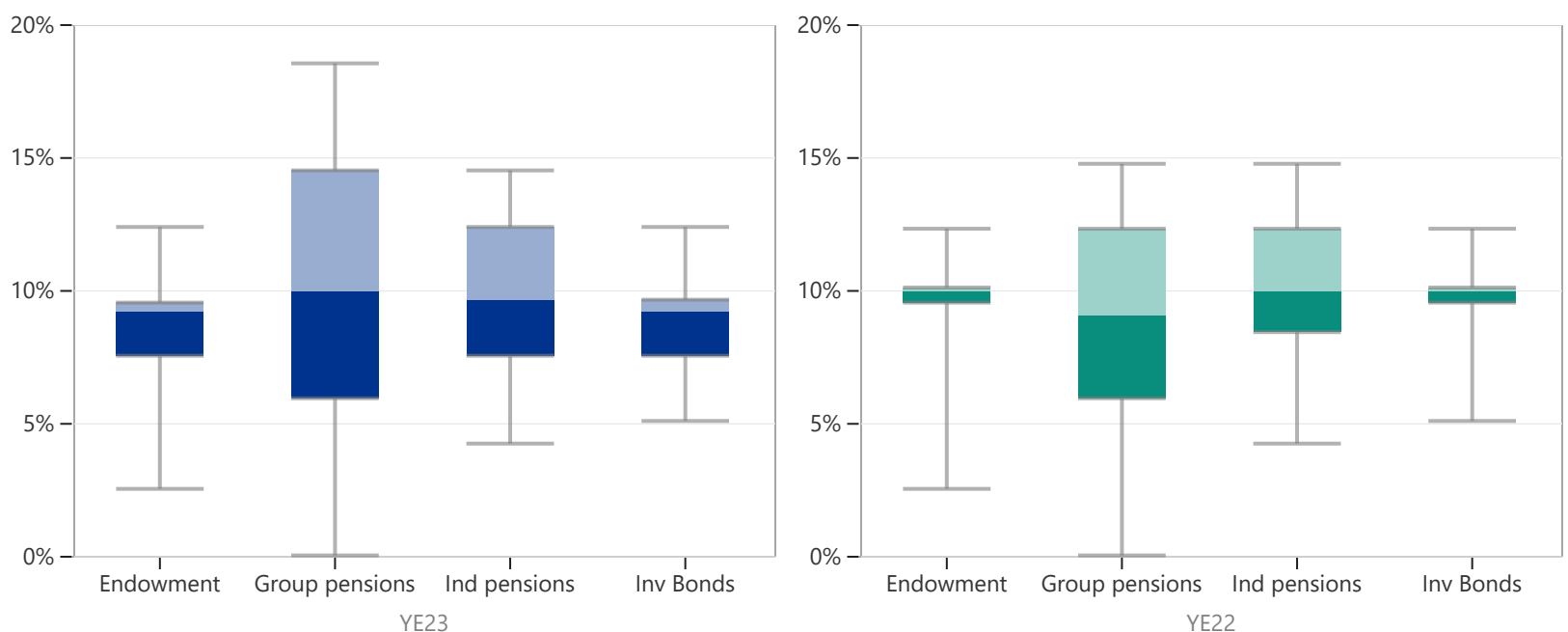
Lapse Risk - Calibrations

Half of the respondents have not changed their calibrations at all. Among those firms who have changed their calibration, we see increases in the mass lapse stress assumption mainly. Some of the movements have been quite significant with movements of over 50%.

6.20a Mass Lapse - 1-in-200 Stress Impact (Unit-Linked Products Only)



6.20b Mass Lapse - 1-in-20 Stress Impact (Unit-Linked Products Only)



Technical Practices Survey 2024

6. Life Underwriting Risk

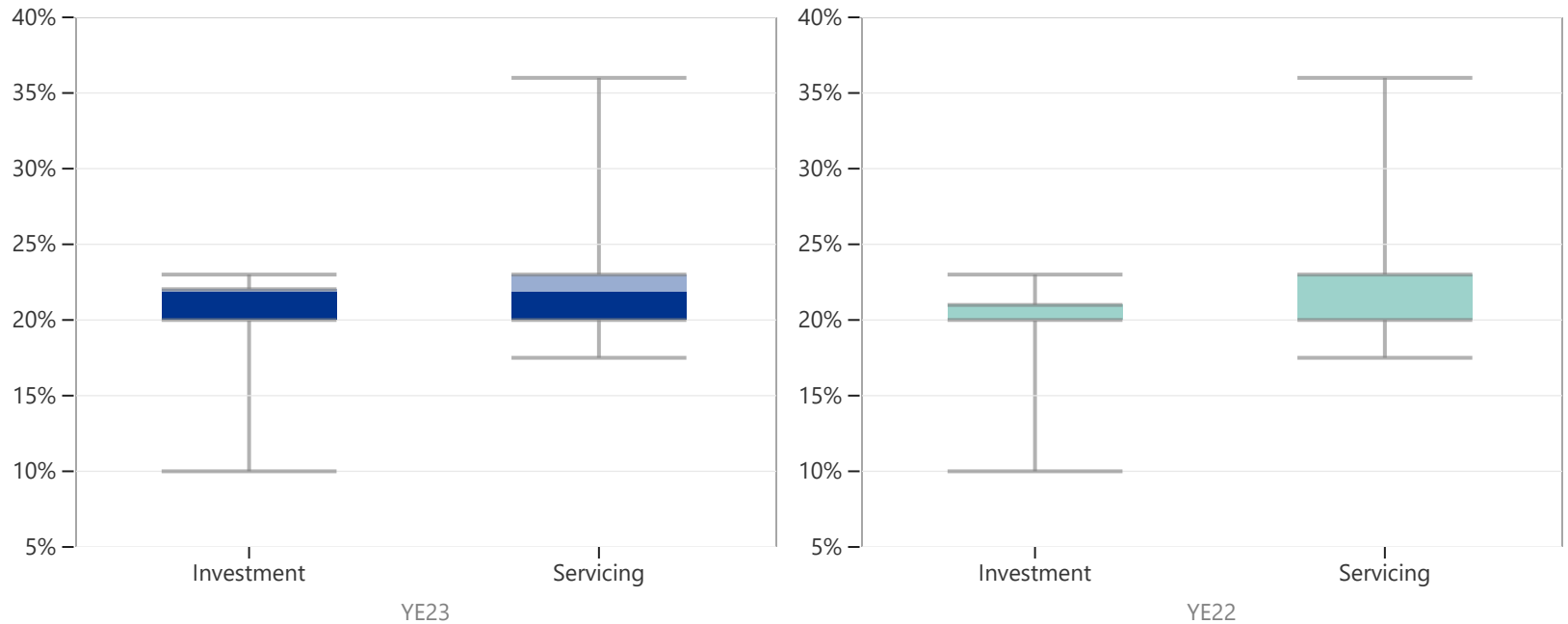
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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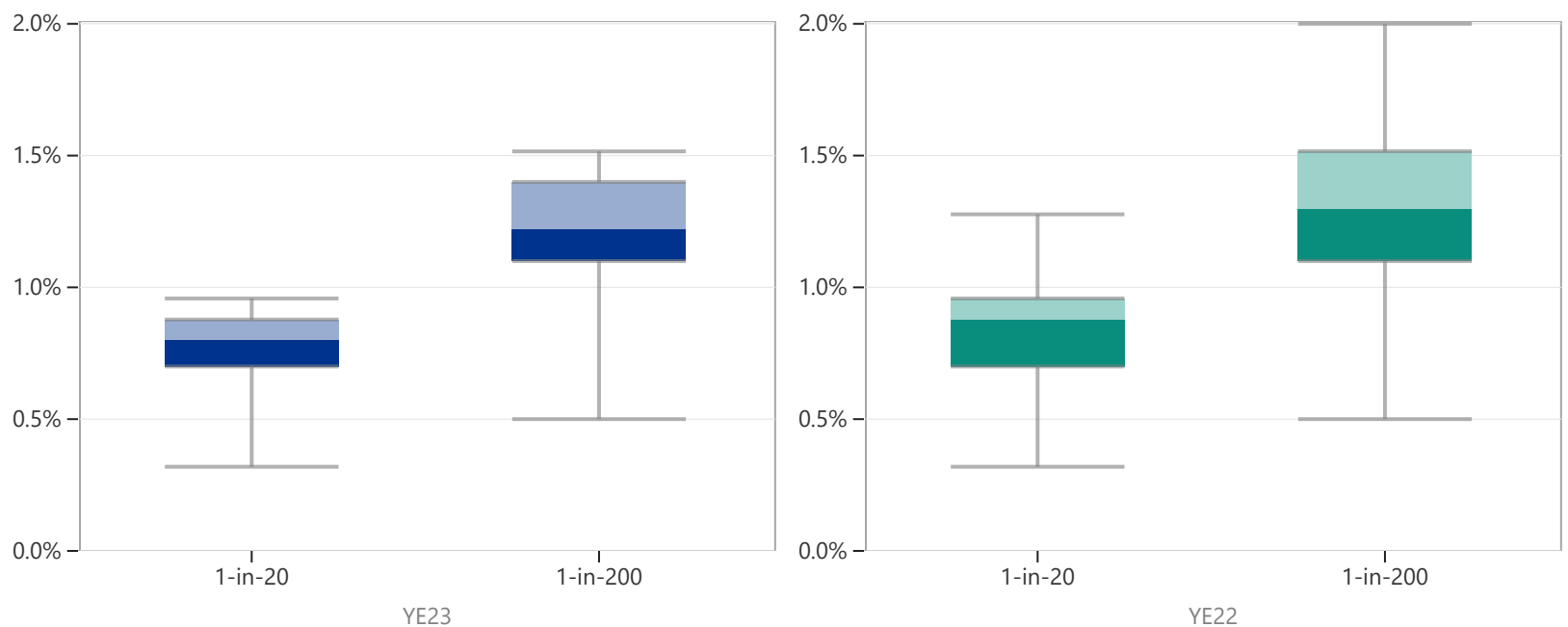
Expense Risk - Calibrations

There have been some very small changes in the expense stresses since the prior year with movements in both directions. On the whole the stresses have remained stable. There are some differences due to sampling differences between the two years.

6.21a Change in Base Investment Expense and Servicing Expense Assumption (1-in-200)



6.21b Change in Expense Inflation



Technical Practices Survey 2024

7. Capital Management

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

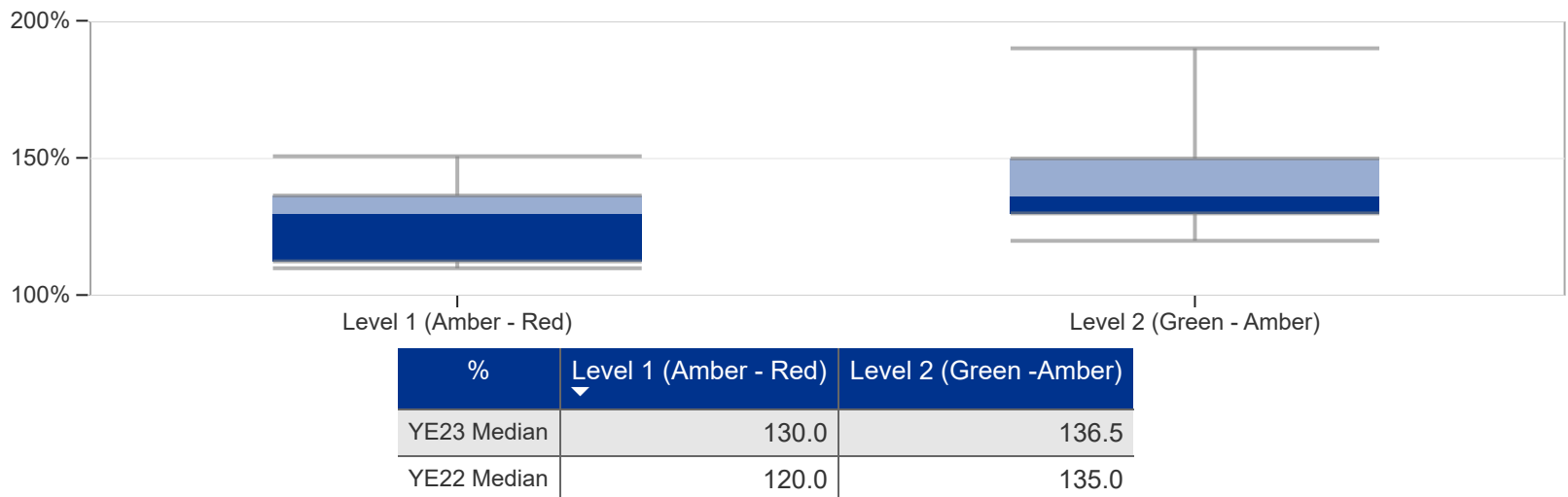
SF/IM

Capital Management

The coverage ratio risk appetite that respondents use are highly dependent on their risk profile and chosen confidence level. The graphs show a high level of variability overall, but the interquartile range does show more consistency. We have observed an increase in the levels of the coverage ratio between this year's survey and that from last year. There is a different set of respondents in the two surveys which has caused some of the difference. The rise in Level 1 median is partly due to sampling differences. Considering on a like-for-like basis, most haven't adjusted their coverage ratio, but two have increased them by around 20%. These two changes have re-ordered the reported ratios and led to a material change in the median for Level 1.

It is relatively common to use a 1-in-10 or 1-in-20 confidence level for calibration of risk appetite. However, there are quite a few firms that stated that they used a more comprehensive approach that considered a range of different scenarios to give a fuller picture of an appropriate risk appetite.

