KPMG

Technical Practices Survey 2022

Solvency II

Financial Services

—

November 2022

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Welcome to the 2022 report

It is with the greatest pleasure that we present to you the 2022 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 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 21 participants submitting responses this year, including full submissions from 10 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. We observe that the core stresses such as those for equity and interest rate risk, as well as those relating to underwriting risk have remained relatively stable compared with the prior period. This maintains the theme we have seen in previous years.

For credit risk calibrations, there have been limited changes in corporate credit calibrations. We note that the key focus areas are to develop bespoke credit calibration for illiquid assets to support firms' strategy, and the implementation of credit risk, including Matching Adjustment under stress, into SCR calculation processes.

Under capital management, target solvency cover ratios have reduced slightly since the previous year. Around a quarter of respondents have reduced capital buffers this year following a general trend for increases last year. These are not wholesale changes, each case is a small refinement. This underlines that capital buffer remains an area of active review within the industry. In order to further support firms in their assessment of the capital management, the report now includes additional calibration points for selected risks at 1-in-10 and 1-in-20 levels.

Model risk continues to contribute significantly to operational risk capital. Tightening the control environment around actuarial models is therefore a key area of focus at the moment.

Each year, in response to market developments and participant feedback, we select thematic areas to explore in more detail in our report. This year those areas include:

- Historic impact of the Covid-19 pandemic on YE21 assumption setting, where the responses indicate that the majority of participants excluded 2020 experience data from their base longevity assumption setting process however most did not make adjustments for setting mortality improvement assumptions. Very few firms made differences to the assumption setting process for lapses or partial withdrawals. Only a third of firms continued to hold COVID-19 related provisions at YE21 and most of these are expected to be released over 2022.

- Forward looking impact of Covid-19 on firms' risk calibrations and correlations, where a lot of uncertainty remains. There is no real consensus on the expectation for how long COVID-19 will continue to impact experience data. There are also varying approaches as to how the data will be treated in future assumption setting.

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

Throughout the report we have included tables which show the median result from the 2021 report (YE20 medians) for comparison against the responses for this year.

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, thus ▢ x

The box and whisker plots, shown illustratively below, has 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 blue section and upper quartile is shown by the light blue section; and

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
Director

Technical Practices Survey 2022

Executive Summary

The executive summary below provides an overview at a glance of how the median responses for the key stresses and indicators of risk appetite compare to the median responses provided in the previous year's survey.

The core stresses such as those on equity, interest rate and underwriting risk have remained relatively stable, as seen in previous years. For the risk appetite, there is a downward shift in the range of Solvency Coverage Ratios from the prior year at both amber and red levels, with around one-quarter of the respondents that participated in both the years reporting a decrease in capital buffers.

For Longevity Risk we have not shown a comparable YE20 Median given the change in survey format this year to include IM01 submissions to the PRA.

	Median Response (YE21)	Median Response (YE20)
Matching Adjustment		
Overall Matching Adjustment (bps) - Average	91	89
Market Risk (99.5% stress)		
UK Equity Stress	-45%	-46%
Equity Implied Volatility Stress (10 years)	14%	12%
Currency Stress – EUR	-21%	-24%
Currency Stress – USD	-27%	-26%
Commercial Property Stress	-31%	-31%
Residential Property Stress	-27%	-30%
Interest Rate Risk (10 years, 99.5% stress)		
Interest Rate – Total Up Stress	187	200
Interest Rate – Total Down Stress	-150	-150
Interest Rate Volatility Stress (5 X 15 ATM swaption) (bps)	19	17
Credit Risk – Average Credit Spread Stress (10 years, 99.5% stress)		
Financials – A	404	433
Financial – BBB	584	591
Non-Financials - A	258	286
Non-Financials - BBB	406	418
Longevity Risk (99.5% stress)		
Female (Age 65) – Stress (increase in EOL, years)	3.0	N/A
Male (Age 65) – Stress (increase in EOL, years)	3.0	N/A

Operational Risk – Contribution of top six scenarios to risk capital

25%	22%	21%	14%	10%	9%

■ Information security ■ Model risk ■ Other ■ Product flaws/mis-sellling ■ Failed or inappropriate pricing/UW ■ Failure of third party

	Median Response (YE21)	Median Response (YE20)
Diversification within scenarios	39%	44%
Other Insurance Risks (99.5% stress)		
Expenses Level Stress as % of Best estimate	21%	21%
Mass Lapse Stress	30%	30%
Solvency Cover Ratio – Risk Appetite		
Red (Immediate action taken)	123%	130%
Amber (Triggers warning)	138%	142%

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

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, with only five out of 17 firms reporting that they do not make use of any LTGM.
Transitional Measures as a % of Technical Provisions remained consistent to previous year as shown in the chart and table below.
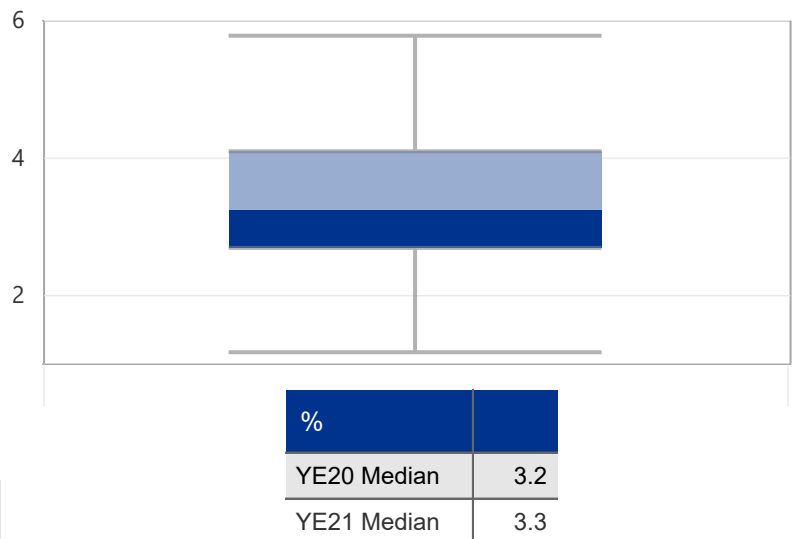Key areas of model development remain broadly similar to previous years, with a greater focus now on methodology improvements.

1.1 Which of the following Long Term Guarantee Measures do you use in your balance sheet?
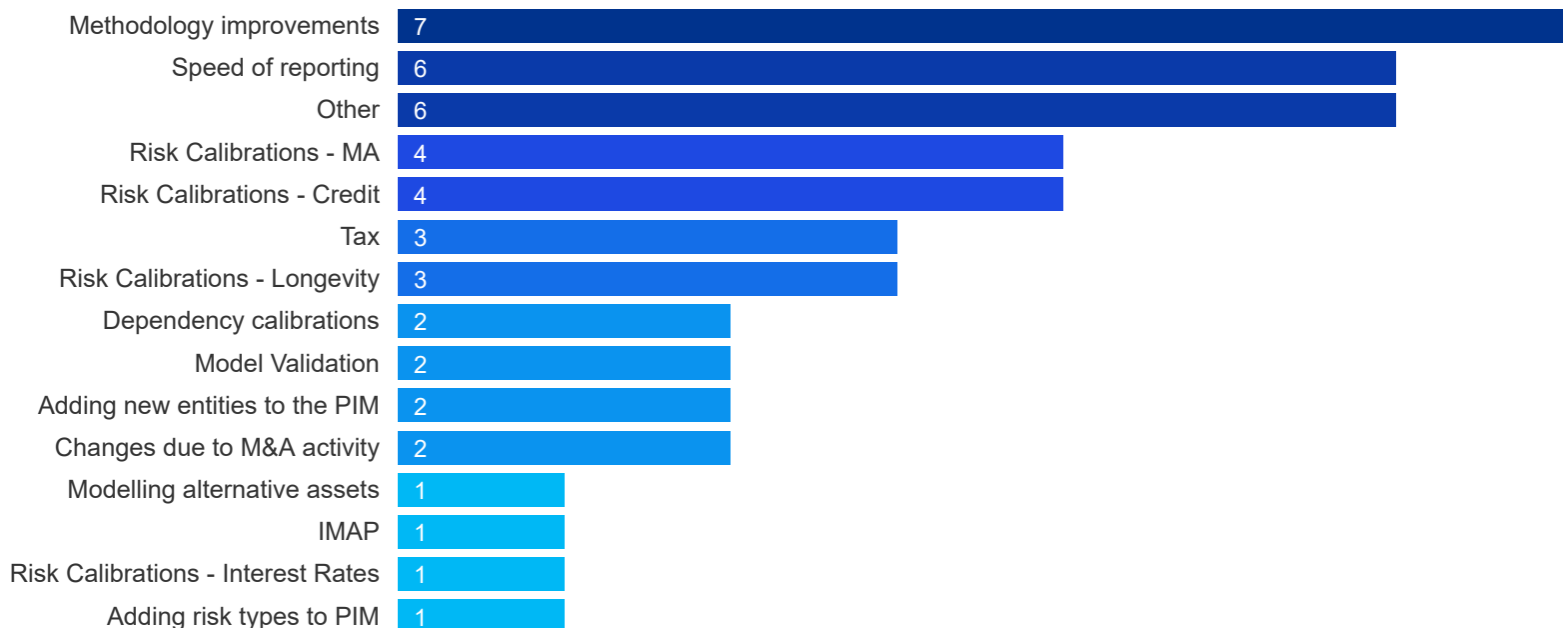
Matching adjustment	8
Transitionals	8
Volatility adjustment	8
None	5
Grandfathering sub debt	1
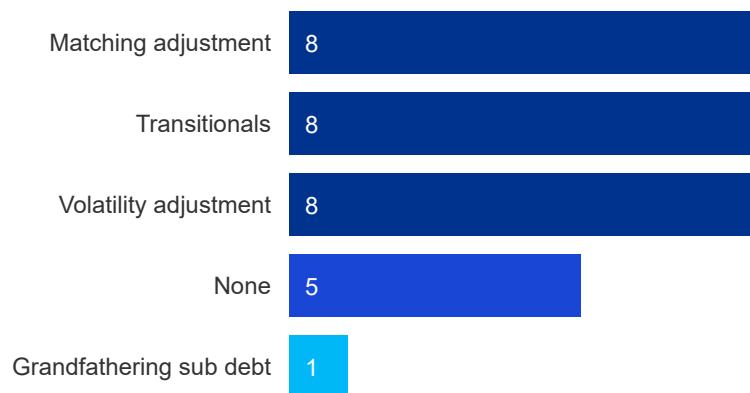
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1.2 What are the Transitional Measures as a % of your Technical Provisions? (IM firms only)

%	
YE20 Median	3.2
YE21 Median	3.3

1.3 What are the key developments or model changes that you will focus on in 2022 & 2023?

Methodology improvements	7
Speed of reporting	6
Other	6
Risk Calibrations - MA	4
Risk Calibrations - Credit	4
Tax	3
Risk Calibrations - Longevity	3
Dependency calibrations	2
Model Validation	2
Adding new entities to the PIM	2
Changes due to M&A activity	2
Modelling alternative assets	1
IMAP	1
Risk Calibrations - Interest Rates	1
Adding risk types to PIM	1

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Responses to 'Other' include model controls, changes to granularity of model outputs, and initiatives to increase automation.

Technical Practices Survey 2022
1. Balance Sheet

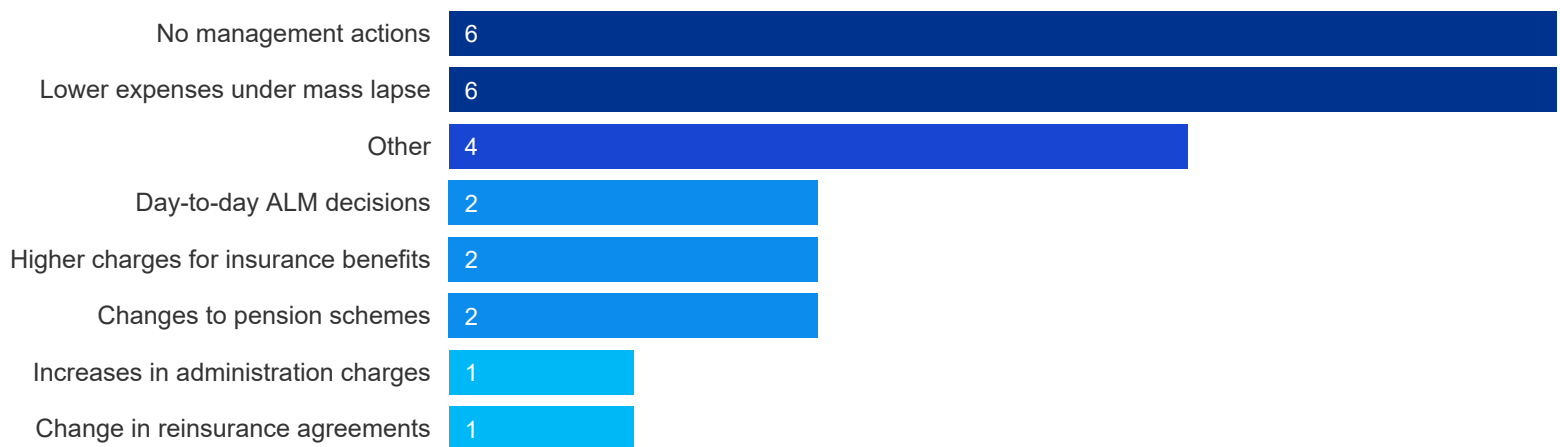| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

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 and changes to the equity backing ratio.

1.4a For non-profit business, which management actions are assumed in the capital measures listed at 31st December 2021?

Category	Value
No management actions	6
Lower expenses under mass lapse	6
Other	4
Day-to-day ALM decisions	2
Higher charges for insurance benefits	2
Changes to pension schemes	2
Increases in administration charges	1
Change in reinsurance agreements	1

Responses to 'Other' include actions to restore MA compliance, planned cost saving initiatives, and changes to backing portfolios for guaranteed funds.

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1.4b For with-profit business, which management actions are assumed in the capital measures listed at 31 December 2021?

Category	Value
Change in final bonus rates	12
Change in regular bonus rates	9
Market value reductions	7
Changes to equity backing ratio	6
Removal of misc. surplus/planned enhancements/past estate distributions	6
Changes/introduction of CoG charges	4
Other	4
No management actions	1
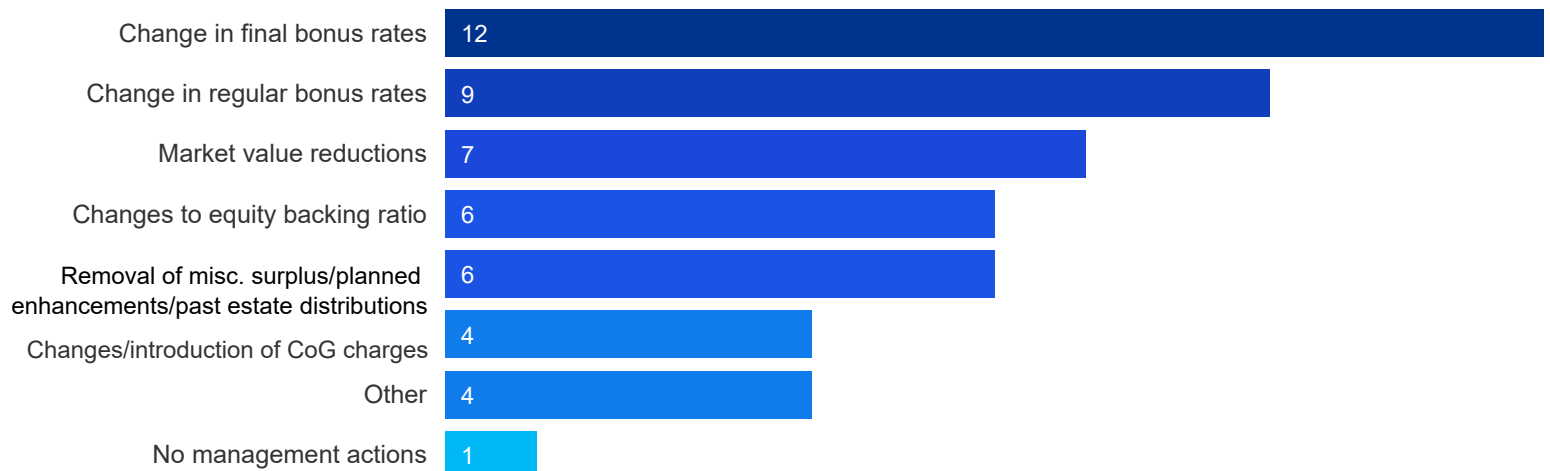
Responses to 'Other' include changes to smoothing limits, rebalancing of dynamic hedges, reduction in level of corporate bonds held, and changes in respect of future discretionary benefits.

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1. Balance Sheet

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SF/IM

Risk Margin

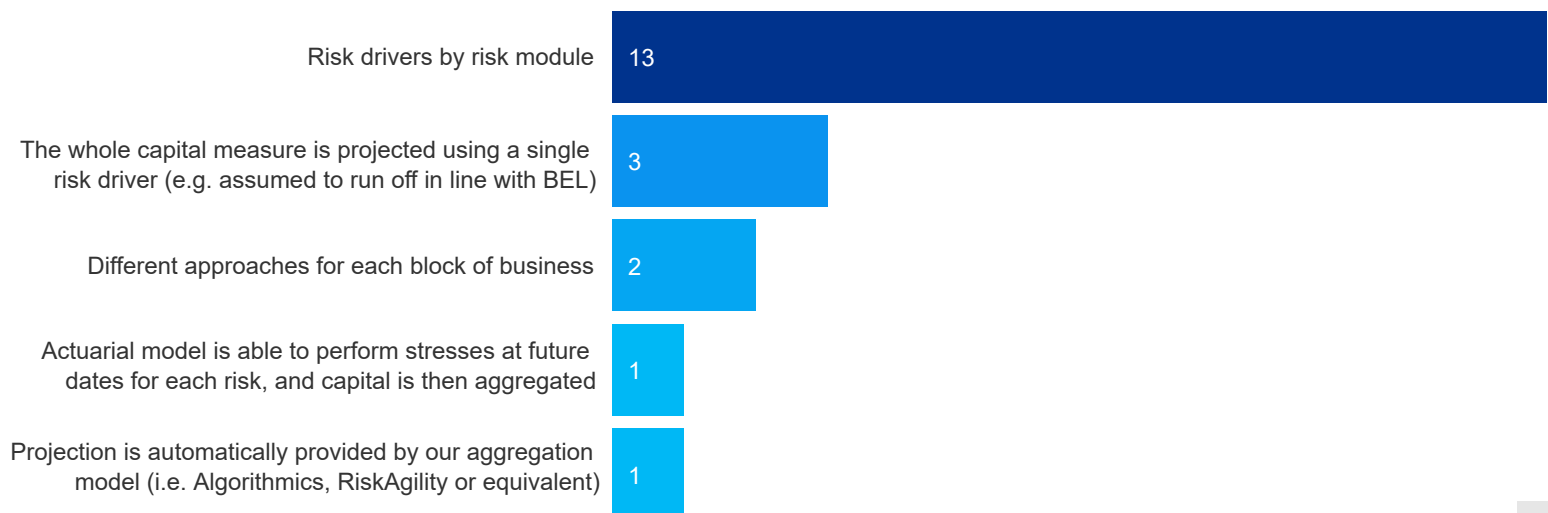We have not observed any changes to Risk Margin projection methodology, as noted in previous years.

We asked firms whether any non-insurance risks have been considered within the risk margin calculations, and the only continuing observation is the inclusion of counterparty default risk by most respondents.

1.5 What is the Risk Margin as a % of your Technical Provisions?
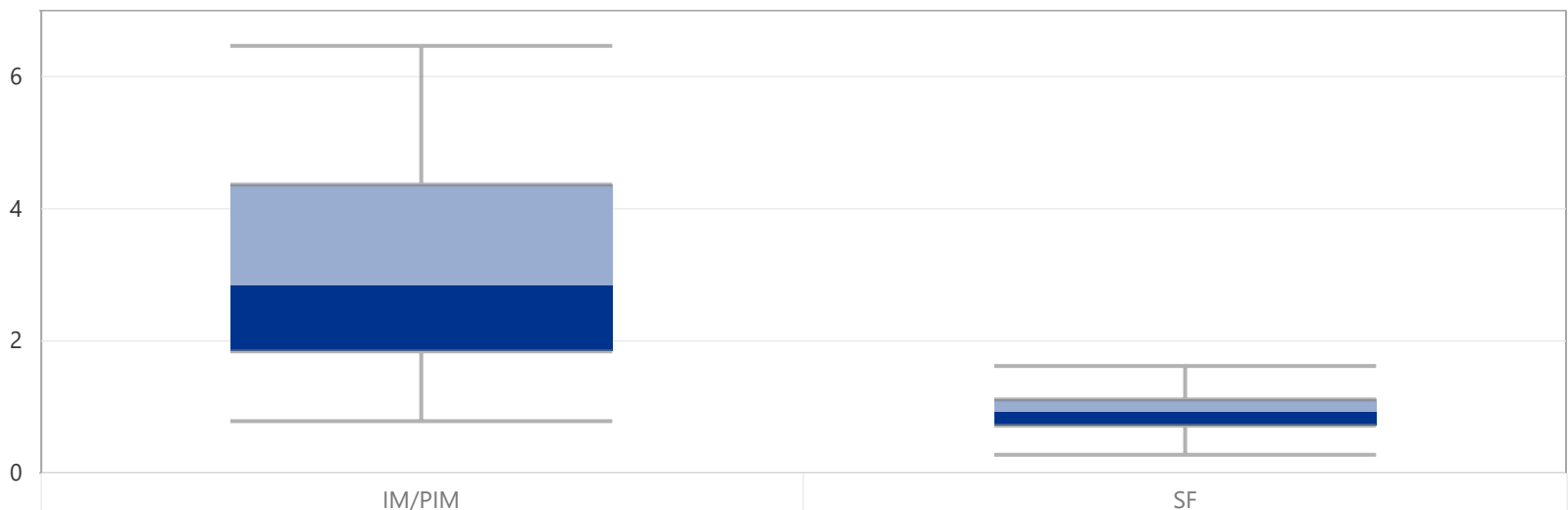
%	IM/PIM	SF
YE20 Median	2.4	1.0
YE21 Median	2.8	0.9

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

Risk drivers by risk module	13
The whole capital measure is projected using a single risk driver (e.g. assumed to run off in line with BEL)	3
Different approaches for each block of business	2
Actuarial model is able to perform stresses at future dates for each risk, and capital is then aggregated	1
Projection is automatically provided by our aggregation model (i.e. Algorithmics, RiskAgility or equivalent)	1

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SF/IM

Pillar 2 and ORSA

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

As we have seen in previous years, the most common differences relate to the Risk Margin, discount rates, and contract boundaries. Changes in the capital methodology are primarily driven by additional risks in scope for SF firms and a more tailored view of operational risks within the business for the IM firms.

1.7a 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?

Area	Value
Remove the risk margin	6
Other	6
RFR - change in ILP allowance	5
Contract Boundaries	5
Allow for different risks in RM	4
Pension scheme risk	4
DTA allowance	3
Remove transitionals used in P1	2
Risk Margin CoC charge	2
RFR - no deduction of CRA	1

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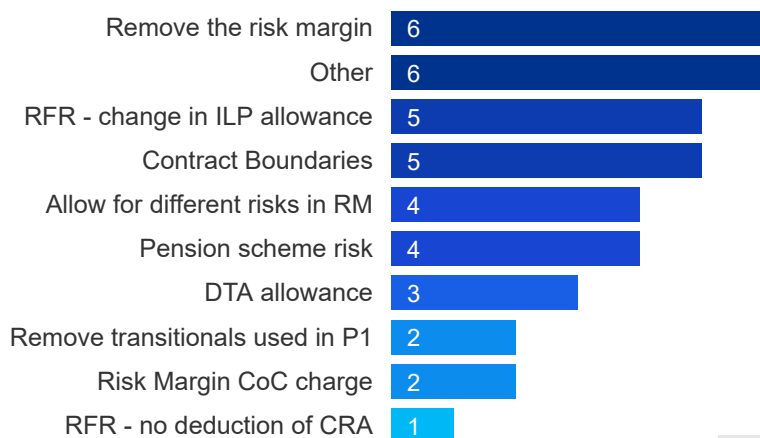
Responses to 'Other' include:
- Shareholders interest in the with-profits fund estate recognised under Pillar 2; No tiering of capital under Pillar 2
- Longevity risk is excluded from the risk margin calculation
- Risk free rates based on gilts and swaps for different blocks of business
- Higher operational risk requirement increases risk margin

1.7b 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?

Area	Value
Operational Risk	7
Risk Calibrations	3
Correlations	3
Other	3
Allowance for non-linearity	2
Remove Fungibility Constraints	1

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Responses to 'Other' include:
- Government bond spread risk not included under Pillar 2 (but included in Pillar 1)
- Differing longevity risk calibration
- Differing treatment of volatility adjustment and liquidity premium
- Allowance for pipeline major model changes pending formal PRA approval.

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

Years	Value
10 years	4
6 years	1
5 Years	8
3 years	4

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

Approach	Value
Risk drivers by risk module	10
Different approaches for each block of business	3
Actuarial model perform stresses at future dates for each risk, and capital is then aggregated	2
Other	2
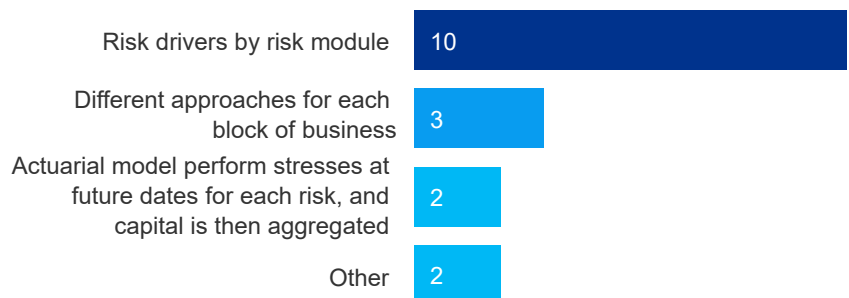
Responses to 'Other' include:
- A combination of modelling and risk drivers is used for the different capital requirements for each risk
- Capital model is used to determine allocated capital requirements at t=0 and this is projected forward using a series of risk drivers and exposure factors

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SF/IM

Volatility Adjustment

The Volatility Adjustment (VA) continues to be attractive to companies, with 66% of respondents applying VA to with-profit funds and 60% applying it to immediate annuities. There are no firms who plan to apply the VA in the future who do not currently do so.

1.10 For which of the following types of business do you apply a Volatility Adjustment?
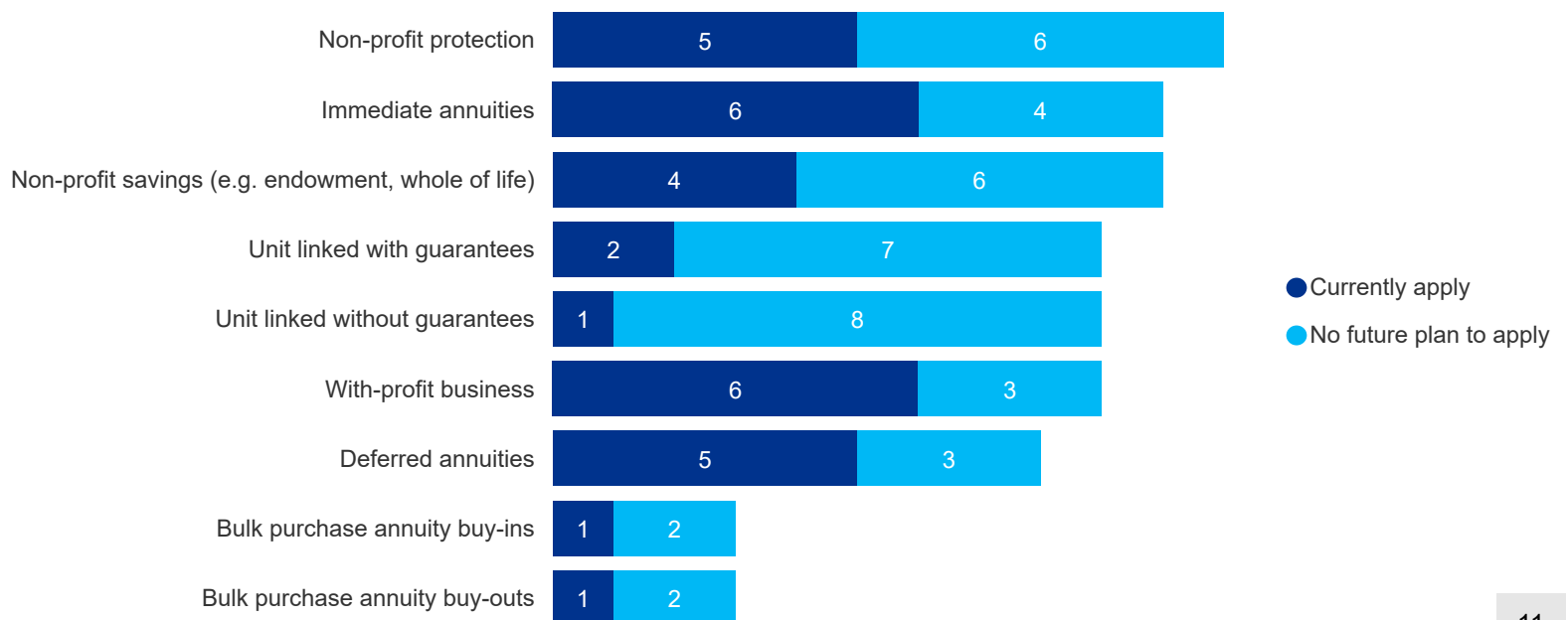
The VA has steadily increased throughout the first six months of the year since YE21, as tabulated below.

%	YE20	YE21	Q122	HY22
Volatility Adjustment	11	15	19	30

*Source: PRA Publications

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1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Matching Adjustment

The average base MA rate marginally increased to 91bps at YE21 from 89bps at YE20 (we have chosen to compare participants using an average for this question to better represent the picture over the year). This is consistent with credit spreads having remained relatively stable over 2021, although we did note some large changes (up and down) for individual firms, in part driven by portfolio optimisation and other factors like ERM restructuring.

1.11a Base Matching Adjustment (bps) - Overall
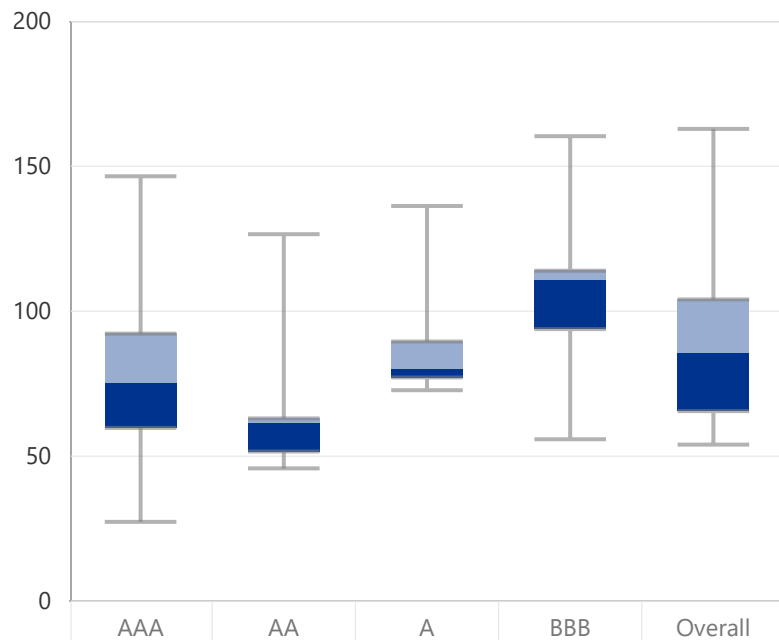
1.11b Proportion of base spread realised as MA (%) - Overall
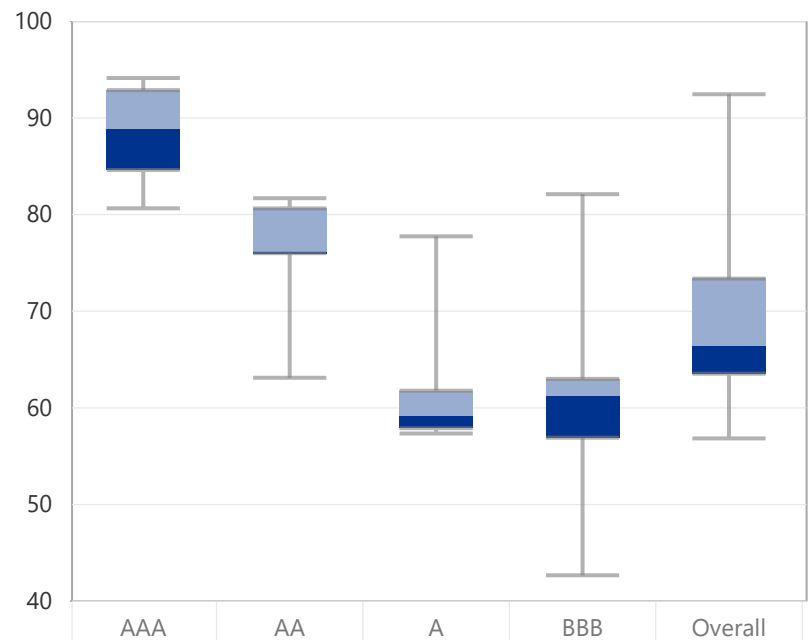
1.11c Base Matching Adjustment (bps) - Non-Financial corporates
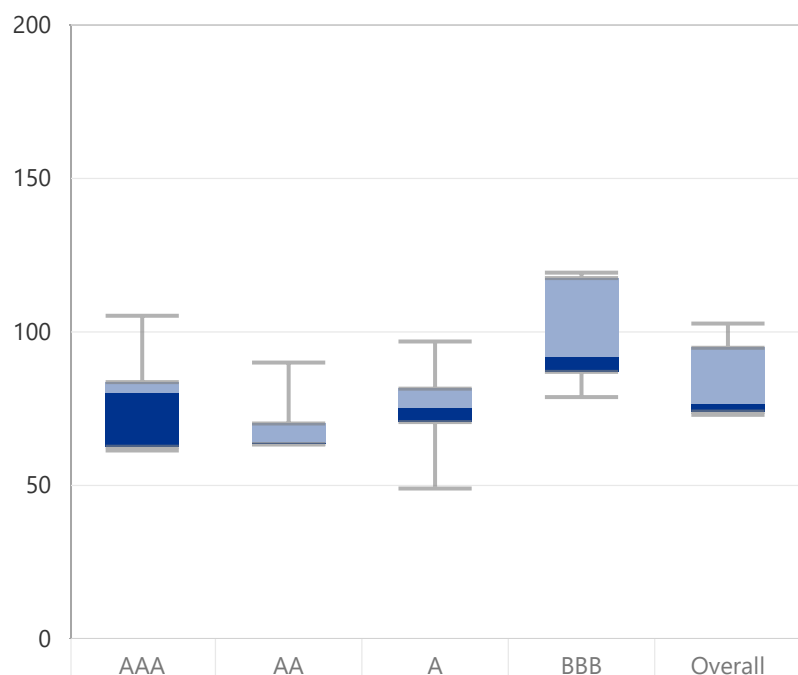
1.11d Base Matching Adjustment (bps) - Financial corporates
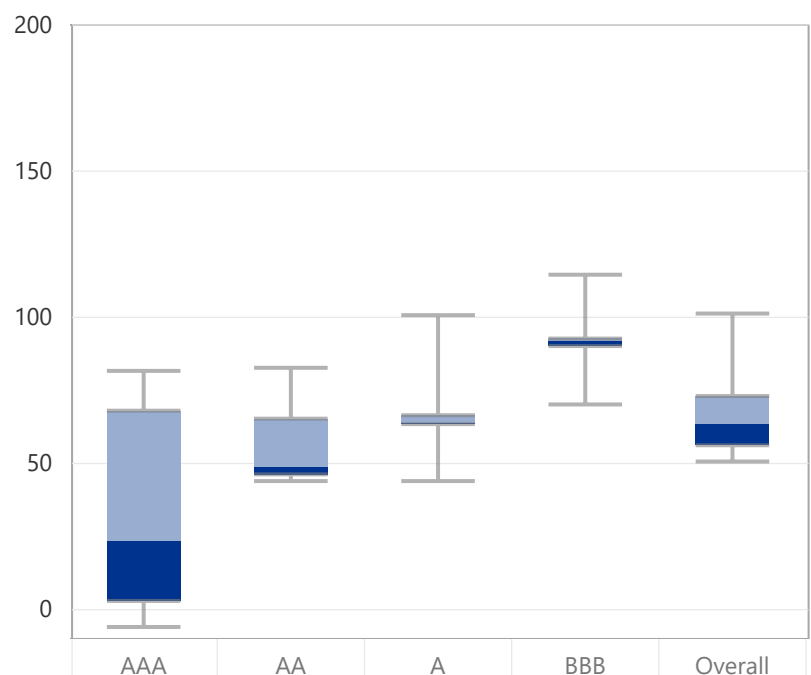
Charts 1.11c and 1.11d exclude the following categories of assets: Infrastructure Debt, Commercial Real Estate Lending, and Restructured ERMs.

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IM

Matching Adjustment

Most firms manually allocate assets to the Matching Adjustment Portfolio (MAP), although we are seeing a trend towards more sophisticated approaches through automation. The majority of firms perform their allocation with a target of compliance with PRA Tests 1 & 3 (plus potentially additional internal constraints), however, two-thirds of firms also try to optimise the size of the MA through asset allocation. We found that some companies are still planning an extension to the MA coverage showing that this is still an evolving area where firms are keen to optimise the benefit.

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

Manual allocation of assets	5
Automatic allocation of assets	3
Combination of above	1

9

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

Compliance with PRA test 1 and 3	8
Maximising MA	6

9
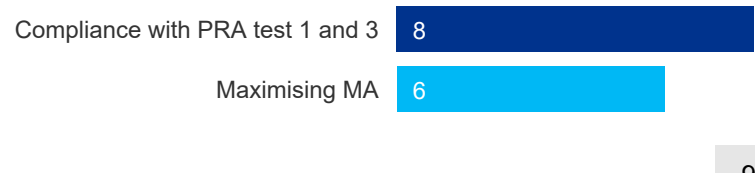
1.14 Which of the following asset classes (excluding any restructures e.g. equity release mortgage assets) do you have approval to include in your matching adjustment portfolios or do you plan to apply for in the future?

Asset class	Currently apply	Plan to apply in future
Cash	10	
Callable bonds (using 'Fisher approach')	8	1
Inflation linked bonds	9	
Supranational	9	
Non-callable fixed interest	8	
Cross currency swaps	6	1
Inflation swaps	7	
Infrastructure debt	7	
Commercial mortgages	6	
Interest rate swaps	6	
Reinsurance asset	5	1
Private Finance initiative loans	4	1
Sale and leaseback	4	1
Social housing loans	5	
Ground rent assets (not restructured)	2	2
Residential mortgage backed securities	3	1
Secured financing	4	
Educational loans	3	
Equity release mortgages (not restructured)	2	1
FX forwards/futures (not restructured)	1	1
Property rental strips (not restructured)	2	
Inflation options	1	
Interest rate swaptions	1	
Student loans	1	

- Currently apply
- Plan to apply in future

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Technical Practices Survey 2022
1. Balance Sheet

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| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Pension Scheme

For Pension scheme Pillar I calculations, IAS19 basis emerged as the widespread choice for both Balance sheet and SCR purposes. However, for Pillar 2 it is evenly split between IAS19 and Funding.

1.15 What basis do you use to calculate your pension scheme liabilities under Pillar 1?

● Funding basis
● IAS 19 basis

Pillar 1 - Balance Sheet: 6
Pillar 1 - SCR: 1 | 5

6

1.16 What basis do you use to calculate your pension scheme liabilities under Pillar 2?

● Funding basis
● IAS 19 basis

Pillar 2 - Balance Sheet: 3 | 3
Pillar 2 - SCR: 4 | 2
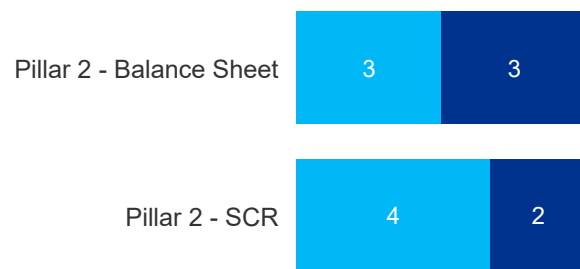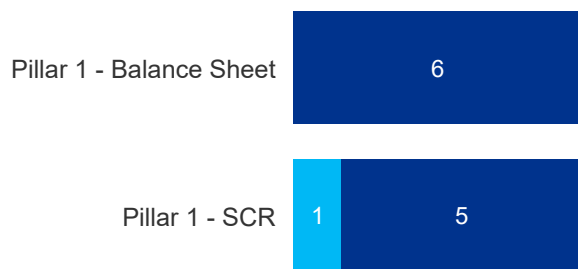
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Most respondents do not allow for any fungibility for the pension scheme surplus. A couple firms that do allow for it added that they either allow for partial fungibility within the ring-fenced fund which is capped at the SCR level or use it only to offset add-on.

1.17 Do you allow capital fungibility for any pension scheme surplus under Pillar 1?

Yes 18%
No 82%

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1.18 Are pension scheme risks allowed to diversify with risks on the rest of the business under Pillar 1?

No 8%
Yes 92%

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Document Classification: KPMG Public
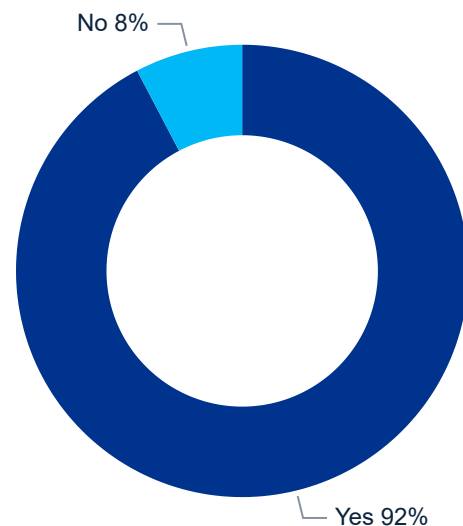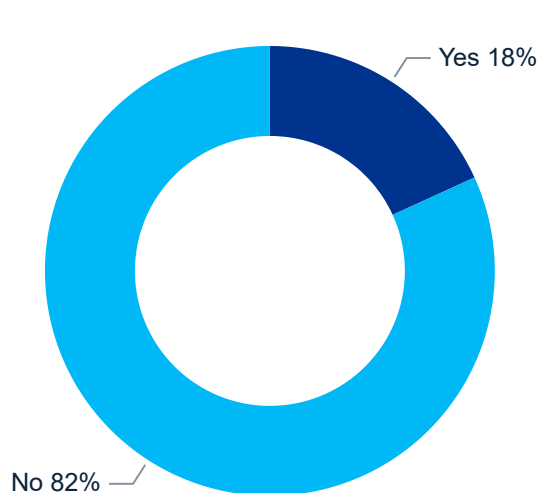
Technical Practices Survey 2022
2. Hot Topics

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Historic Treatment of COVID-19

Each year, in response to market developments and participant feedback, we select thematic areas to explore in more detail. In line with last year, we have continued to look at the impact of COVID-19. For context, this questionnaire was produced and the responses submitted (for the most part) in Q3 2022.

The majority of firms indicated that they excluded 2020 data in their longevity base assumptions setting at YE21 in light of the experience data observed since the start of the COVID-19 pandemic, with 6 of these firms also excluding 2021 data. The most popular approach for lapse bases was to make no change to existing processes and to include all available data, with very few firms indicating they excluded 2020 and 2021 data. There is no real consensus on the approach used to set mortality assumptions, with responses ranging from firms maintaining their YE20 assumptions to updating their assumptions using all available up to date data.

2.1 Did you do anything differently in the assumption setting process at YE21 in light of the experience data observed since the outbreak of the COVID-19 pandemic?
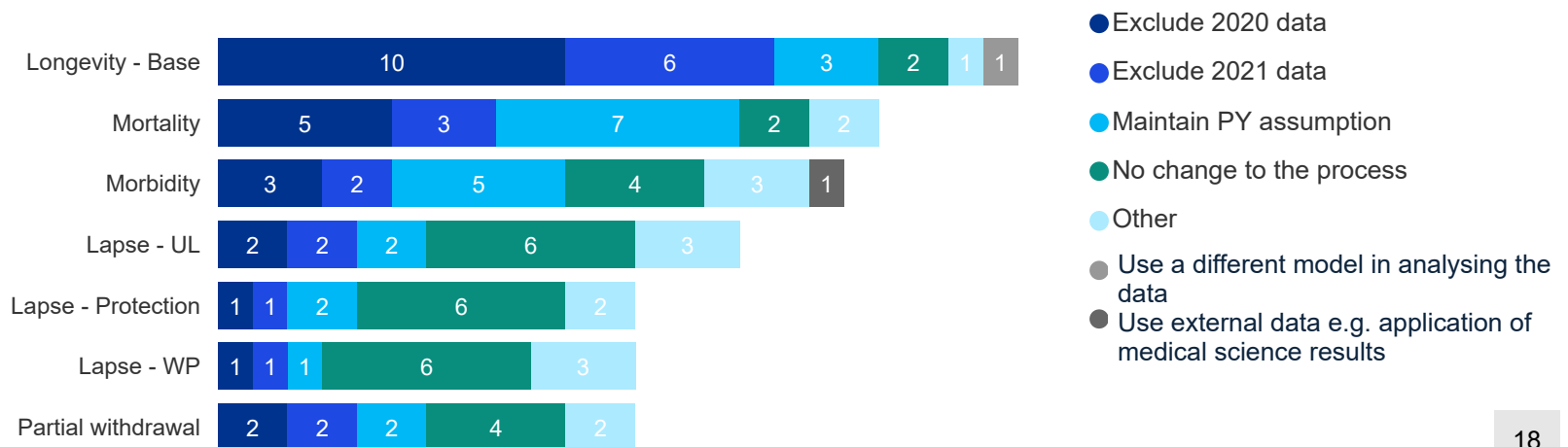
Responses to 'Other' include:
- Excluding the majority of 2020 data but not all
- Considering both with and without 2020 and 2021 data when choosing the most appropriate approach per assumption
- Applying uplifts to morbidity assumptions
- Increasing the number of years of data included in the experience analysis

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2.2 Do you include any adjustment to reflect the impact of the COVID-19 pandemic in your longevity improvement assumptions?

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Technical Practices Survey 2022
2. Hot Topics

SF/IM

Historic Treatment of COVID-19

Over two thirds of firms indicated they did not hold any additional provisions in respect of COVID-19 for the purposes of YE21 reporting. Of the firms who did hold such provisions, half indicated that they plan to release these during 2022, whilst the rest indicated they would maintain these provisions over 2022.

2.3 Did you hold an additional provision in respect of COVID-19 for the purpose of YE21 reporting?

Yes 30%
No 70%
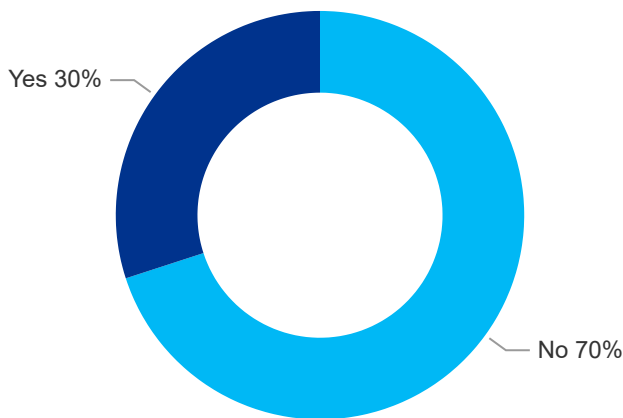
2.4 If you held an additional provision in respect of COVID-19 for the purpose of YE21 reporting, do you plan to release any provisions during 2022 given the impact of the pandemic observed so far?

No 40%
Yes 60%
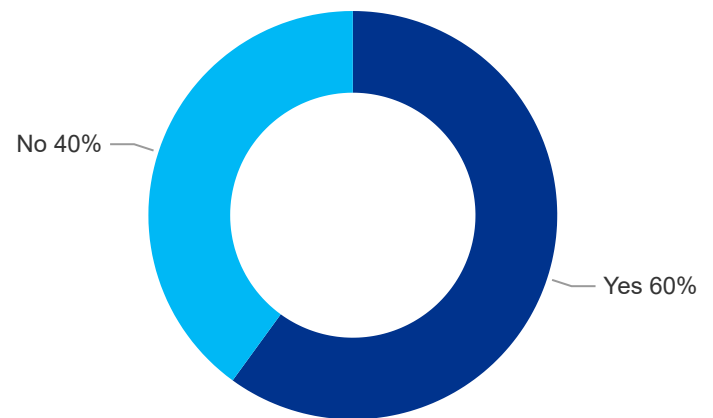
20	Although 6 firms noted in question 2.3 that they held an additional provision, only 5 firms provided further information for question 2.4	5

2.5a In your experience analysis, from the start of the pandemic in 2019, over what period will you consider your experience to be impacted by the COVID-19 pandemic?

Up to YE20 1
Up to YE21 5
Up to YE22 3
Other 6

2.5b How will you treat this COVID-19 data within the experience investigations going forward?

Other 8
Exclude entirely 5
No adjustments 4
Apply different weightings 1
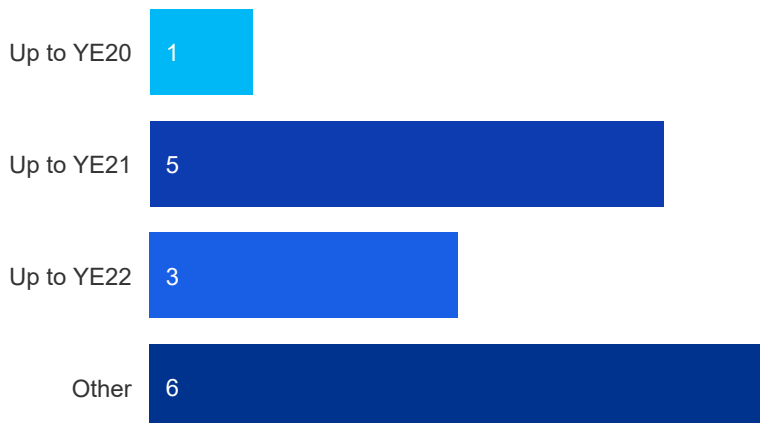
Responses to 'Other' include differing impacts dependent on assumption.

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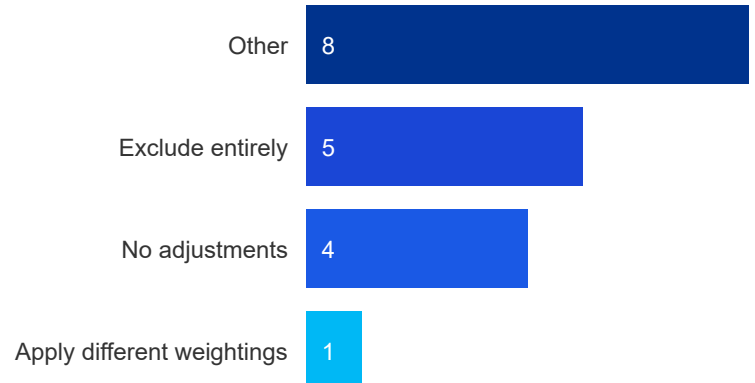
Responses to 'Other' include -
- including all data just adjusting assumptions for elements of historic experience not expected to impact future experience
- varying treatment dependant on decrement.

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Technical Practices Survey 2022
3. Standard Formula Specific Risks

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SF

## Lapse and Expense Risk

This section looks at the Standard Formula specific risks.

In particular, for the majority of insurers mass lapse is the biting scenario out of the three lapse stresses, although there are a couple of respondents for whom the lapse down stress is the most onerous. For the mass lapse scenario, management actions provide the main justification for assuming expenses vary with policy numbers, examples of which are considered in chart 3.3 below. These are generally considered over a period of 2-3 years. Other reasons include expense agreements and the ability to recover commissions to offset a larger per-policy spread of overheads.

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

- Mass lapse
- Lapse down

17%
83%
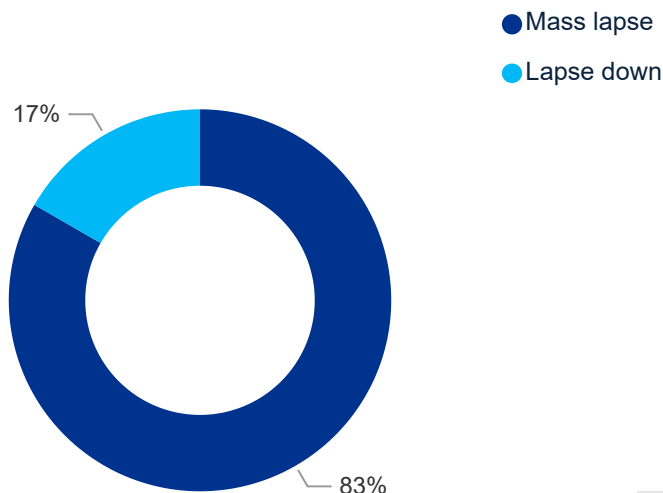
3.2 What assumption do you make about expenses in each of the lapse stresses?

- Expenses vary with policy numbers
- Overheads which run-off over time
- Overheads which stay fixed

Mass lapse	6	3	2
Lapse down	7	2	
Lapse up	7	2	

11

11
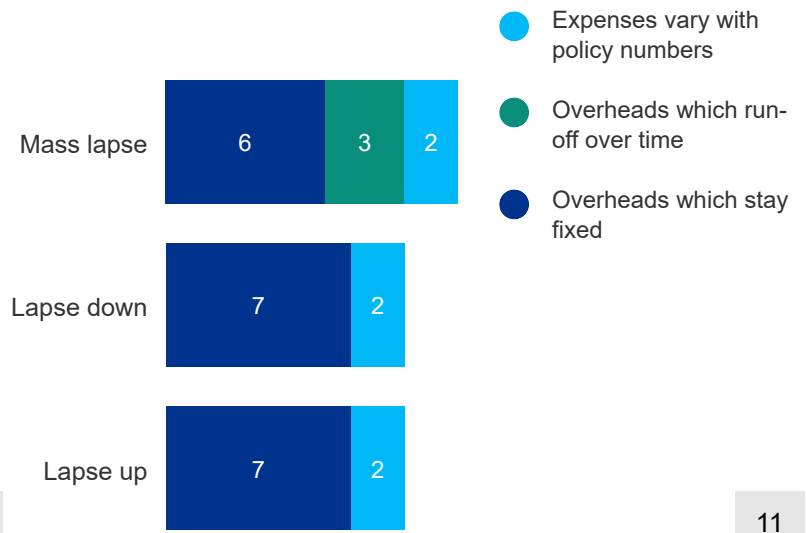
3.3 Within the mass lapse stress do you assume any further management actions to reduce costs on a permanent basis or while volumes recover?

Direct actions on staff (e.g. headcount reductions)	7
Fixed expenditure cuts (e.g. property, equipment costs)	5
Less direct actions on staff (e.g. reward changes, headcount freezes)	3
Other actions (e.g. reduced project spend)	2
Miscellaneous	2
Outsourcing cost cuts and change in balance of fixed/variable costs	1
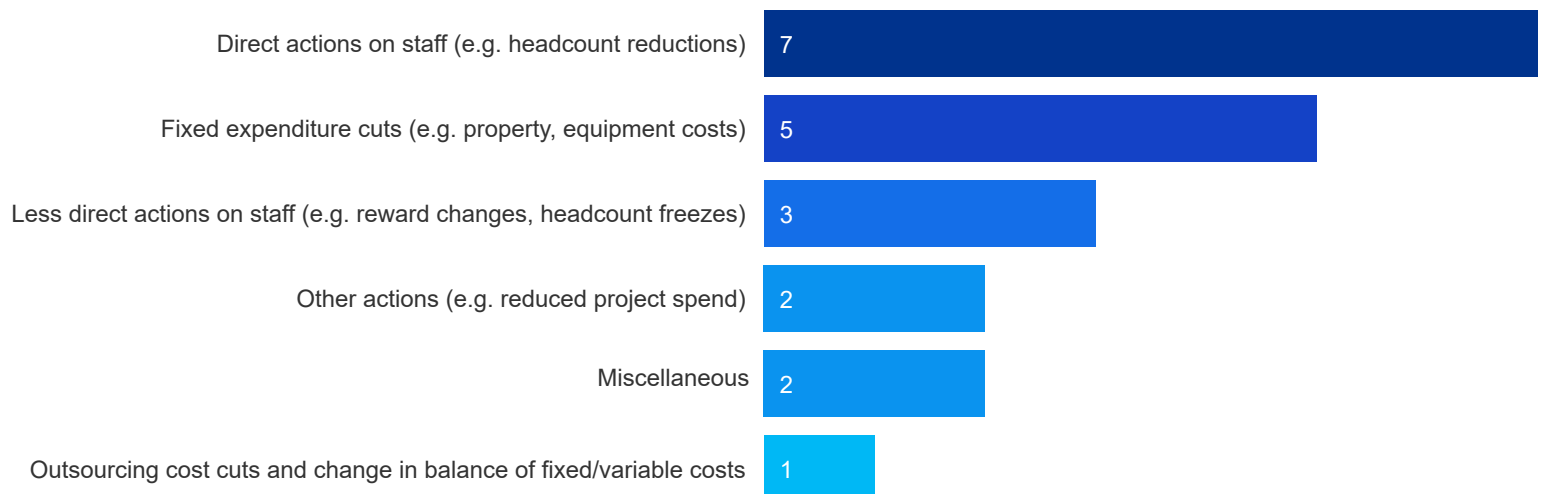
'Miscellaneous' includes a more ad-hoc approach and a combination of the above.

10

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

SF

Expense and Long Term Equity (LTE) Risk

As we have seen in previous years, all firms stress overhead and variable expenses and the majority of firms 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 firms do not stress the expenses for inflation while some only stress at the end of the outsourcing term.

This year, respondents were asked whether they apply the less onerous equity stress in respect of strategic long-term equity investments as allowed under the Standard Formula. Only one respondent indicated that this was the case, due to holdings in subsidiaries.

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

3.5 Do you stress your fixed outsourced expenses in the expense risk SCR?
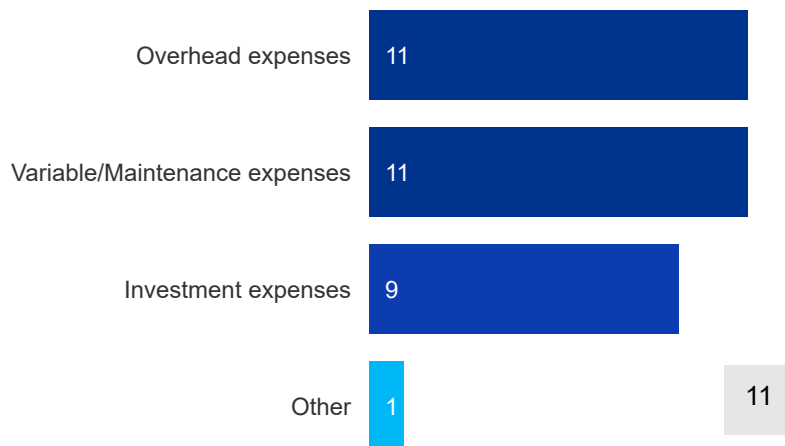
'Other' includes project expenses. Note that one respondent subjects the investment expenses to the inflation component but not the base component of the expense stress.

3.6 Do you use the Long-Term Equity stress for any assets?

- No, we have no relevant assets
- No, despite some qualifying assets
- Yes

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| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Equity

There have been no significant movements in the equity stress calibrations since the previous year. The median 1-in-200 equity stresses for the different currencies have converged slightly, though there has been no material difference year on year in the magnitude of the stresses for any currency. The overall trend is a downward equity stress, though this is very minor. Private equity continues to attract the most onerous stresses with a median of 55%. This is lower than the previous year when we had limited survey data and the median ranged between 65% to 70%.

4.1a Equity Stress (%) - Key markets
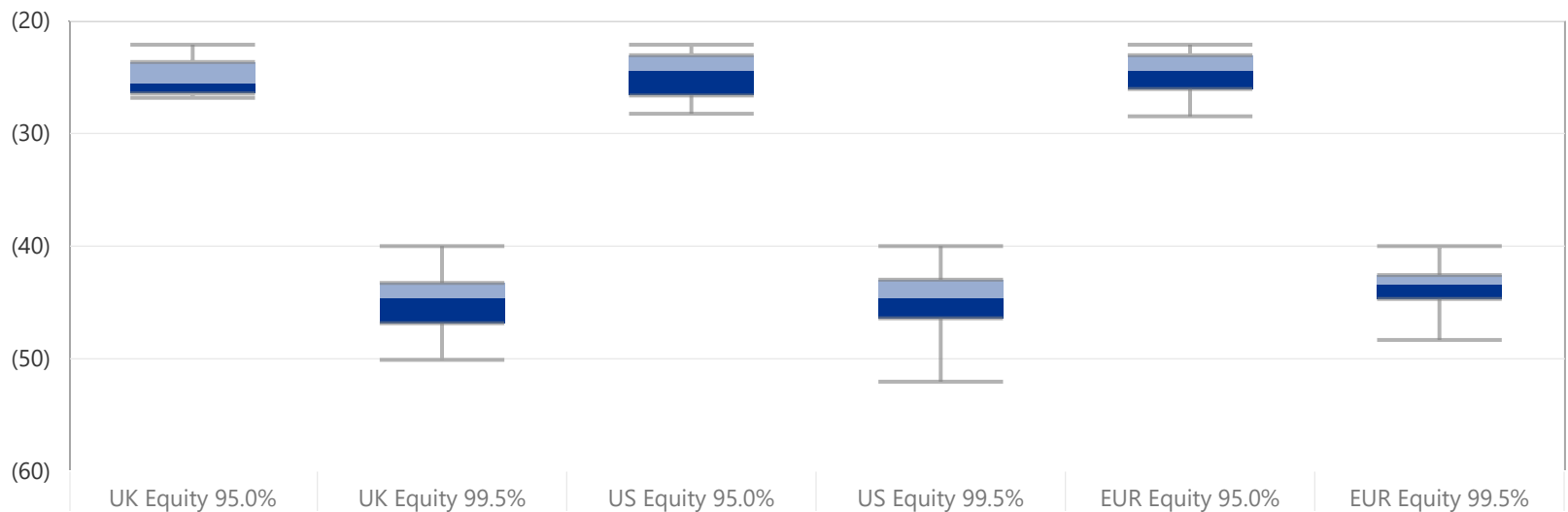
4.1b Equity Stress (%) - Others

%	UK Equity 99.5%	US Equity 99.5%	EUR Equity 99.5%	EM Equity 99.5%	Private Equity 99.5%
YE20 Median	(46)	(47)	(44)	(45)	
YE21 Median	(45)	(45)	(43)	(45)	(55)

Technical Practices Survey 2022
4.Market Risk

IM

Equity Volatility and Correlation factors

The median for the base equity volatility for a term of 10 years has seen a small increase from 18% to 19%, in line with the previous trend. The range of responses has contracted somewhat, although this is mostly due to sampling differences. The median 1-in-200 additive stress at the 10 year term has also increased slightly from 12% to 14%.

Some firms have decided to strengthen their correlation factors between EUR and other (UK/US) equity, although these have remained largely stable, close to 100% for all currency pairs.

4.2 Equity Rate Volatility - Base and additive stress % (10 year)
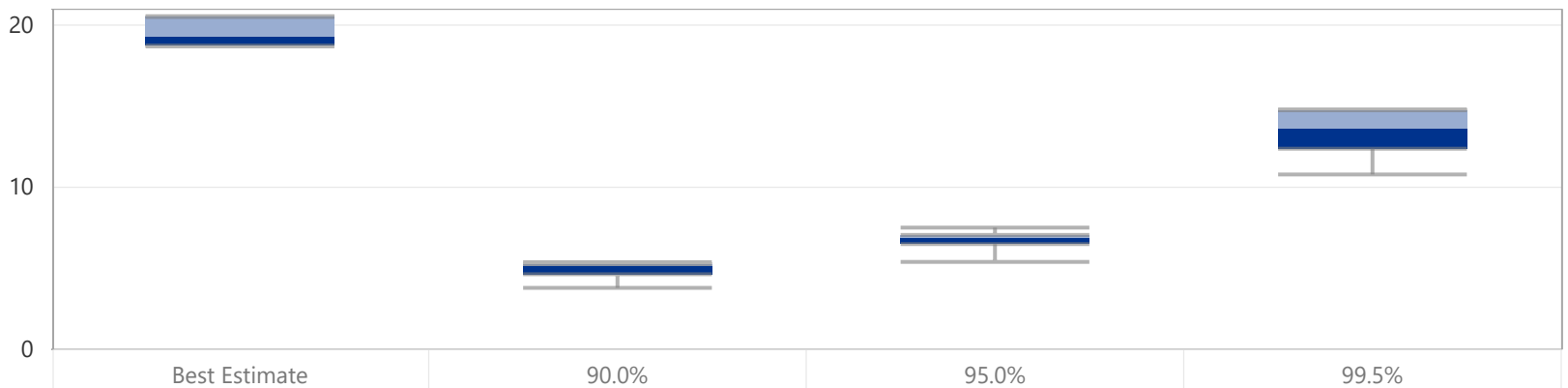
%	Best estimate	90.0%	95.0%	99.5%
YE20 Median	18			30
YE21 Median	19	24	26	33

Please note that the medians in the table above are shown as cumulative amounts.

4.3 Correlation factors between UK, US and EUR equity assets (%)
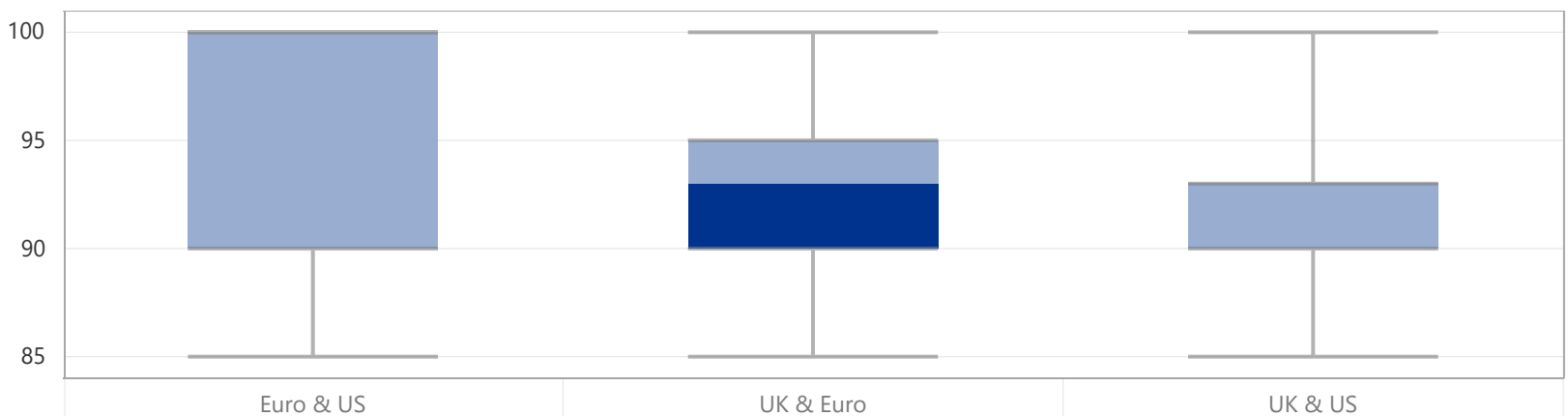
%	Euro & US	UK & Euro	UK & US
YE20 Median	90	92	91
YE21 Median	90	93	90

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Property and Property volatility

The property stresses have weakened slightly and while many firms apply the same stress to both property types, a few firms differentiate between the two, leading to a higher median for commercial (31%) compared to residential property (27%).

4.4 Property Stress (%)
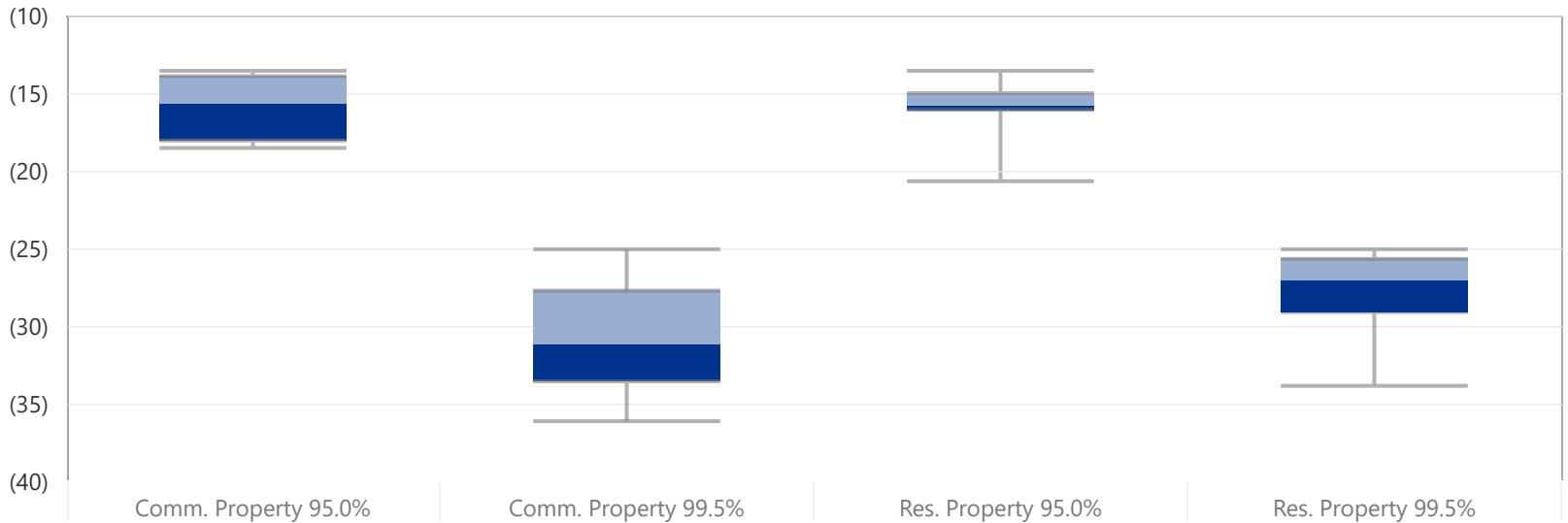
%	Comm. Property 95.0%	Comm. Property 99.5%	Res. Property 95.0%	Res. Property 99.5%
YE20 Median		(36)		(30)
YE21 Median	(16)	(31)	(16)	(27)

Comm. - Commercial, Res. - Residential

4.5 Commercial Property Rate Volatility (%) – additive stress (10 year)
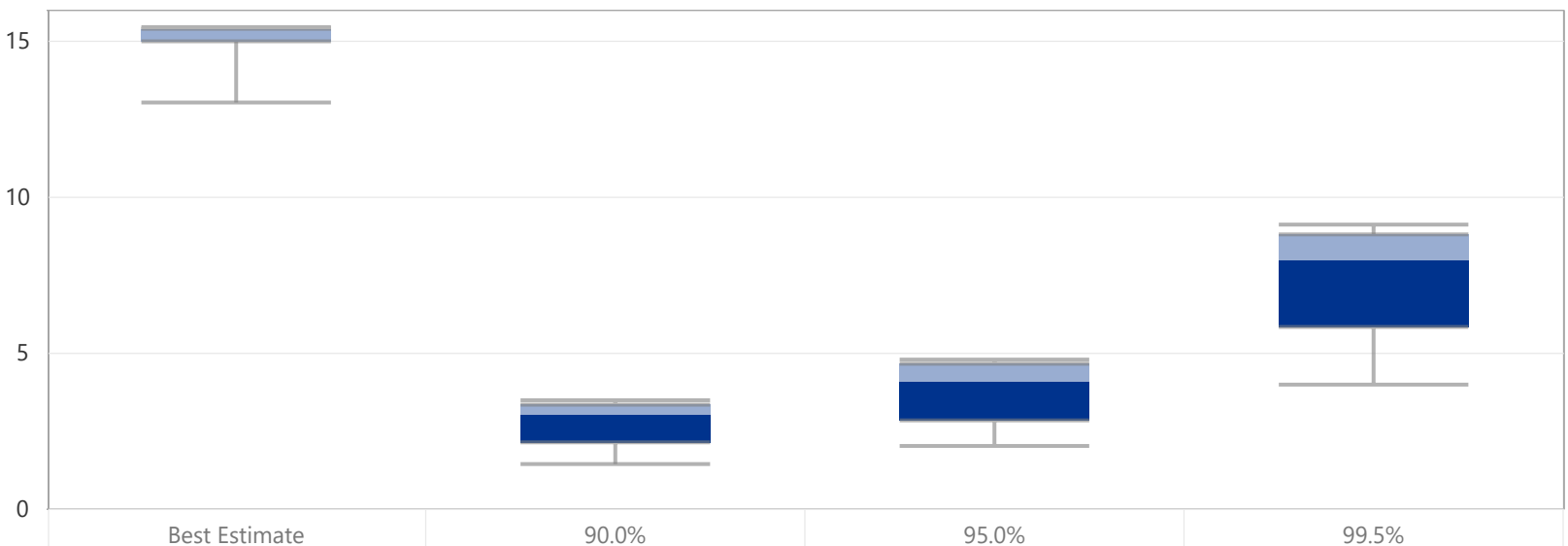
Technical Practices Survey 2022
4.Market Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Inflation and Currency

For market inflation calibrations, the range of responses has increased with the upper limit increasing from c200 bps to c300 bps while the lower limit remains unchanged. The median stress amount is 172 bps.

Given current inflation levels, it is no surprise that the median inflation assumption has again increased this year by c.70 bps to c.410 bps for a 10-year term. Interestingly, this has not been mirrored in the 1-in-200 additive stress which has generally been kept level by firms or even decreased in some cases.

The median currency stresses have remained relatively unchanged for the last few years at the 1-in-200 level for both currencies. For both currencies there is a general consensus around the magnitude of the stresses although there is an outlier for the EUR which has remained consistent since the prior year. There is a single respondent who uses the same risk profile for both USD and EUR exchange rates with the remainder using currency specific stresses.