7.1 At the operating company level what coverage ratio for SCR do you set as the Risk Appetite?



7.2 What is your approach to calibration of the Risk Appetite and the confidence level used?

Company	Level 1 (Amber - Red boundary)	Level 2 (Green - Amber boundary)
1	Based on the Level 2 boundary after removal of any buffer	1-in-25
2	Based on practicalities and available immediate management actions and regulatory expectations.	Close to 1-in-4
3	Allowance for additional capital under ORSA	1-in-20
4	1-in-10	1-in-50
5	Lower limit set to provide cushion above 100%, not set with respect to any particular confidence level	1-in-10
6	1-in-10	1-in-25
7	1-in-10	Based on the Level 1 boundary plus a buffer
8	1-in-20	1 in 75
9	Based on the Level 2 boundary after removal of any buffer	Based on overall risk of default
10	1-in-10	1-in-10
11	Based on the Level 2 boundary after removal of any buffer	1-in-20
12	Based on the Level 2 boundary after removal of any buffer	1-in-5
13	Based on the Level 2 boundary after removal of any buffer	1-in-10
14	1-in-20	1-in-20
15	1-in-20	Based on the Level 1 boundary plus a buffer

Technical Practices Survey 2024

7. Capital Management

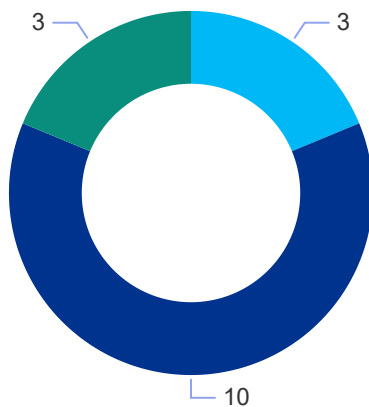
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

Capital Management

The majority of firms calibrate their coverage ratio risk appetite using $t=0$ position only. In chart 7.4, 'Base Actions' do not need specific approval and are included in the SCR (e.g. investment decisions within current limits, policyholder charge increases, dynamic aspects of policyholder benefits etc.). 'Contingent Actions' are known to be available and feasible but have not been specifically board approved and 'Recovery Actions' would be taken in the stresses used for calibration. Similar to previous year, temporary business issues and economic conditions remain to be the key features considered in the risk appetite.

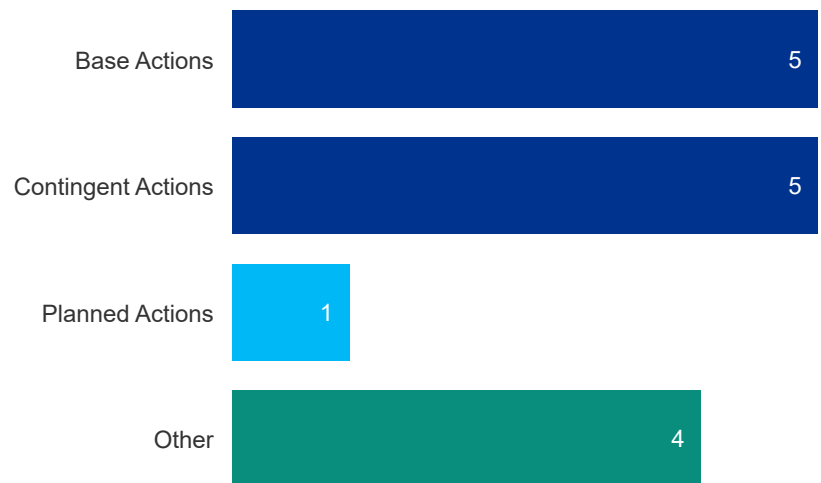
7.3 Is your coverage ratio risk appetite calibrated using the $t=0$ position only or do you perform a projection over the first year?



● Projection considering entirety year 1 ● $t=0$ position only ● Other

'Other' includes using bespoke approach along with performing projection over a longer period.

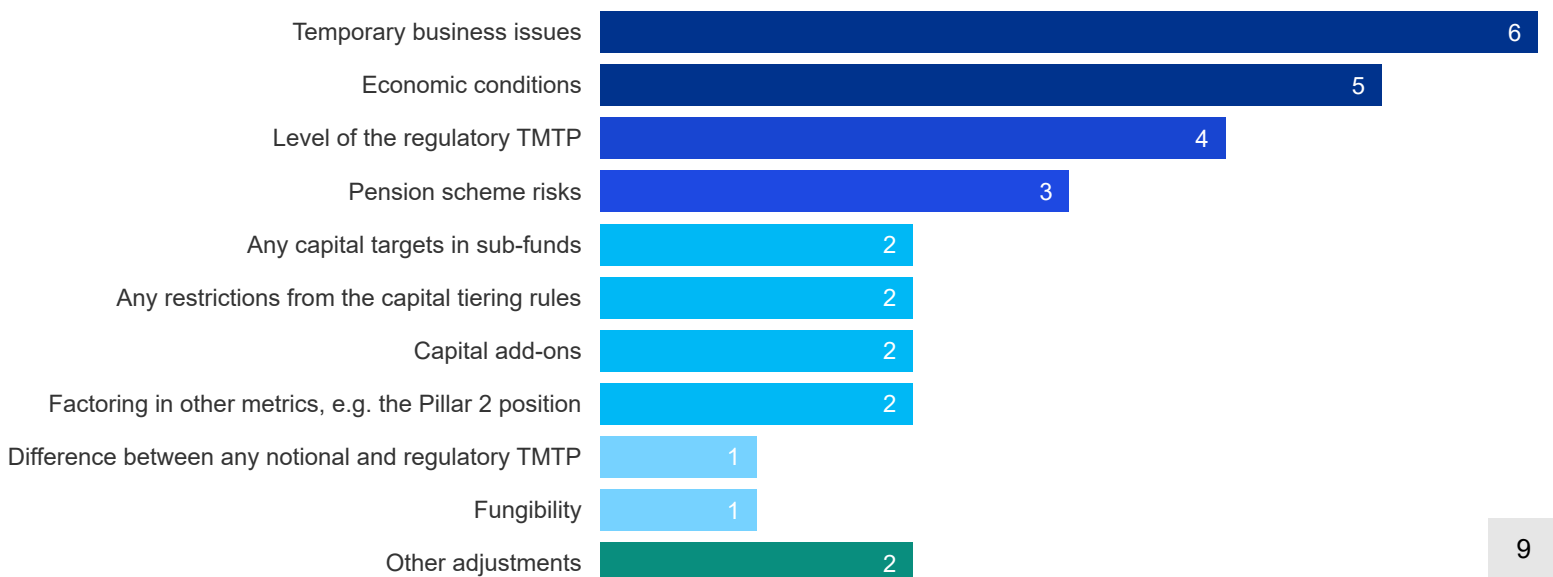
7.4 In your coverage ratio Risk Appetite calibration which Management Actions do you allow for?



'Other' includes a combination of base, stress, planned and recovery actions, or no management actions included

15

7.5 Which of the following adjustments are considered as part of setting your coverage ratio risk appetite?



9

'Other' includes adjustments for the risk that solvency estimates are less accurate than hard close results and allowance for VA to vary under credit stress

Technical Practices Survey 2024

7. Capital Management

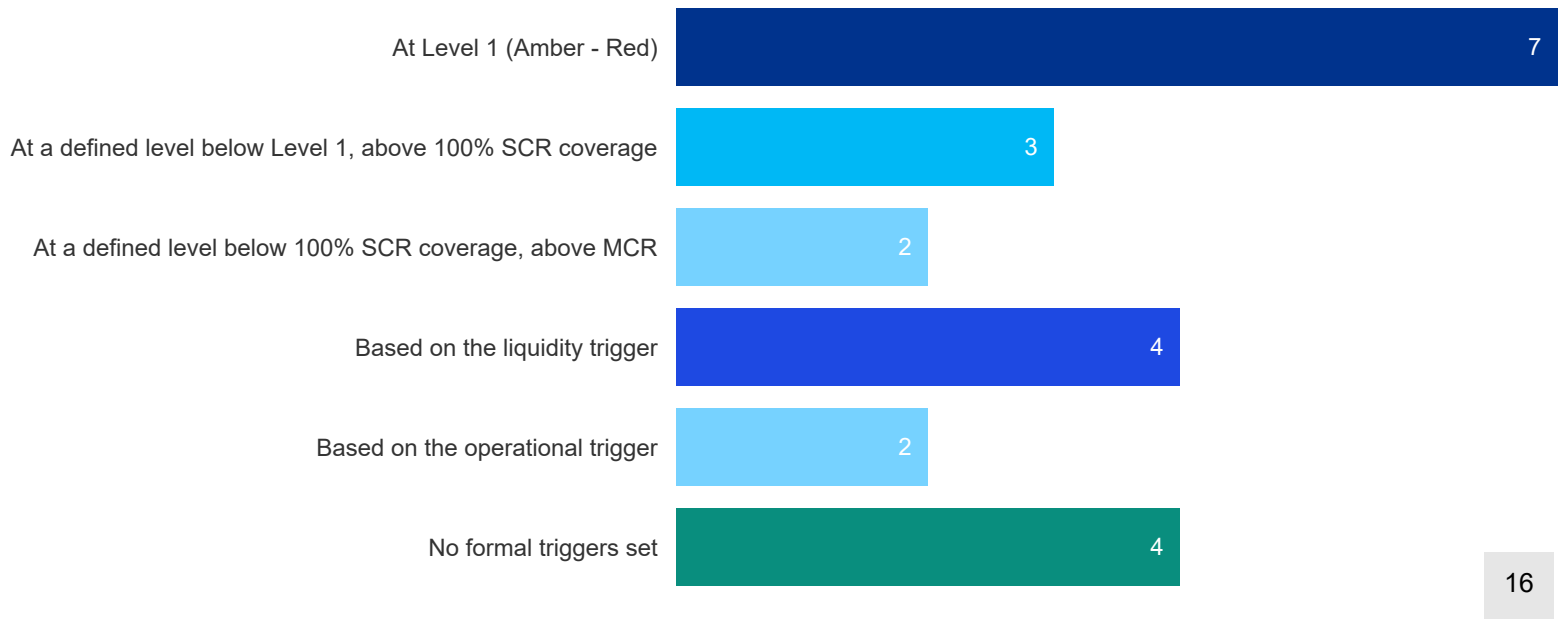
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

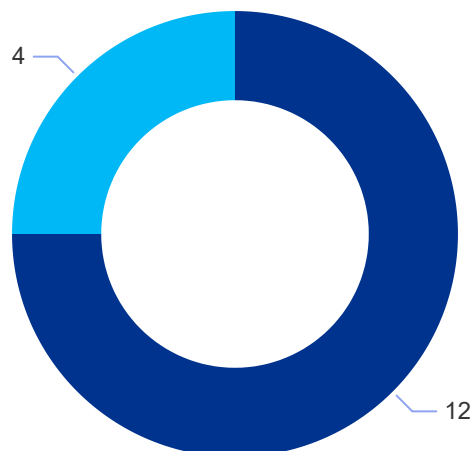
Capital Management

The majority of firms neither changed their approach or calibration in the last 12 months, nor do they plan to change in the near future, at least the next 12 months. The respondents that planned to revise their approach or calibration in the next year commented that the removal of prudence in risk appetite, and reflection of changes in methodology and management actions are the key drivers of change. A few respondents also stated that their recovery plan triggers are set at the group level focusing on group solvency position rather than the insurance entity.

7.6 How have you defined the point at which your Recovery Plan is initiated?

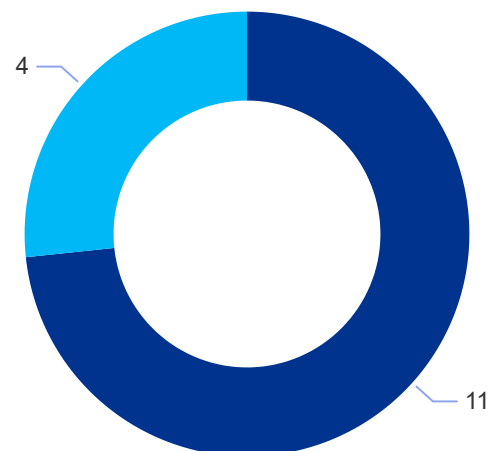


7.7 Have you changed your approach or calibration of risk appetite levels in the last 12 months?



● No ● Yes

7.8 Have you planned any changes in your approach or calibration of risk appetite in the near future, say next 12 months?



● No ● Yes

Technical Practices Survey 2024

7. Capital Management

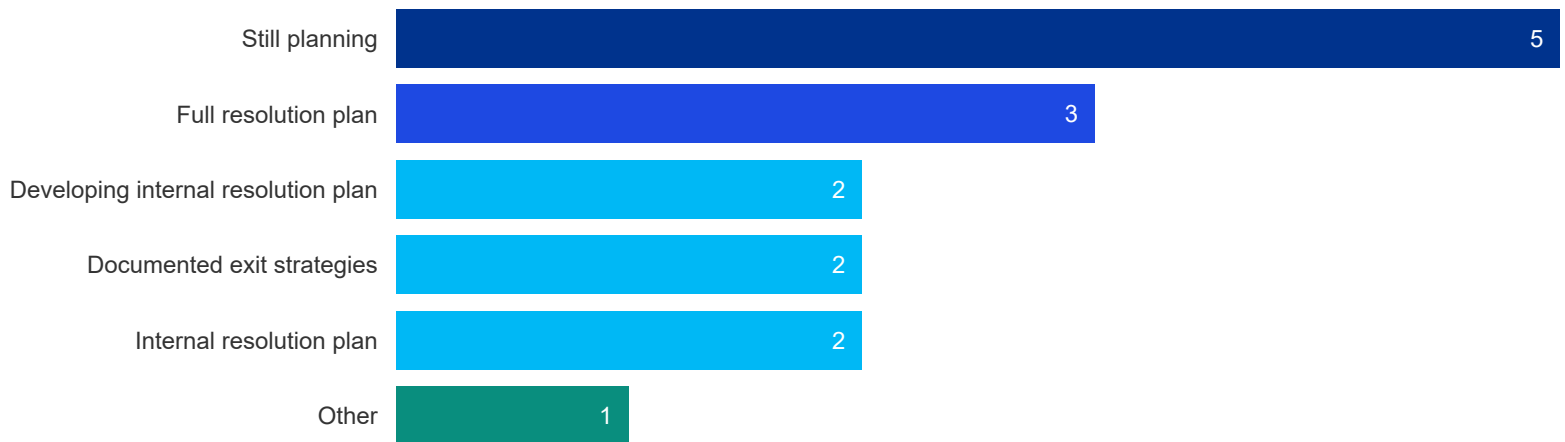
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

Recovery and Resolution Planning (RRP) / Solvent Exit

The PRA proposed in consultation paper CP2/24 that insurers perform and document a Solvent Exit Analysis (SEA) and a Solvent Exit Execution Plan (SEEP), if applicable, by Q4 2025. Most of the respondents stated they will not undertake any actions before the PRA publishes the policy statement. Half of the respondents already have a resolution plan or have documented their exit strategies. Some of them have an existing document which could be used as a starting point in preparing an SEA and a SEEP if applicable. The rest are still planning or developing their approach.