4.6a Implied inflation (bps) - Term 10

4.6b Implied inflation (bps) - Term 15
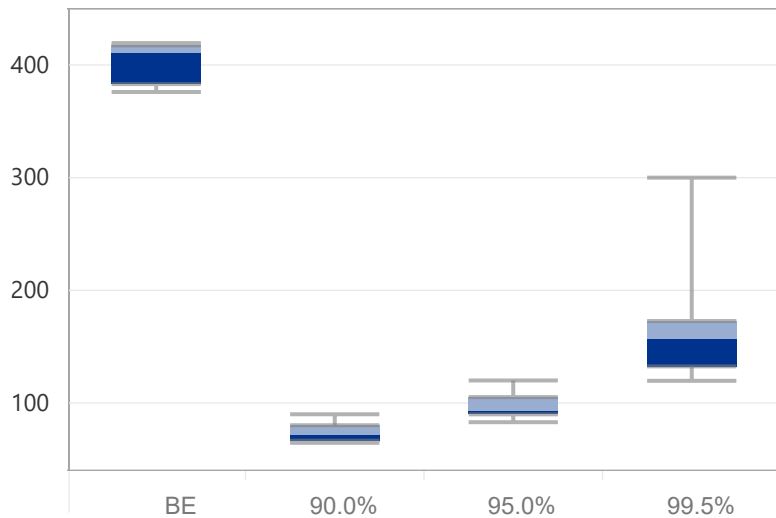
*BE stands for Best Estimate
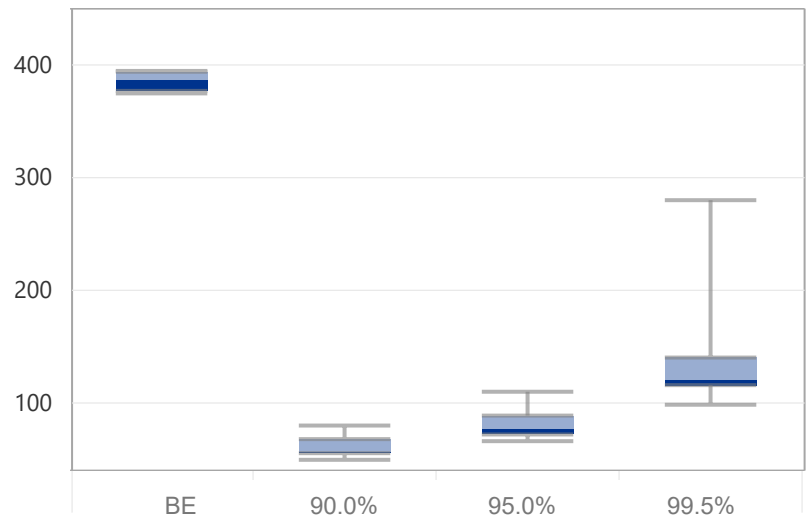
4.7 Currency stress (%) - Depreciation with respect to GBP (Percentiles)

Change in exchange rate, EUR to GBP

Change in exchange rate, USD to GBP

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Interest Rate Risk

Interest rates rose significantly over 2021. This resulted in some of the companies responding to the interest rate movements by increasing their interest rate stresses.

There is a wide disparity in the interest rate stresses (including interest rate volatility and gilt-swap spread stresses) produced by different companies. This reflects the variety of methodologies adopted in the industry, in particular, whether companies use additive or multiplicative stresses, or a combination of the two.

For this year's survey we have aligned the terms requested in charts 5.1a and 5.1b to those in IM 01. As such the median boxes for these charts do not contain equivalent medians for YE20, where terms 2 and 25 year were not requested.

5.1a Interest rates 1-in-200 down shocks (bps) GBP
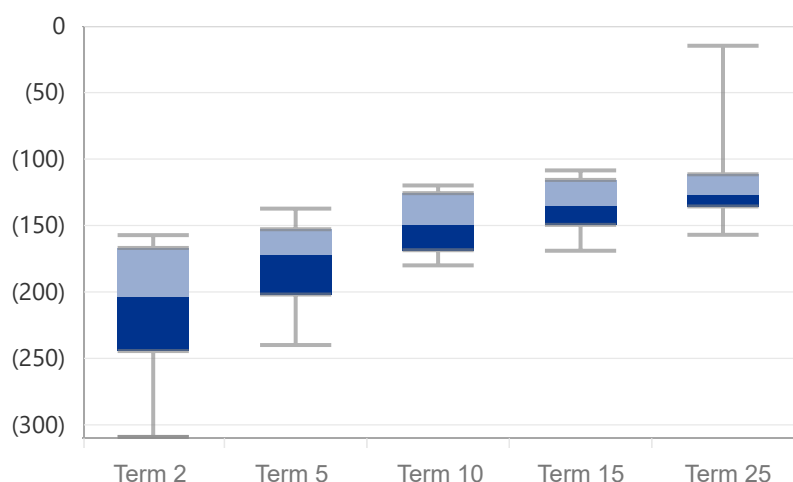
	Term 2 0.5%	Term 5 0.5%	Term 10 0.5%	Term 15 0.5%	Term 25 0.5%
YE20 Median		(171)	(150)	(120)	
YE21 Median	(203)	(172)	(150)	(135)	(127)

5.1b Interest rates 1-in-200 up shocks (bps) GBP
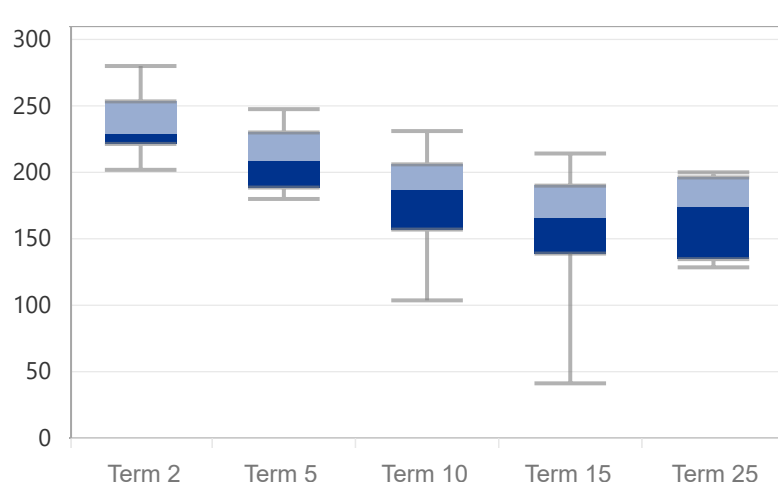
	Term 2 99.5%	Term 5 99.5%	Term 10 99.5%	Term 15 99.5%	Term 25 99.5%
YE20 Median		217	200	169	
YE21 Median	229	208	187	165	174

5.1c Interest rates 1-in-20 down shocks (bps) GBP
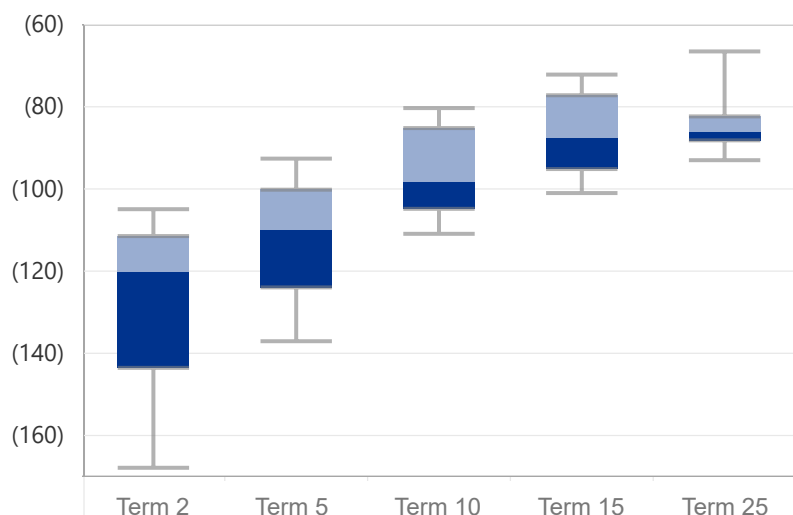
5.1d Interest rates 1-in-20 up shocks (bps) GBP
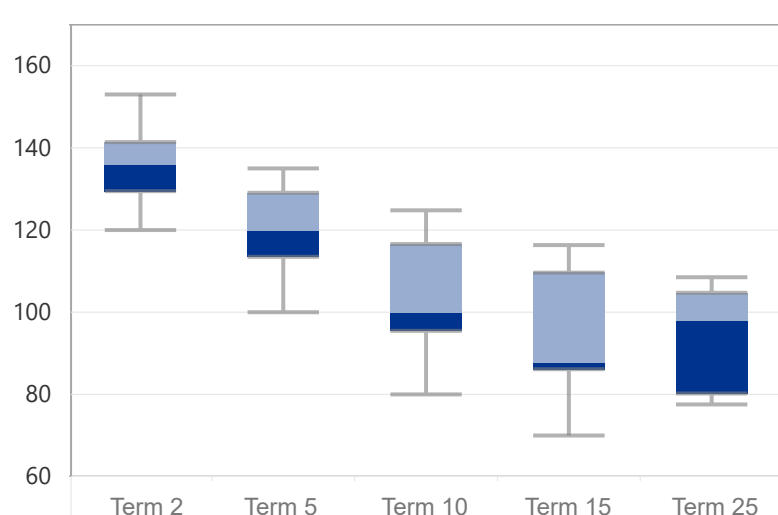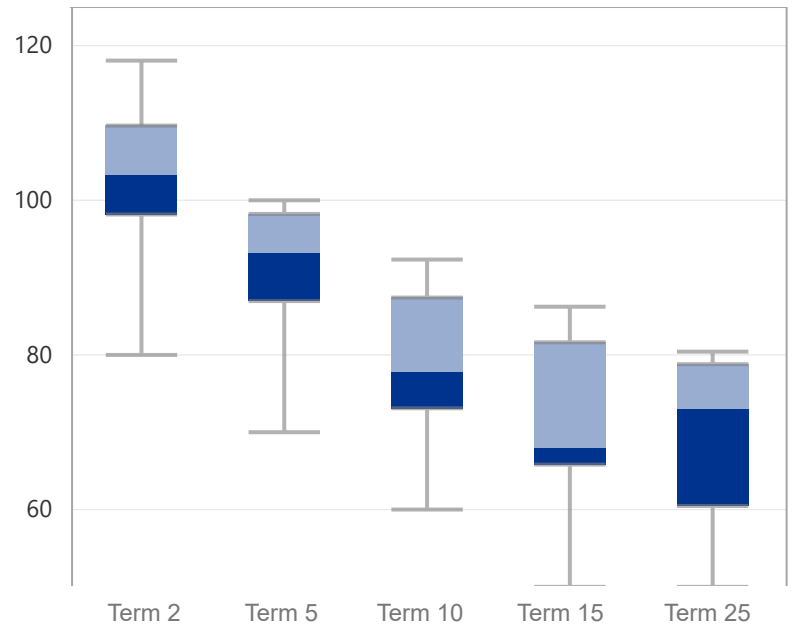
Technical Practices Survey 2022
5. Interest Rate Risk
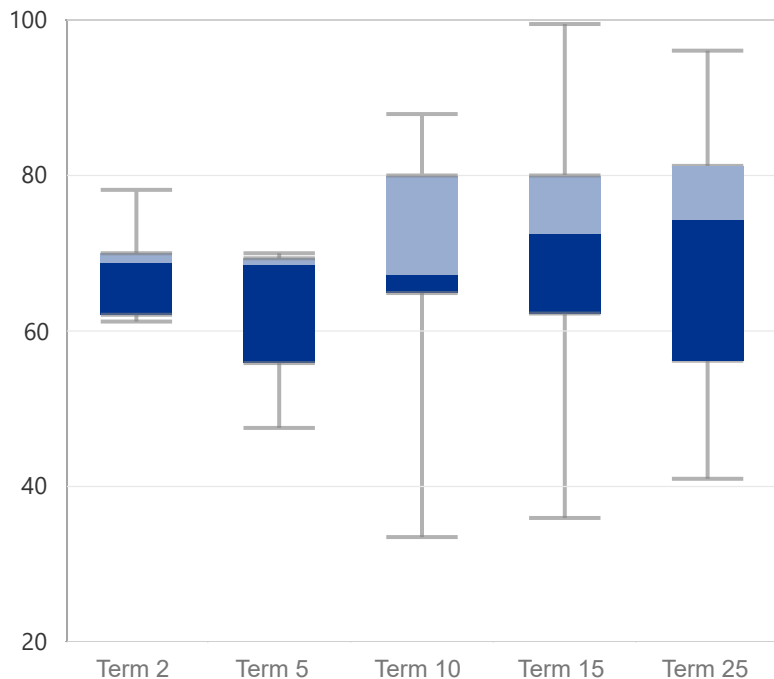
IM

Interest Rate Risk

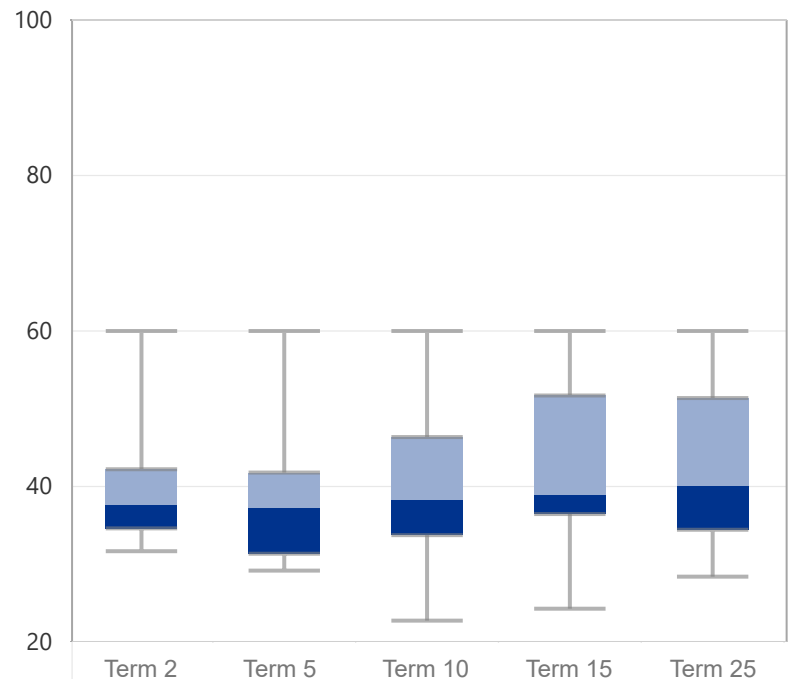**5.1e** Interest rates 1-in-10 down shocks (bps) GBP
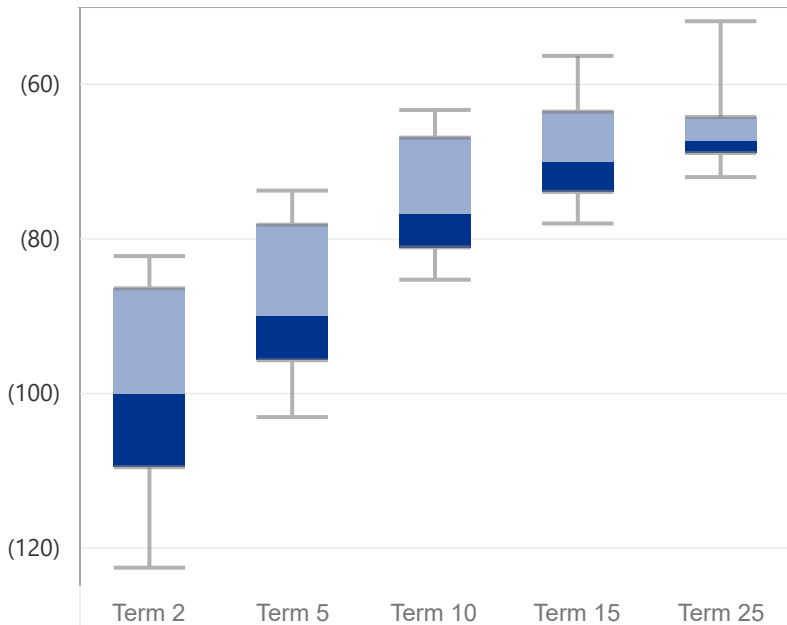
5.1f Interest rates 1-in-10 up shocks (bps) GBP

5.2a Sovereign/swap spread - 1-in-200 stress GBP (bps)

5.2b Sovereign/swap spread - 1-in-20 stress GBP (bps)

The median sovereign / swap spread stresses for YE21 reduced compared to YE20. This reduction is consistent with the fall in sovereign swap spread over 2021.
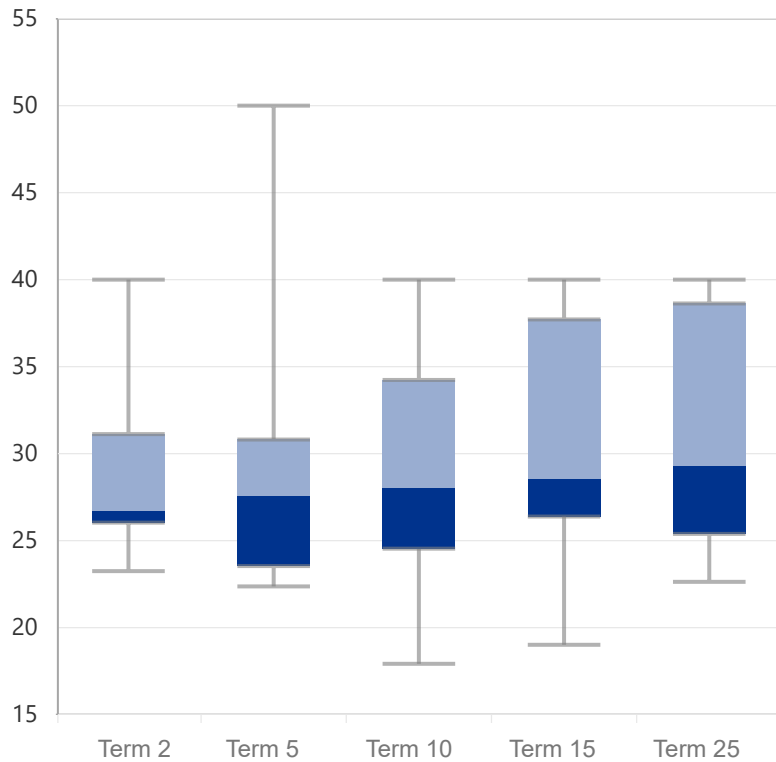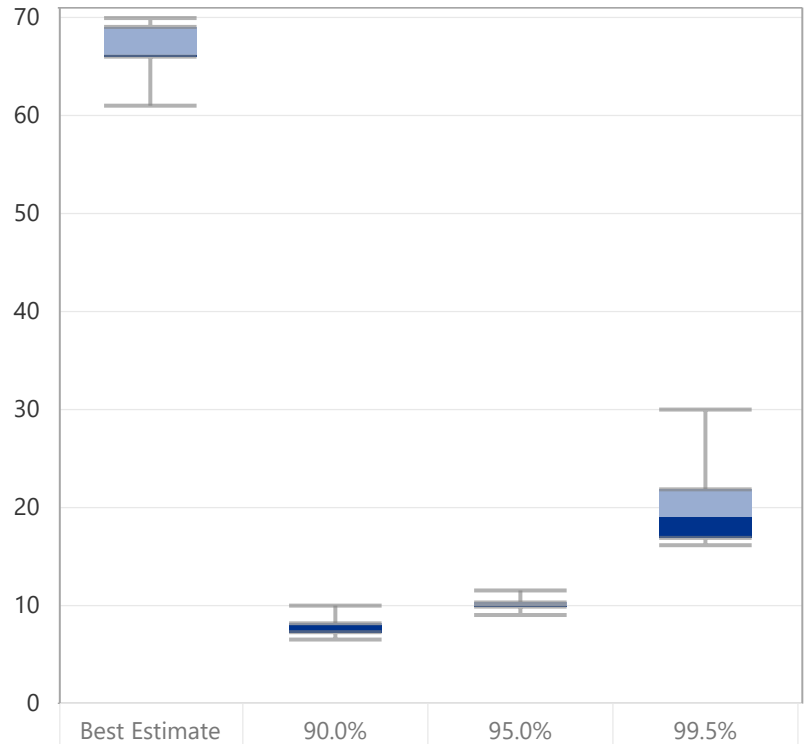
1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Interest Rate Risk

5.2c Sovereign/swap spread - 1-in-10 stress GBP (bps)

5.3 Interest rate volatility (bps)

5.4 How are shocks applied to interest rates?

Additive/Multiplicative with a switching point	2
Multiplicatively (log normal distribution)	2
Other	6

'Other' includes additively with a logistic or non-normal distribution, multiplicatively with a displacement factor, or by percentiles of another statistical distribution.

10

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Interest Rate Modelling

Most respondents allow for negative interest rates in their risk models, with approximately half of those firms applying a lower bound to the interest rates produced by their interest rate risk model. All respondents indicated that they hold capital for the spread between swaps and gilts.

5.5a Does your interest rate model allow for negative interest rates for base and stress purposes?
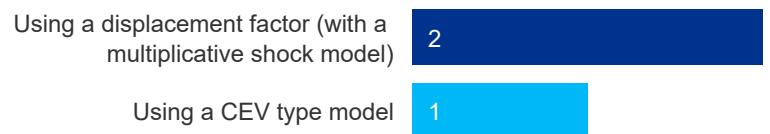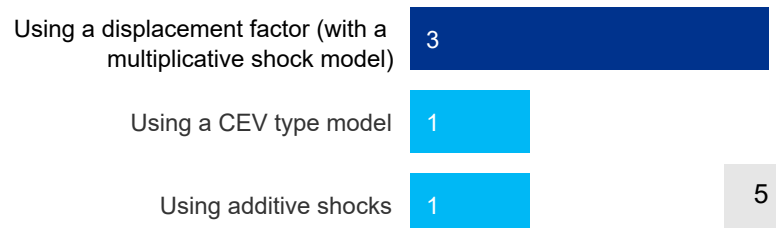
Base

Yes, with no lower bound	5
Yes, with lower bound	3

Stress

Yes, with lower bound	5
Yes, with no lower bound	1

8
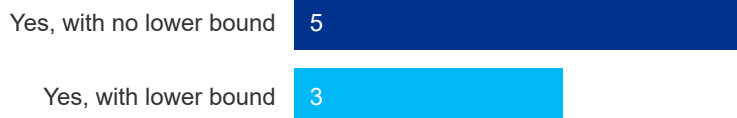
5.5b If your interest rate model allows for negative interest rates, can you set out how this is achieved in the model?
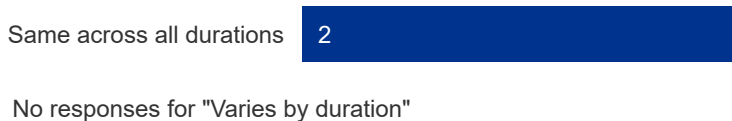
Base

Using a displacement factor (with a multiplicative shock model)	2
Using a CEV type model	1

Stress

Using a displacement factor (with a multiplicative shock model)	3
Using a CEV type model	1
Using additive shocks	1

5

5.5c If your model allows for negative interest rates with a lower bound, how does your firm set the lower bound?

Base

Same across all durations	2

No responses for "Varies by duration"

Stress

Same across all durations	4
Varies by duration	2

6

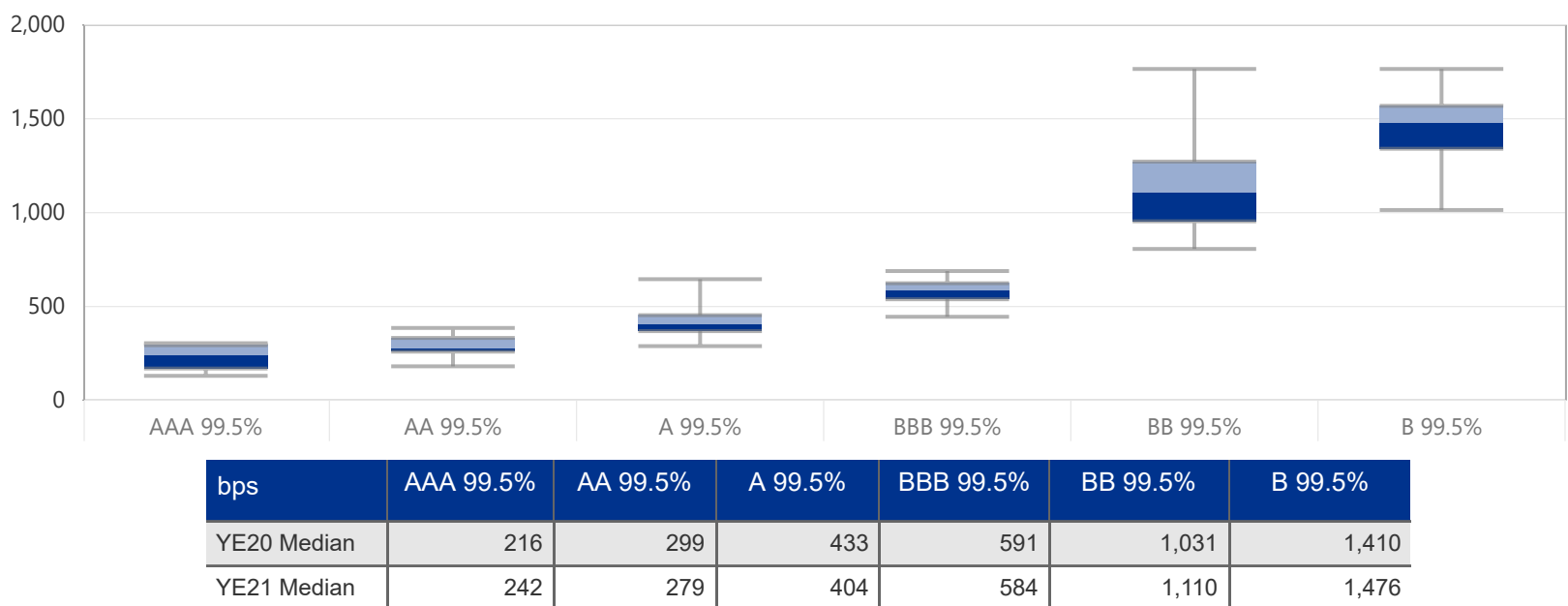| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax / 13. Correlation

IM

Asset-side Calibration - Total spread risk

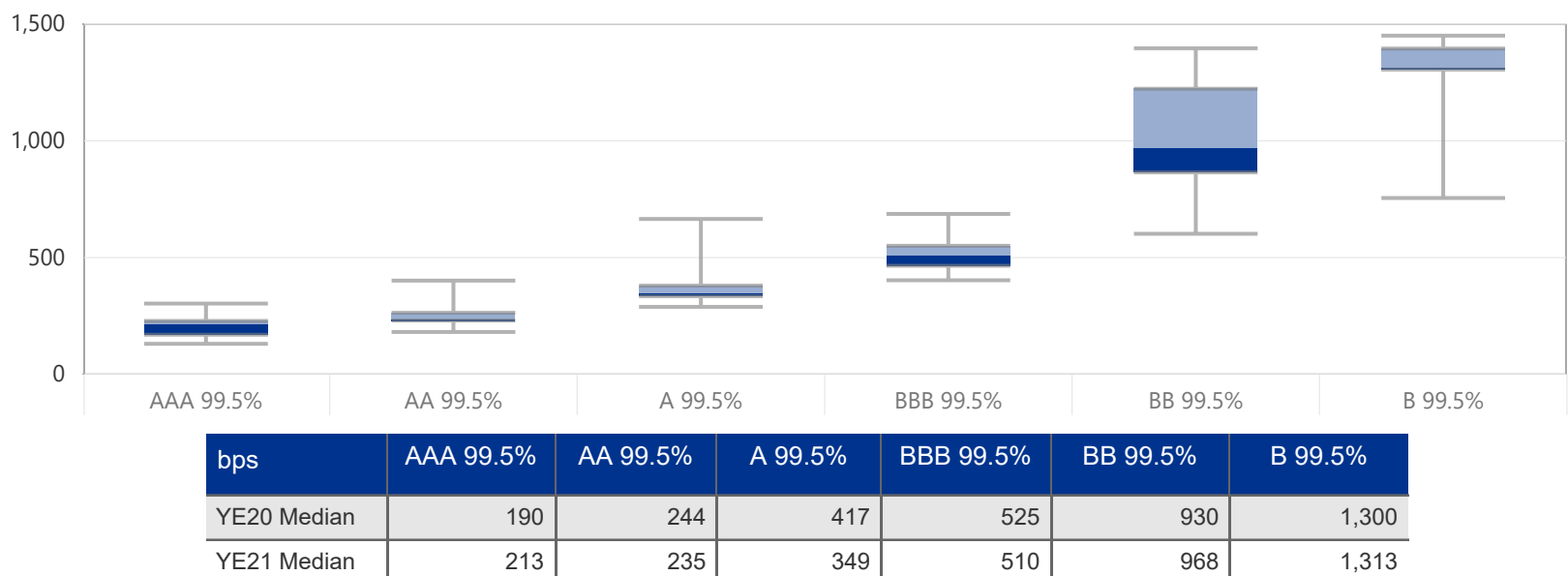The credit sections cover both SII calibration and modelling methodology adopted by life insurers in the UK. The sections are divided into:
- Asset side credit risk - risk of change in the market value of credit risky assets
- Liability side credit risk - risk of change in discount rate used to value annuity liabilities by those firms that have received permission to apply a Matching Adjustment

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 99.5th percentile. We also asked for spread only calibrations, however the responses were insufficient for reasonable comparisons to be drawn.

6.1a Change in Total Corporate Bond Spreads - Financials 10 years (bps)

bps	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%	BB 99.5%	B 99.5%
YE20 Median	216	299	433	591	1,031	1,410
YE21 Median	242	279	404	584	1,110	1,476

6.1b Change in Total Corporate Bond Spreads - Financials 15 years (bps)

bps	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%	BB 99.5%	B 99.5%
YE20 Median	190	244	417	525	930	1,300
YE21 Median	213	235	349	510	968	1,313

Technical Practices Survey 2022
6. Credit Risk

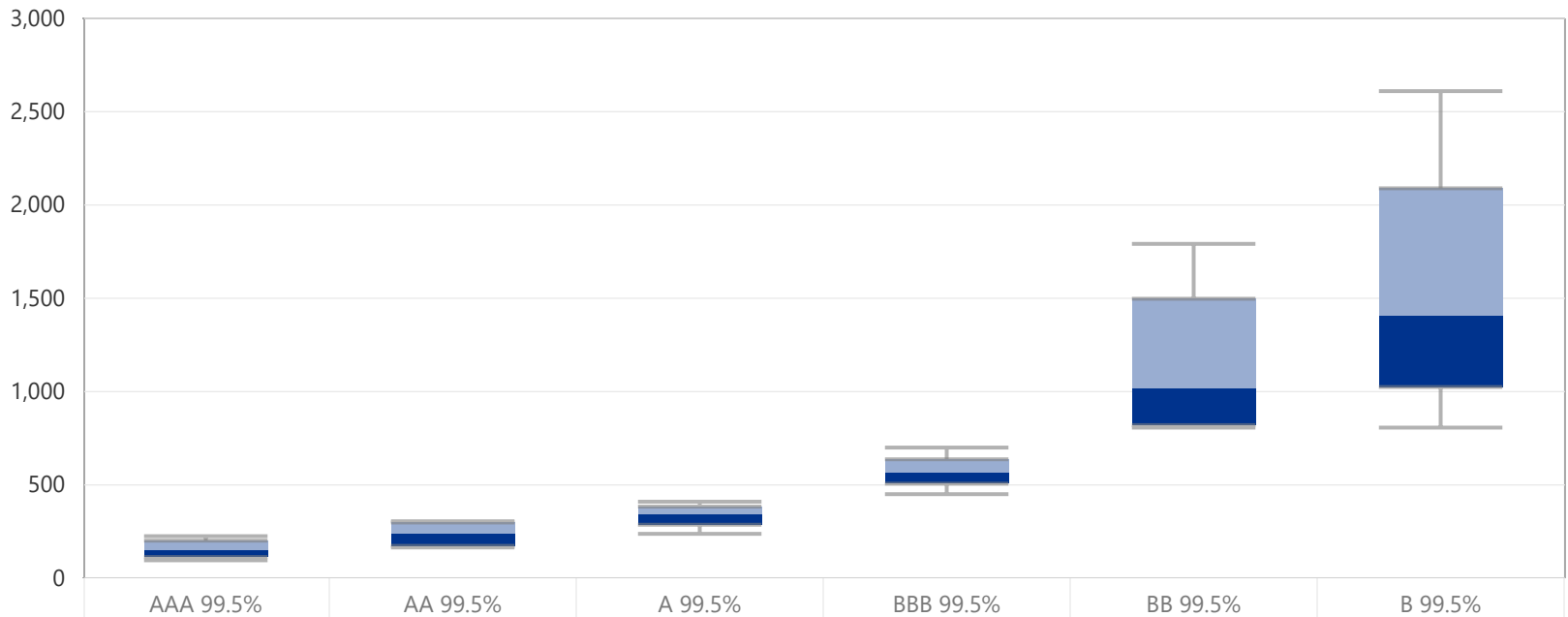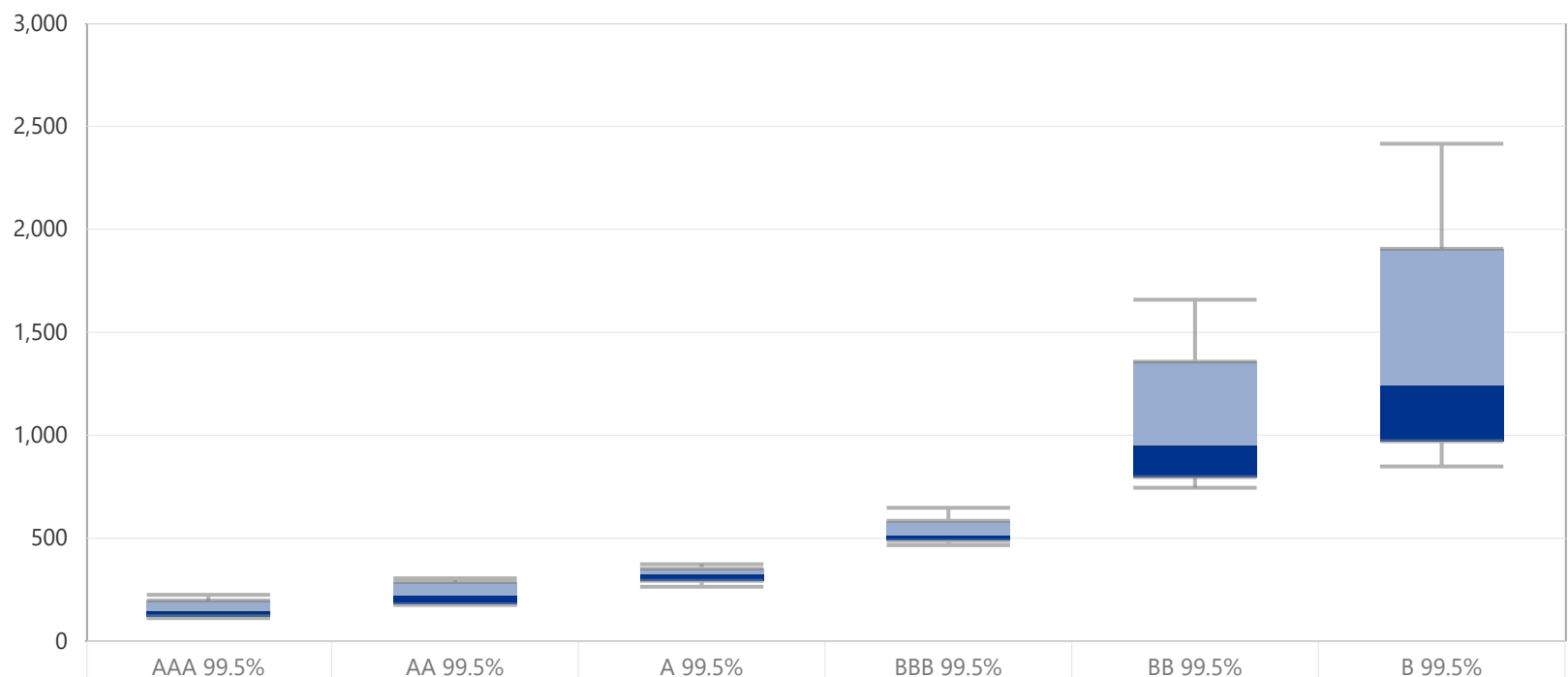| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Calibration - Total spread risk

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 99.5th percentile.

6.2a Change in Total Corporate Bond Spreads - Non-Financials 10 years (bps)
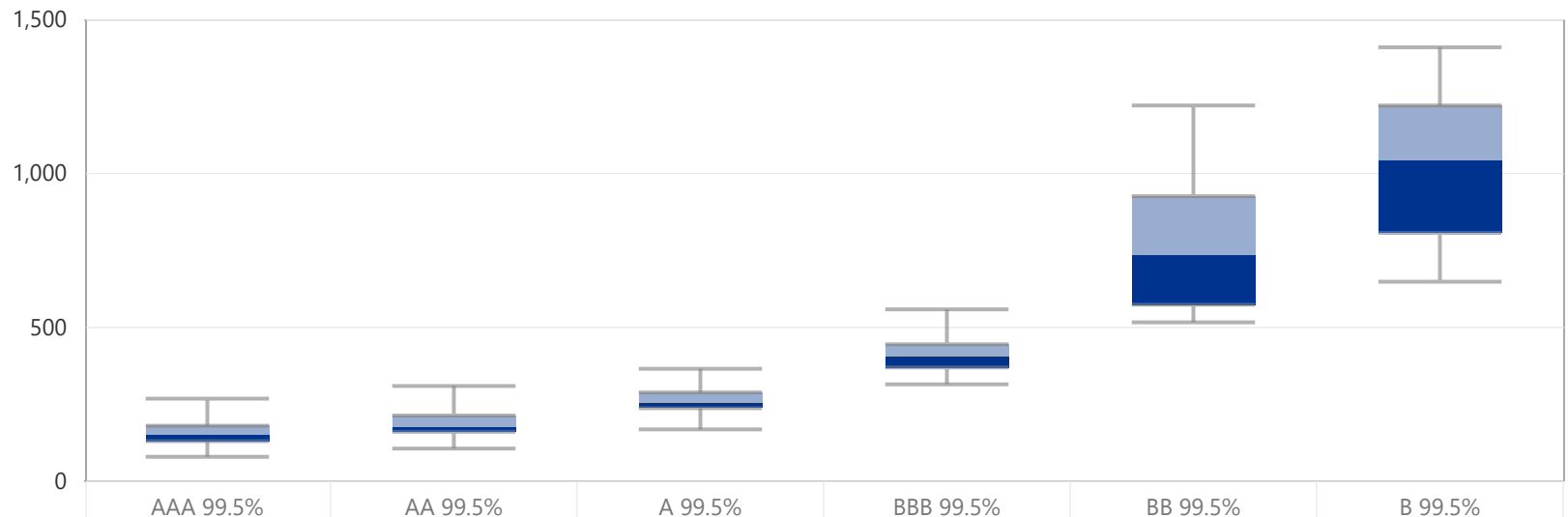
bps	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%	BB 99.5%	B 99.5%
YE20 Median	153	193	286	418	882	981
YE21 Median	153	179	257	406	735	1,043

6.2b Change in Total Corporate Bond Spreads - Non Financials 15 years (bps)
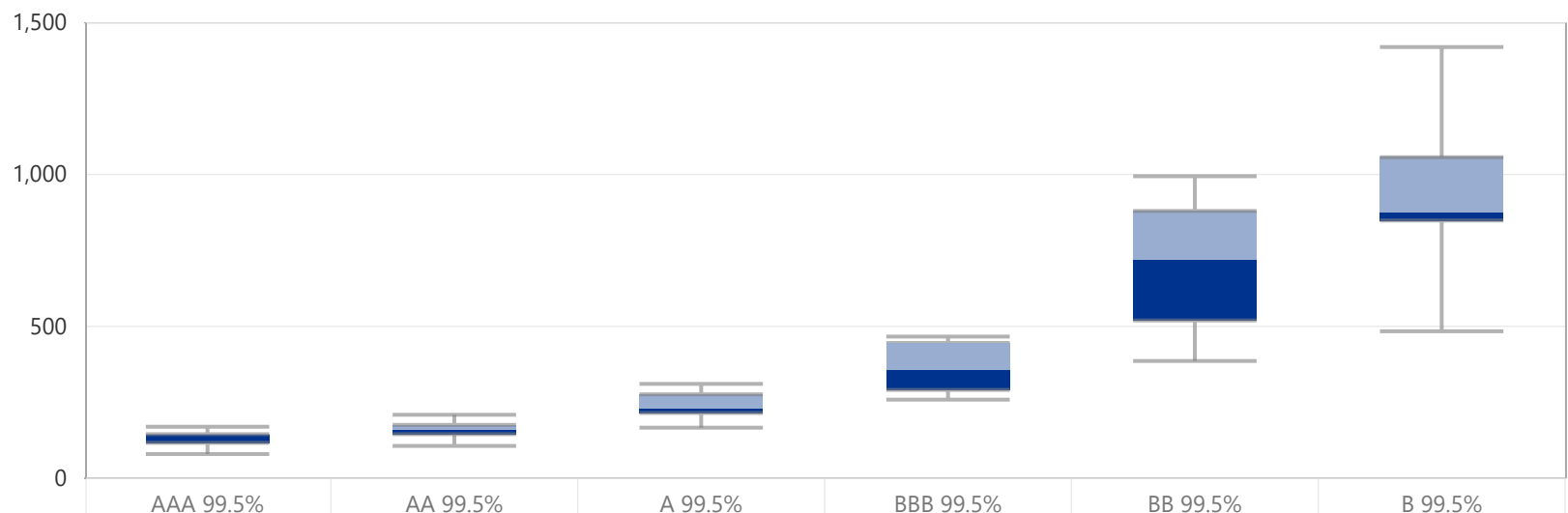
bps	AAA 99.5%	AA 99.5%	A 99.5%	BBB 99.5%	BB 99.5%	B 99.5%
YE20 Median	145	177	262	358	723	941
YE21 Median	143	162	232	358	718	875

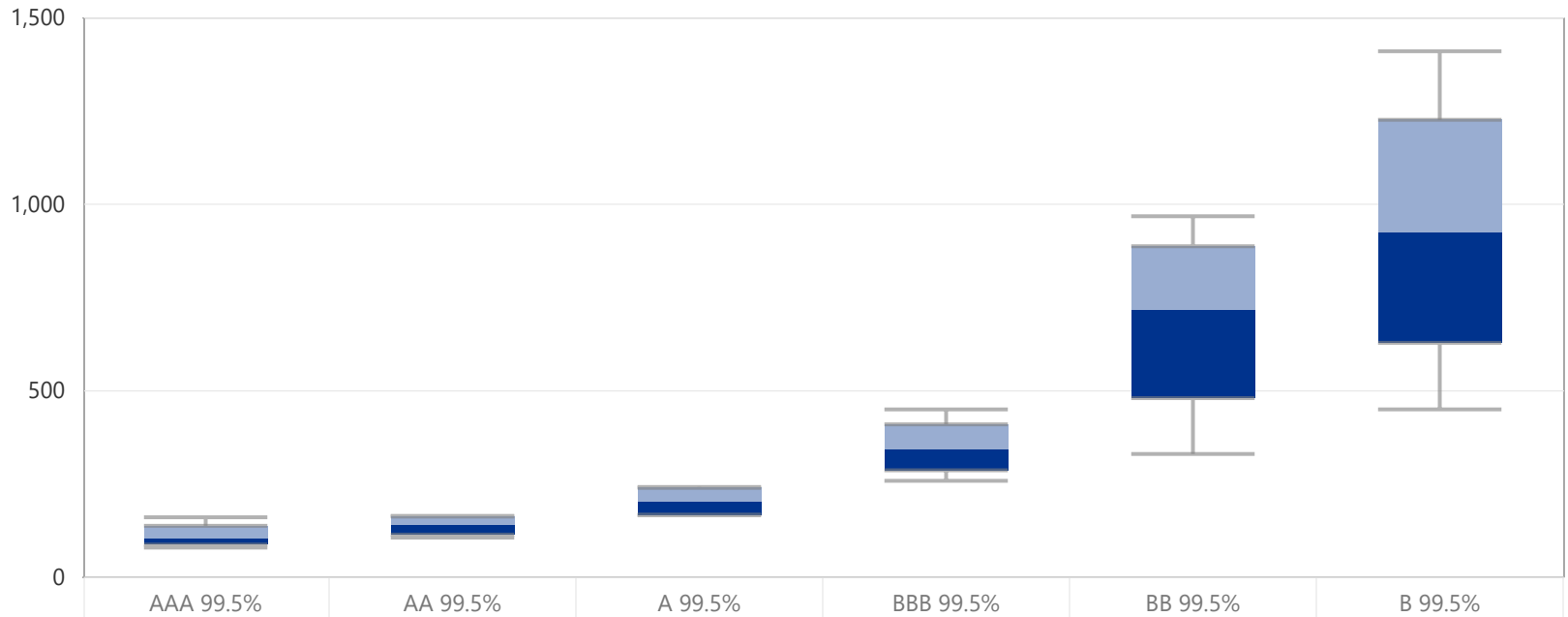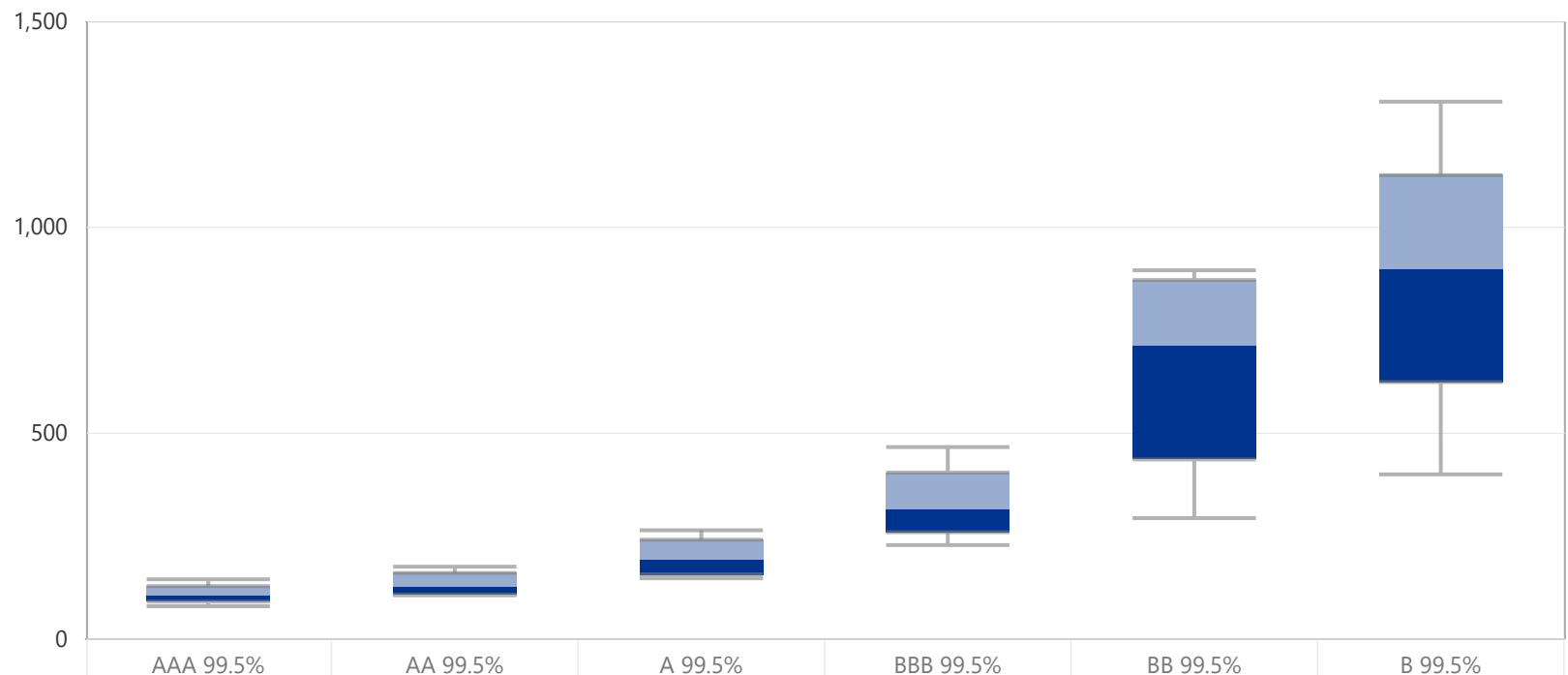| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Calibration - Total spread risk

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 99.5th percentile.

6.3a Change in Total Bond Spreads - Commercial Real Estate Lending 10 years (bps)

6.3b Change in Total Bond Spreads - Commerical Real Estate Lending 15 years (bps)

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Technical Practices Survey 2022
6. Credit Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Asset Side Calibration - Total spread risk

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 99.5th percentile.

6.4a Change in Total Bond Spreads - Infrastructure Debt Lending 10 years (bps)

6.4b Change in Total Bond Spreads - Infrastructure Debt Lending 15 years (bps)

Technical Practices Survey 2022
6. Credit Risk

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Calibration - Credit Risk

The volatility of credit spread widening shocks (incorporating the effect of spread volatility and migration) has historically been higher for Financial bonds than for Non-Financial bonds. This is shown below for A and BBB. A full view of other ratings can be found in the 'Asset Side Calibration Appendix' towards the end of the Credit Risk section.

The following charts show the change in total bond spreads (incorporating spread volatility and migration risk) for A and BBB rated bonds at 99.5th and 95th percentiles in bps.
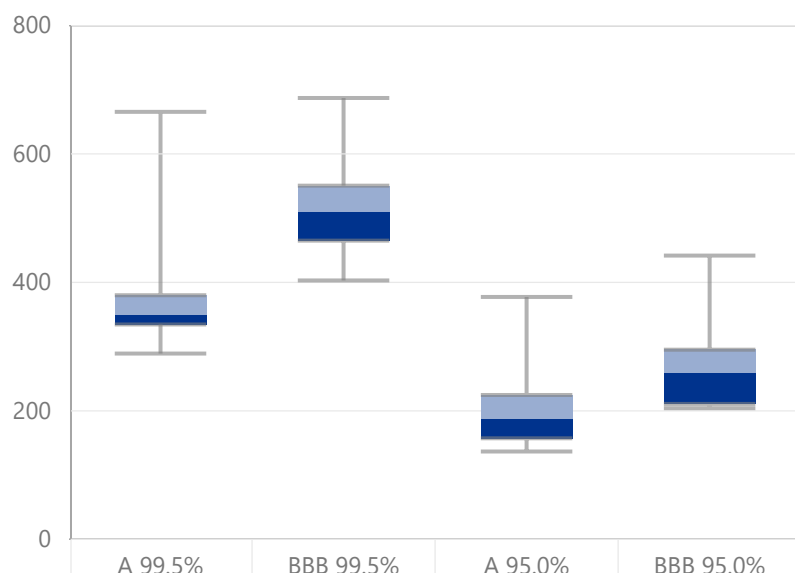
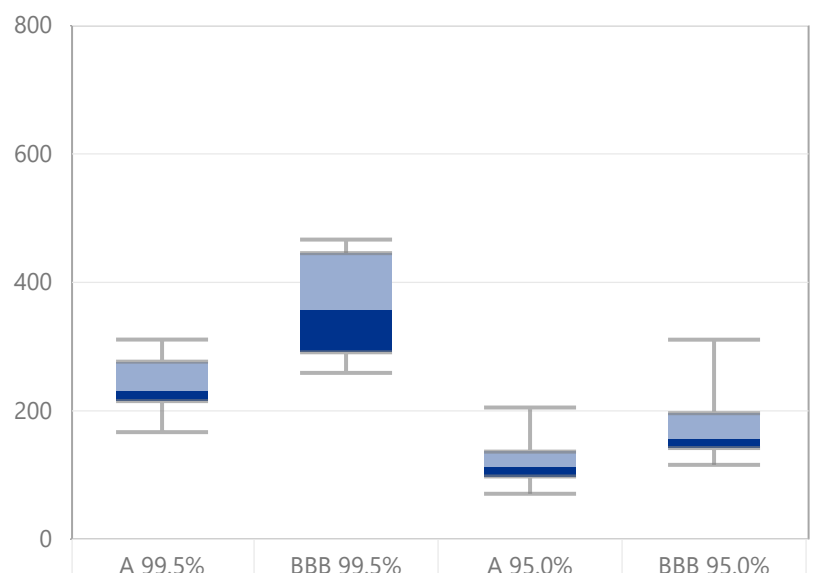**6.5a** Change in Total Corporate Bond Spreads - Financials 10 years (bps)
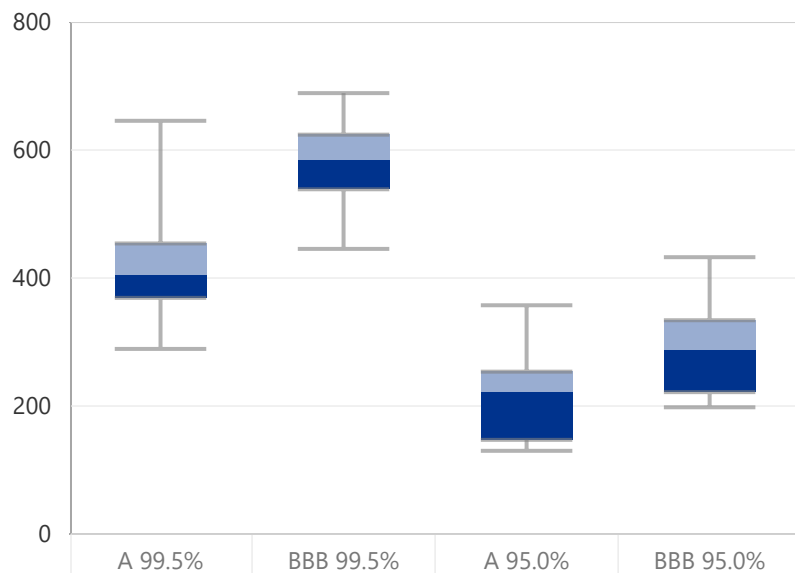
6.5b Change in Total Corporate Bond Spreads - Non Financials 10 years (bps)
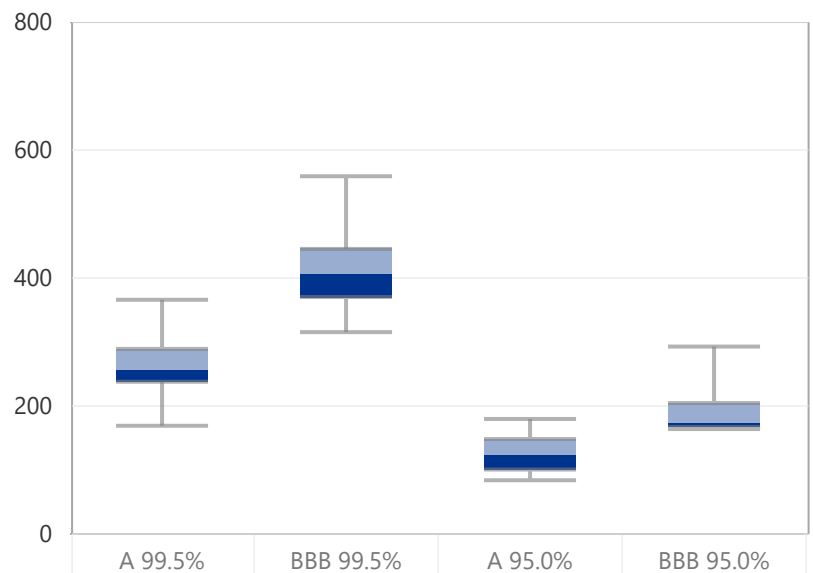
6.5c Change in Total Corporate Bond Spreads - Financials 15 years (bps)

6.5d Change in Total Corporate Bond Spreads - Non Financials 15 years (bps)
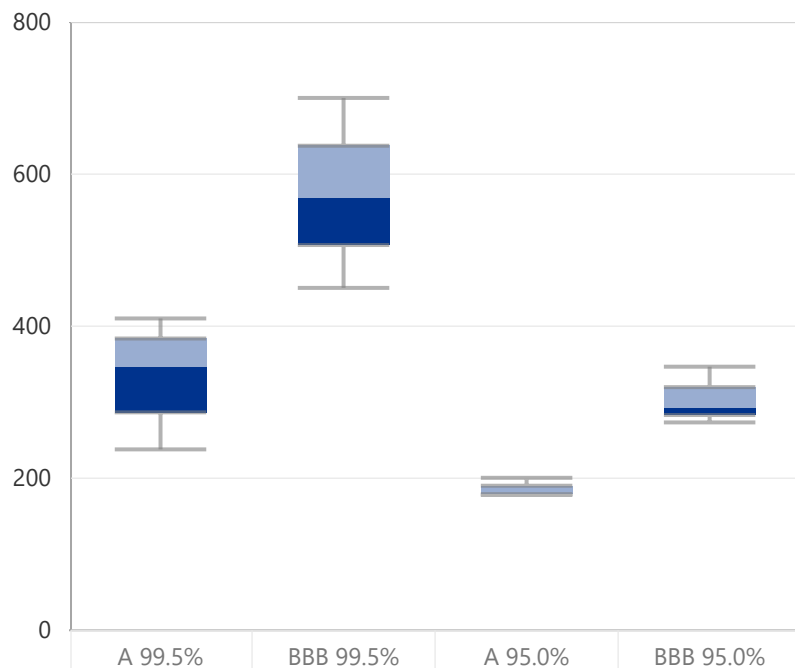
Technical Practices Survey 2022
6. Credit Risk

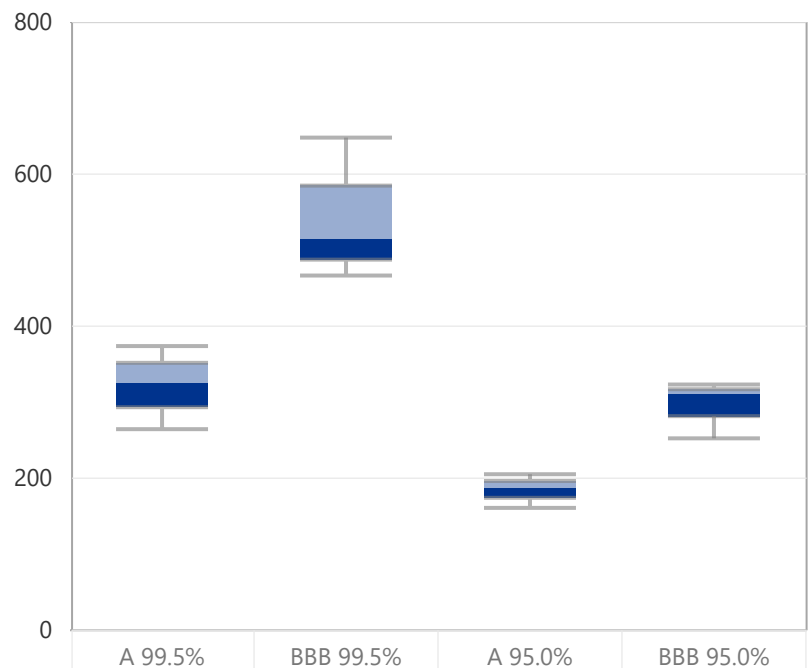| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Asset Side Calibration - Credit Stress

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for A and BBB rated bonds at the 99.5th and 95th percentiles. While we also requested for information on spread only calibrations, we received limited responses so are unable to provide a meaningful comparison.
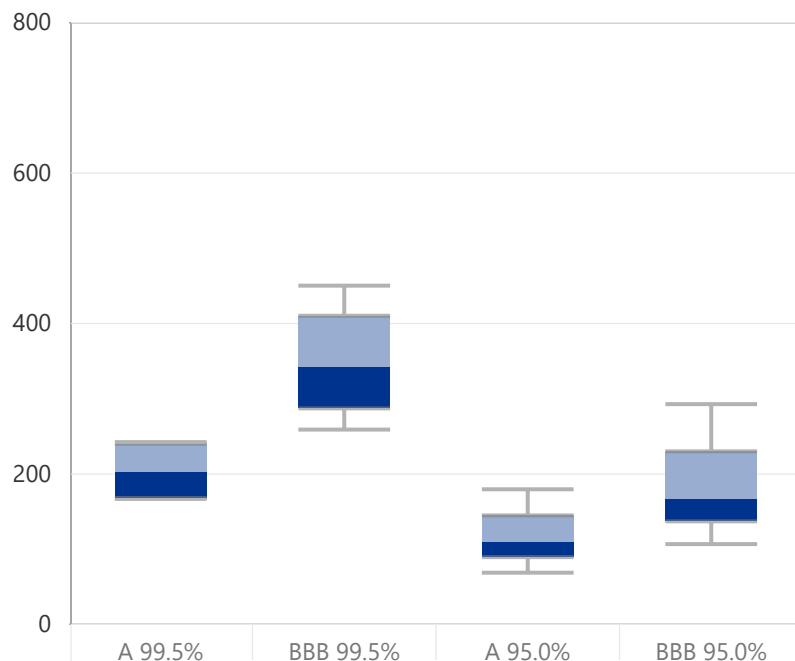
6.5e Change in Total Bond Spreads - Commercial Real Estate Lending 10 years (bps)
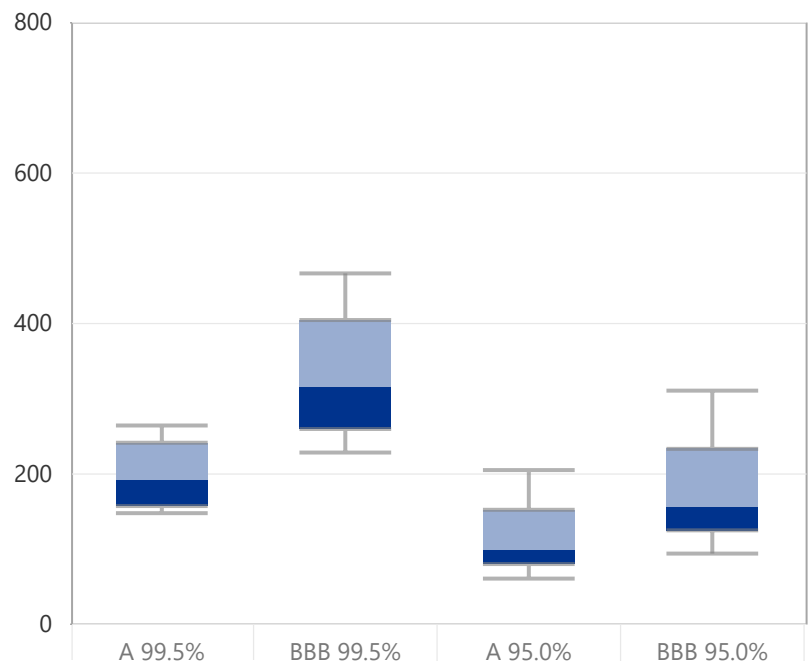

6.5f Change in Total Bond Spreads - Commercial Real Estate Lending 15 years (bps)

6.5g Change in Total Bond Spreads - Infrastructure Debt 10 years (bps)

6.5h Change in Total Bond Spreads - Infrastructure Debt 15 years (bps)

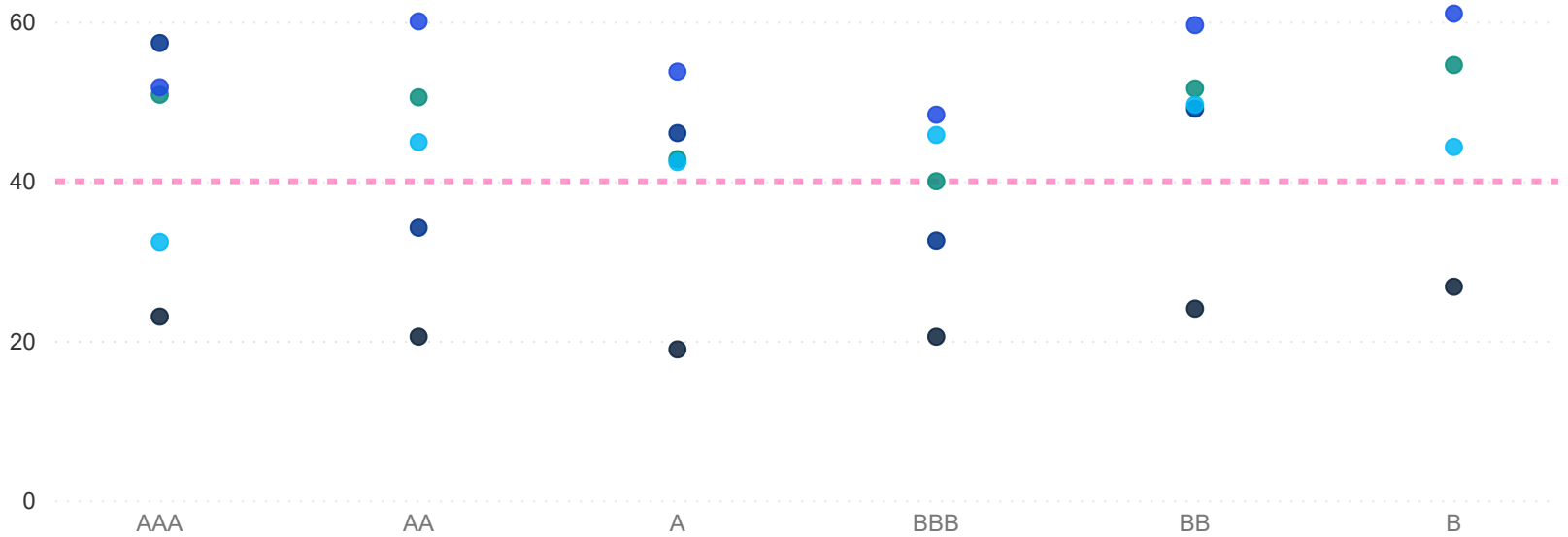| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

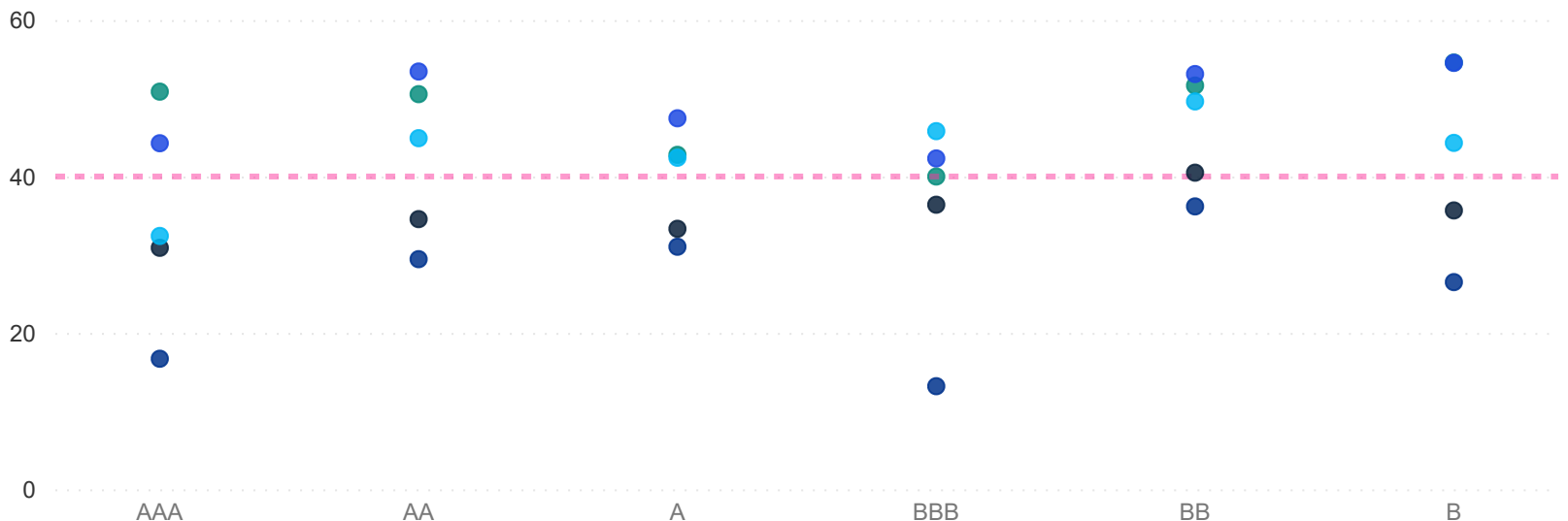## Asset Side Calibration - Transition and Default Stress

We have introduced new questions in this year's survey concerning the probability of downgrade and default. 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 a widely used benchmark which is broadly represented by the red dotted line. Each dot colour in the chart below represents the response of a particular firm.

We also asked for transition and default information on Commercial Real Estate Lending and Infrastructure Debt however the depth of responses was insufficient to provide meaningful insight.

6.6a 1-in-200 probability of downgrade and default for Financial Corporates (%)

6.6b 1-in-200 probability of downgrade and default Non-Financial Corporates (%)

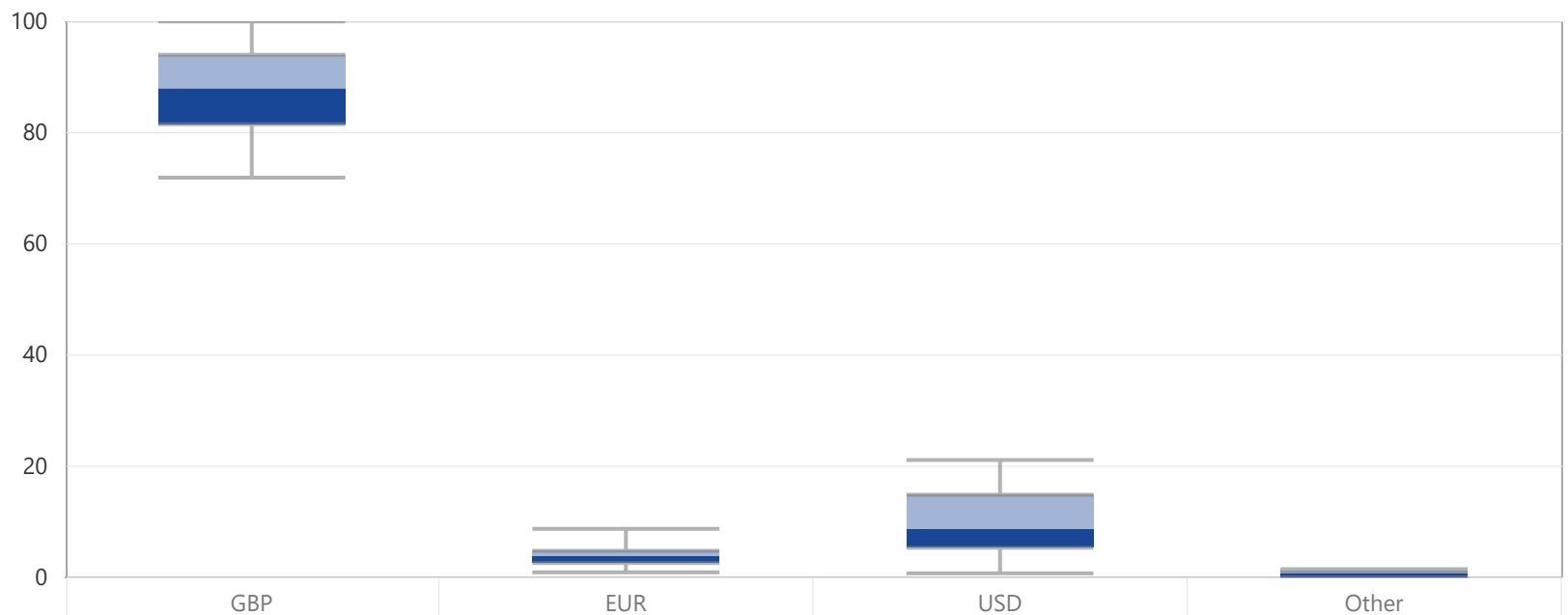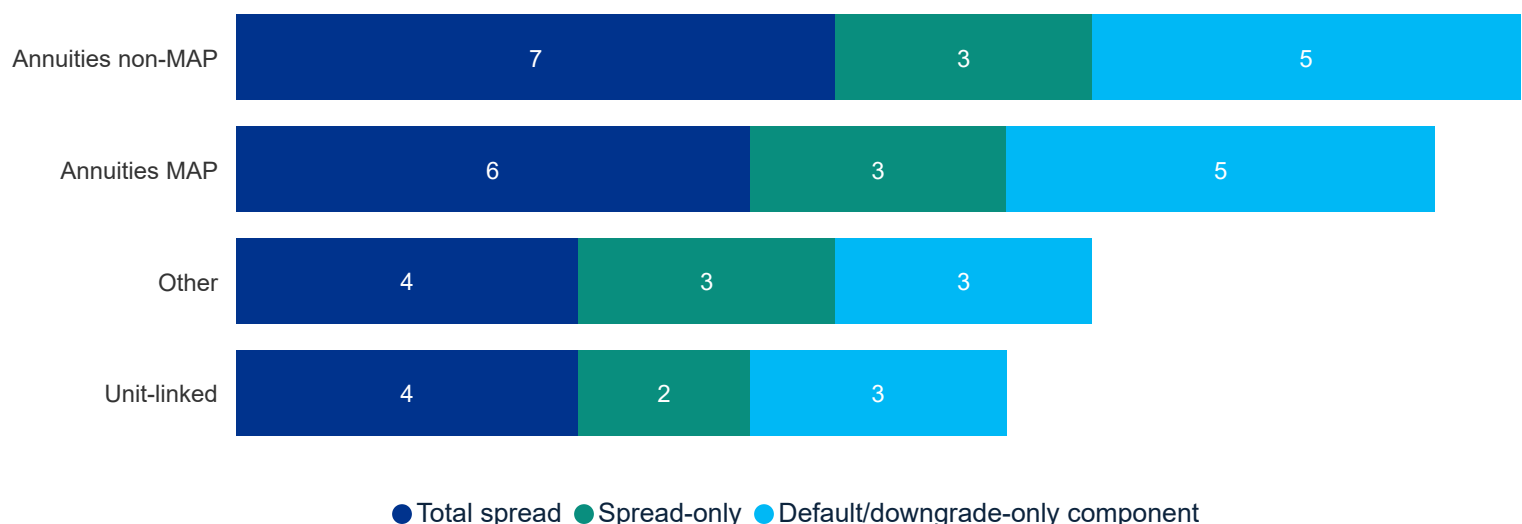| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Credit Risk - Modelling Approach

Within the universe of all credit risky assets, we believe that corporate bonds are the largest single asset class to which life insurers are exposed. Exposure to commercial mortgage real estate and infrastructure investment is also now increasing.

In this section, we discuss the approaches to modelling credit risk that have been adopted across the UK life insurance sector.

6.7 What proportion of your portfolio is held in the following currencies (%)?

6.8 Which of the following credit-related stress components do you calibrate?

● Total spread ● Spread-only ● Default/downgrade-only component

'Other' refers to other product lines

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM   **Asset Side Calibration – Credit Risk Drivers**

Only one firm reported that they used a specific, non-credit risk driver for an asset class.