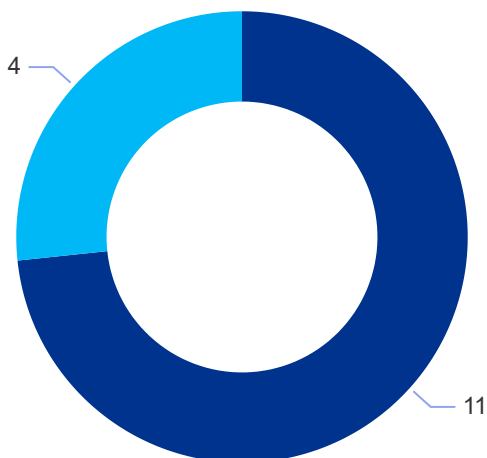
7.9 To what extent are you already prepared for the PRA's focus in 2024 on the ease of exit for insurers?



'Other' includes engaging with management and the PRA

15

7.10 Do you intend to undertake any work before PRA publishes its policy statement (PS)?



● No ● Yes

7.11 Do you possess a framework / documentation which could be used as a starting point in preparing an SEA and, if applicable, a SEEP?



12

Technical Practices Survey 2024

7. Capital Management

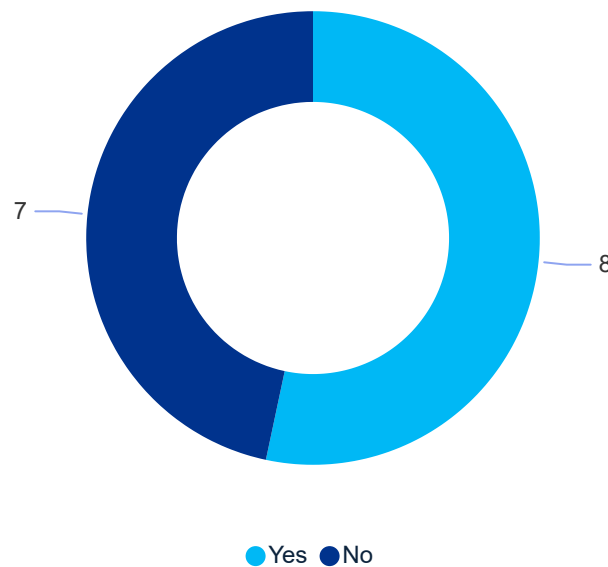
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

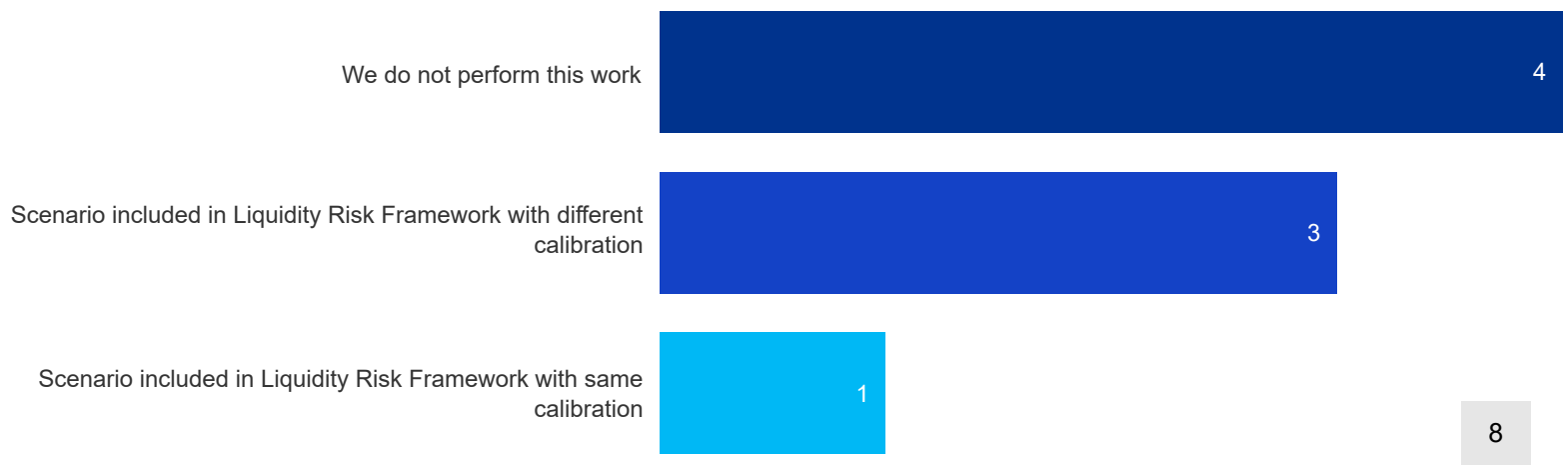
Liquidity Risk

In 2024, the PRA has been consulting with the industry over its approach to monitoring liquidity risk through Liquidity Subject Expert Groups. This is likely to result in substantially enhanced reporting requirements for certain life insurers with exposure to derivatives or mass lapse risk. A consultation paper is expected later in the year relating to the new requirements. We anticipate the new reporting template will require a banking style approach where liquidity resources and needs are analysed in very granular time periods. It is too early to understand the resulting impacts on monitoring metrics or approaches but liquidity is likely to remain an area of close regulatory focus.

7.12 Are you expecting to be included in the PRA's new reporting requirements that it will consult on later in the year?



7.13 Have you performed any work to understand how the SF mass lapse scenario would impact your liquidity position?



Technical Practices Survey 2024

7. Capital Management

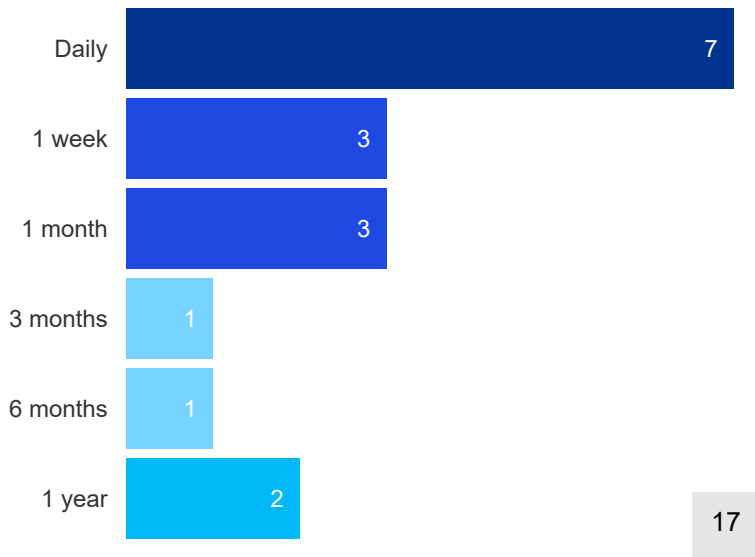
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

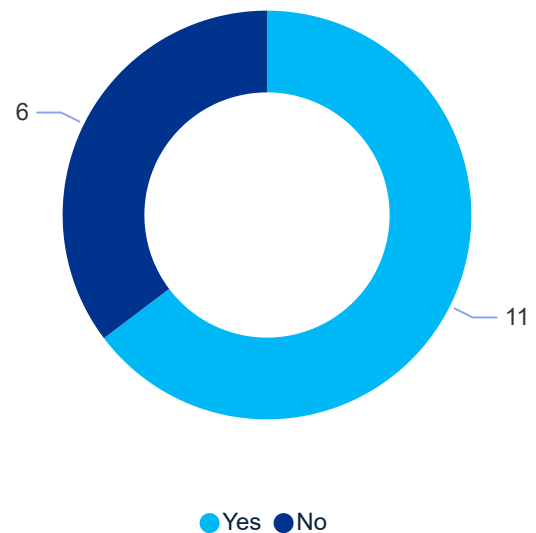
Liquidity Risk

Respondents differ in their approach to liquidity. A majority of the respondents use a Liquidity Coverage Ratio (LCR) for measuring their resilience to liquidity risk. Other respondents stated they monitor their liquidity resilience with stress testing or with a liquidity buffer expressed in monetary value above the liquidity requirement. Many of the respondents are focusing on the very short-term horizons, which is a continuation of a trend seen last year.

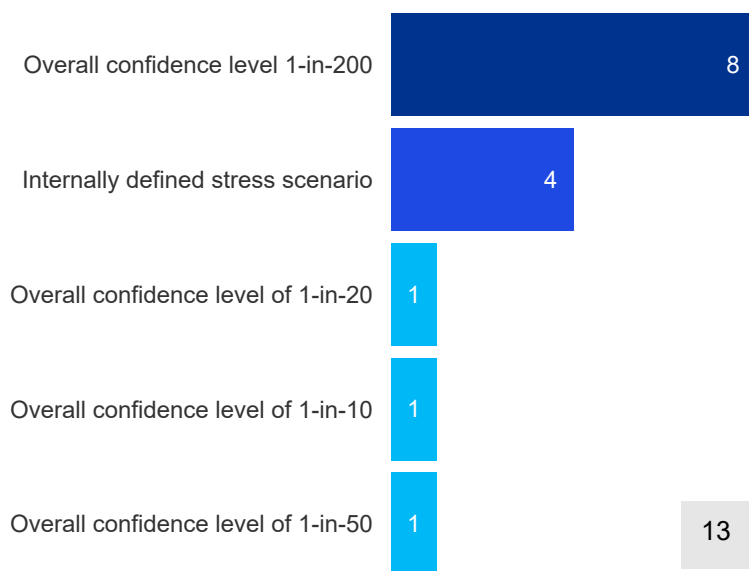
7.14 What is the shortest time horizon you consider for liquidity risk?



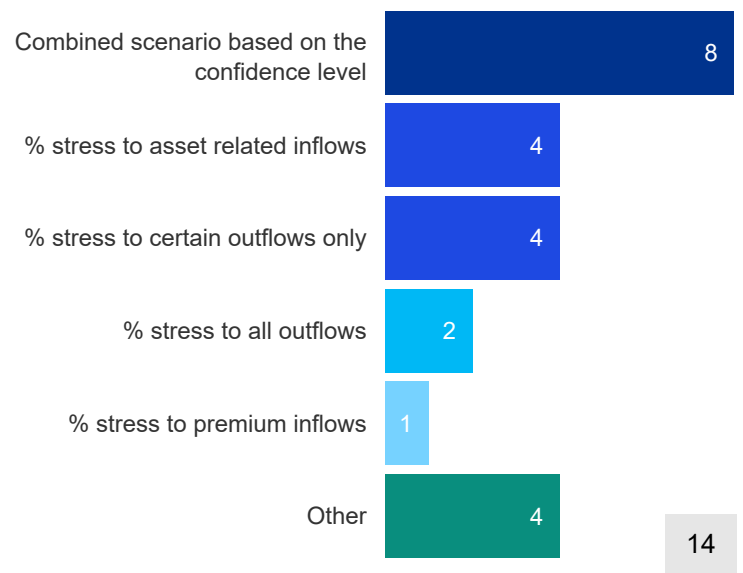
7.15 Do you use a Liquidity Coverage Ratio (LCR) for measuring your resilience to liquidity risk?



7.16 What is the basis of your LCR in stressed conditions?



7.17 How do you apply the stress?



'Others' include stress applied to market value and availability of assets, combined market/persistency stress impacting fee income generation and in, and defined scenarios impacting outflows.

Technical Practices Survey 2024

7. Capital Management

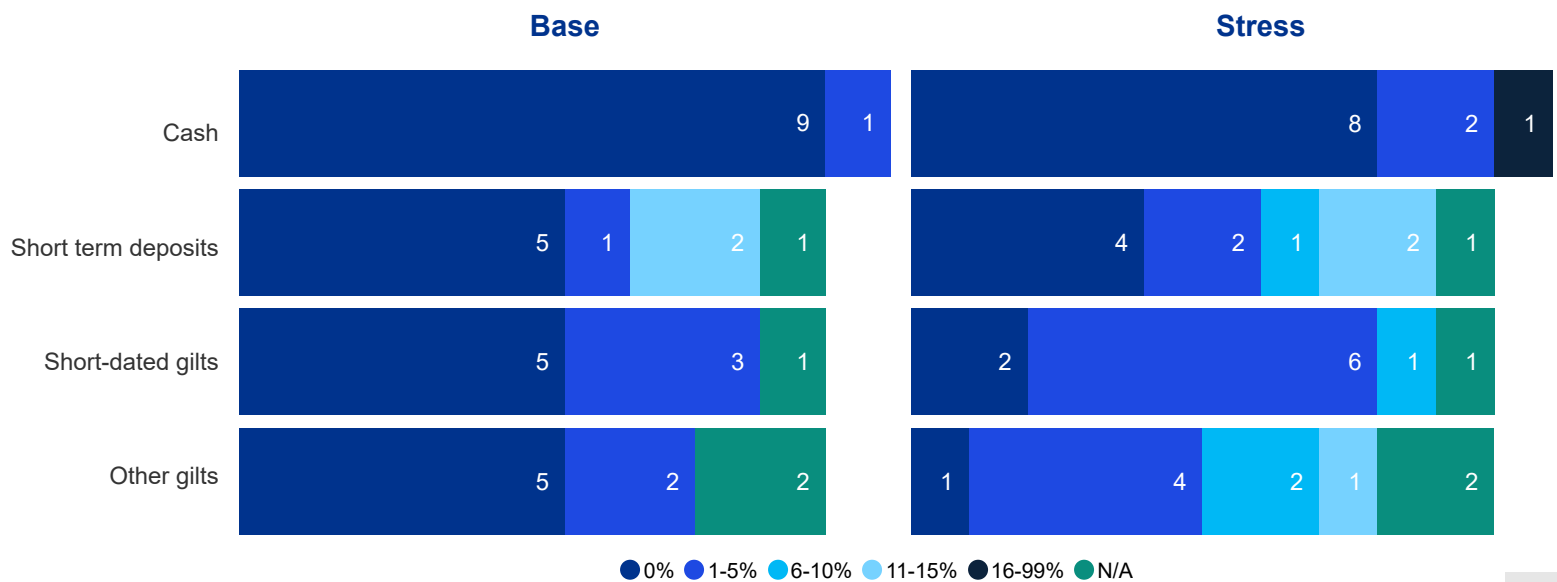
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