6.9 What specific risk drivers do you allow for within your capital modelling (e.g. in your proxy model)?

	1	2	3	4	5	6	7	8	9
Default risk drivers					✓	✓		✓	
Matching Adjustment Offset (MAO)	✓		✓					✓	✓
Fundamental spread		✓							
Spread risk driver	✓	✓	✓		✓	✓	✓	✓	✓
Transition risk driver						✓	✓	✓	
Other			✓	✓					✓
Common to all in scope asset classes?	Y	Y	Y	Y	Y	Y	Y	Y	N

'Other' risk drivers include:
- 3 'Other' represents a single risk driver that covers downgrades, i.e. transitions, and defaults.
- 4 did not provide information on the 'Other' risk driver
- 9 'Other' risk driver applicable to Commercial Real Estate Lending represents property level, property volatility, net rental income, cost of liquidity, cost of capital
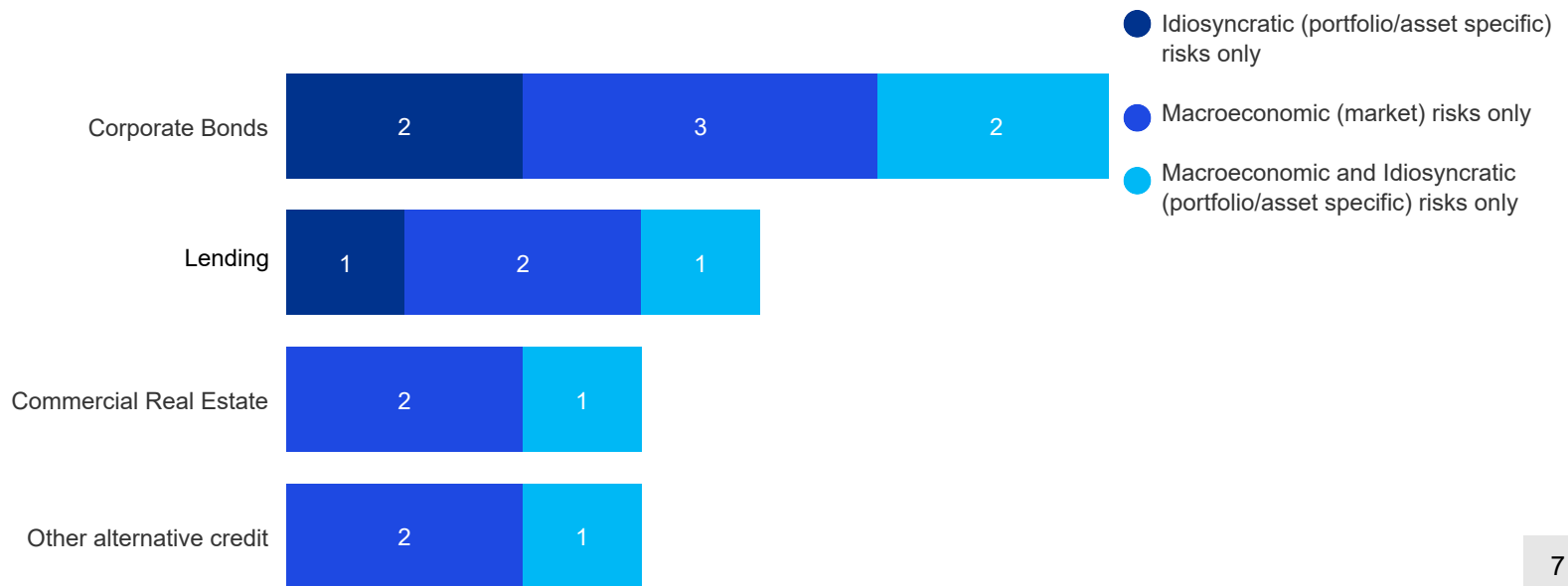
Technical Practices Survey 2022
6. Credit Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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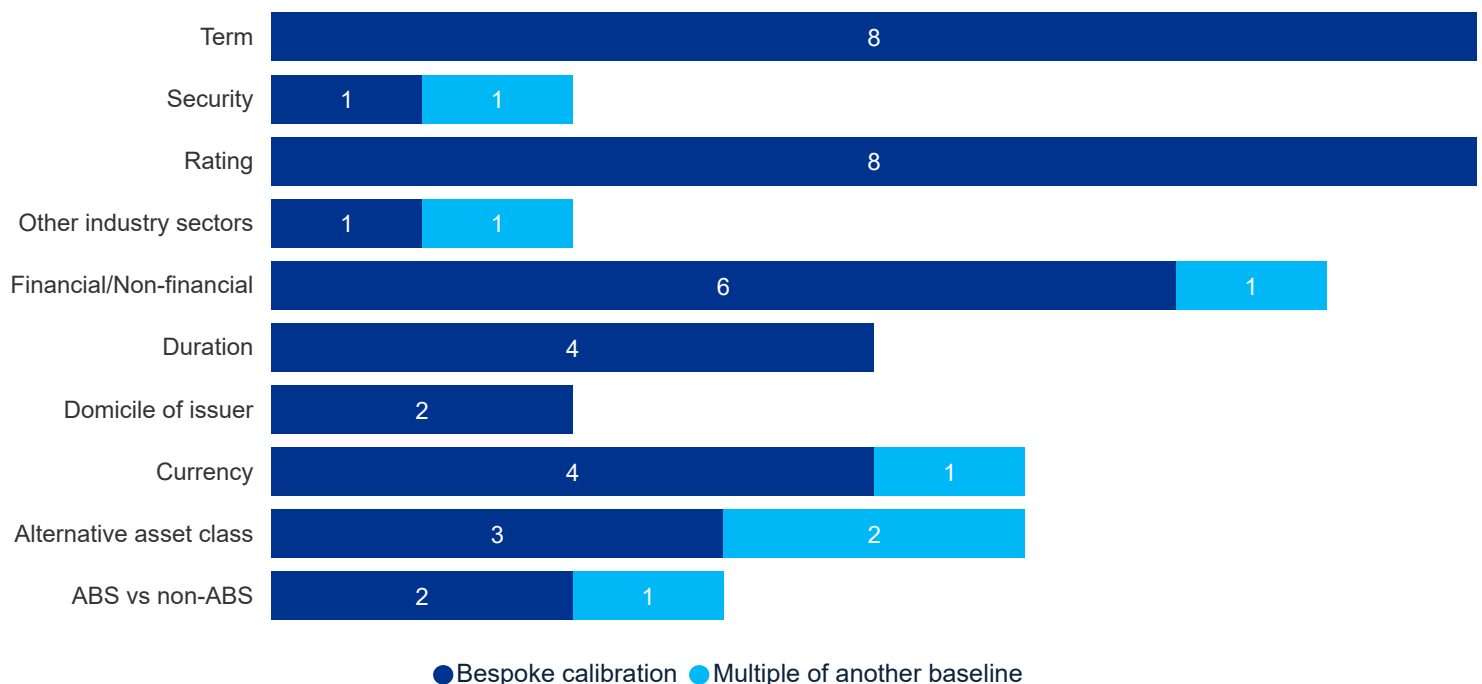## Asset Side Calibration - Risk Drivers

Rating and term continue to be the most influential aspects of a credit holding which impact the credit stress calibration.

6.10 What is the source of risk drivers for the different credit asset classes listed below in calculating your credit spreads SCR?

Legend:
- Idiosyncratic (portfolio/asset specific) risks only
- Macroeconomic (market) risks only
- Macroeconomic and Idiosyncratic (portfolio/asset specific) risks only

Asset Class	Idiosyncratic	Macroeconomic (market)	Macroeconomic and Idiosyncratic
Corporate Bonds	2	3	2
Lending	1	2	1
Commercial Real Estate		2	1
Other alternative credit		2	1

7

6.11 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 output total spread stress?

Factor	Bespoke calibration	Multiple of another baseline
Term	8	
Security	1	1
Rating	8	
Other industry sectors	1	1
Financial/Non-financial	6	1
Duration	4	
Domicile of issuer	2	
Currency	4	1
Alternative asset class	3	2
ABS vs non-ABS	2	1

● Bespoke calibration ● Multiple of another baseline

8

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1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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Asset Side Calibration - Credit Stress

6.12 Have you applied any expert judgements or overlays in respect of credit risk within the calibrations applied for market risks?
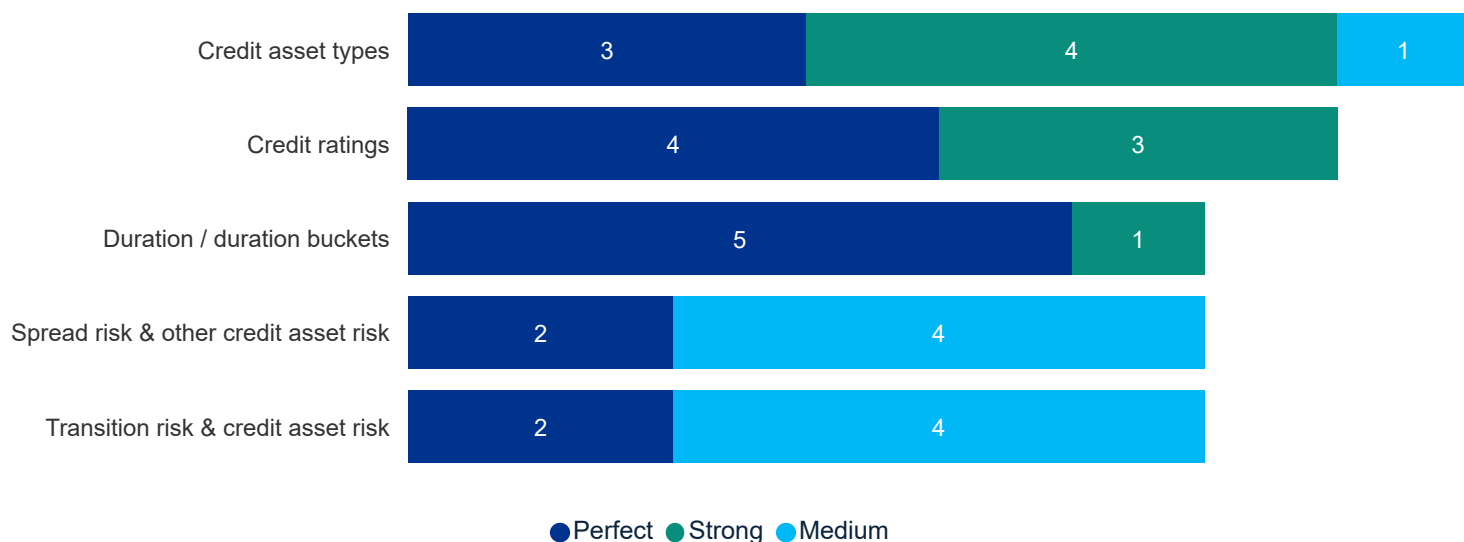

Yes 44%

No 56%
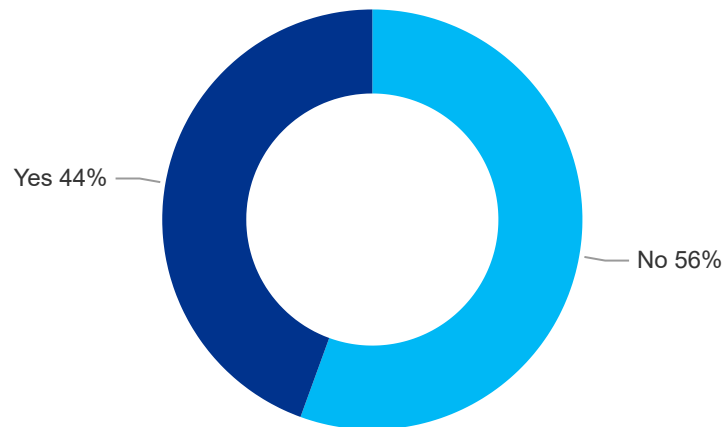
9

6.13 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%.
- Uncorrelated: 0% correlation

	Perfect	Strong	Medium
Credit asset types	3	4	1
Credit ratings	4	3	
Duration / duration buckets	5	1	
Spread risk & other credit asset risk	2		4
Transition risk & credit asset risk	2		4

●Perfect ●Strong ●Medium

8

The chart above indicates that firms tend to allow for diversification between different risks sund credit ratings for the total spreads risk driver.

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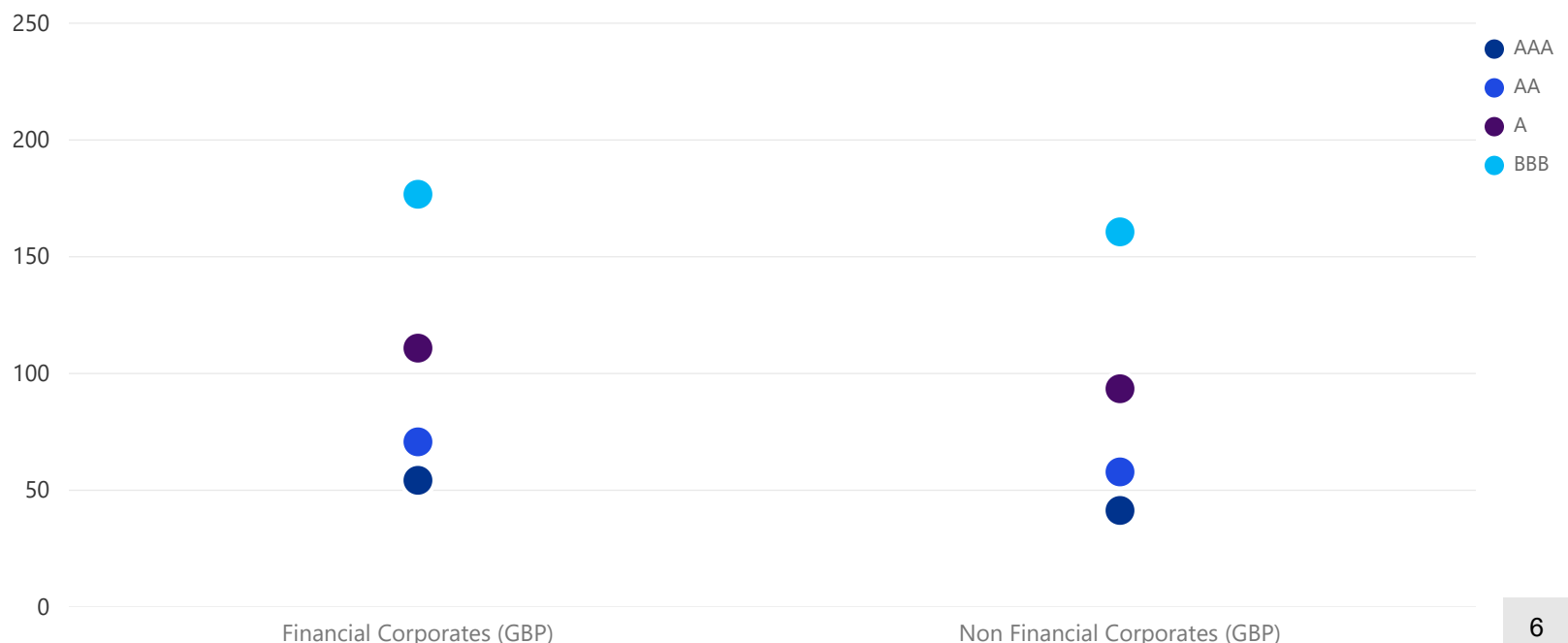| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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Liability Side Credit Risk - Calibration

Credit risk remains a very significant risk and focus for a number of firms. We have continued to benchmark the 1-in-200 default and downgrade component of credit stress, as it is indicative of the credit spread stress capital net of offset from changes in MA. The range of 1-in-200 average fundamental spreads stress as a % of total spread stress is too wide to provide a meaningful benchmark.

6.14a Average change in fundamental spreads prior to re-balancing, 1-in-200 stress for 10 years (GBP) (bps)
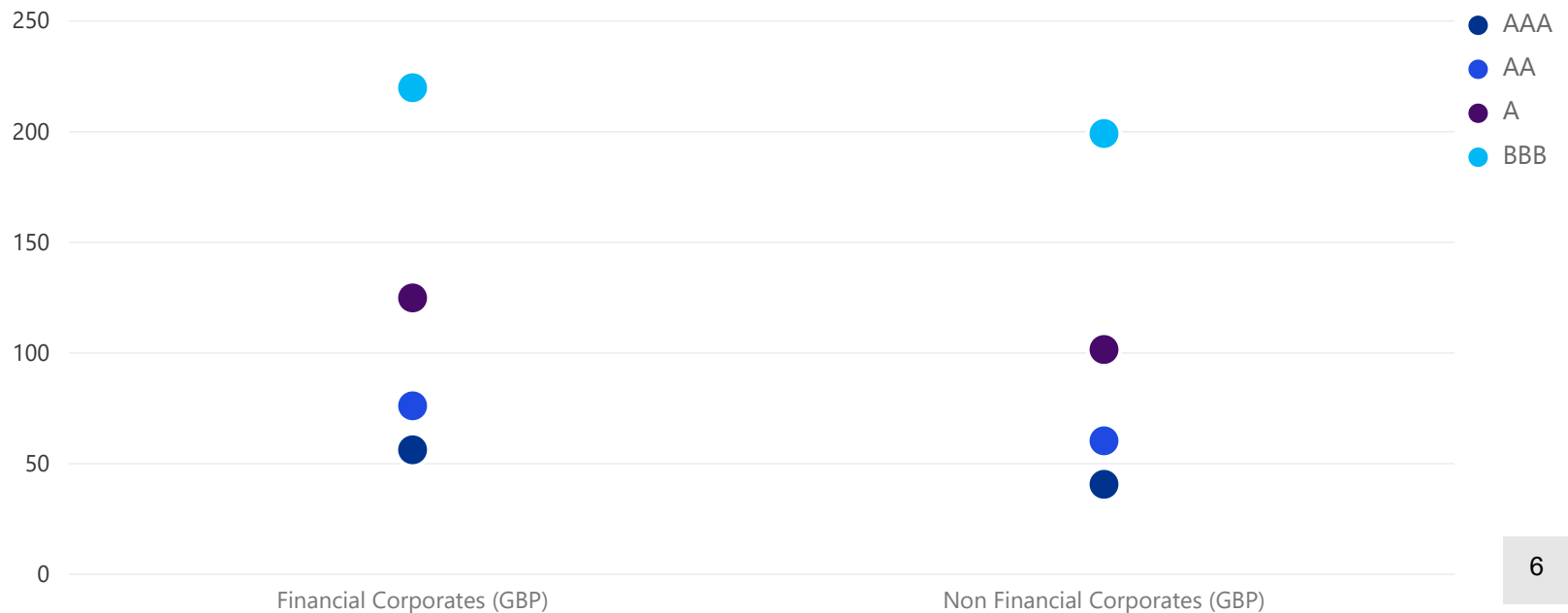
6.14b Average change in fundamental spreads prior to re-balancing, 1-in-200 stress for 15 years (GBP) (bps)

6

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Technical Practices Survey 2022
6. Credit Risk

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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Liability Side Calibration - Fundamental Spreads Under Stress

Similar to last year, all respondents adopt a bespoke calibration for components of Fundamental Spreads (FS) under stress. In modelling FS in stress, cost of downgrade is the assumption that is most commonly varied in comparison to base EIOPA.

6.15 Which elements of the fundamental spread calibration do you allow for in your stress calibration?
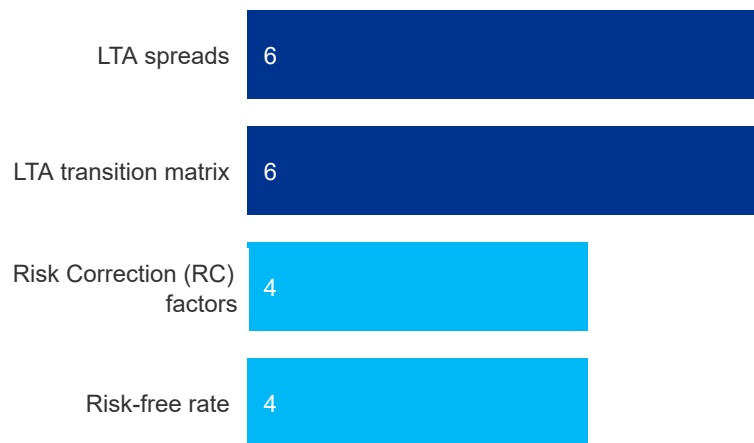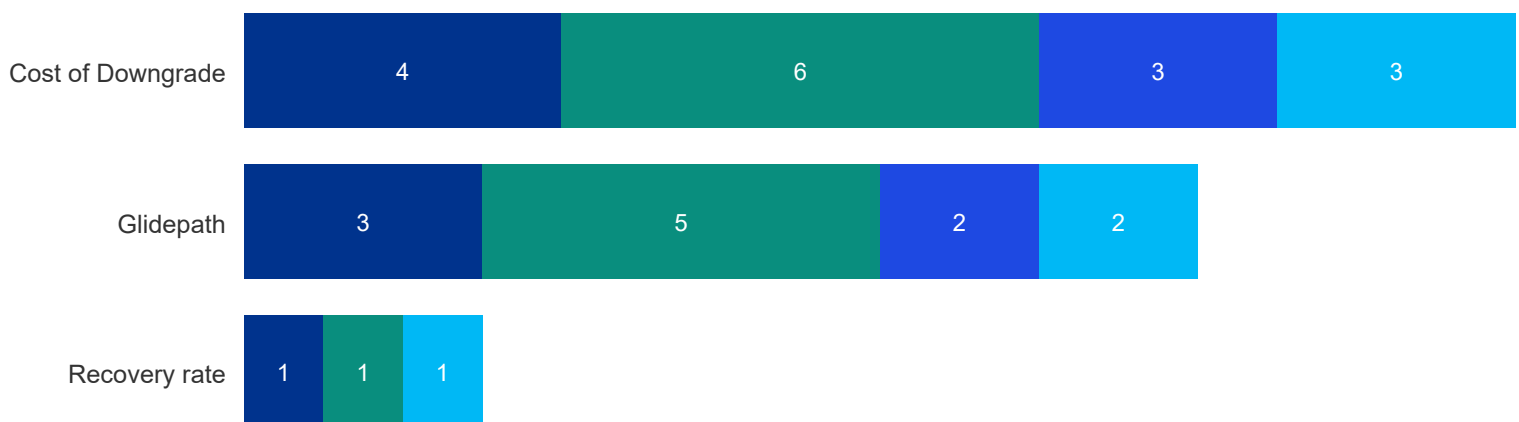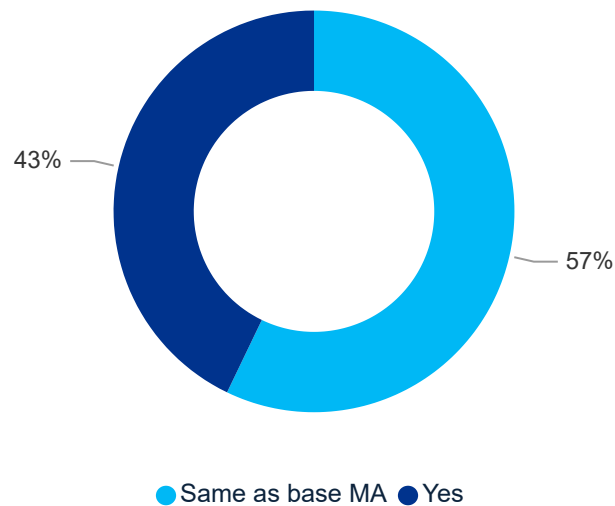

6.16 Do you allow for a glidepath period for transitions within each of the components respectively?
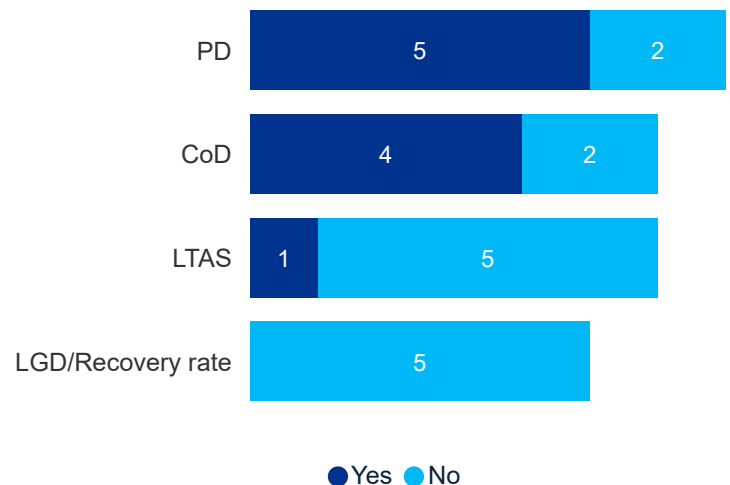
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7

6.17 To model FS in stress, which of the following assumptions do you vary compared to base EIOPA?

7

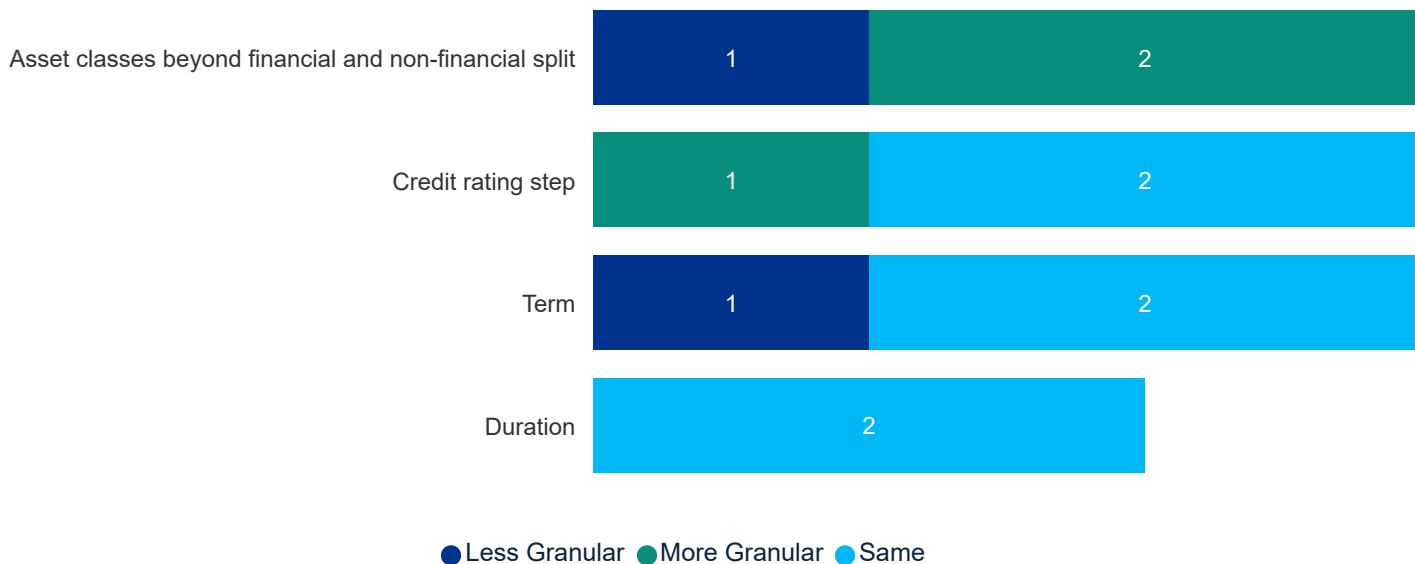| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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Liability Side Calibration - Fundamental Spreads Under Stress

6.18 Do you calibrate stressed Fundamental Spreads (FS) at a different granularity as compared to base FS, e.g. more credit rating steps or asset classes?

43%   57%

● Same as base MA ● Yes

7

6.19 If you answered yes to question 6.18, is this the same, more or less granular than the base FS?

Asset classes beyond financial and non-financial split	1	2
Credit rating step	1	2
Term	1	2
Duration		2

● Less Granular ● More Granular ● Same

3

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1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Matching Adjustment Under Stress Calibration

6.20 Rebalancing strategy - how are defaults treated within the stressed matching adjustment portfolio?

Replaced with new bonds as per stressed portfolio	3
Assets replaced with risk-free asset	1
Assume loss by applying stressed LGD	1
Assume loss by applying stressed LGD (ultimate)	1
Remove defaulted assets from MAP	1

6

6.21 Rebalancing strategy - how are defaults treated within the stressed matching adjustment portfolio?

No action assumed as using buy-and-hold strategy	3
Replace with assets of higher rating	3
Other	2

6.22 How do you treat sub-investment grade bonds, e.g. below BBB rating?

Allow for BBB cliff	4
Adjust CoD	2
Other	3

'Other' includes additional capital injected to the MAP to cover cost of increased Fundamental Spreads, this capital dilutes the MA and replacement assets assume same mix as existing (no change to investment strategy)

7
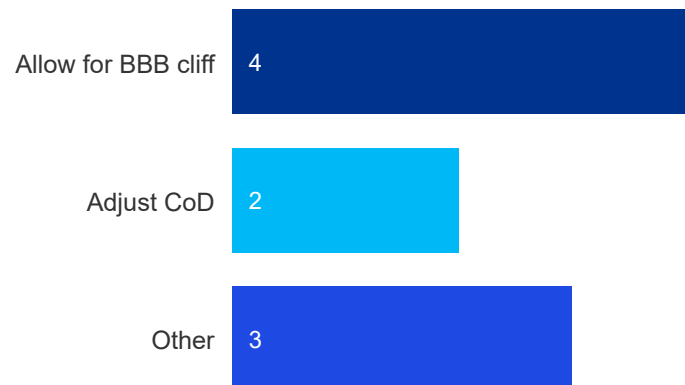
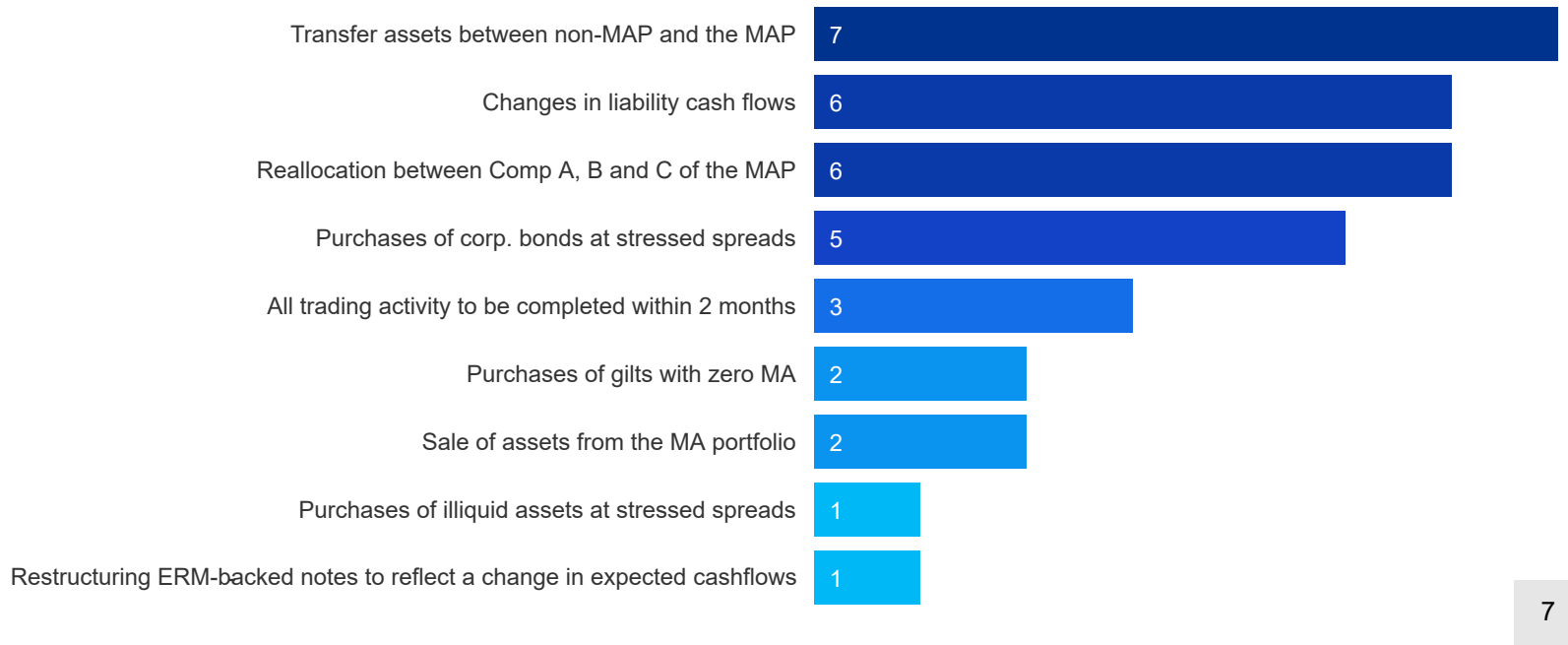'Other' includes bespoke approaches such as replacing bonds with investment grade,and adjust PoD and LTAS.

7

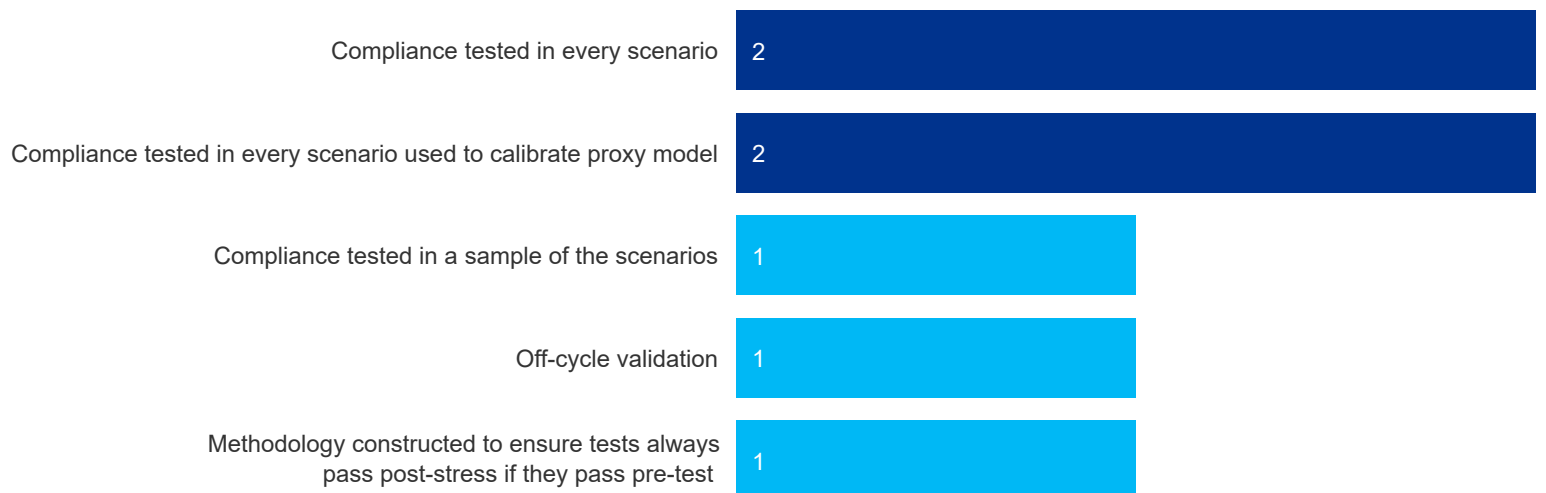| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Matching Adjustment Under Stress Calibration

Similar to last year, in demonstrating compliance with the Matching Adjustment regulations under stress, all firms allow for transfer of assets between the non-MA Portfolio and the MA Portfolio, and most of them also allow for changes in liability cashflows.

6.23 In demonstrating compliance with the Matching Adjustment regulations under stress, which of the following do you allow for?