Liquidity Risk

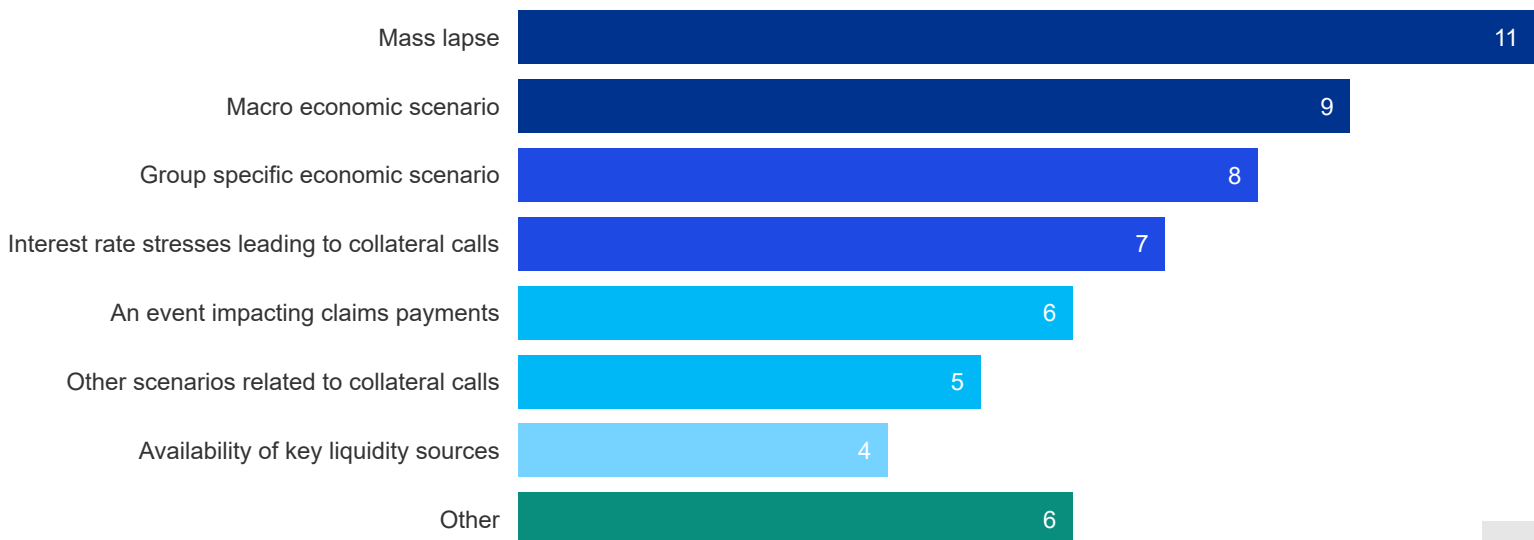
We observed that a wide range of stresses are applied in order to give a full picture of liquidity risk. We asked participants what level of haircuts they are applying on different asset types when assessing liquidity. The haircuts vary by asset type and reflect the ability to monetise holdings under stressed conditions. Most of the respondents do not apply any haircut on cash assets in either base or stressed scenarios. Half of the respondents do not apply haircuts on gilts and short term deposits in base, but most of them have a haircut in stress. Mass lapse and economic scenarios continue to be the most common stresses considered by the respondents.

7.18 What haircuts do you apply to the following asset types in assessing the liquidity risk in both Base and Stressed scenario?



11

7.19 What liquidity scenarios do you test within your SST framework or ORSA?



15

'Other' includes a combination of the above and a range of operational risk scenarios.

Technical Practices Survey 2024

8. Operational Risk

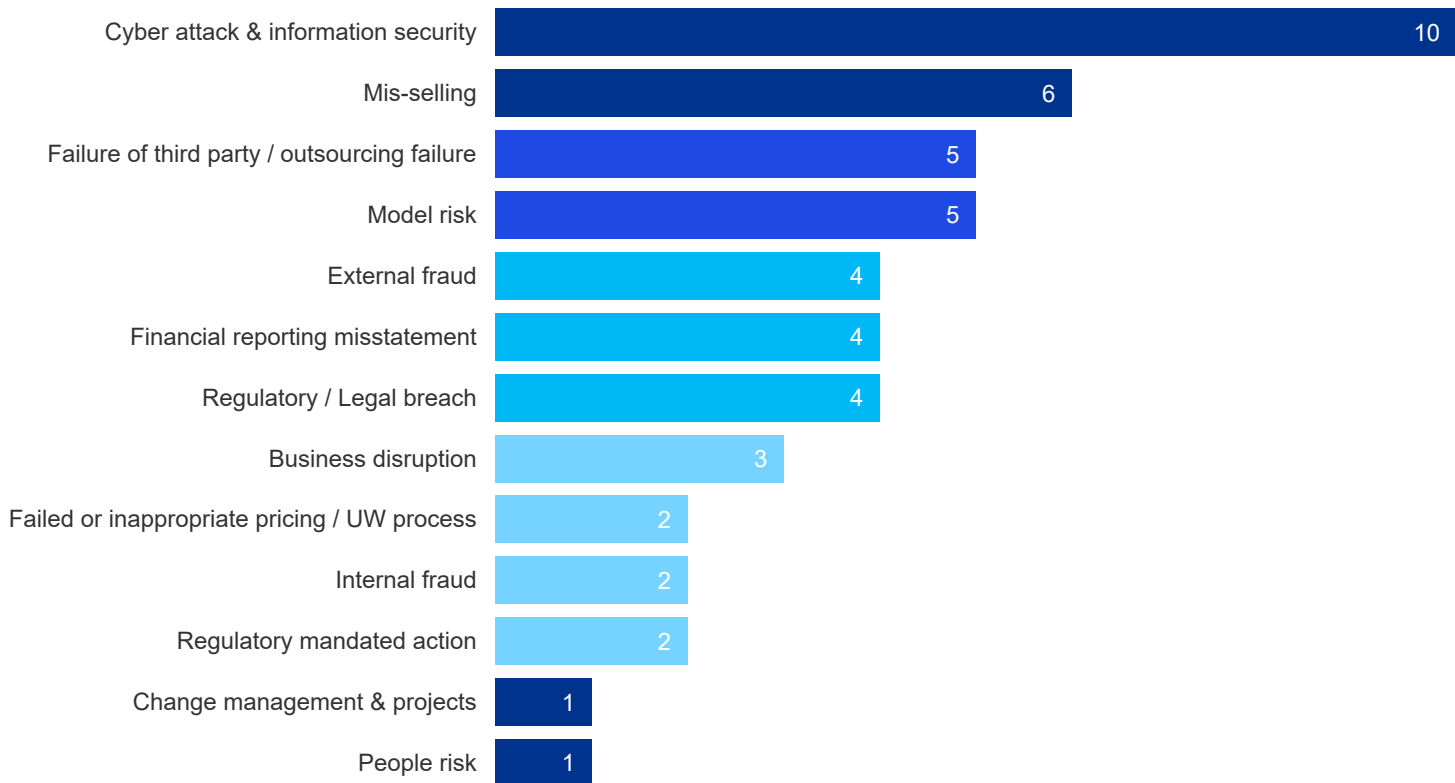
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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SF/IM

Operational Risk Capital

This section covers methodologies in respect of operational risk capital. We asked about the sort of risk scenarios that materially contribute to operational risk capital. We continue to see a wide range of responses which reflects differences in the operating models of respondents and therefore the risks that arise. There are also some differences in how risks are classified and defined. In line with prior year, most respondents continued to rank cyber attack and information security, model risk and mis-selling within their top five.

8.1 If you were to rank your largest Operational risks (by undiversified capital), which of the following would be in the top five risks?



Technical Practices Survey 2024

8. Operational Risk

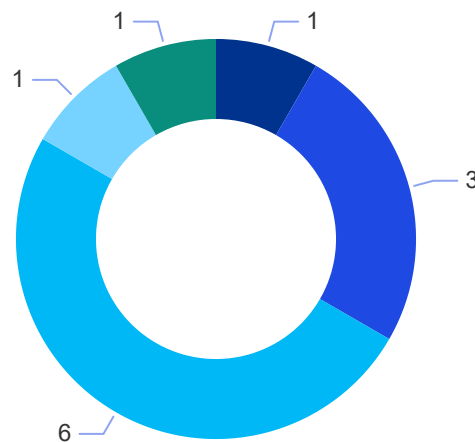
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF/IM

Operational Risk Capital and Calibration

Similar to last year, the majority of the respondents stated they are using statistical frequency / severity models for estimating their operational risk capital requirement. Most respondents use risk workshops to calibrate the operational risk capital model and it remains common practice to explore a relatively wide number of scenarios and ensure the workshop participants consider recent events and data when discussing model parameters and risk drivers. Many respondents find the process of holding workshops to explore operational events to be a useful exercise and therefore they are using this as part of their overall risk management as well as to set capital requirements

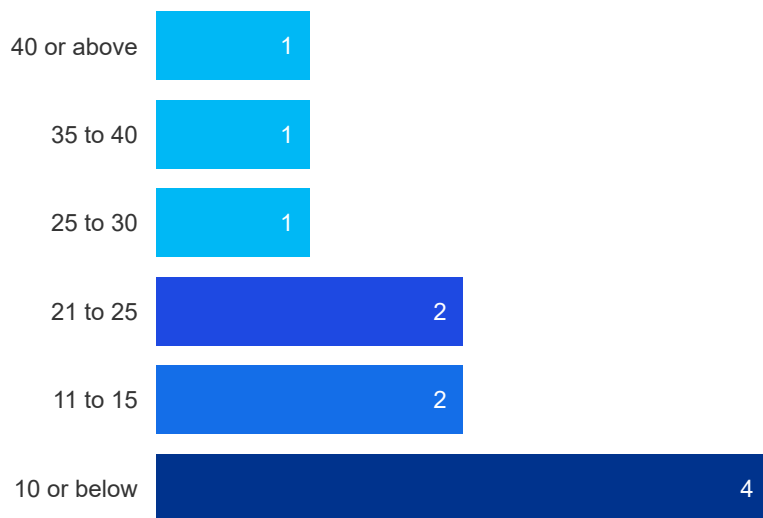
8.2 What type of methodology does your firm use for estimating its operational risk capital requirement?



● Simple estimation approach
 ● Multiple scenarios (deterministic)
 ● Monte Carlo / statistical frequency / severity model
 ● Statistical model using conditional dependencies
 ● Other

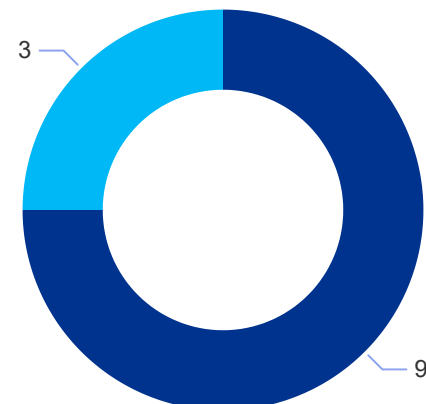
'Other' includes using a hybrid model, which combines historic loss data in a statistical model with deterministic scenario analysis of multiple scenarios.

8.3 For how many different operational risks do you use scenario workshops / expert judgement to set the modelling parameters?



11

8.4 Do you model your frequency and severity distribution separately?



● Yes
 ● No

Technical Practices Survey 2024

8. Operational Risk

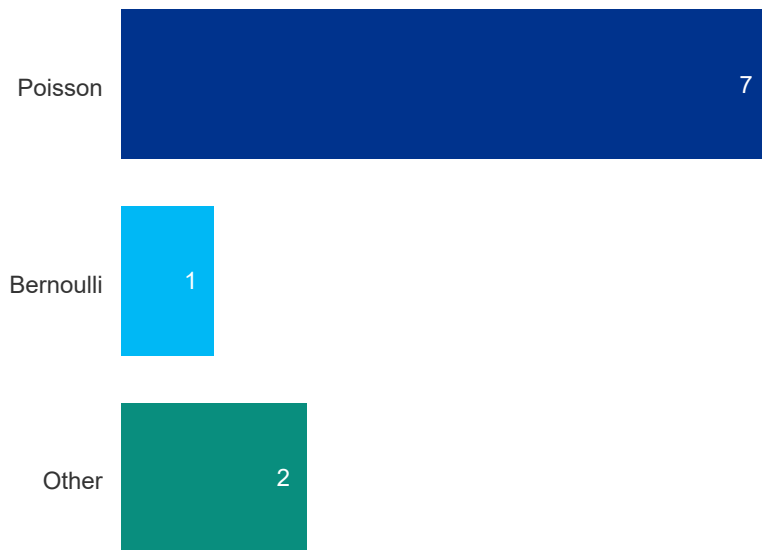
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF/IM

Operational Risk Capital and Calibration

The Poisson distribution remains the most common way to model event frequency. For severity, there is a wider variety of distributions used and the use of more than one distribution is also prevalent. The Log-normal distribution remains the most commonly used statistical distribution to model severity. Most respondents use a single type of risk event when fitting the severity distribution.