Transfer assets between non-MAP and the MAP	7
Changes in liability cash flows	6
Reallocation between Comp A, B and C of the MAP	6
Purchases of corp. bonds at stressed spreads	5
All trading activity to be completed within 2 months	3
Purchases of gilts with zero MA	2
Sale of assets from the MA portfolio	2
Purchases of illiquid assets at stressed spreads	1
Restructuring ERM-backed notes to reflect a change in expected cashflows	1

7

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

Compliance tested in every scenario	2
Compliance tested in every scenario used to calibrate proxy model	2
Compliance tested in a sample of the scenarios	1
Off-cycle validation	1
Methodology constructed to ensure tests always pass post-stress if they pass pre-test	1

6

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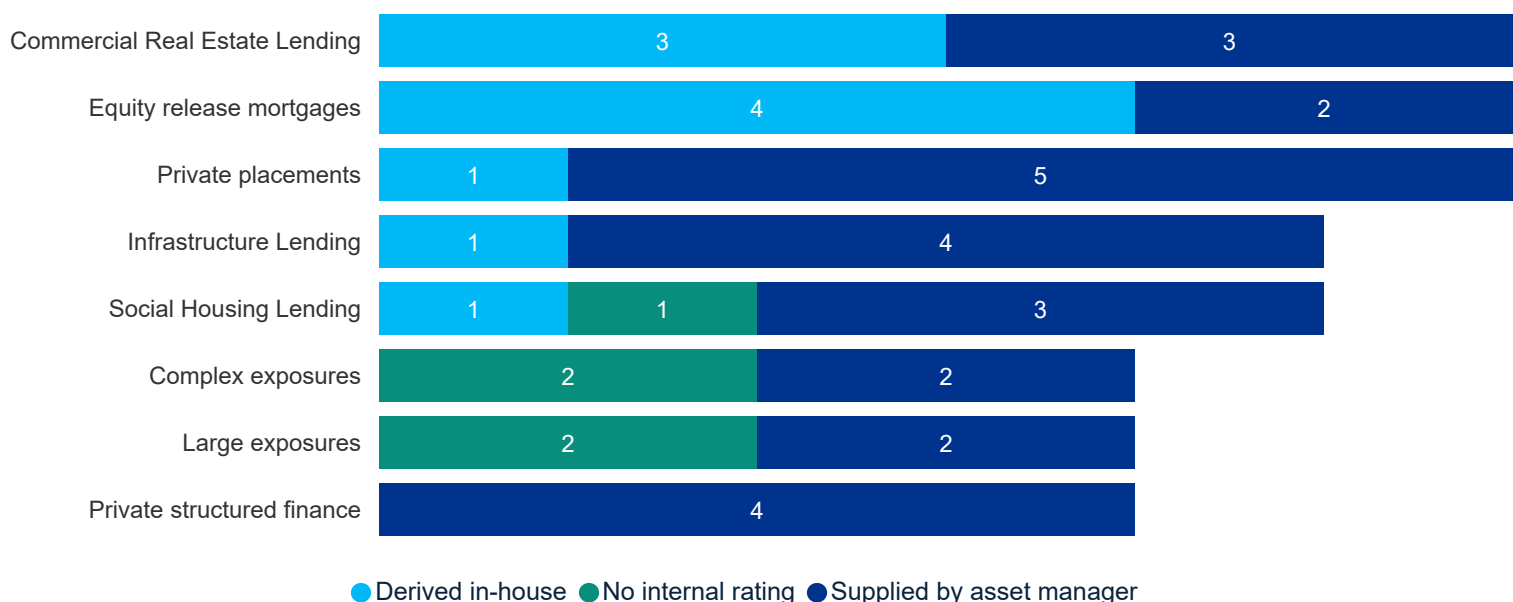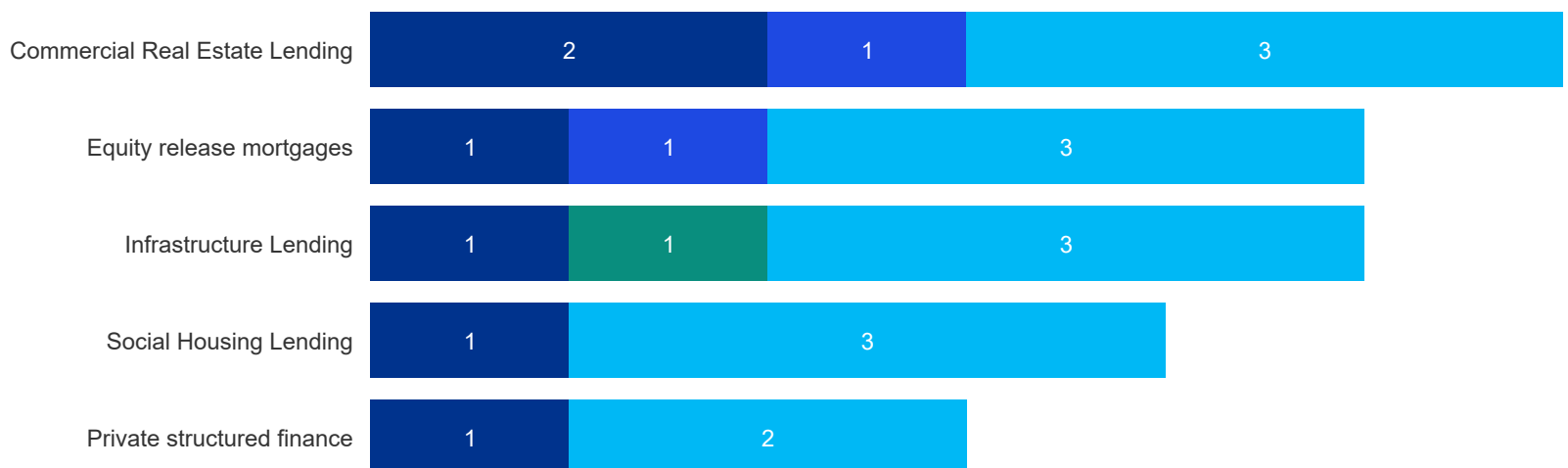| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Internal Ratings

As expected, almost all Internal Model companies maintain an internal credit rating approach. However, we noted a very large reliance on asset managers to provide the rating.

6.25 Do you have an internal ratings framework?

No 10%

Yes 90%
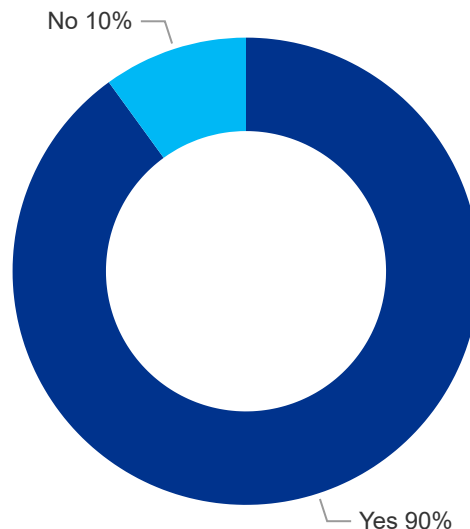
10

6.26 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?

Asset type	Derived in-house	No internal rating	Supplied by asset manager
Commercial Real Estate Lending	3		3
Equity release mortgages	4		2
Private placements	1		5
Infrastructure Lending	1		4
Social Housing Lending	1	1	3
Complex exposures		2	2
Large exposures		2	2
Private structured finance			4

● Derived in-house ● No internal rating ● Supplied by asset manager

9

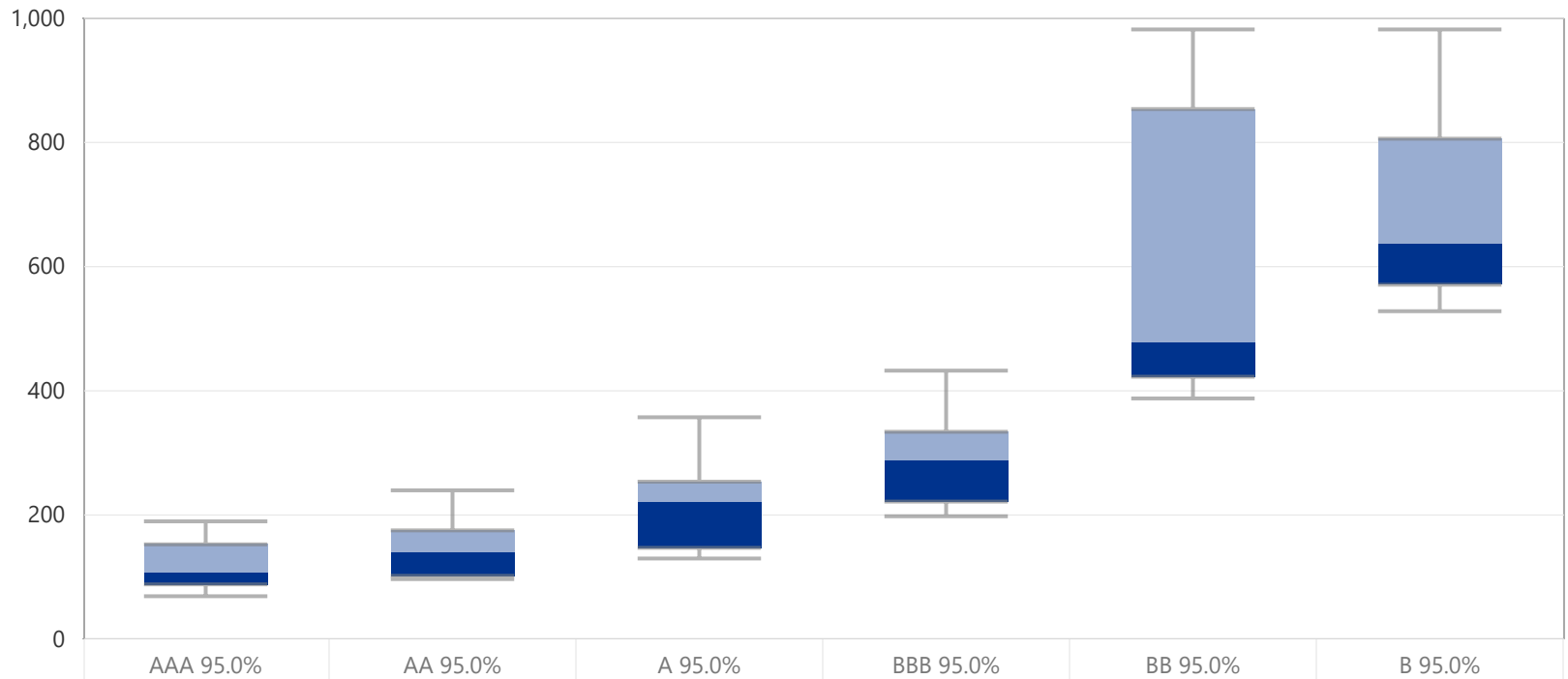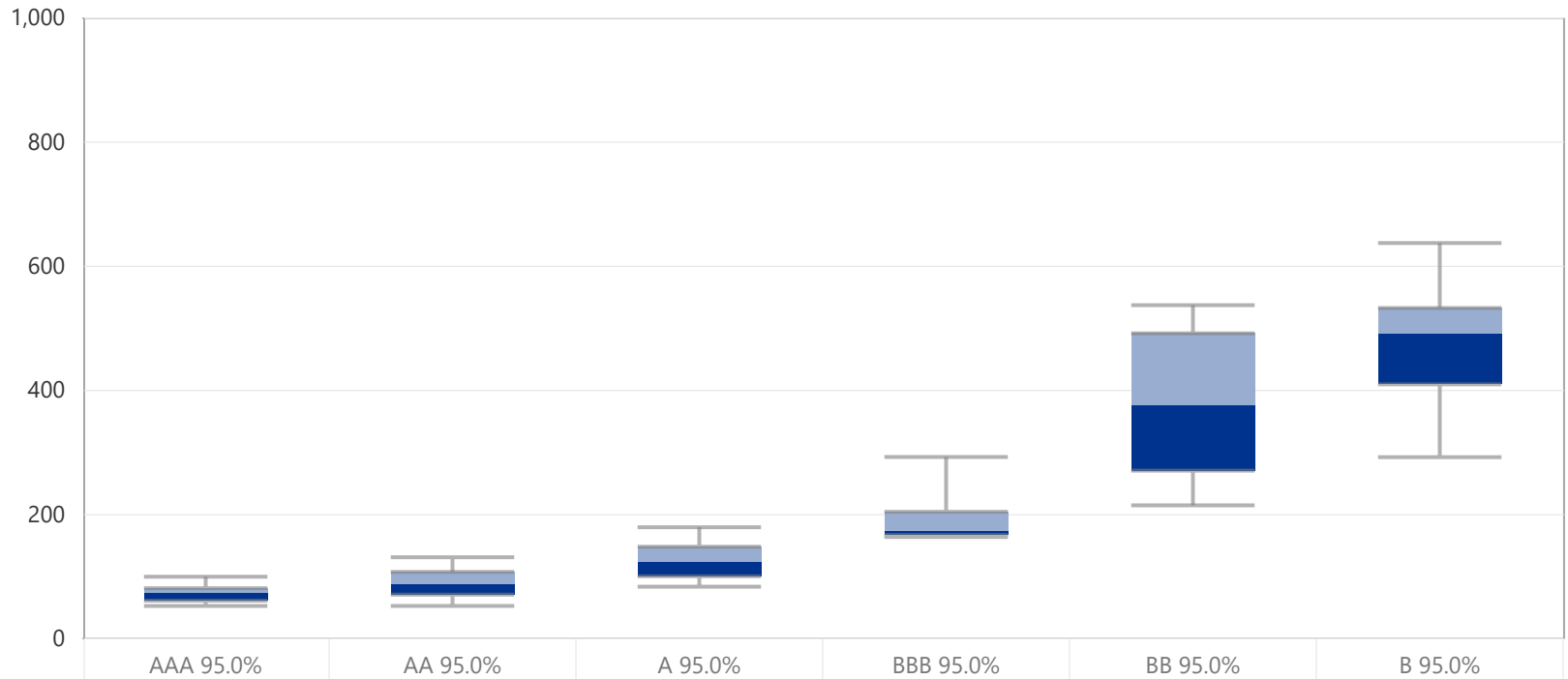| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Internal Ratings

6.27 How do you validate that your internal rating methodology gives comparable ratings to an external methodology (ECAI consistent) as referenced in SS3/17 (April 2020 update)?

Category	Value
Internal validation of Ratings methodology	6
Compare to a sample of externally rated	4
External validation of Ratings methodology	3
Other	3
Compare method to an ECAI methodology	2

'Other' includes a comparison of internal and external ratings for assets that have both, and internal rating performance analysis.

7

6.28 If you have an internal ratings framework, which of the following approaches do you use for internal ratings?

Asset class	A Rating Agency Methodology	Scorecard approach	Stochastic model	Update a Rating Agency Methodology per asset class
Commercial Real Estate Lending	2		1	3
Equity release mortgages	1		1	3
Infrastructure Lending	1	1		3
Social Housing Lending	1			3
Private structured finance	1			2

● A Rating Agency Methodology ● Scorecard approach ● Stochastic model ● Update a Rating Agency Methodology per asset class
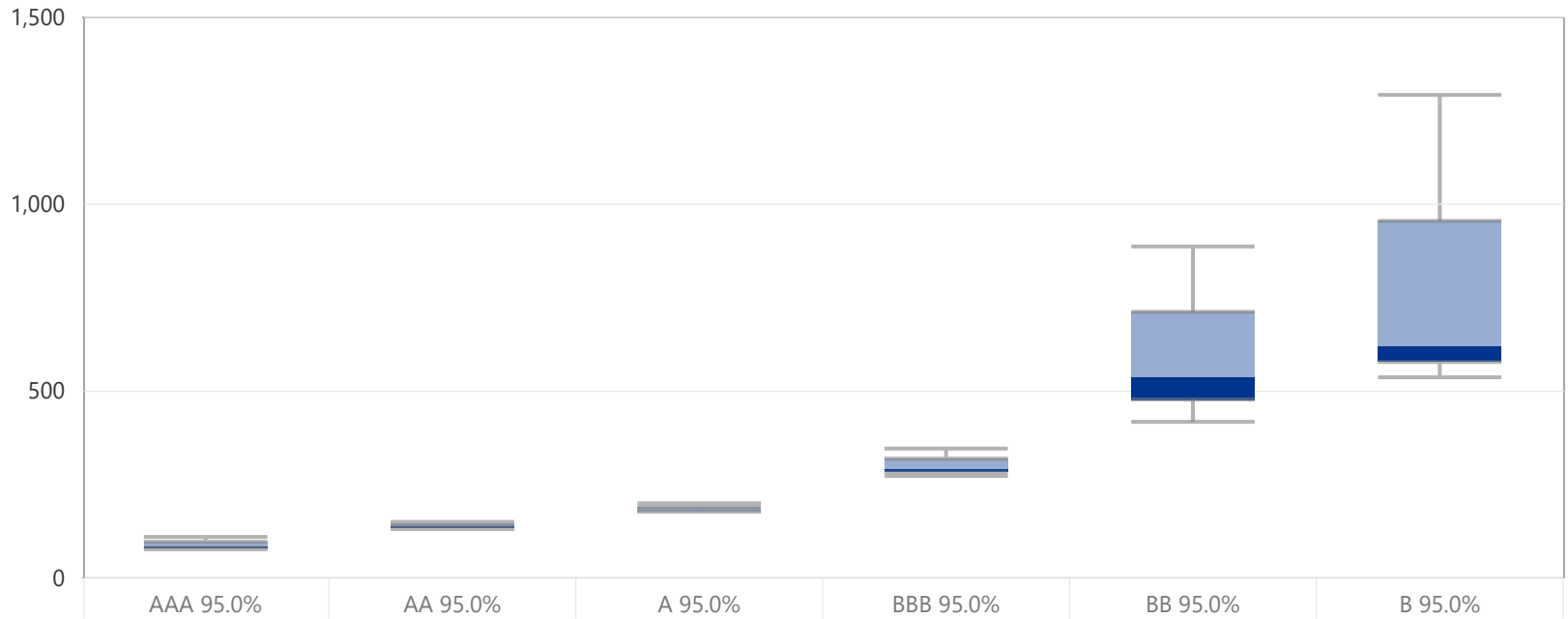
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6. Credit Risk - Appendix

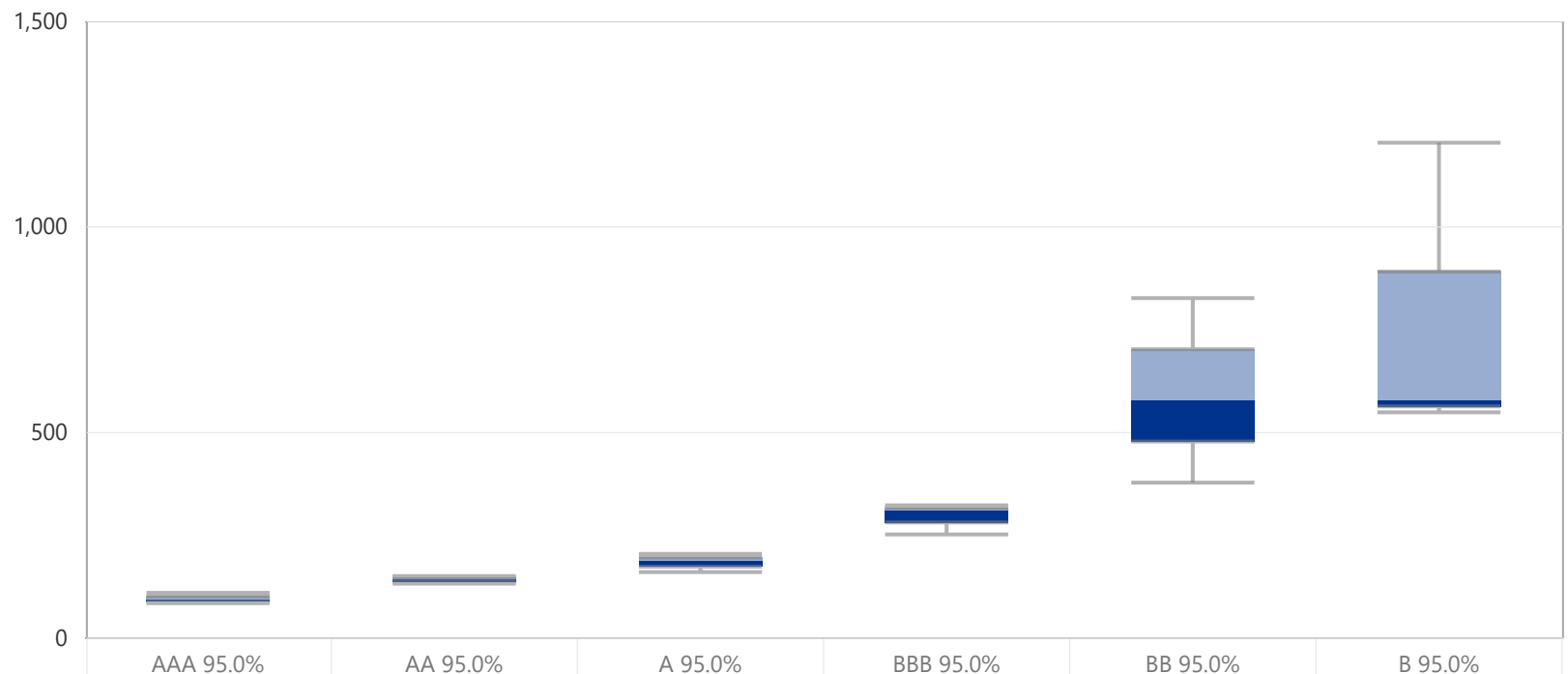| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Asset Side Calibration - Appendix

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 95th percentile.

6.29a Change in Total Corporate Bond Spreads - Financials 10 years (bps)

6.29b Change in Total Corporate Bond Spreads - Financials 15 years (bps)

Technical Practices Survey 2022
6. Credit Risk - Appendix

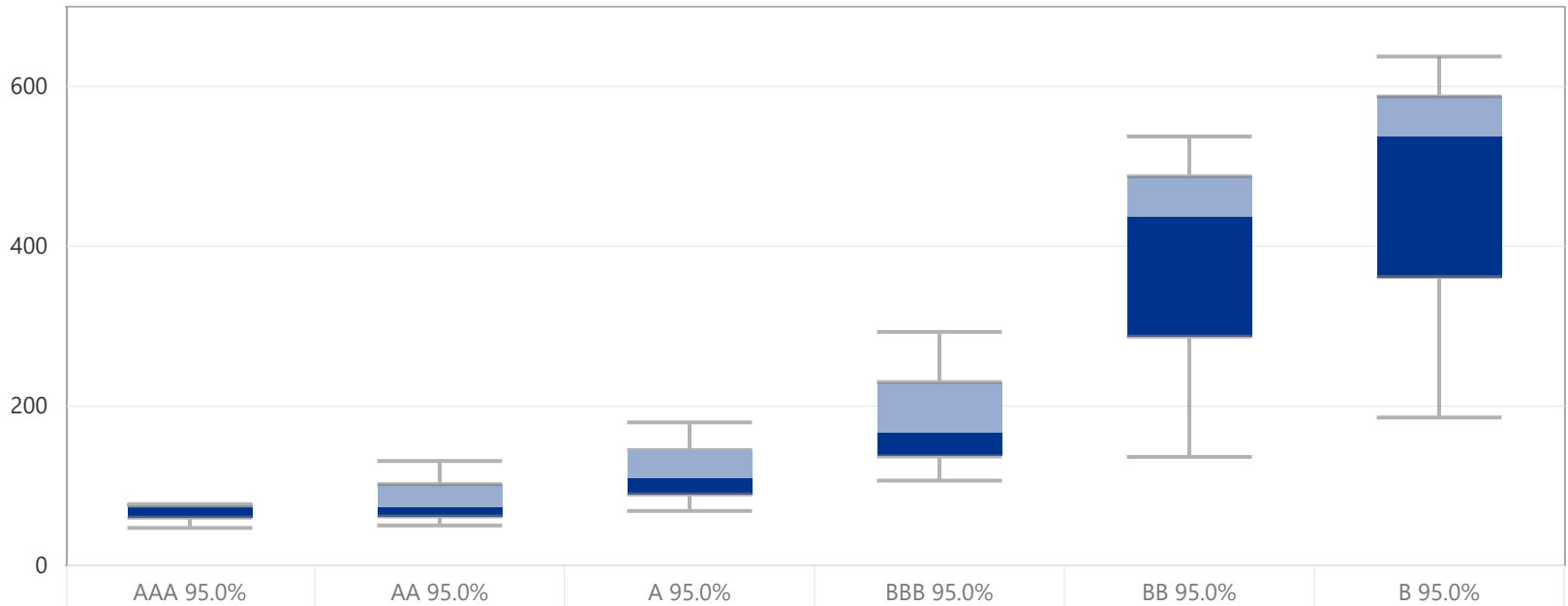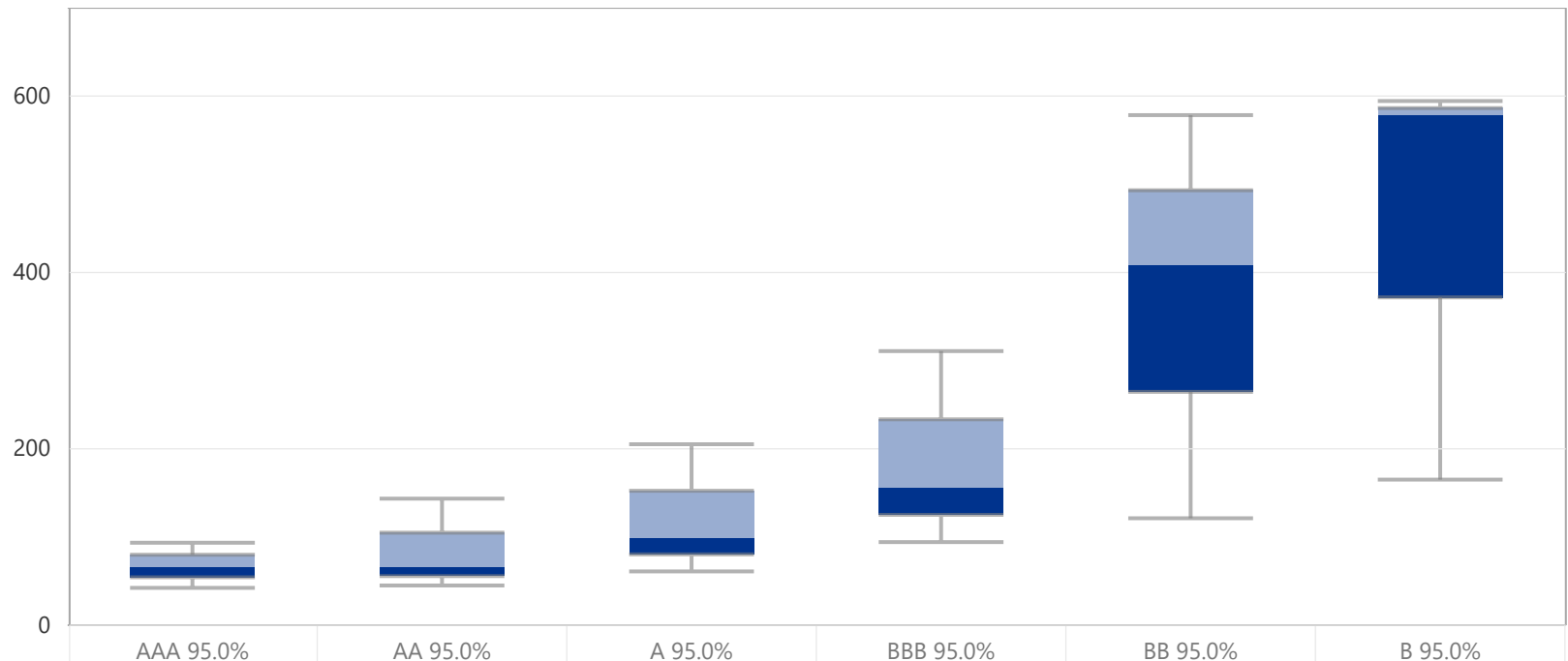| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Calibration - Appendix

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 95th percentile.

6.29c Change in Total Corporate Bond Spreads - Non Financials 10 years (bps)

6.29d Change in Total Corporate Bond Spreads - Non Financials 15 years (bps)

Technical Practices Survey 2022
6. Credit Risk - Appendix

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Calibration - Appendix

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 95th percentile.

6.29e Change in Total Bond Spreads - Commercial Real Estate Lending 10 years (bps)

6.29f Change in Total Bond Spreads - Commerical Real Estate Lending 15 years (bps)

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1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Asset Side Calibration - Appendix

The following charts show the change in total bond spreads in bps (incorporating spread volatility and migration risk) for various different ratings at the 95th percentile.

6.29g Change in Total Bond Spreads - Infrastructure Debt Lending 10 years (bps)

6.29h Change in Total Bond Spreads - Infrastructure Debt Lending 15 years (bps)

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Methodology and Approach

Given the ongoing focus on Lifetime Mortgages (LTMs) this section captures some of their key calibration details of the IFRS valuation and the treatment under Solvency II.

For the IFRS valuation, the majority of firms use a Real World LTM NNEG valuation. Under Solvency II, for stressing the LTMs restructuring, the majority of firms looked through to the underlying assets.

As Effective Value Test (EVT) requirements are becoming better understood, more firms are now testing the EVT under all stress scenarios of the proxy model and we expect this will continue to increase over time. The Solvency II restructured notes spread over risk-free rate varies significantly with the largest variation seen at the BBB rated level. This variability is part of the rational for the PRA EVT that looks through each firm's individual approach to enable the PRA to compare consistently between firms.

7.1 Do you use risk-neutral or real world parameters, or both, in LTM NNEG valuation used in determining the IFRS Fair value?
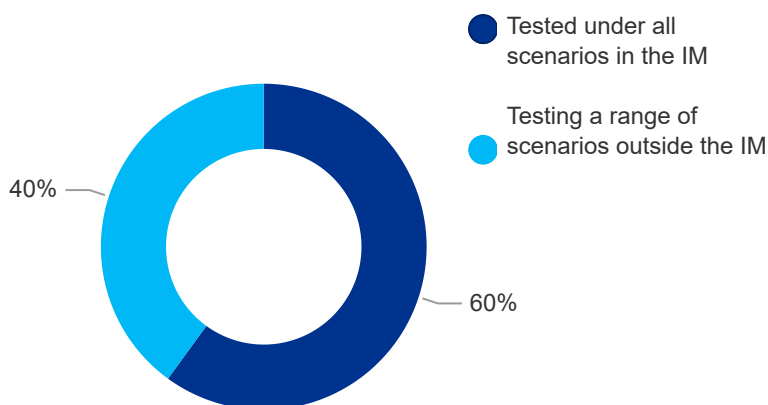
- Real World
- Both



20%

80%
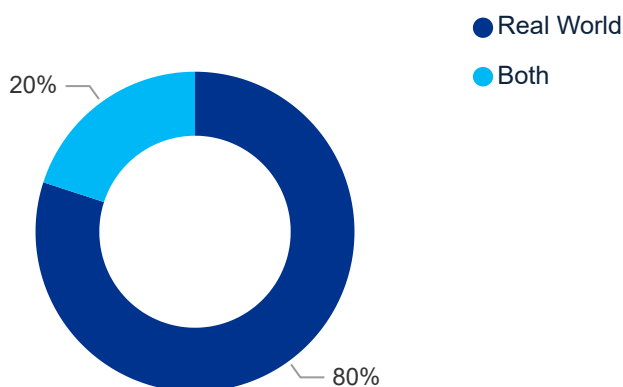
7.2 Please describe your approach to stressing your LTM restructure

- Look through to underlying assets
- Treat like an equivalent corporate bond
- Treat like a corporate bond with adjustment

17%

17%

67%

5
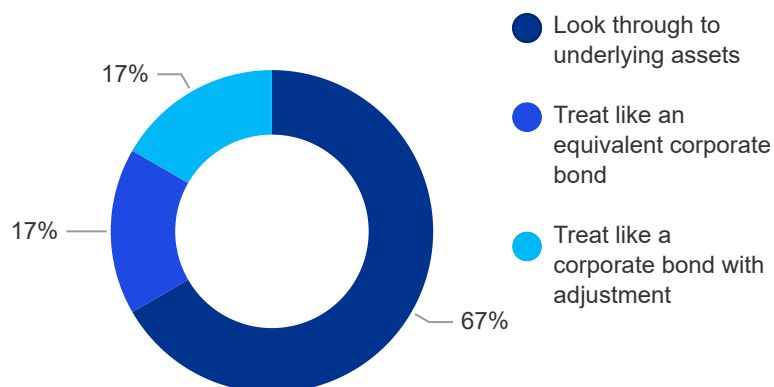
6

7.3 What is your calculation approach for PRA's EVT?

- Tested under all scenarios in the IM
- Testing a range of scenarios outside the IM

40%

60%

7.4 Average spread over Solvency II risk-free rate by rating

5

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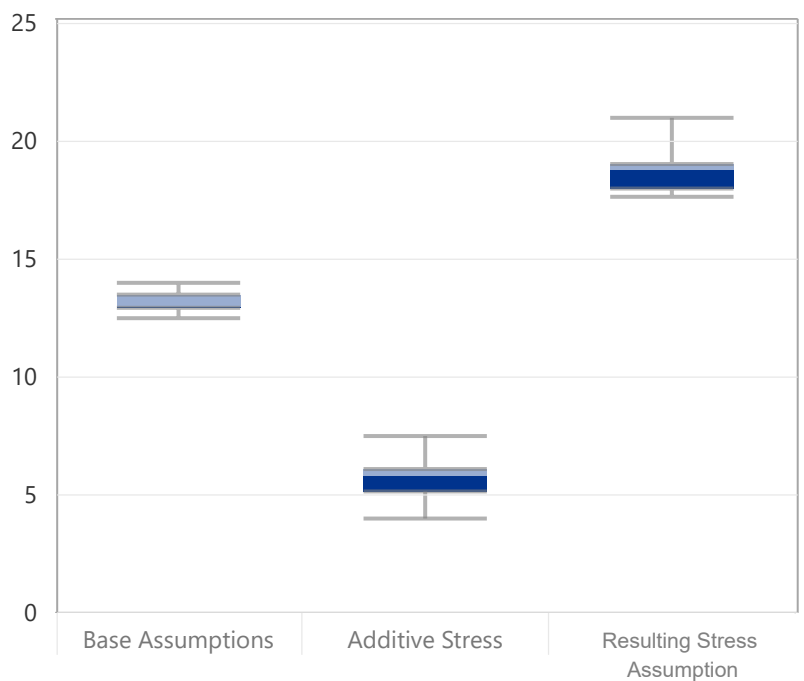| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Assumption Calibration

For underlying LTM assumptions the house price growth assumption was between 3.2% and 4.7% (reducing to between 0.7% and 3.3% under stress) and the house price volatility assumption was between 12.5% and 14% (increasing to between 17.7% and 21% under stress).