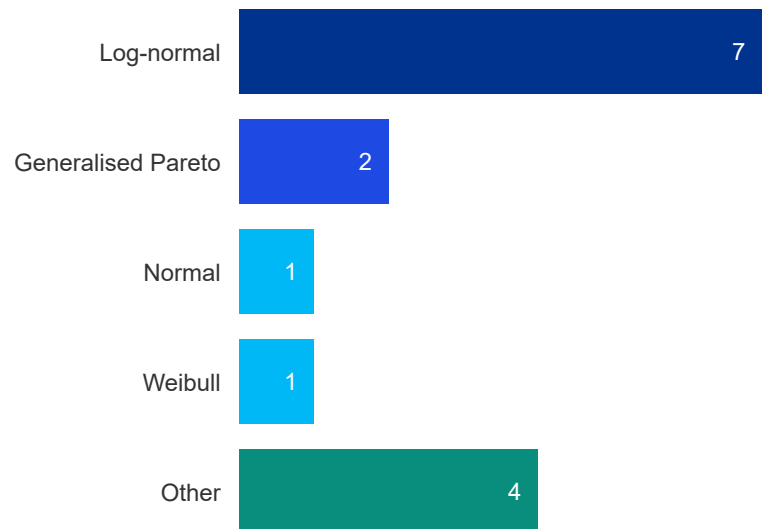
8.5 What statistical distributions are used to model the frequency of your operational risk scenarios?



'Other' is conditional Bernoulli distribution and expert judgements, exposure-based scenario analysis using various distributions

9

8.6 What statistical distributions are used to model the severity of your operational risk scenarios?



'Other' includes the Burr distribution, expert judgements, exposure-based scenario analysis using various distributions and Cubic-spline fitting

10

8.7 Do you use any blending of different risk events to fit a distribution to the severity of any scenario or are they based on a single type of risk event?



10

Technical Practices Survey 2024

8. Operational Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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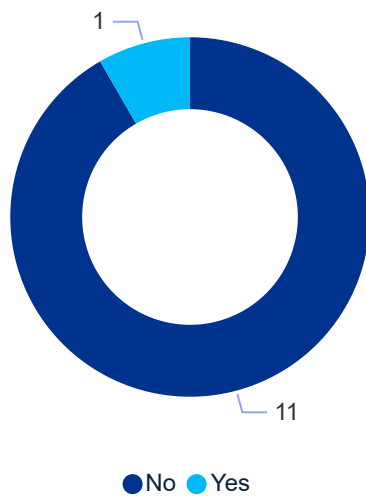
SF/IM

Operational Risk Capital and Calibration

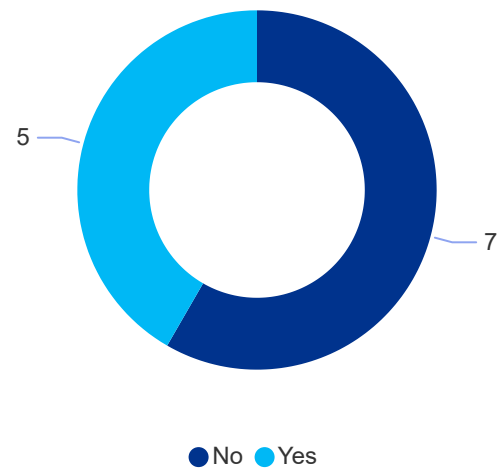
The operational risk modelling has remained fairly static over the year among our respondents, though they indicate an appetite to change over the next year. Four respondents plan to update the operational risk assumptions and model after a model review. One respondent commented that they plan to update the model to reflect changes in business and increased exposure to cyber risk.

As in previous years, the majority of companies source data from internal and external data for identifying and calibrating events, with a leaning towards internal data. Further, the direct use of data for setting parameters is limited with greater use of this data to inform expert judgement and validating the risk capital.

8.8 Have there been any changes to the statistical distributions used to model the frequency or severity of your operational risk scenarios in the last 12 months?



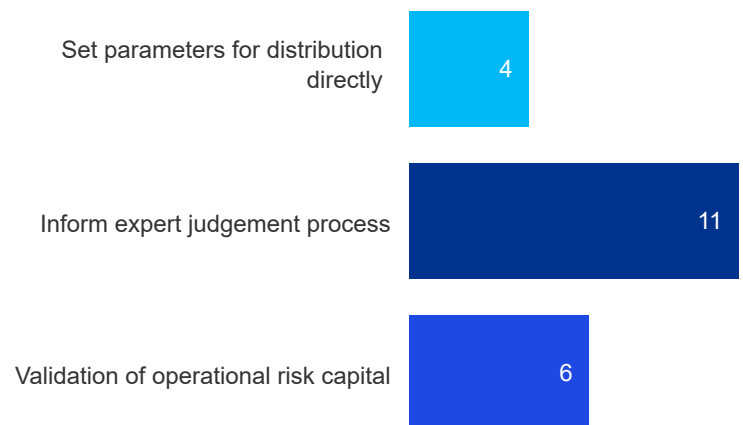
8.9 Have you planned any changes to your operational risk modelling in the near future, say next 12 months?



8.10 What data do you use in your operational risk calibration process?



8.11 How is internal/external data used in your operational risk model?



12

12

Technical Practices Survey 2024

8. Operational Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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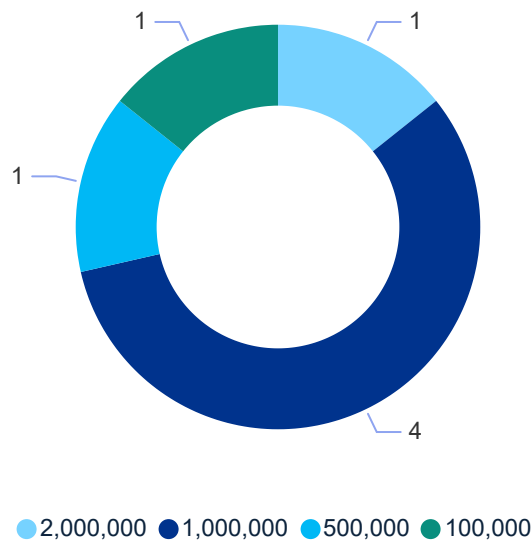
SF/IM

Operational Risk Capital and Calibration

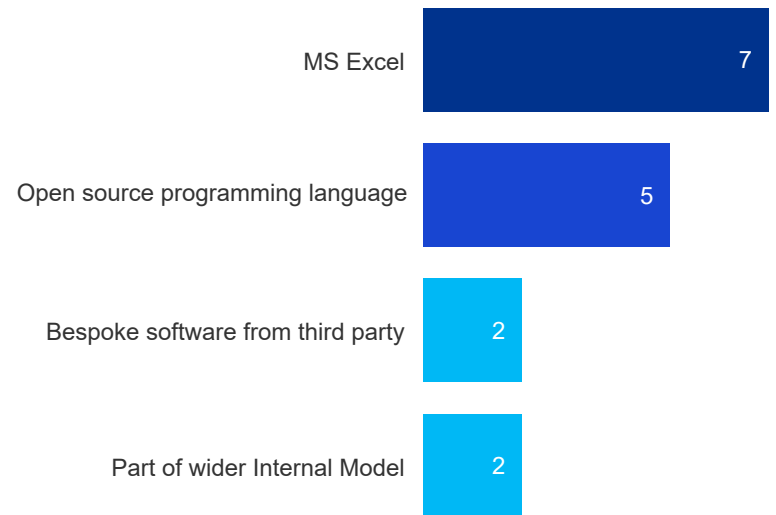
Most of the respondents have spreadsheet models or open source programming language models tailored for their operational risk portfolio. Almost all of the respondents are performing at least 100,000 simulations in their models.

In the operational risk modelling, about half of the respondents allow for the recoveries from corporate insurance in the operational risk scenarios. For the respondents that allow for diversification between operational risks, and between other risks, all of them set the correlations between risks using expert judgment. Three of the respondents stated that they supplement the expert judgments with causal driver approach as well.

8.12 How many simulations are used in your operational risk model?

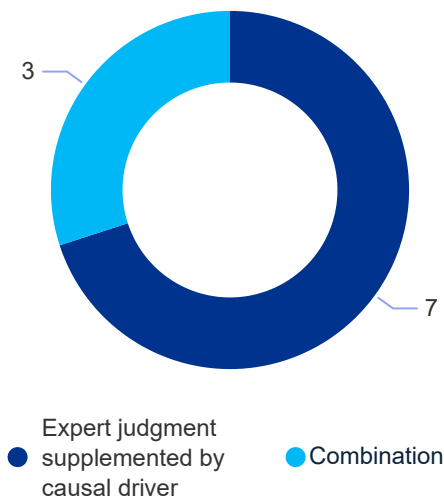


8.13 Which software platform is used to model your operational Risk?

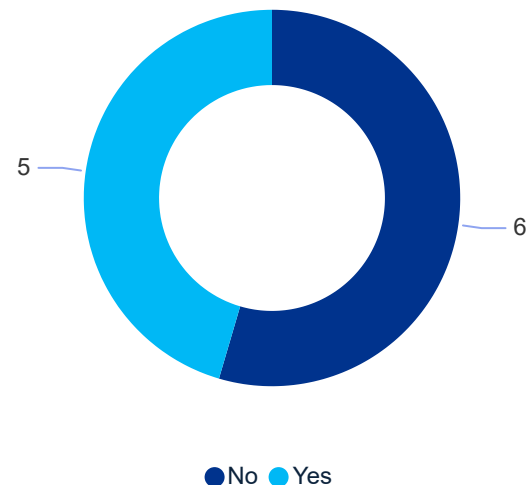


12

8.14 On what basis are correlations set between operational risks, and between operational risk and other risks?



8.15 Do you allow for recoveries from corporate insurances on your operational risk scenarios?



Technical Practices Survey 2024

8. Operational Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
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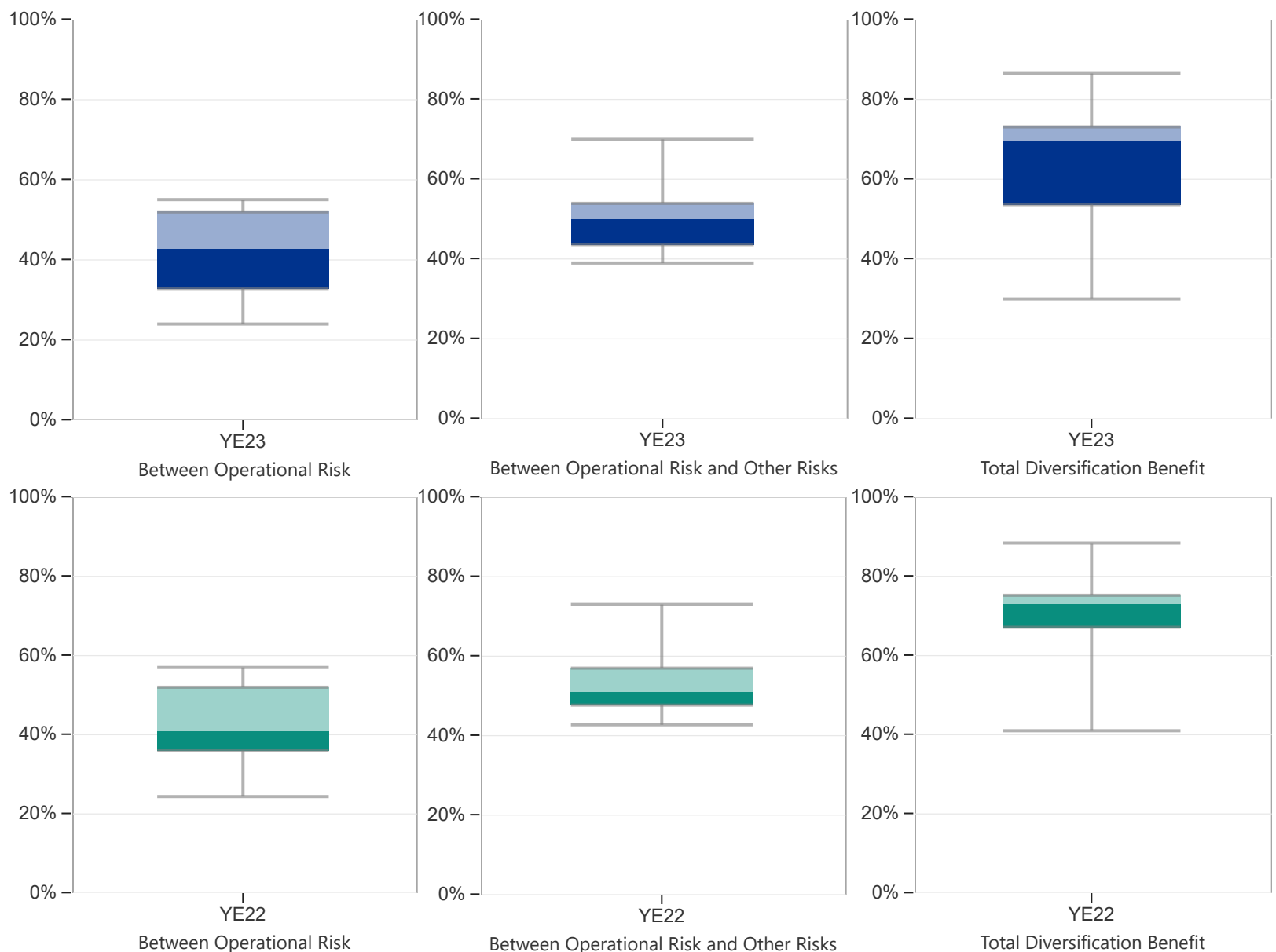
SF/IM

Correlations, Diversification, and Recoveries

Operational risk diversifies heavily with other risks, ranging from 30% to 87% across our respondents. The respondents achieve a high level of diversification between different operation risk and between the total operational risks and other risks. Therefore, operational risk contributes less to the overall capital requirement than might appear from the individual scenarios. The level of diversification benefit is based on subjective assumptions based on expert judgement. Even the alternative approach of using causal driver analysis is underpinned by expert judgment. Therefore, insurers need to keep the correlation parameters and level of diversification benefit under review, given the level of impact on the results.

One firm responded with substantially higher diversification benefit between their operational risks and other risks as a percentage of undiversified operational risk capital as compared to all other respondents. Diversification benefit between operational risks remained consistent to previous year. However, diversification benefit between operational risks and other risks has decreased slightly when compared to last year.

8.16 What diversification benefit are you able to achieve, as a percentage of undiversified operational risk capital?



Technical Practices Survey 2024

8. Operational Risk

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

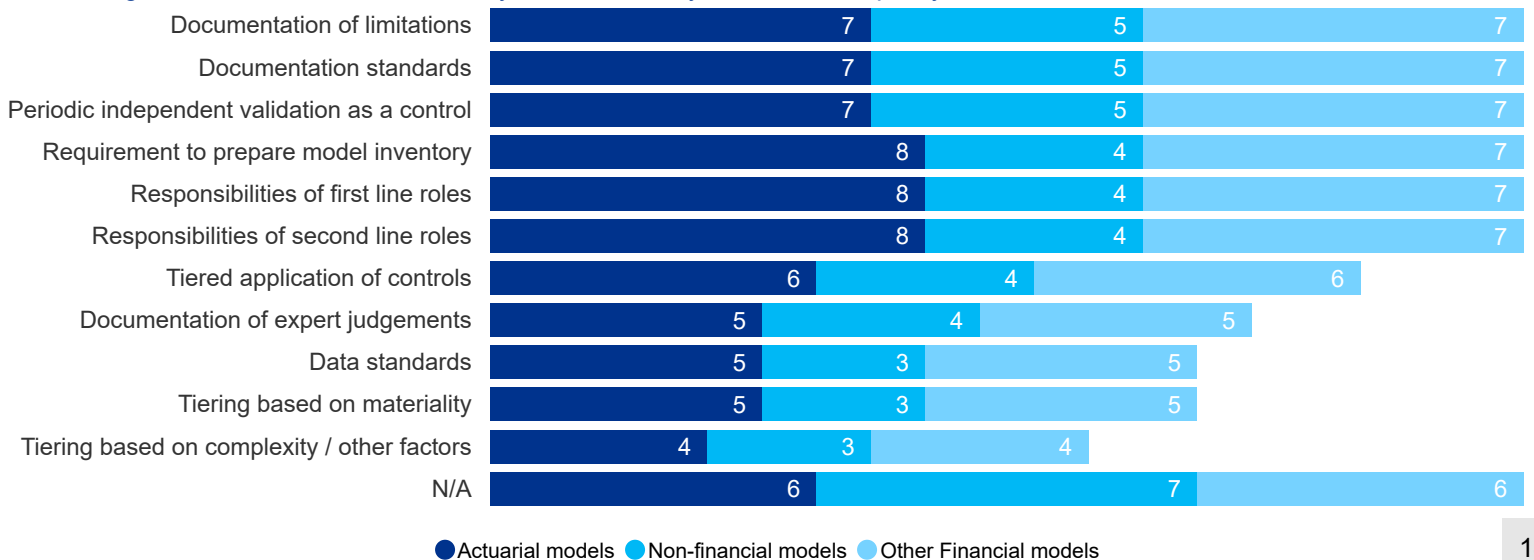
SF/IM

Model Risk Management

Given the importance of model risk and the continued regulatory focus, we asked respondents about their model risk management. We see continued progress in setting up model risk frameworks and extending the Internal Model control environment to wider models. We continue to see a high degree of consistency in approaches between respondents. Respondents treated actuarial models, financial models and other models the same within their framework. The chart below shows a varying degree of controls applied to the three types of models. One of the most common risk control measure is regular independent validation. Respondents also regularly use controls related to documentation such as maintaining standards or documenting limitations as well as defining clear roles and responsibilities as ways of managing model risk.

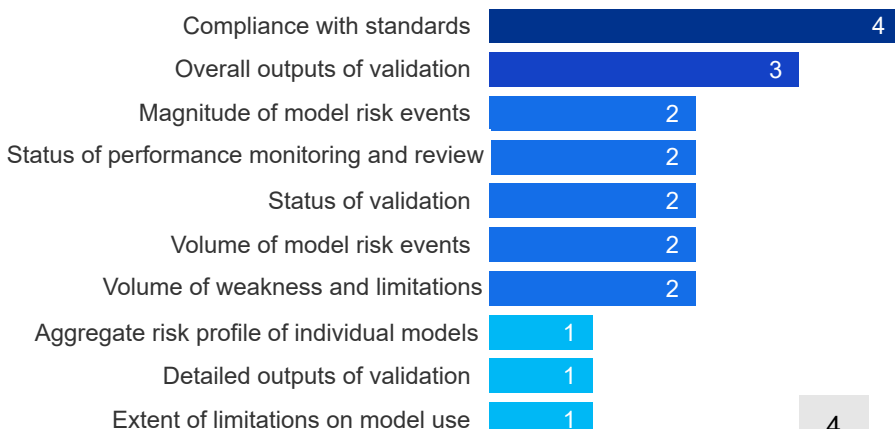
The metrics for risk appetite are broad and variable across the respondents. The most common metric is around compliance with standards and overall level of output of validation. There is some measurement around volume of events, weakness and limitations. The governance structure for model risk management and model validation is variable across respondents. About half of the respondents do not have a dedicated committee for model oversight. Half of the respondents have a Line 2 Committee for model risk governance, and a few also have a Line 1 Committee that supports the model methodology and technical review. For respondents that use Standard Formula, if a committee is used, it oversees all models. However, the position for respondents that use an Internal Model is mixed. Two respondents have a single committee covering both the IM and other models, but another two have separate committees for the different models.

8.17 To manage model risk, what controls do you mandate in your model risk policy for models other than the Internal Model?



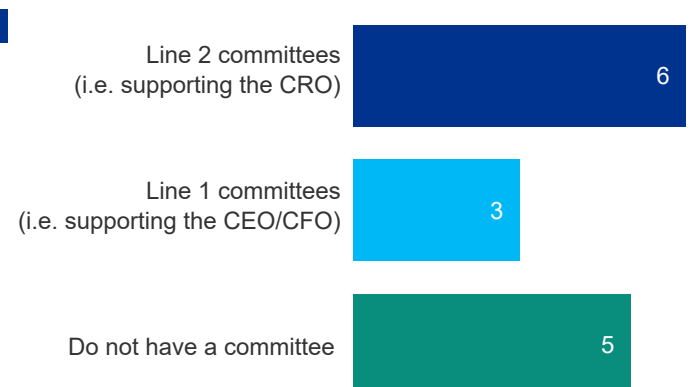
14

8.18 Which of the following components are included in your risk appetite / reporting for model risk?



4

8.19 Do you have a committee dedicated to model risk management and model validation?



11

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9. Aggregation

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

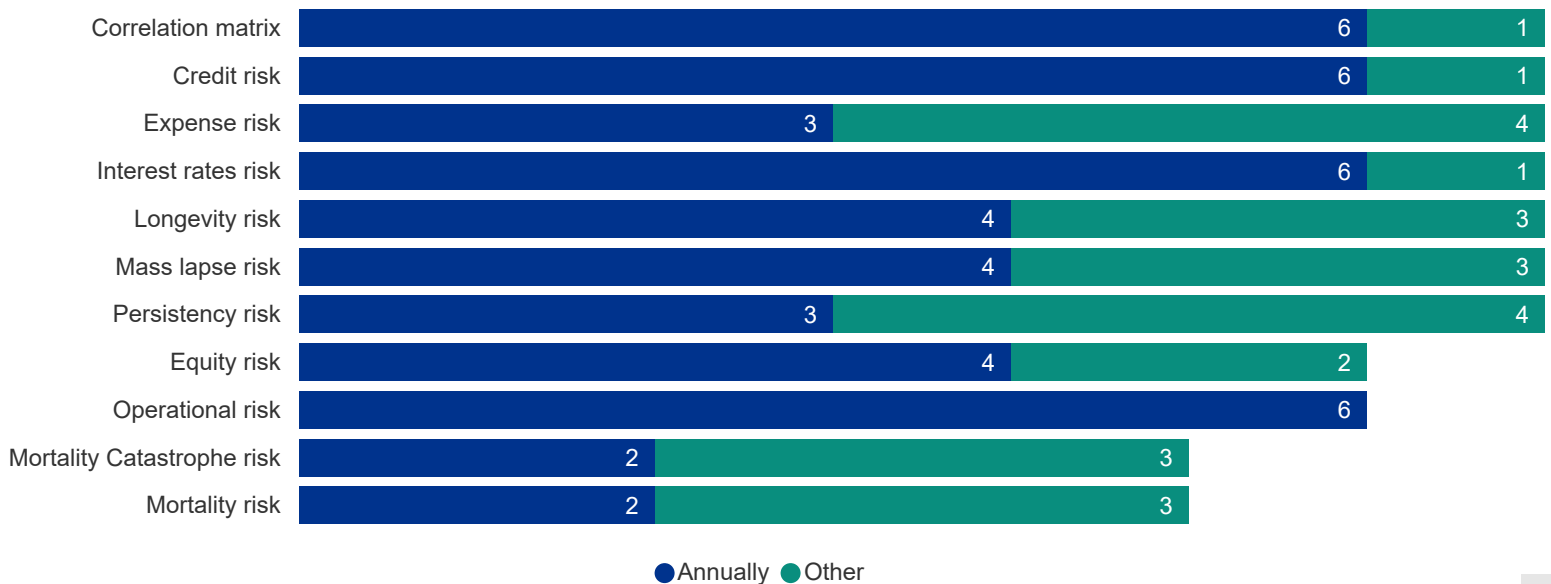
IM

Risk Calibration and Proxy Models

In general firms continue to perform their risk calibrations annually but some firms update the less material risks less frequently, for example on a triennial basis.

A number of firms are enhancing the calculation of Matching Adjustment under Stress (MAuS) in their capital model. Other areas of development include enhancing the current proxy model fitting algorithm, increasing the amount or improving the quality of the data used for calibration and validation, and moving to direct integration with credit modelling.

9.1 How frequently do you calibrate the following risks?



7

'Other' refers to respondents who do not have a fixed calibration frequency or who calibrate on a triennial or biennial basis

9.2 Are you planning any development to your capital model?



'Other' includes adding subsidiary entity and using higher polynomial terms for certain types of business

6

Technical Practices Survey 2024

9. Aggregation

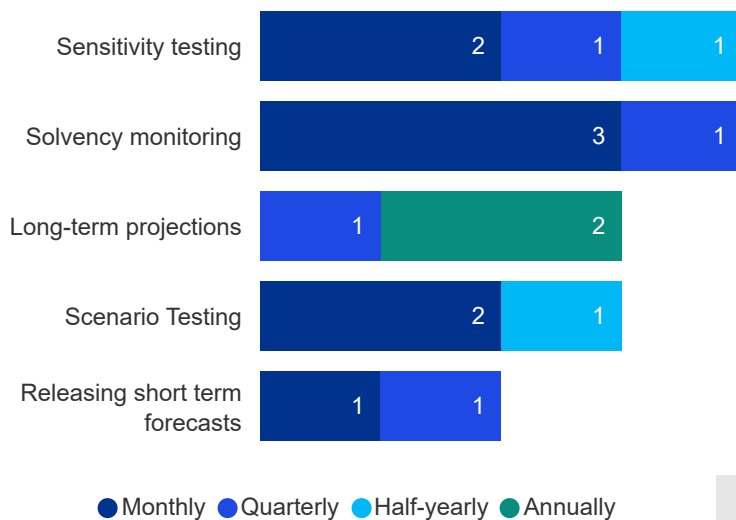
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

Proxy Modelling

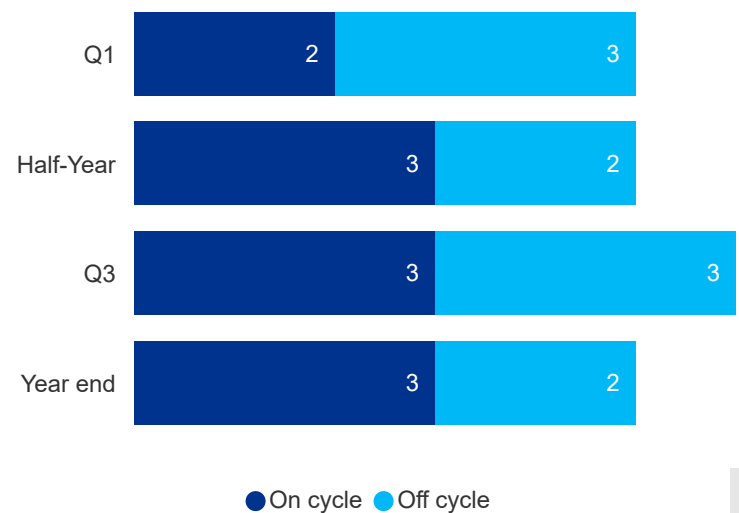
Proxy modelling is used for purposes beyond measuring capital requirements. Our respondents are also using these models for short term forecasting and long-term projections. The calibration process is increasingly happening on-cycle, using enhancements in IT infrastructure and cloud computing to achieve this. Not all firms have developed the capabilities to calibrate the proxy model for reporting on-cycle. For those reporting off-cycle, all perform their calibration within three months prior to reporting date.

9.3 For what purposes do you use your proxy model?



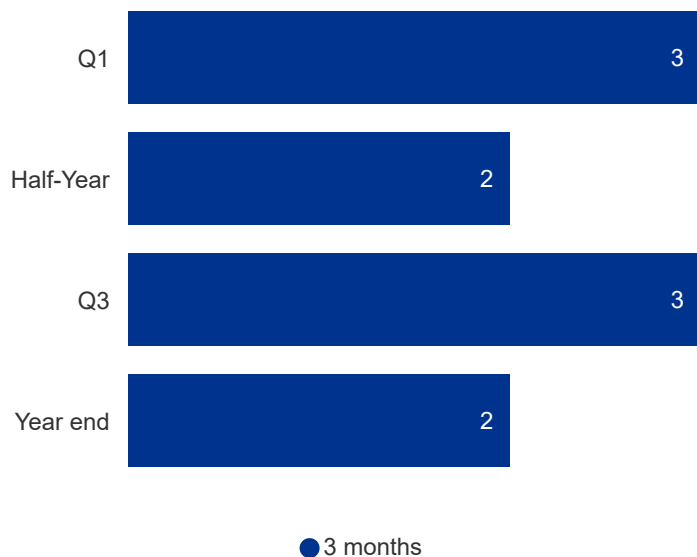
4

9.4a At each reporting period, do you calibrate your proxy model for reporting on-cycle or off-cycle?