7.5 House price growth (pre-dilapidation or any other deductions) (%)
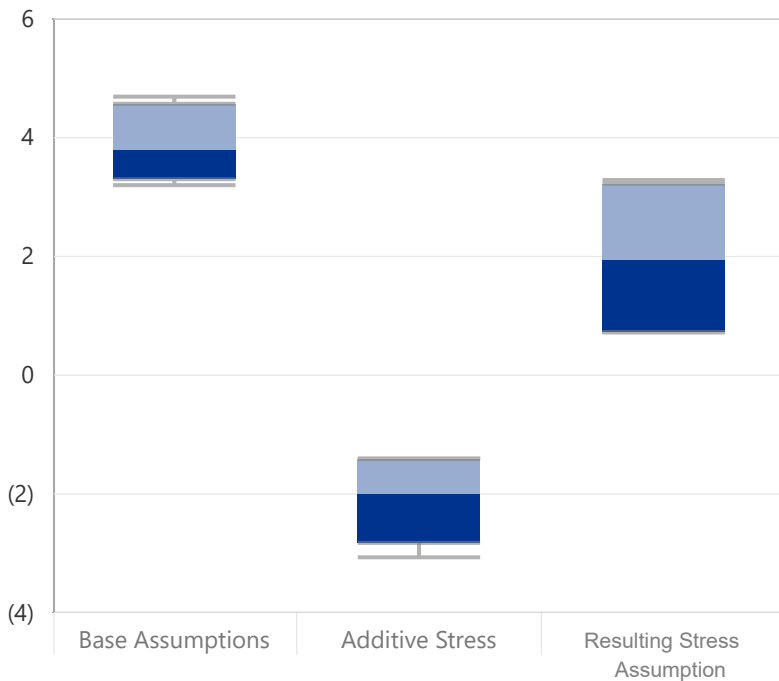
7.6 House price growth volatility (%)

7.7 Average base sale cost (%)
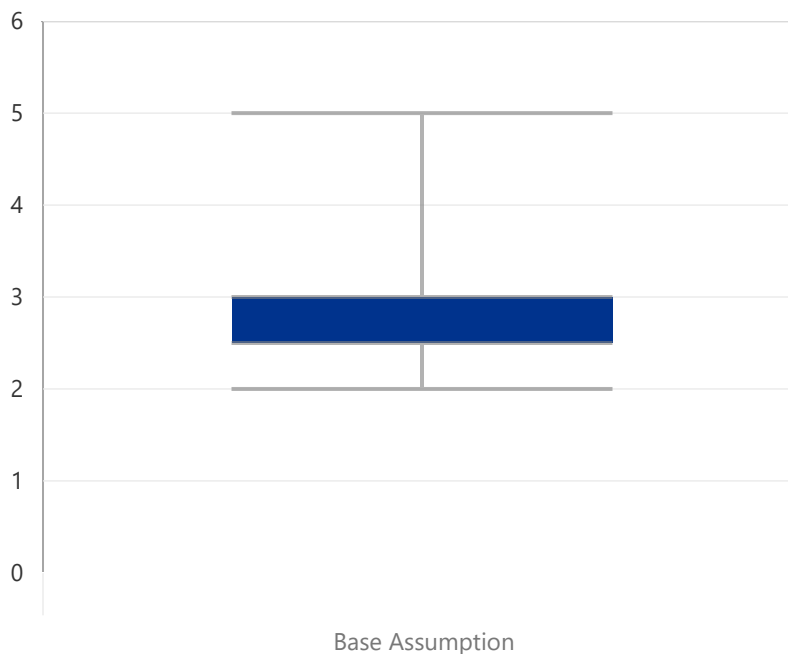
7.8 Average base voluntary redemption rates for a single life policy, policy year 10 (%)
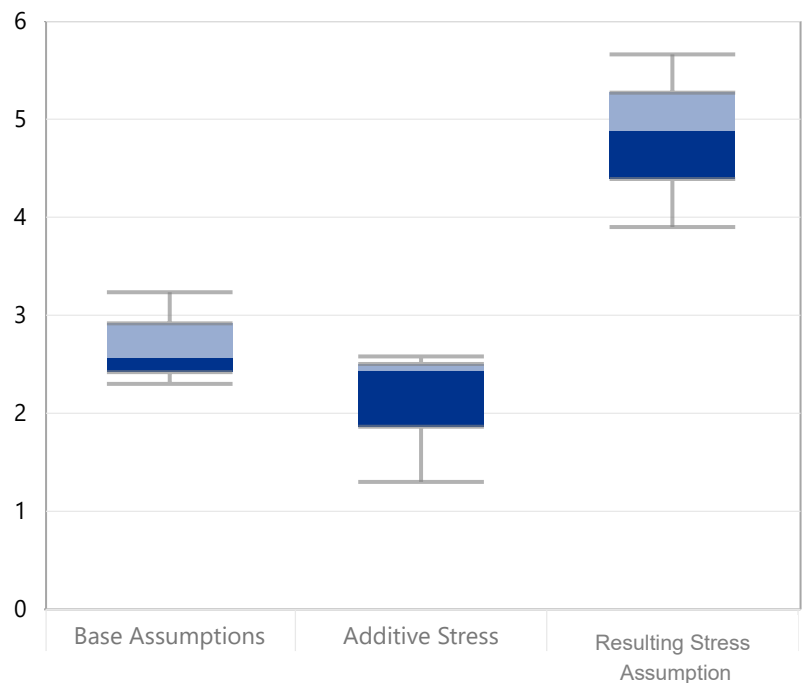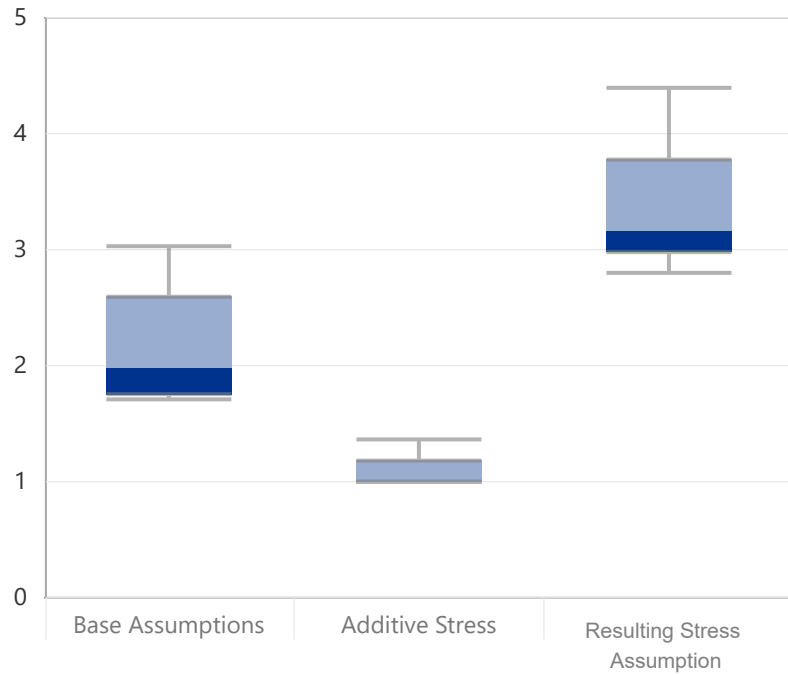
Technical Practices Survey 2022
7. Lifetime Mortgages

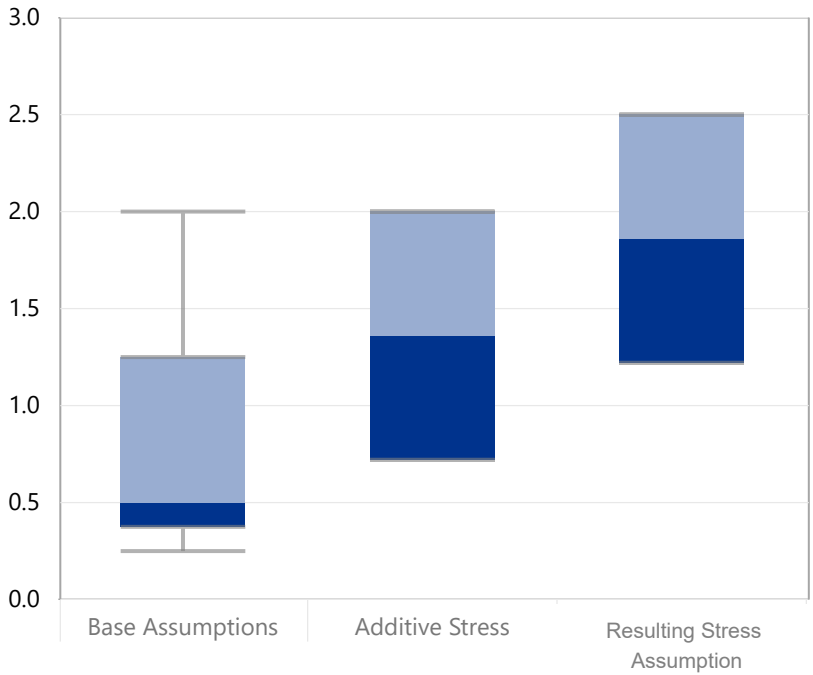| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Assumption Calibration

The median for the additive stress for average liquidity premium can be compared with the median observed for the stress for non-financial bonds - it lies between than the median additive stress for A-rated and AA-rated bonds.
All participants have a property sale delay period between 8-12 months.
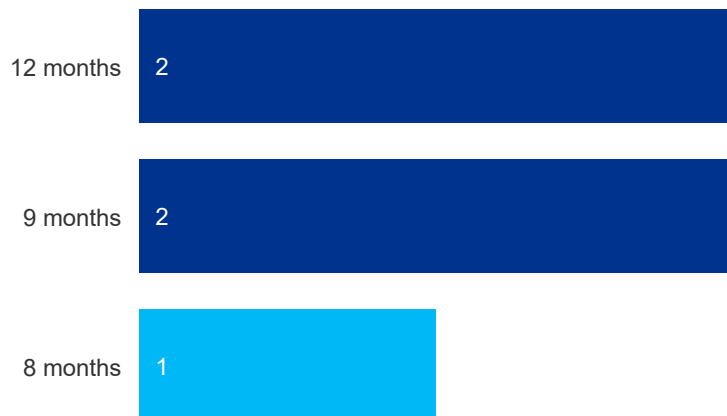
7.9 Average liquidity premium over the Solvency II risk-free rate (bps)

7.10 Deferment rate used in EVT (%)

7.11 What is your property sale delay assumption?

5

Technical Practices Survey 2022
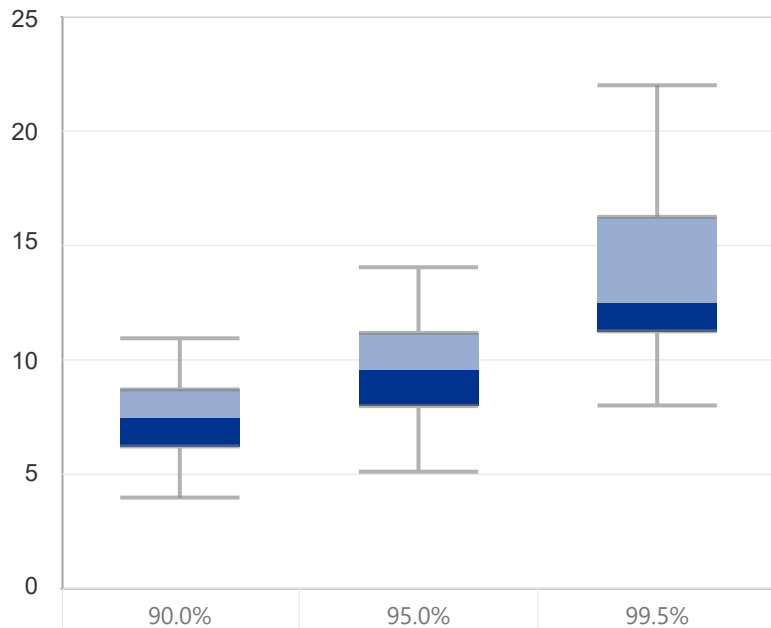## 8. Mortality & Longevity Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Base Mortality Risk

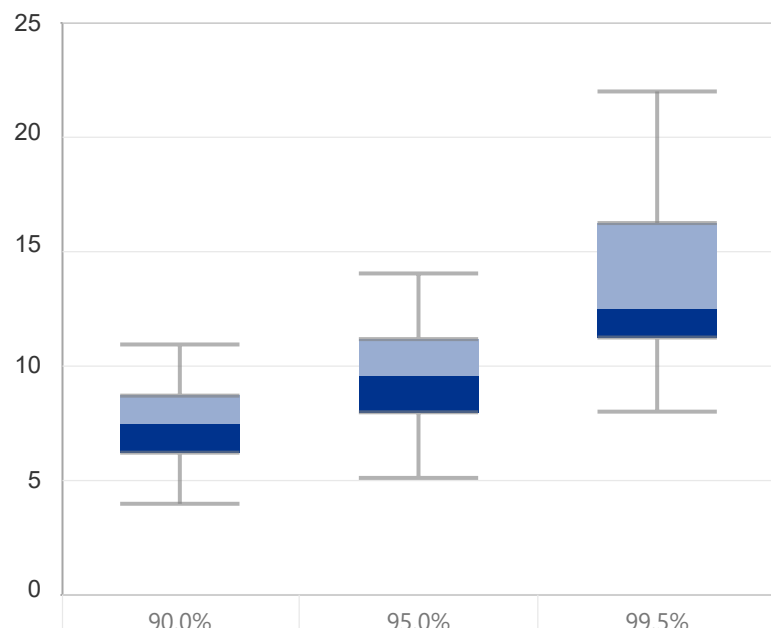The charts below use data from firm's IM 01 templates.

8.1a Change in mortality rate at age 25 (Males & Females) (%)

8.1b Change in mortality rate at age 40 (Males & Females) (%)
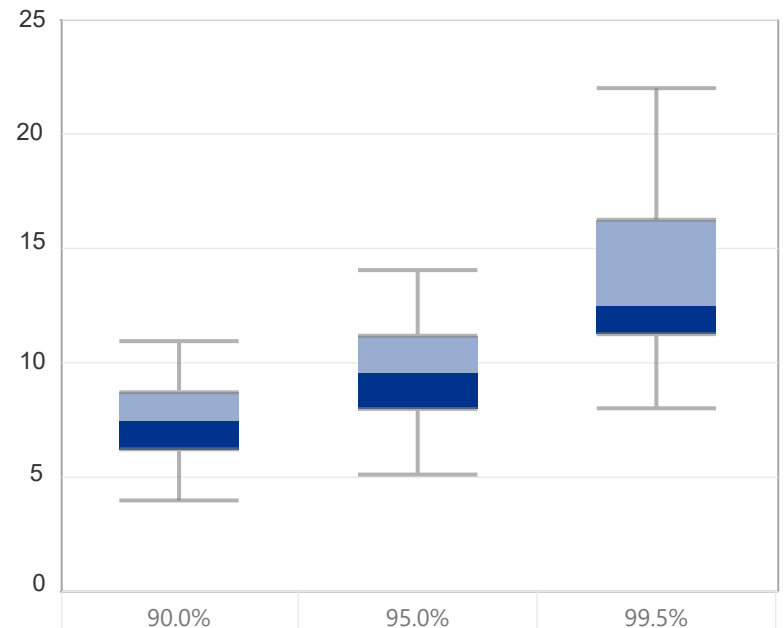
8.1c Change in mortality rate at age 55 (Males & Females) (%)

Technical Practices Survey 2022
8. Mortality & Longevity Risk

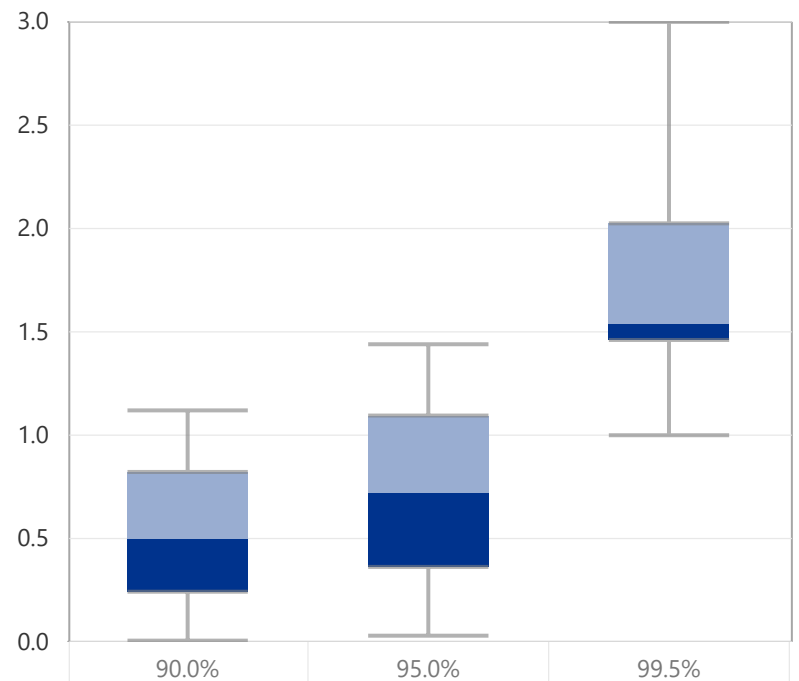| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Mortality Catastrophe Risk

The charts below use data from firm's IM 01 templates.

Only one firm applied different stresses for different ages at a 90.0% and 95.0% level, and only two firms applied different stresses for different ages at a 99.5% level, when considering ages 25, 40 and 55.
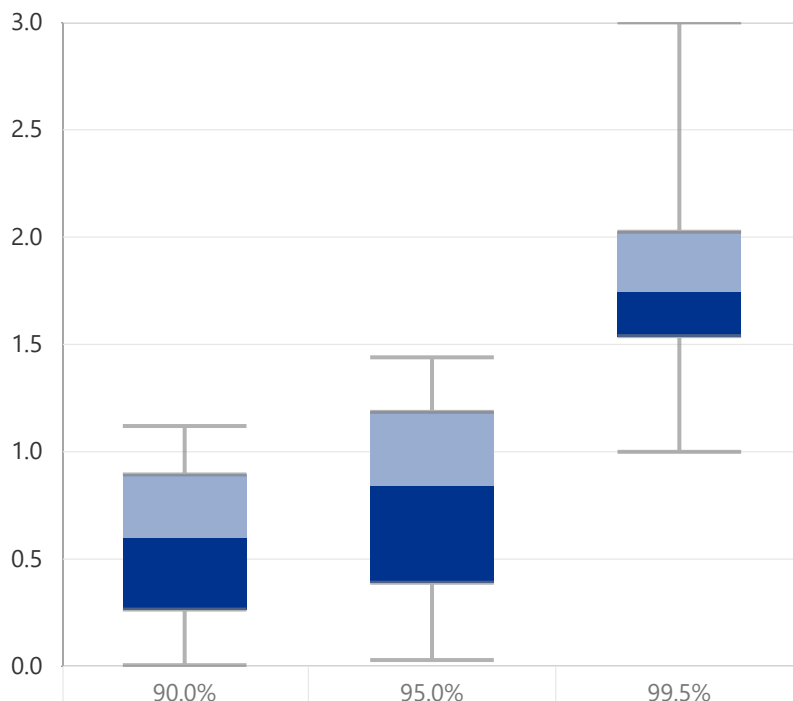
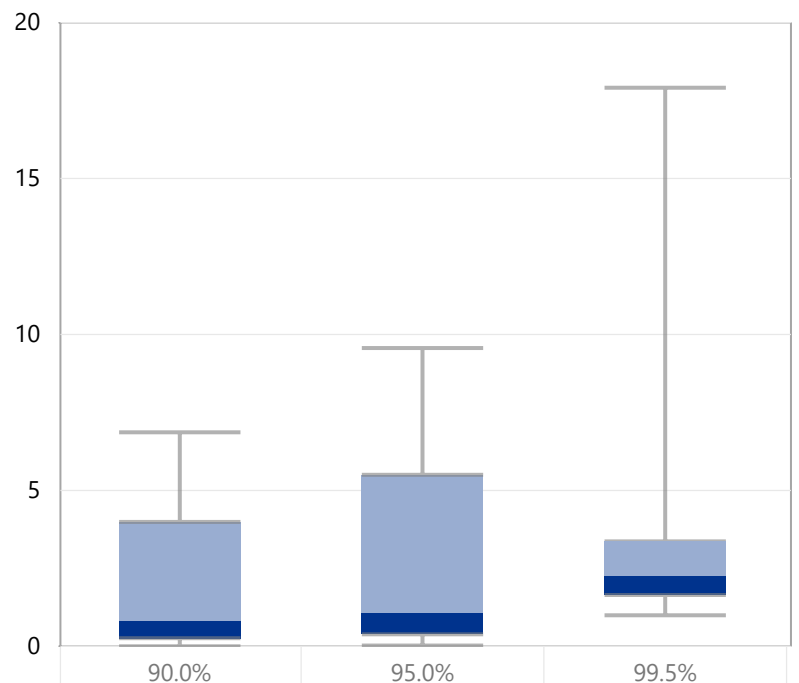**8.2a** Mortality catastrophe for age 25 (overall) (deaths per 1000)
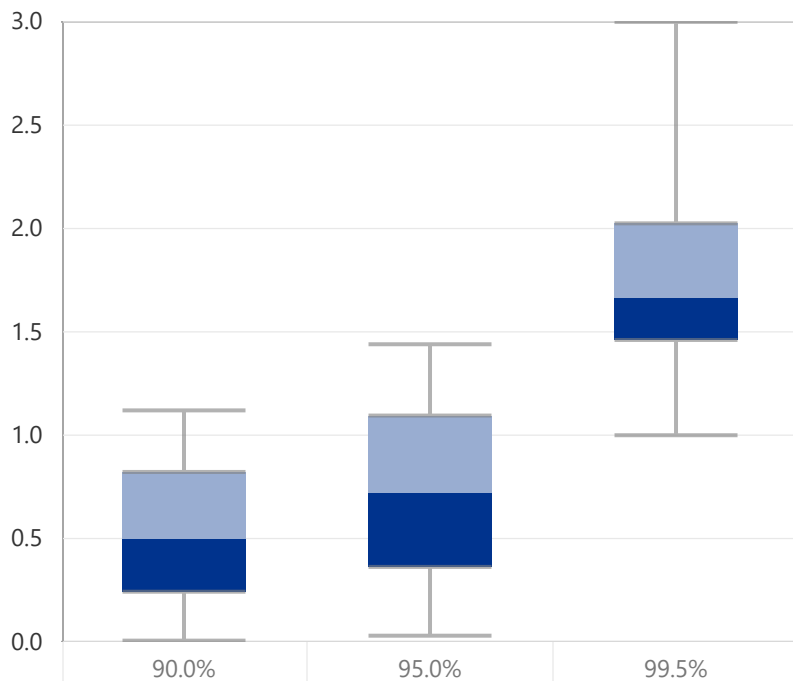
8.2b Mortality catastrophe for age 40 (overall) (deaths per 1000)

8.2c Mortality catastrophe for age 55 (overall) (deaths per 1000)

8.2d Mortality catastrophe for age 75 (overall) (deaths per 1000)

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Base Mortality Modelling

Most companies set their base mortality assumption by graduating against a standard table, typically using tables published by the CMI with the most common tables in use being the 08 series tables.

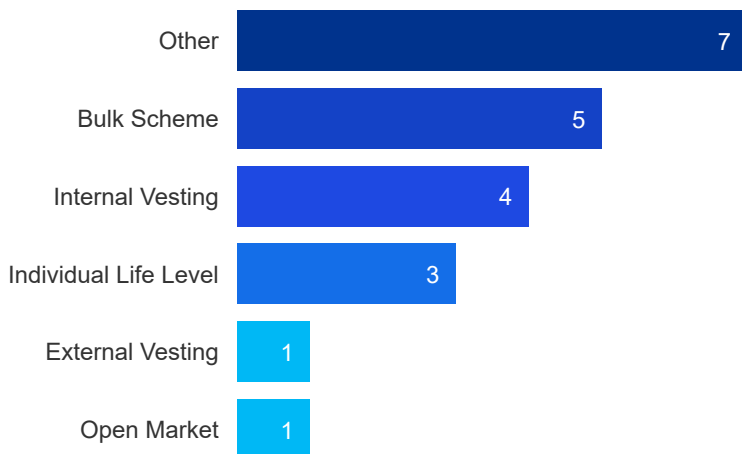**8.3** Which of the following best describes the method used to set your base mortality assumptions?
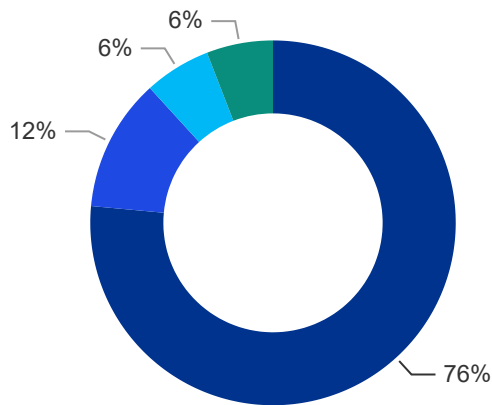
●Standard Table ●Other ●Internal experience ●Using a GLM

'Other' includes fitting to internal base tables, and using a theoretical model based on individual mortality characteristics calibrated to portfolio experience
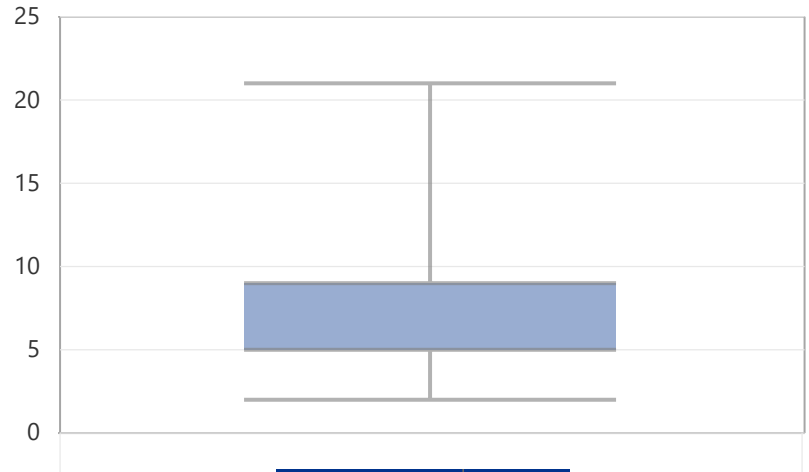
17

8.4 How many years of historical data do you use to set base mortality assumptions?

Years	
YE20 Median	5
YE21 Median	5

8.5 What portfolio segments do you set separate assumptions for?

Other	7
Bulk Scheme	5
Internal Vesting	4
Individual Life Level	3
External Vesting	1
Open Market	1

'Other' includes a mixture of bespoke approaches

14

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

●00 Series ●08 series ●S3 Series ●Other
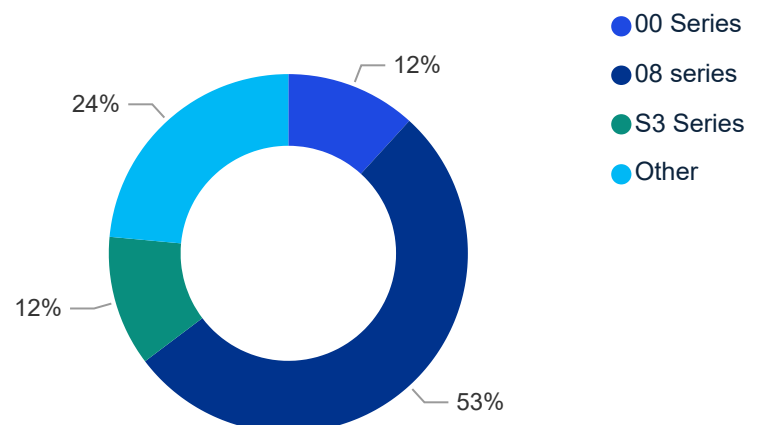
'Other' includes use of the 16 series mortality tables and England & Wales population tables

17

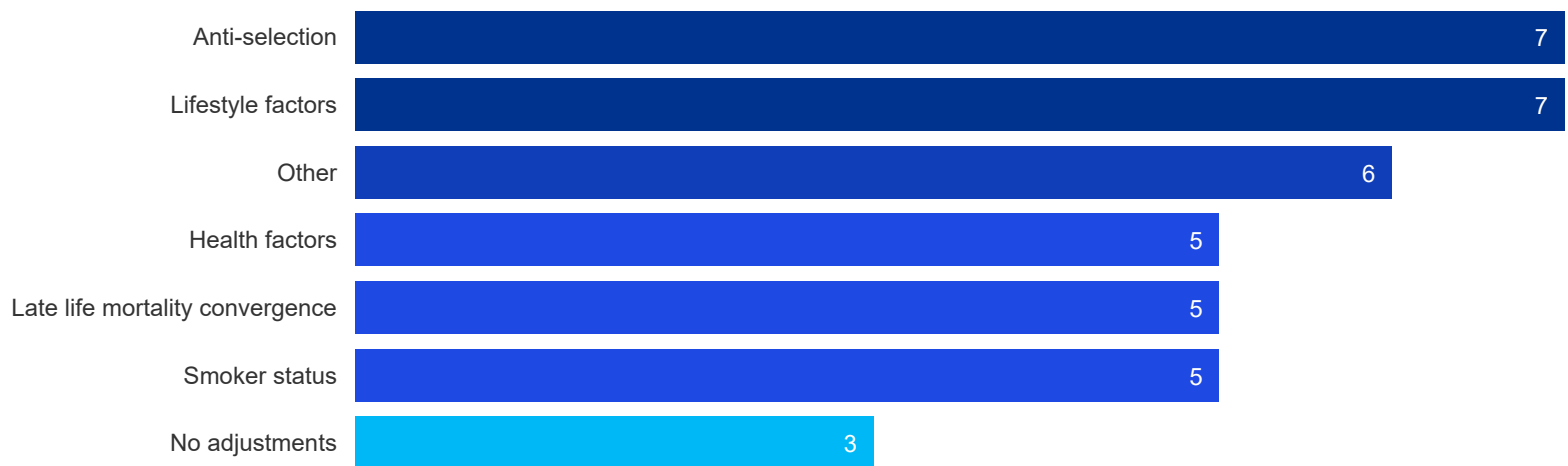| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Base Mortality Modelling

A significant proportion of companies also apply adjustments to their base mortality assumptions to reflect risk features relevant to their portfolios, such as anti selection and lifestyle factors, with these factors generally applied at individual policy or block of business level.

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

Adjustment	Value
Anti-selection	7
Lifestyle factors	7
Other	6
Health factors	5
Late life mortality convergence	5
Smoker status	5
No adjustments	3

'Other' include adjustments for marital status, temporary selection loadings on the first life, and IBNR adjustments.

15

8.8 At what level are these adjustments applied?

- Policy level
- Block / Scheme level
- Other

50%
36%
14%
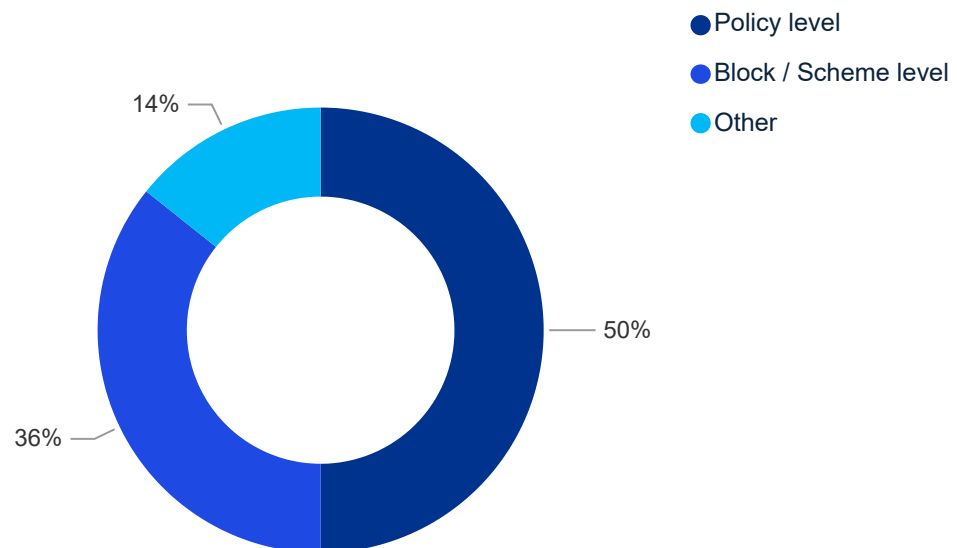
'Other' includes life level and age group level.

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Document Classification: KPMG Public

Technical Practices Survey 2022
8. Mortality & Longevity Risk

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Longevity - Annuitant Mortality Improvements

The previous pages within the mortality section referred to the mortality risks faced by insurers on their protection business. The following pages focus on longevity risks, as faced by firms on their annuity business.

The majority of companies plan to adopt the CMI 2021 model for reporting at YE22 with the remainder split broadly evenly between the 2018, 2019 and 2020 versions of the model. We note that the Core calibration of the CMI 2021 model does not allow for 2020 or 2021 experience and that the mortality improvements produced by the CMI 2021 Core model are broadly similar to those produced by the 2019 and 2020 models.

A similar proportion of companies are planning to adopt the latest available CMI model for reporting at YE22. A similar approach was adopted at YE21.

8.9 Which version of the CMI model do you currently use (and plan to use for YE22) for best estimate mortality improvements?

2021
- 2020: 5
- 2019: 10
- 2018: 3

2022 - Plan
- 2021: 10
- 2020: 3
- 2019: 3
- 2018: 2
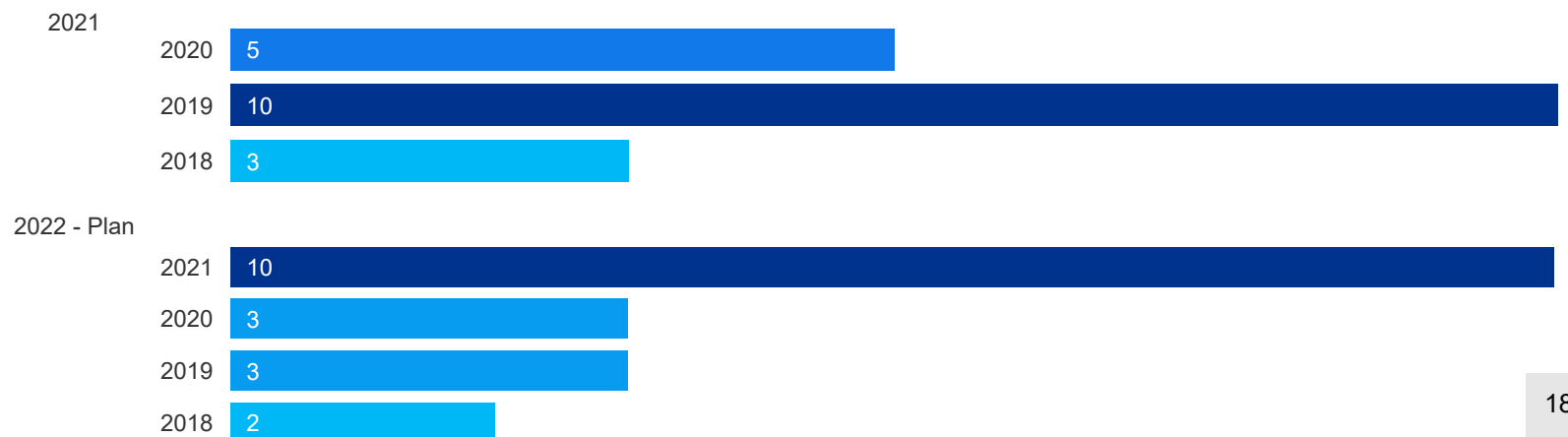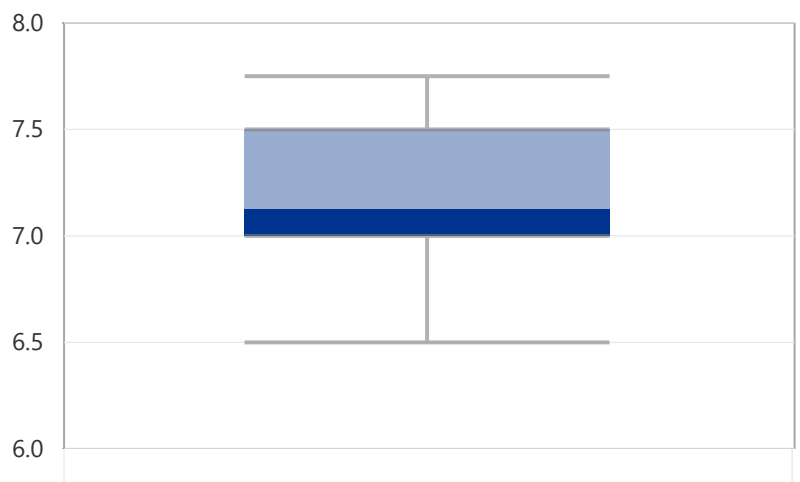
18

8.10a Do you use core, extended or advanced calibration in your longevity improvement basis?

Core / Extended / Advanced

44% / 44% / 11%

18

8.10b 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?
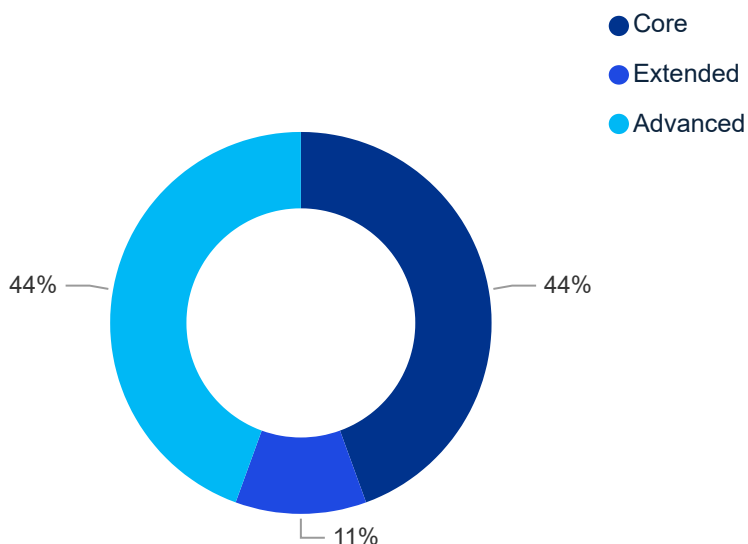
Value	
YE20 Median	8
YE21 Median	7

Technical Practices Survey 2022
8. Mortality & Longevity Risk

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SF/IM

Longevity - Annuitant mortality improvements

The long-term rates of mortality improvement assumptions are generally higher for males than for females, although the median assumption is 1.5% for both males and females in the survey.
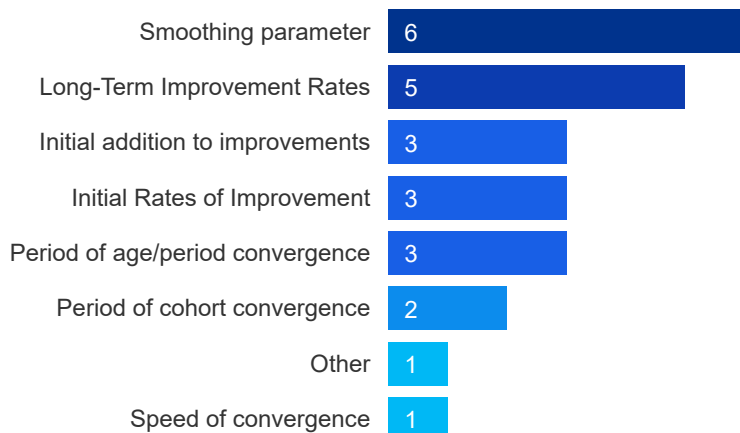
The most common adjustments from the CMI Core calibration is to adjust the smoothing parameter.

8.11 Long term rate of improvement (%)
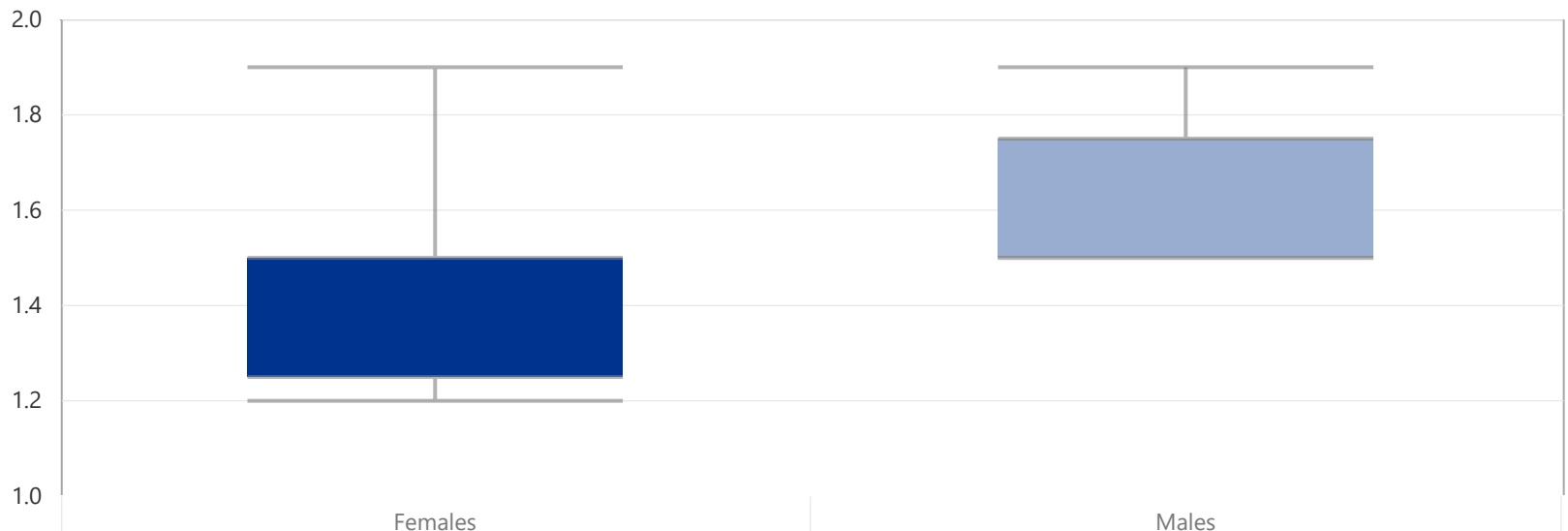
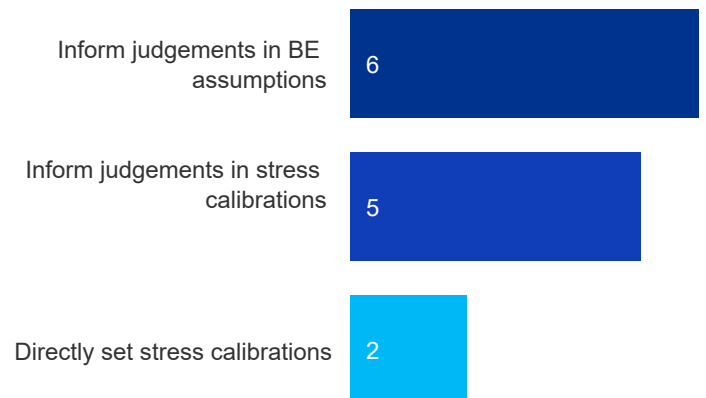|	Females	Males
YE20 Median	1.5	1.5
YE21 Median	1.5	1.5

8.12 If you use an Extended or Advanced calibration for the CMI model, which calibration changes do you make?

Smoothing parameter	6
Long-Term Improvement Rates	5
Initial addition to improvements	3
Initial Rates of Improvement	3
Period of age/period convergence	3
Period of cohort convergence	2
Other	1
Speed of convergence	1

'Other' includes setting a minimum cohort age and using a set calibration age range

9

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

Inform judgements in BE assumptions	6
Inform judgements in stress calibrations	5
Directly set stress calibrations	2

9

Technical Practices Survey 2022
8. Mortality & Longevity Risk

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Longevity - Annuities (Stress)

The approaches to modelling longevity risk are largely unchanged from YE20, with the majority of firms continuing to use a normal model. As in last year's survey, many firms consider multiple models in deriving their longevity trend risk calibrations.