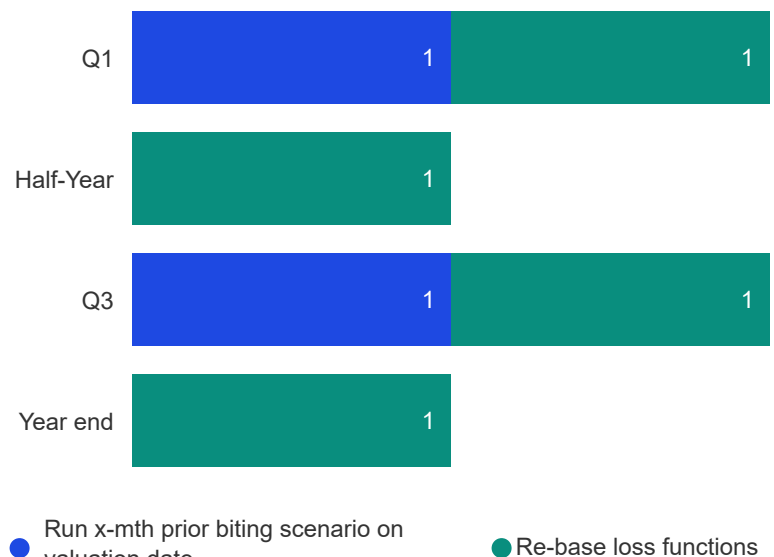
6

9.4b If performed off cycle, how many months prior to reporting date is the calibration performed?



3

9.4c If performed off cycle, how is the SCR rolled forward?



2

Technical Practices Survey 2024

9. Aggregation

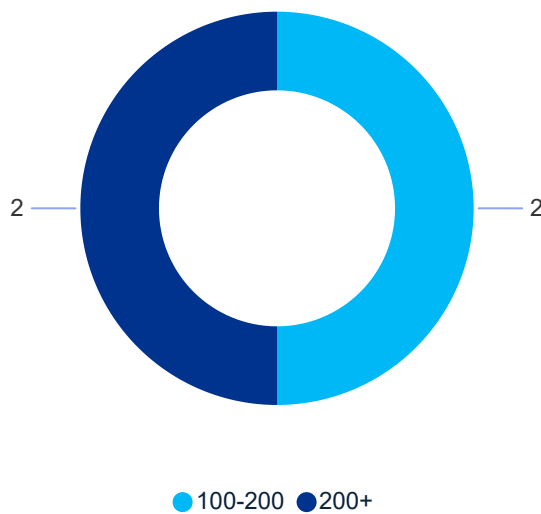
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM Proxy Modelling

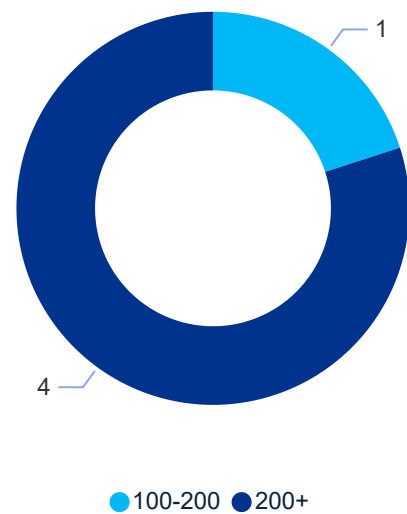
All of the respondents use a minimum of 100 scenarios, with With Profits an Other Funds using a minimum of 200. The number of validation scenarios varies from the number of fitting scenarios, with some firms using a more parsimonious approach. We note that there is no change in process among respondents.

9.5 For your largest fund, how many fitting scenarios do you perform?

With-profits Fund

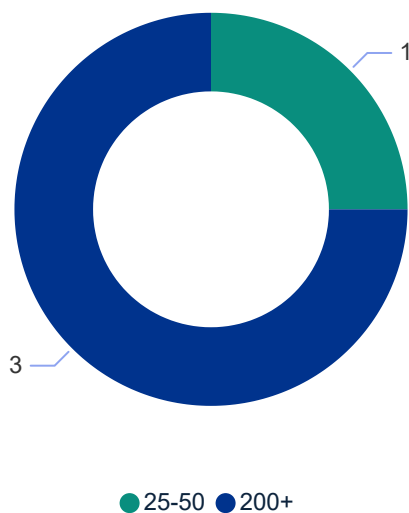


Other Funds

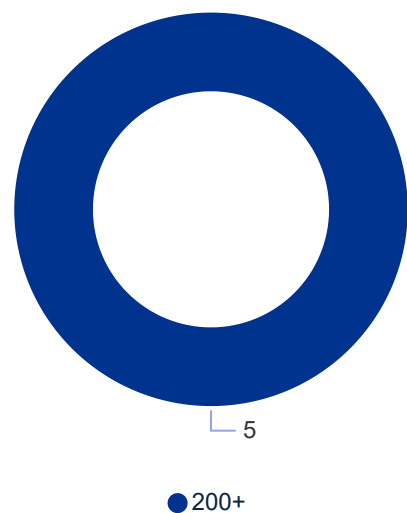


9.6 For your largest fund, how many validation scenarios do you perform when testing the goodness-of-fit?

With-profits Fund



Other Funds



Technical Practices Survey 2024

9. Aggregation

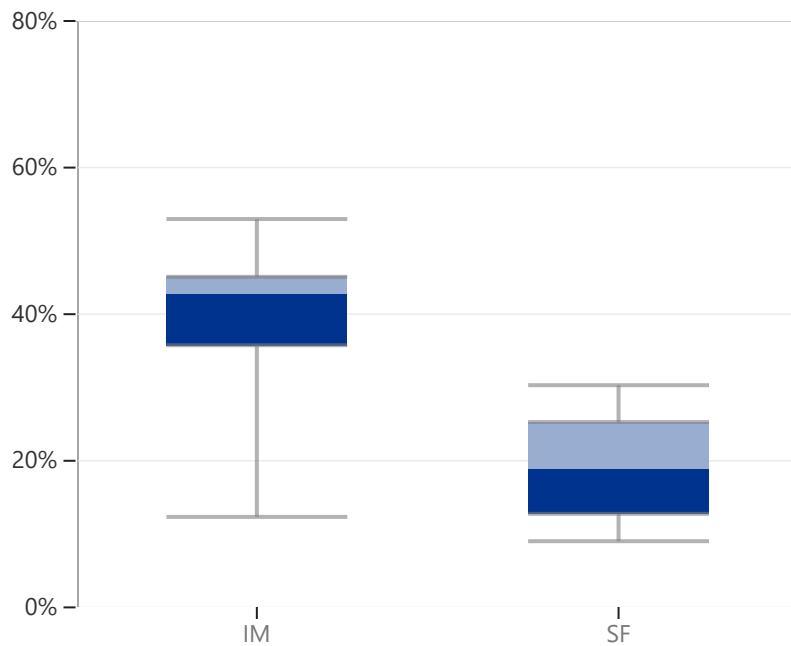
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

SF/IM

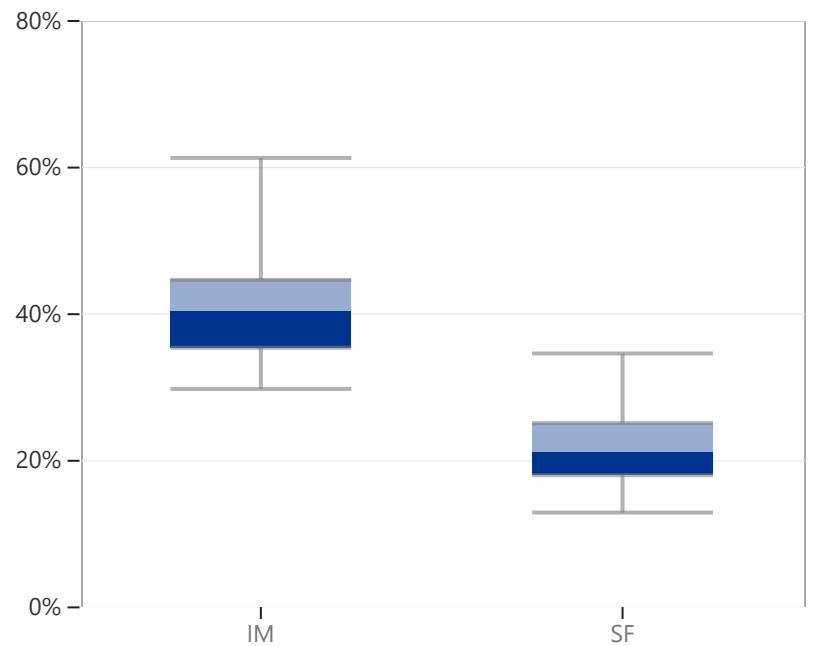
Diversification Level

The diversification benefits presented in chart 9.10 are the percentage by which the total SCR, excluding Loss Absorbing Capacity of Technical Provisions and Deferred Taxes. Internal Model firms are able to achieve higher diversification than the Standard Formula firms.

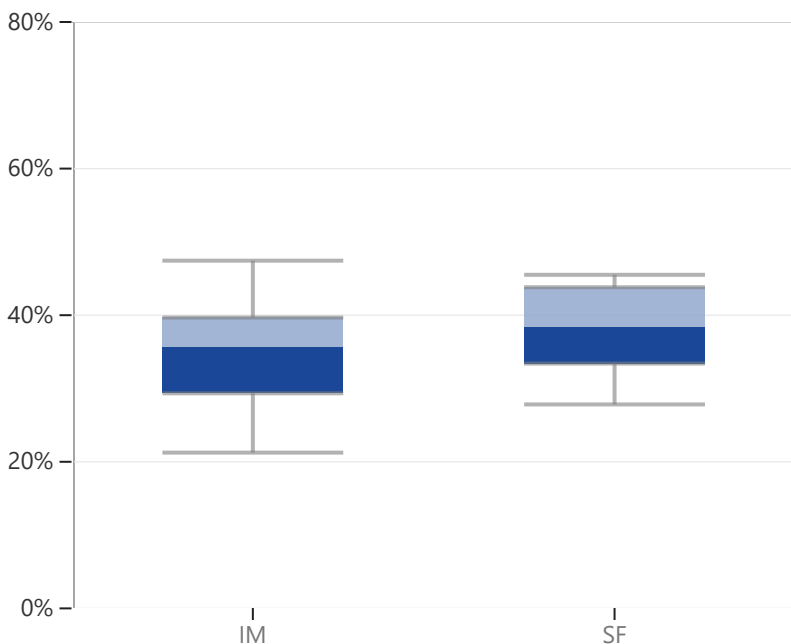
9.7 Diversification amongst life risks as a percentage of total undiversified risk (%)



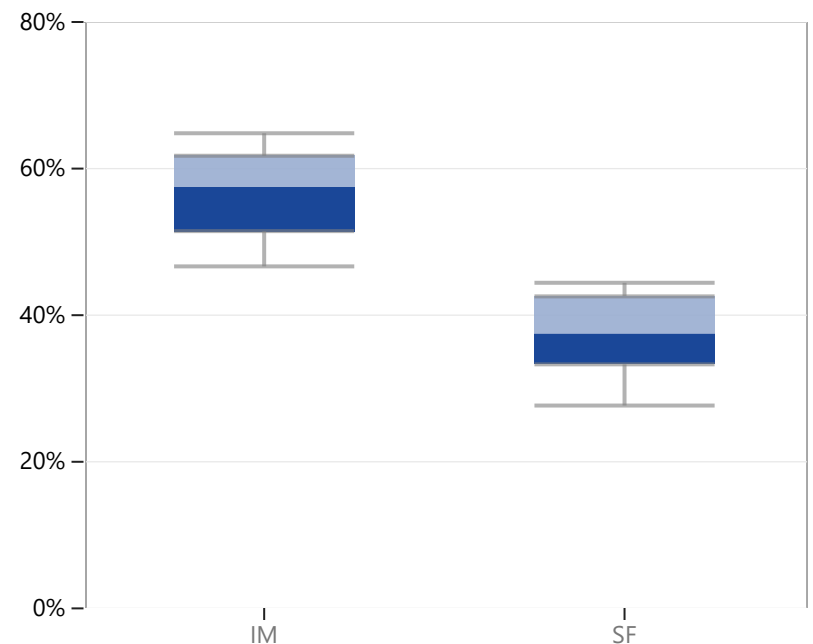
9.8 Diversification amongst market risks as a percentage of total undiversified risk (%)



9.9 Diversification between risk modules (%)



9.10 Total Diversification (%)



Technical Practices Survey 2024

10. Correlation

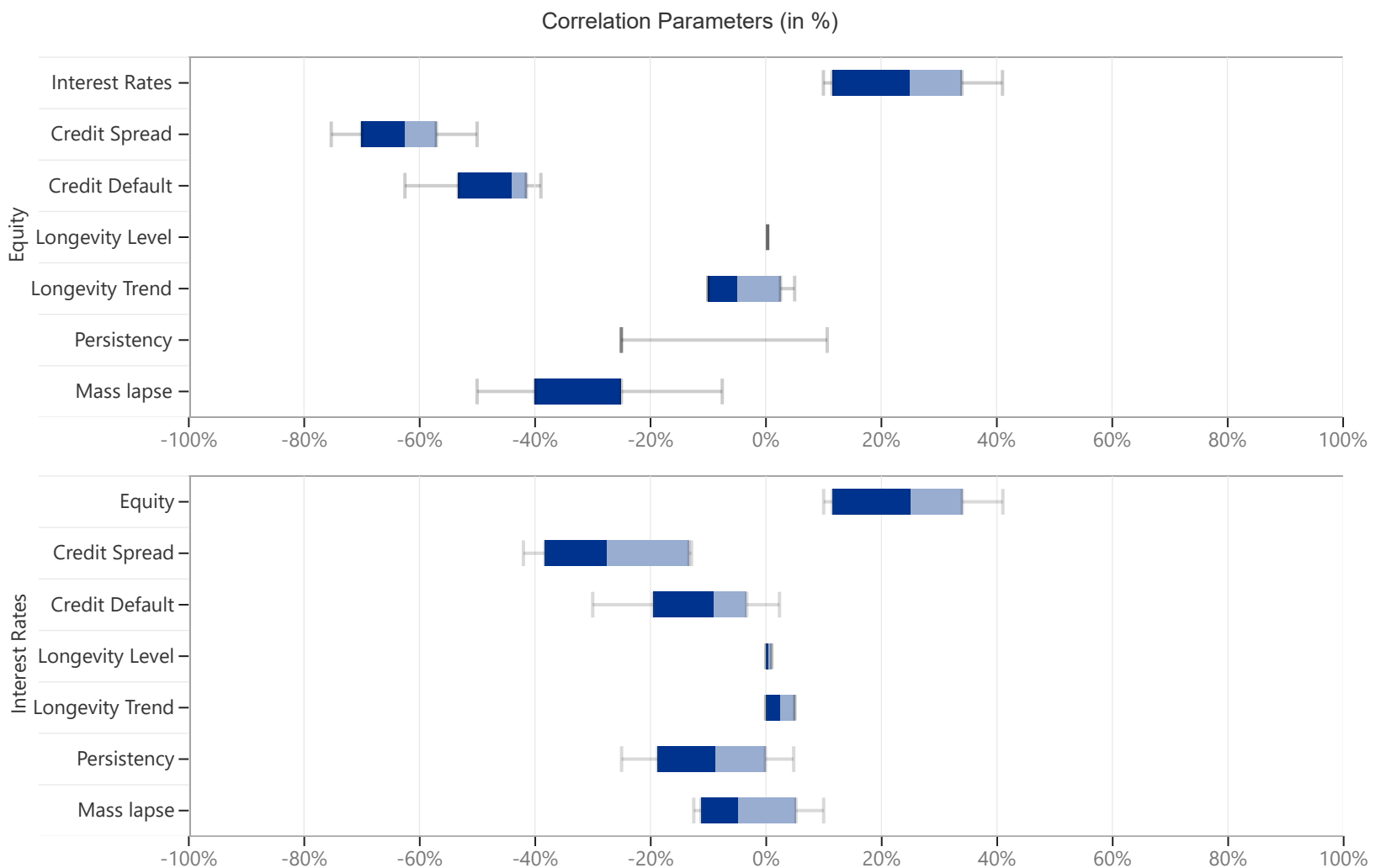
1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM

Correlation Parameters

Correlation matrices were provided by eight internal model firms. The majority of the correlations have remained unchanged from year to year with two firms making no changes at all to their correlation matrix. This is, however, an area of significant judgement and the movements are relatively minor, less than 5% movement. Only one respondent made a change to any of their market/non-market correlations.

In order to facilitate better comparability for the correlation pairs, the data submitted have been amended where required to appropriately align sign conventions amongst respondents. Not all respondents complete a full correlation matrix, so there are some correlation pairs with fewer data points than others.



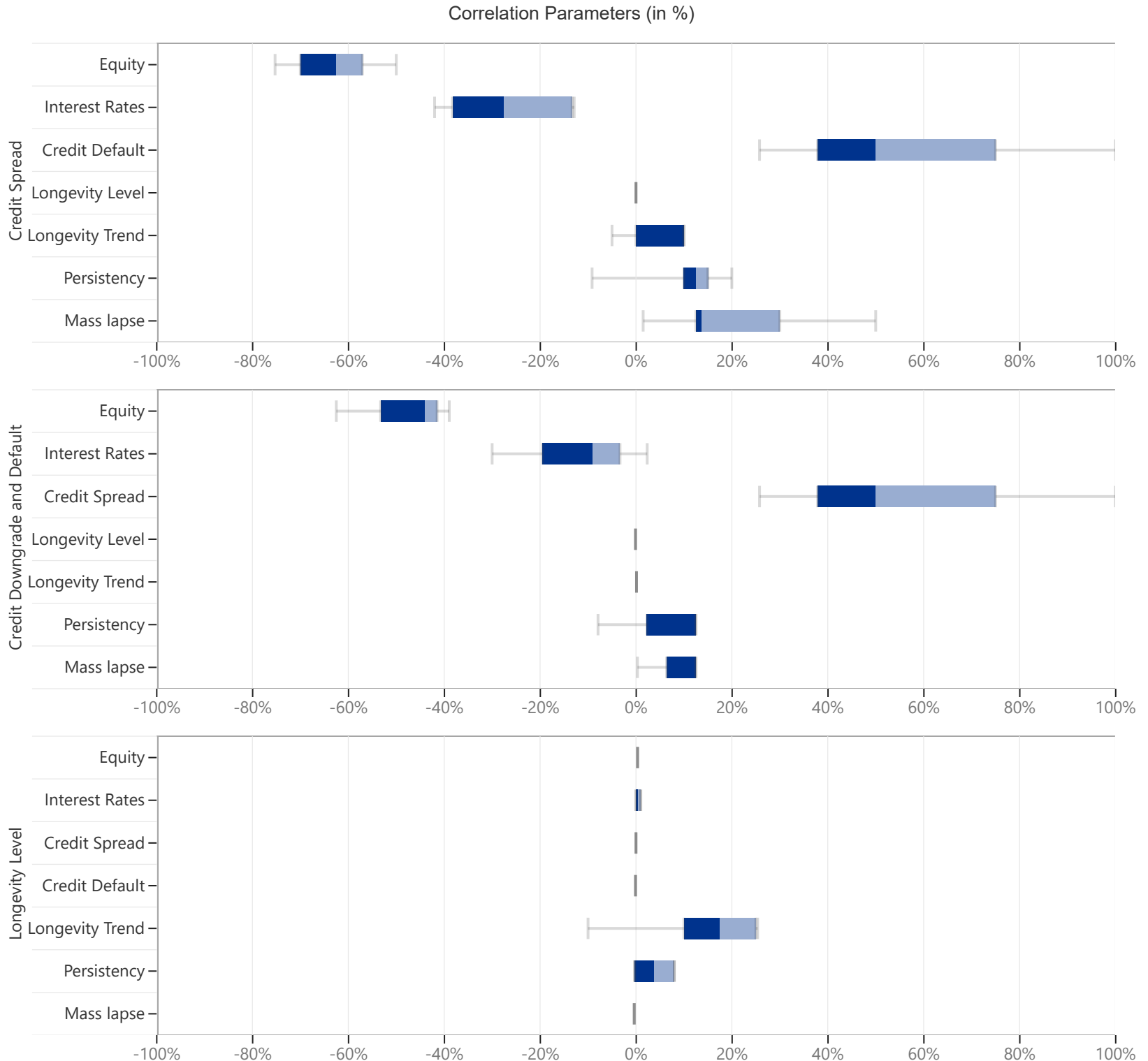
Technical Practices Survey 2024

10. Correlation

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM Correlation Parameters

We have not seen significant movements for the correlations between these pairs for most respondents, but only minor changes.



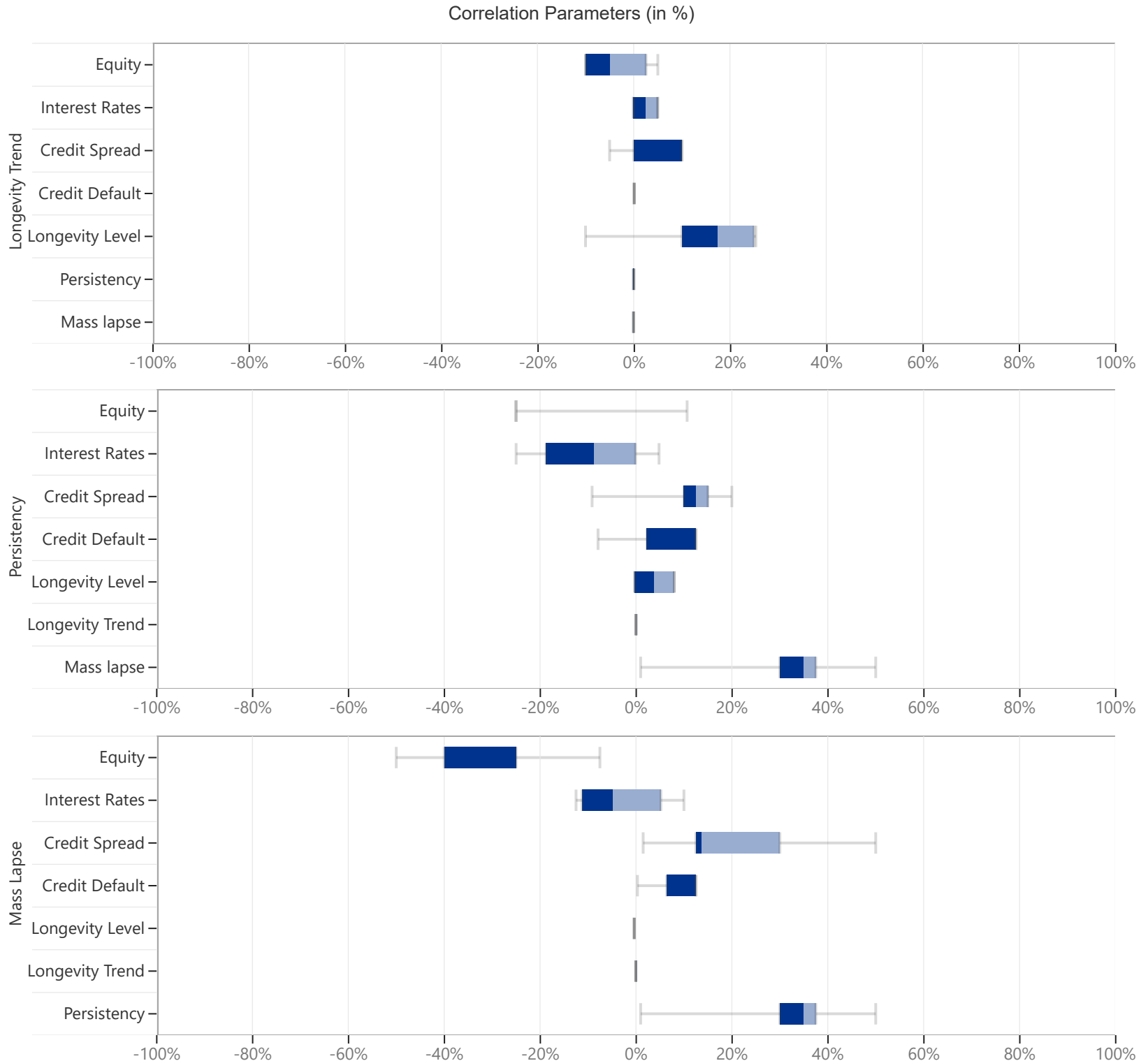
Technical Practices Survey 2024

10. Correlation

1. Hot Topics	2. Balance Sheet	3. Standard Formula	4. Market Risk (excl. Credit)	5. Credit Risk
6. Life Underwriting	7. Capital Management	8. Operational Risk	9. Aggregation	10. Correlation

IM Correlation Parameters

We have not seen significant movements for the correlations between these pairs for most respondents.



Glossary

ALM	Asset and Liability Management
BE	Best Estimate
Bps	Basis Points
CMI	Continuous Mortality Investigation
CoC	Cost of Capital
CoD	Cost of Downgrade
CoG	Cost of Guarantees
CRE	Commercial Real Estate Lending
CQS	Credit Quality Step
DB	Defined Benefits
DTA	Deferred Tax Assets
ECAI	External Credit Assessment Institutions
EIOPA	European Insurance and Occupational Pensions Authority
EoL	Expectation of Life
ERM	Equity Release Mortgages
EVT	Effective Value Test
FRN	Floating Rate Note
FS	Fundamental Spread
FX	Foreign Exchange
HPI	House Price Index
IBNR	Incurred But Not Reported
IM	Internal Model
IR	Interest Rate
LACDT	Loss Absorbing Capacity of Deferred Tax
LGT	Loss Given Default
LT	Long Term

LTAS	Long Term Average Spreads
LTGM	Long Term Guarantee Measure
LTM	Lifetime Mortgage
LTR	Long Term Rate
MA	Matching Adjustment
MAP	Matching Adjustment Portfolio
MAuS	Matching Adjustment under Stress
MBS	Mortgage Backed Securities
MV	Market Value
Non-MAP	Non-Matching Adjustment Portfolio
ORSA	Own Risk and Solvency Assessment
PCA	Principal Component Analysis
PIM	Partial Internal Model
PoD	Probability of Default
PRA	Prudential Regulation Authority
RFR	Risk Free Rate
RM	Risk Margin
SCR	Solvency Capital Requirement
SF	Standard Formula
ST	Short Term
T&D	Transition and Default
TMTP	Transitional Measure on Technical Provisions
TP	Technical Provisions
UL	Unit-linked
UW	Underwriting
VA	Volatility Adjustment
WP	With Profits

We are grateful to all the respondents who found the time in their busy schedules to take part and would like to extend our thanks to all of you once again. The differences in the profile of the 19 respondents who have contributed to this survey showcases the usefulness of the benchmarking and set out an excellent indication of the UK life industry's approach to Solvency II.

The survey requires a large investment of resources on our part, in particular the analysis and interpretation of the data. I would like to extend a very special thank you to all my colleagues for their hard work in carrying out the survey and compiling this report whilst at the same time carrying out their client service responsibilities. I would also like to extend particular thanks to Sophie Gong, Charlotte Nugent, Raashi Pasari, Stephanie Leung and Abhishek Garg for their hard work in managing the survey.



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Principal adviser



Jo Thorpe
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Tom Murphy
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We value your contribution and hope that you find the report useful and interesting. We would like to extend a very special thank you to all those who participated in the survey:

- Aegon UK
- Aviva
- Countrywide Assured
- Forester Life
- HSBC Life
- Irish Life Assurance
- Just Group
- Legal & General
- LBG
- NFU Mutual

- Phoenix
- Quilter
- Royal London Mutual
- St. James's Place
- Unum
- Utmost
- Vitality Life
- Wesleyan Assurance
- Zurich Assurance





If you would like more information on any of the results set out in this report including electronic copies of the graphs and results set out within, or if you would like more information or assistance with regard to industry and technical actuarial practices,

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