Of the companies that allow for data and event risks in their longevity trend risk models, most allow for diversification between these risks, whilst one firm considers event and data risk to form part of a single overall stress "continuum".
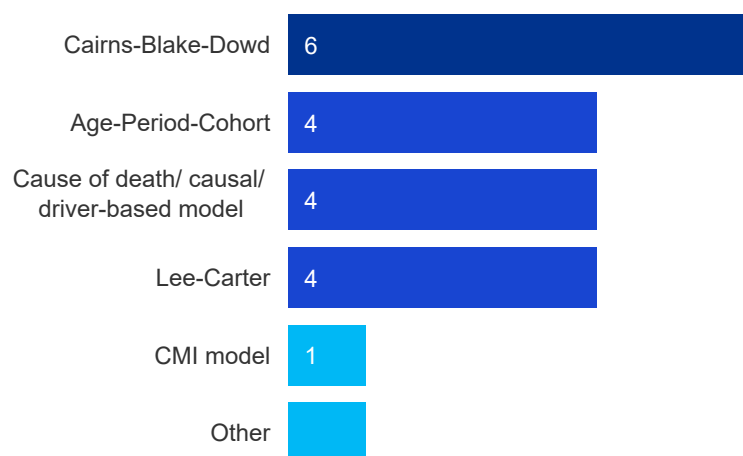
8.14 Which of the following models do you use for modelling longevity base mortality stresses?

- Normal
- Cause of death / causal / driver based model
- Other

78%
11%
11%
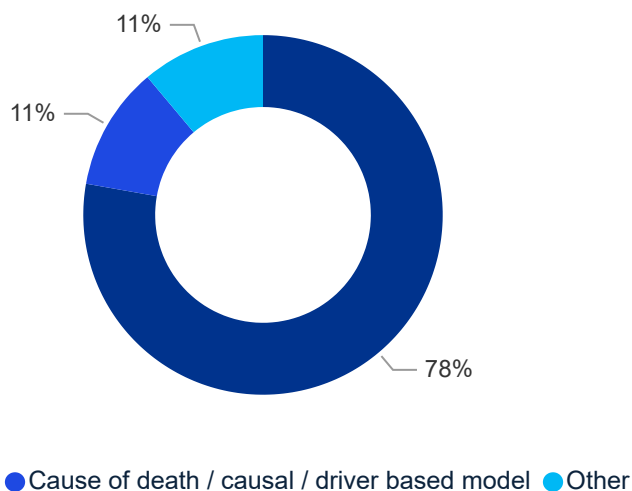
'Other' includes using a Log-normal distribution combined with expert judgement

8

8.15 Which of the following models do you use for modelling longevity trend stresses?

Model	Value
Cairns-Blake-Dowd	6
Age-Period-Cohort	4
Cause of death/ causal/ driver-based model	4
Lee-Carter	4
CMI model	1
Other	

'Other' includes using a range of stochastic models to assess the model risk element of stress.

8

8.16 How do you consider the "Data Risk" and "Event Risk" in your longevity trend risk model?
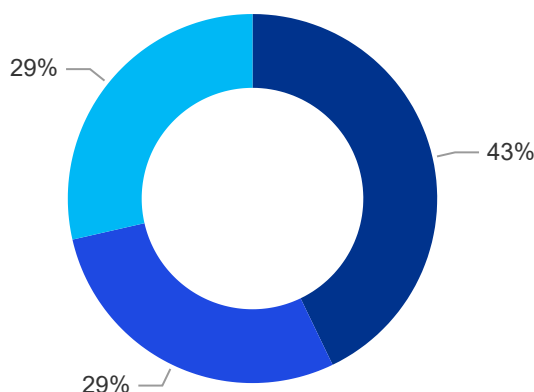
- Components of our model
- Model validation against such risk scenarios
- Other

43%
29%
29%

'Other' includes as part of an expert judgement overlay to the outputs of a stochastic model, and covering data risk elsewhere from the longevity trend risk model.

7

Technical Practices Survey 2022
8. Mortality & Longevity Risk

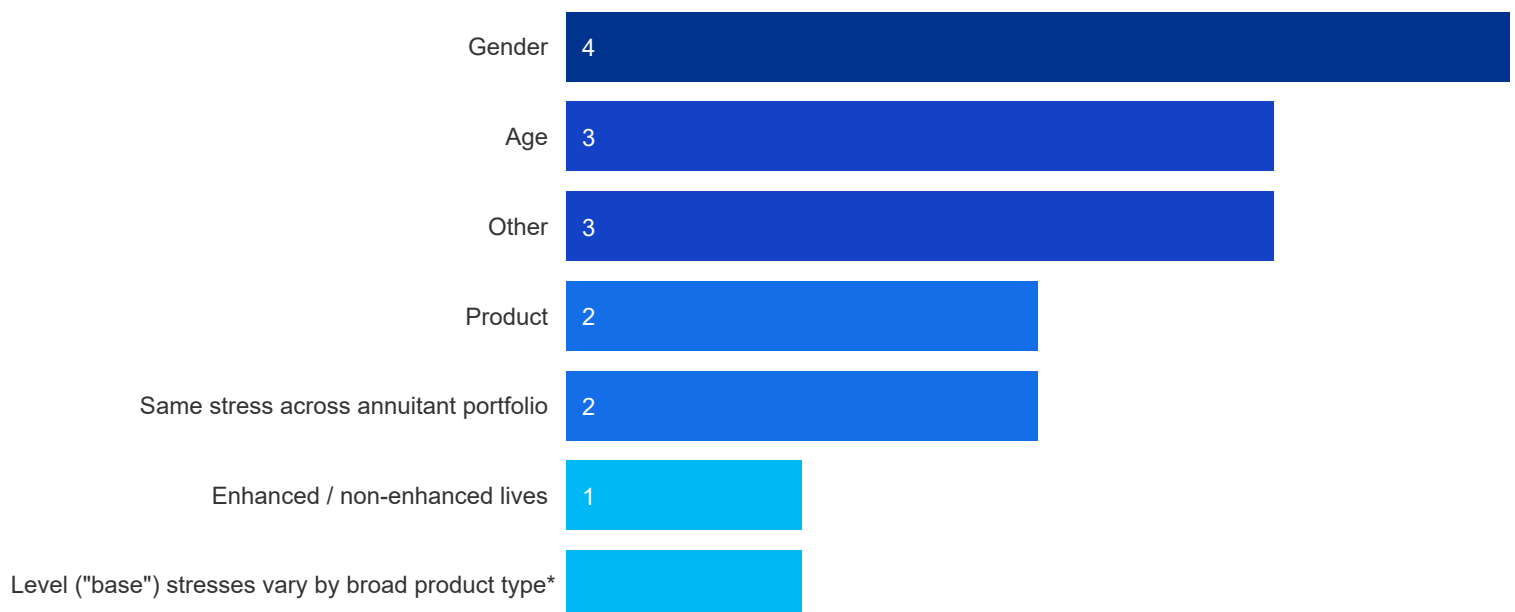| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Longevity - Annuities (Stress)

8.17a If you include "Data Risk" and "Event Risk / New Information Risk" in your longevity trend risk model, can you please set out how do you allow for diversification between them?

25%

75%
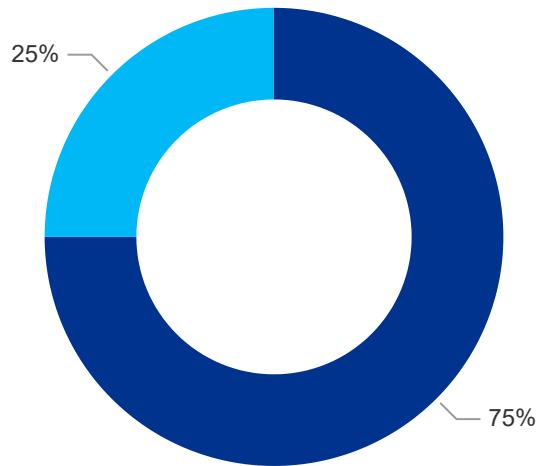
● Modelled independently allowing for correlation between them ● Part of a single overall continuum

4

8.17b Please specify whether the magnitude of stress scenario is deemed to vary for the following heterogeneous groups.

Group	Value
Gender	4
Age	3
Other	3
Product	2
Same stress across annuitant portfolio	2
Enhanced / non-enhanced lives	1
Level ("base") stresses vary by broad product type*	

*A separate trend stress is applied to deferred BPA members and structured settlements (PPOs) than other annuity.

6

Technical Practices Survey 2022
## 8. Mortality & Longevity Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Longevity Calibrations - Internal Model

The impact of the longevity improvements is similar to that of the 1-in-200 stress.
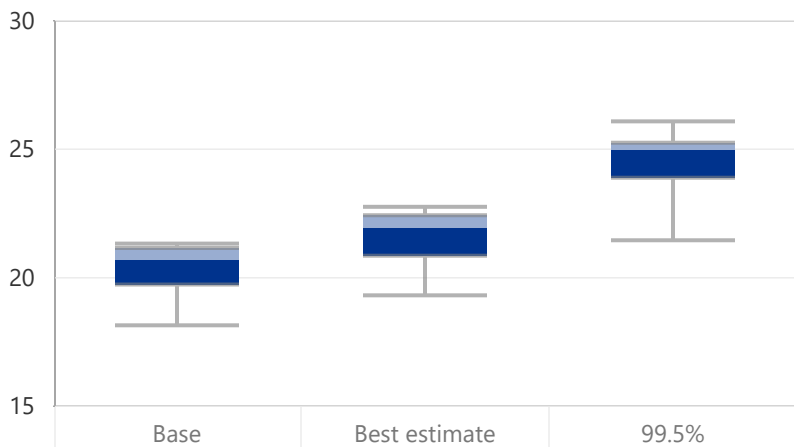Expectation of life denoted in years in the charts below.

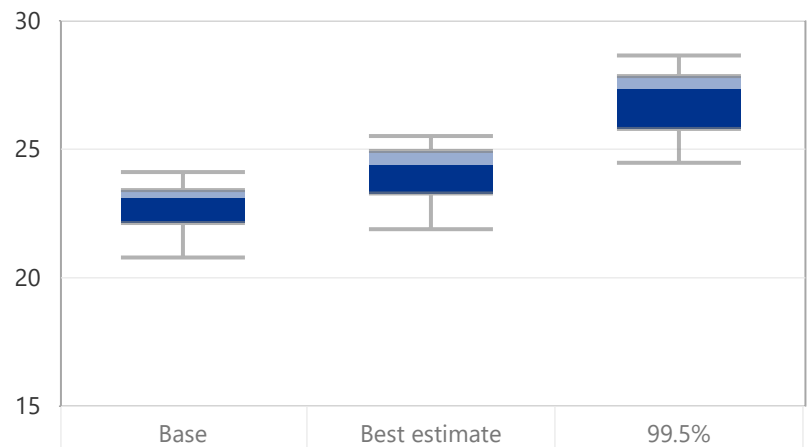**8.18a** Expectation of Male Life Aged 50 - IM/PIM only
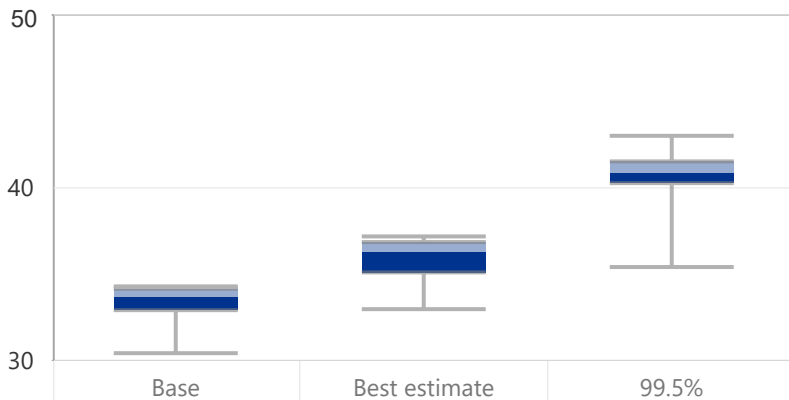
8.18b Expectation of Female Life Aged 50 - IM/PIM only

8.18c Expectation of Male Life Aged 65 - IM/PIM only

8.18d Expectation of Female Life Aged 65 - IM/PIM only

8.18e Expectation of Male Life Aged 80 - IM/PIM only

8.18f Expectation of Female Life Aged 80 - IM/PIM only

Technical Practices Survey 2022
8. Mortality & Longevity Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM

Longevity Calibrations - Internal Model

Firms who did not respond with a full IM01 submission have been excluded on this page to ensure a like for like comparison between stresses. The ranges and medians are therefore not directly comparable with other Longevity Calibration insights elsewhere in the report. Expectation of life denoted in years in the charts below.

8.18g Expectation of Male Life Aged 50 - IM/PIM only

8.18h Expectation of Female Life Aged 50 - IM/PIM only
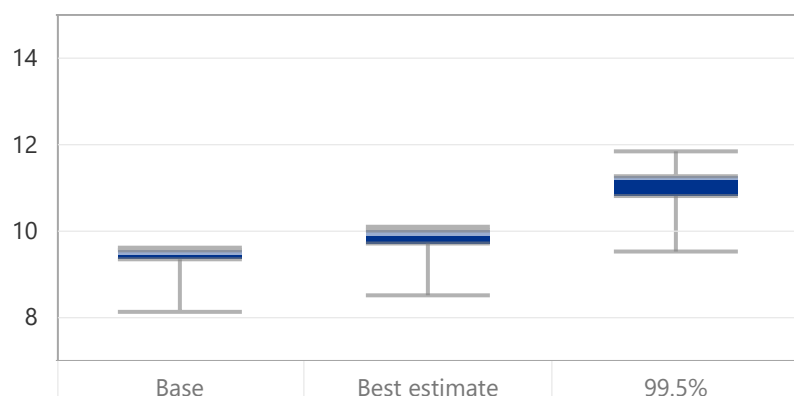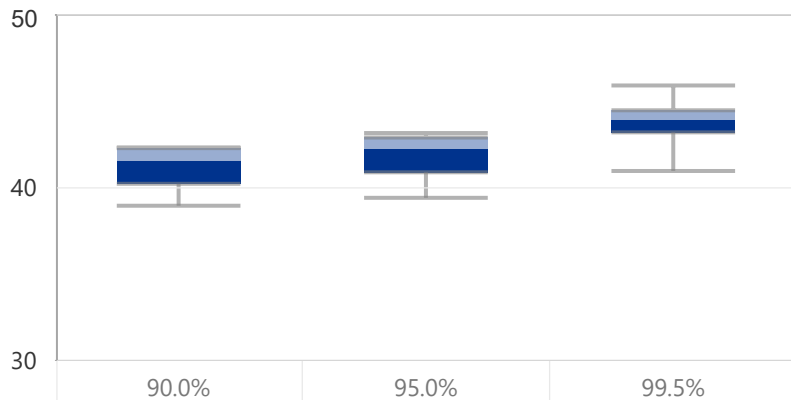

8.18i Expectation of Male Life Aged 65 - IM/PIM only
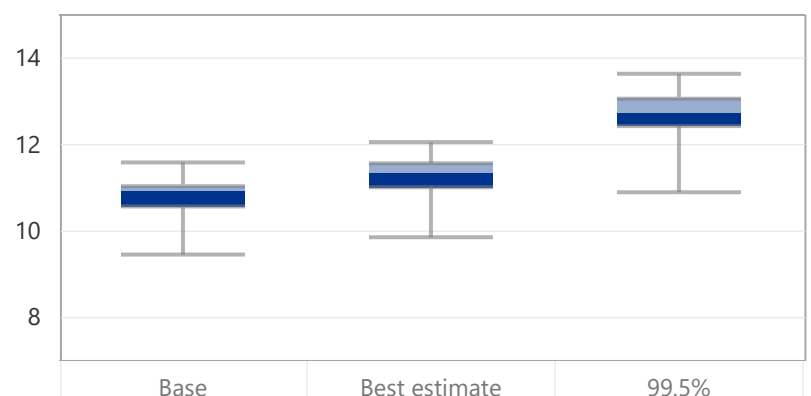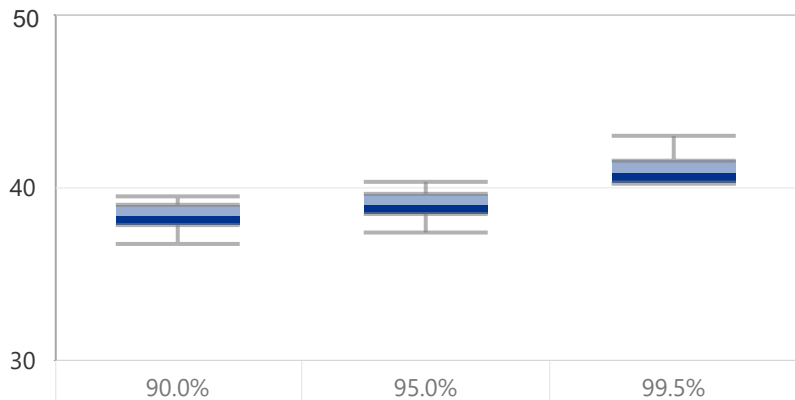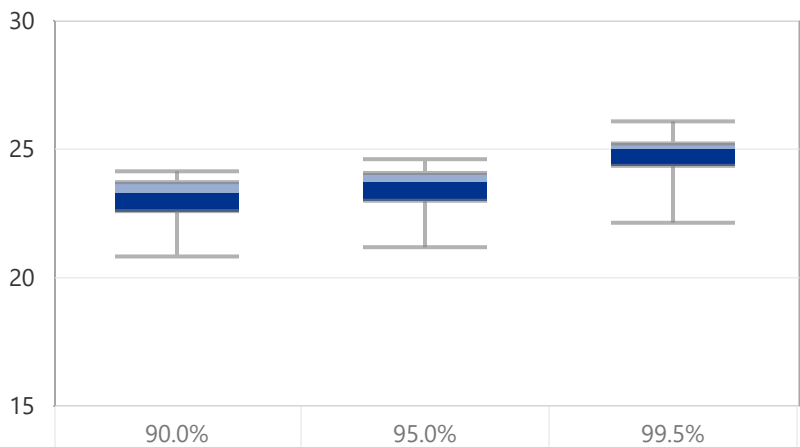
8.18j Expectation of Female Life Aged 65 - IM/PIM only
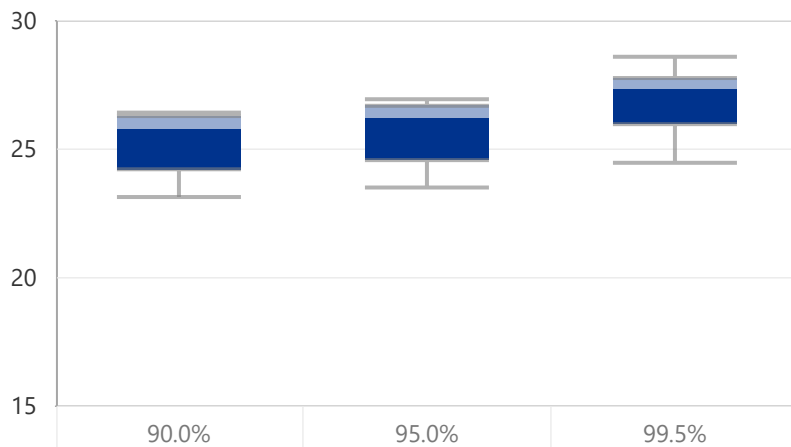
8.18k Expectation of Male Life Aged 80 - IM/PIM only

8.18l Expectation of Female Life Aged 80 - IM/PIM only

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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IM

Longevity Calibrations - Internal Model

Expectation of life denoted in years in the charts below.

8.19a 1-in-200 Stress Impact (EoL) - Aged 50

8.19b 1-in-200 Stress Impact (EoL) - Aged 65

8.19c 1-in-200 Stress Impact (EoL) - Aged 80

Technical Practices Survey 2022
8. Mortality & Longevity Risk

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk

7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

IM   **Longevity Calibrations – Internal Model**

The tables below sets out, for each age and gender:
- Best estimate expectation of life without allowance for mortality improvements
- Best estimate allowance for mortality for mortality improvements, as an increase in absolute expectation of life
- Overall stress allowance, as an increase absolute expectation of life
- Increased in stressed expectation of life, as a percentage of the base without improvements.

We note that the stress impact for males is generally larger than for females.

All figures below are shown as market average, with average defined as the mean of the dataset, using data from firm's IM 01 templates.

Age 50		
	Female	Male
	Market Average	Market Average
Base Mortality	36.6	33.3
BE Improvements	2.6	2.5
1-in-200 Stress Impact (EoL)	4.4	4.6
1-in-200 Stress Impact (%) *	11.1%	12.9%

Age 65		
	Female	Male
Base Mortality	22.8	20.3
BE Improvements	1.3	1.2
1-in-200 Stress Impact (EoL)	2.8	2.8
1-in-200 Stress Impact (%) *	11.7%	13.1%

Age 80		
	Female	Male
Base Mortality	10.7	9.2
BE Improvements	0.5	0.4
1-in-200 Stress Impact (EoL)	1.4	1.4
1-in-200 Stress Impact (%) *	12.7%	14.2%

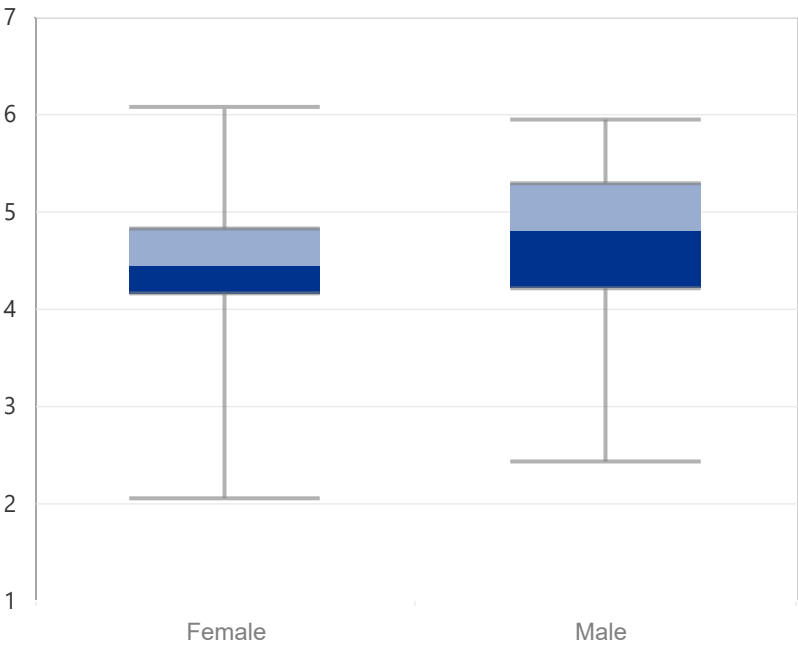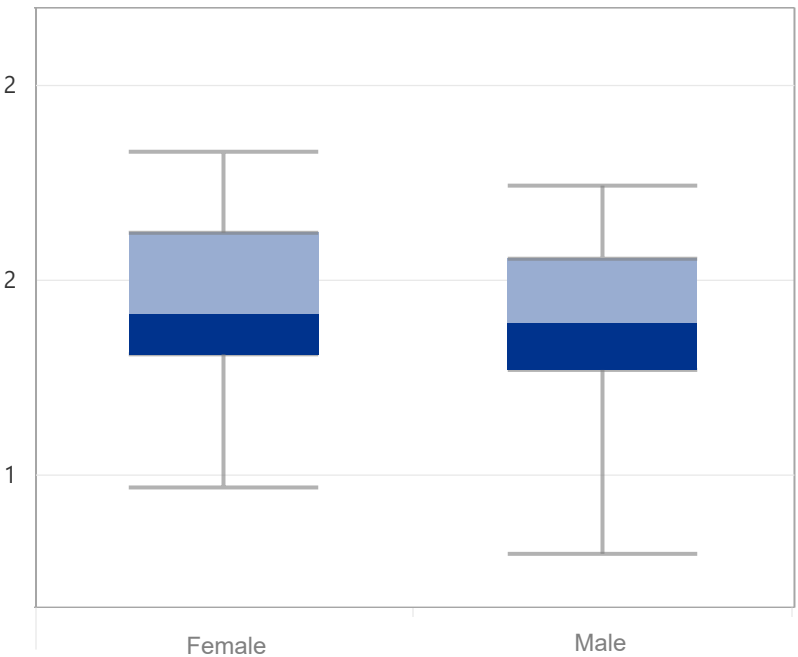*Increase in EoL under a 1-in-200 Stress as a % of Base EoL with improvement.

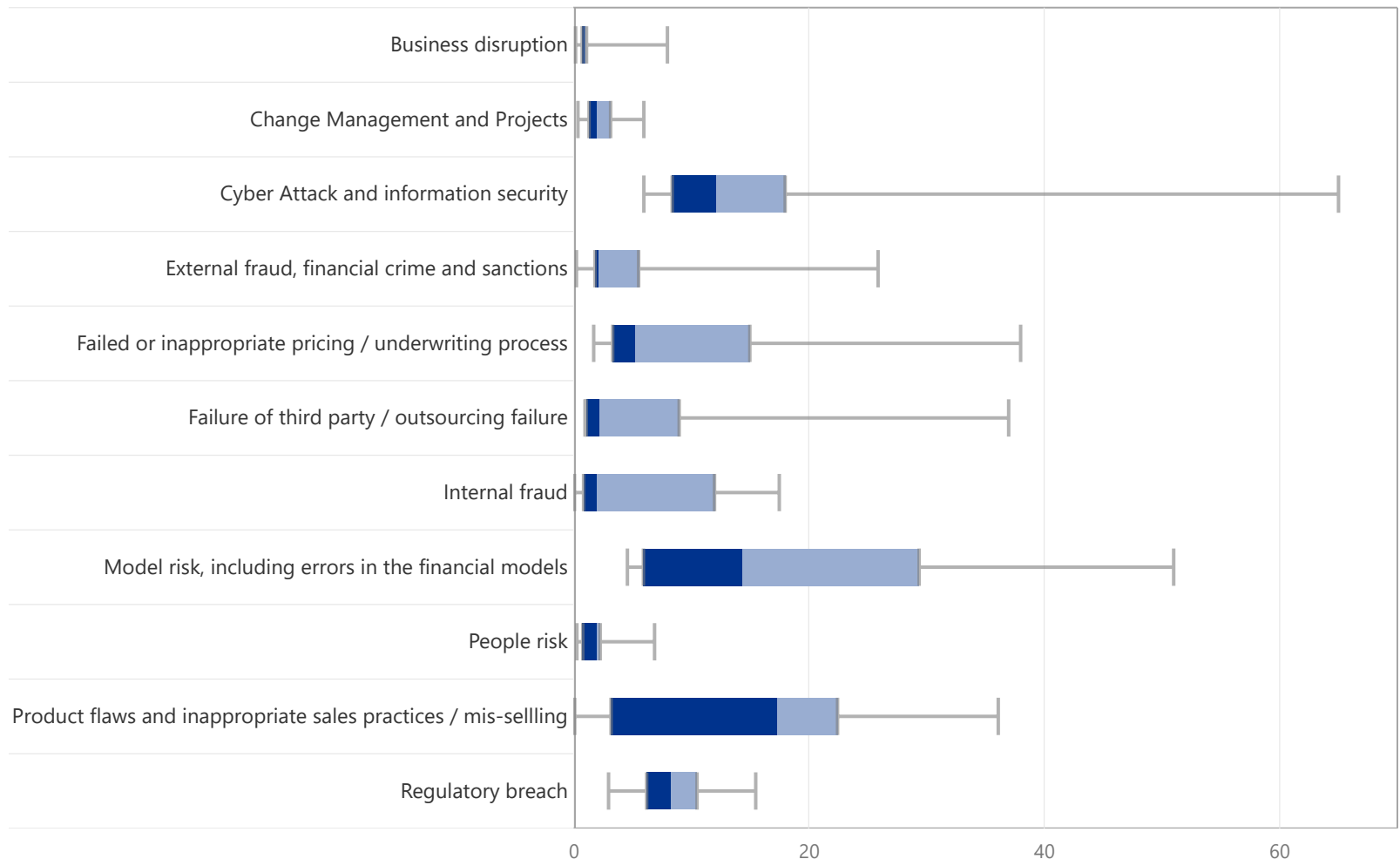| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Operational Risk Capital

This section covers methodologies in respect of Operational Risk Capital. We continue to see a wide range of responses to question 9.1. This reflects differences in the operating models of respondents and therefore the risks that arise; and differences in the classification of operational risk. It is noticeable that some of the maximums are very high indicating that some respondents have concentrations of risks in certain categories. The median values are more relevant for comparing categories. We have prepared the ranges shown based only on those companies that report non-zero proportions in the category.

The responses show that Model Risk is a very serious risk for many companies, this is a similar message to last year. Tightening the control environment around actuarial models is an area of focus at the moment which might offer the chance to reduce the capital held for this risk. The high level of capital held for regulatory failures and product flaws reflects the importance of managing the conduct risk agenda. Cyber Risk and Information Security stands out as the responses are very varied showing variety in both exposure and quantification. It has the highest minimum showing that it is significant for all respondents that categorise it separately and the third highest median showing its overall significance.

In relation to model risk, around two-thirds of respondents stated that they had a model risk policy in place. Those respondents that did not have a policy stated that either one was in development, the risk was covered by other policies or there were formal model risk management arrangements in place but not a policy covering them. The majority of respondents have extended the coverage of the model risk policy beyond actuarial and finance models recognising that a high level of model reliance exists in a number of places within insurers. We found some instances where there were fewer controls mandated for those models outside of actuarial and finance.

9.1 What proportion of your total operational risk capital do each of the following scenarios contribute (%)?

1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

SF/IM

Operational Risk Capital and Calibration

9.2 Have you implemented a model risk policy to improve model controls, and if so which models are in scope of this policy?

- Actuarial models: 10
- Other Financial models: 9
- Non-financial models: 7

13

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

- 53%
- 6%
- 12%
- 6%
- 24%
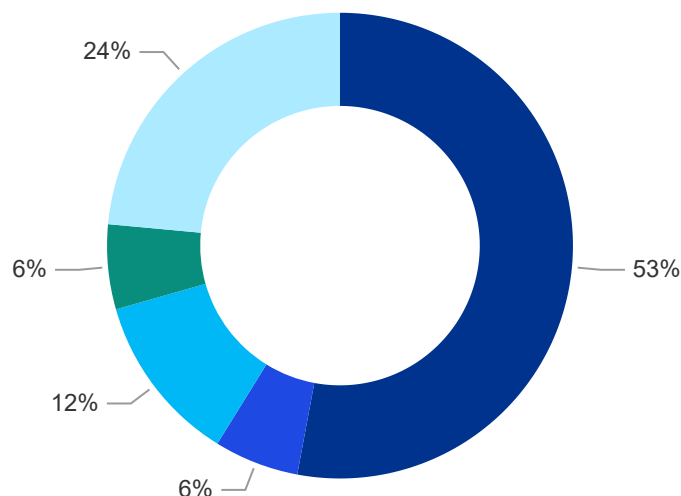
- ● Statistical frequency/severity models with multiple risk scenarios
- ● Statistical models with conditional dependencies
- ● Simple estimate approach
- ● Deterministic approach
- ● Other

'Other' includes calculating capital deterministically from data from individual risks, making use of deterministic scenario analysis, using a loss data model, and using a hybrid of the scenario options listed above.

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Technical Practices Survey 2022
9. Operational Risk

| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
7. LTM	8. Mortality & Longevity Risk	9. Operational Risk	10. Aggregation	11. Cap Management	12. Tax	13. Correlation

SF/IM

Operational Risk Capital and Calibration

It remains common practice to explore a relatively wide number of scenarios to investigate operational risk. Many insurers find the process of holding workshops to explore operational events to be a useful exercise and therefore insurers are using this as part of their overall risk management as well as to set capital requirements.

9.4 For how many different operational risks do you use scenario workshops / expert judgement to set the modelling parameters?
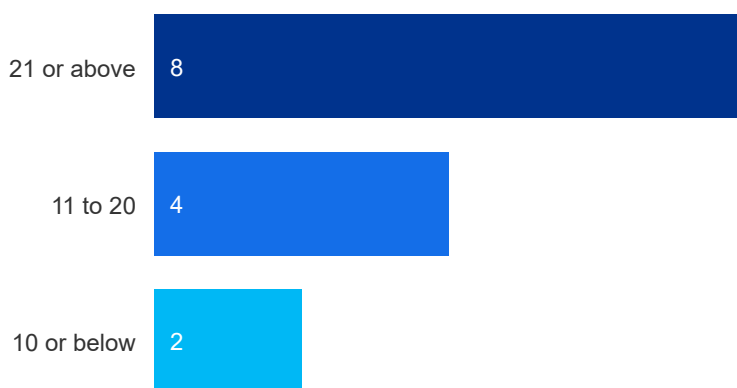
9.5 Do you allow for recoveries from corporate insurances on your operational risk scenarios?

Yes 46%   No 54%

14

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9.6 What data do you use in your operational risk calibration process?
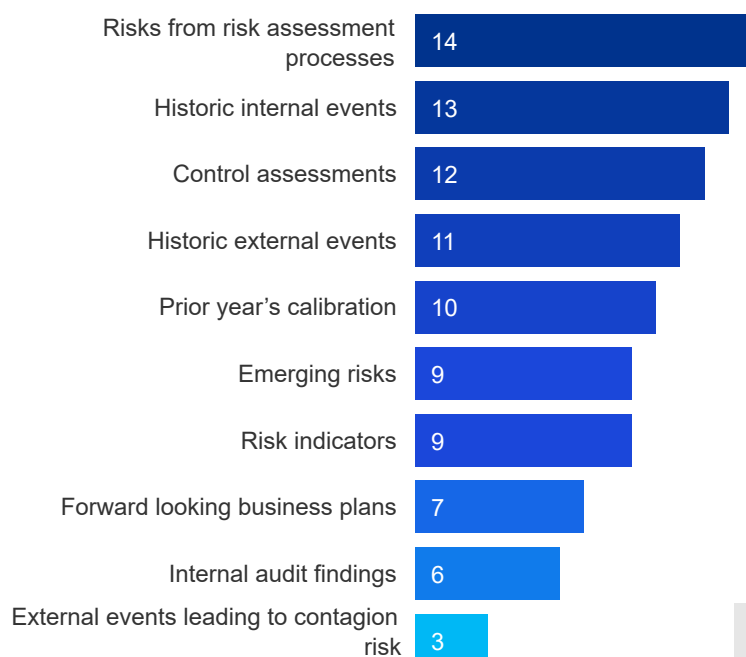
9.7 How is internal/external data used in your operational risk model?
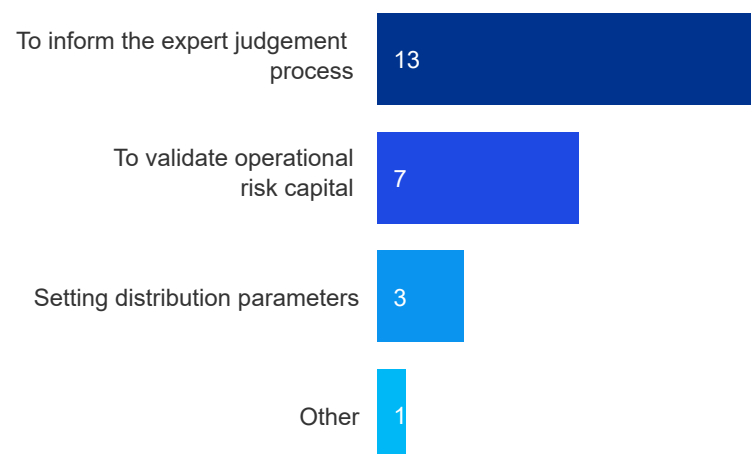
'Other' includes applying weightings to data used, and combining scenario analysis using external loss data with internal data to set model parameters.

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SF/IM

Operational Risk Capital and Calibration

None of our respondents have made changes to the statistical distributions used to model the frequency or severity of operational risk in the last 12 months. Only one firm stated that it was looking to make changes this year. Given the economic changes seen in recent years, it is not surprising that refining the operational risk model appears to not be an area of focus at the moment. The risk workshops which drive the parameters for use in models is how respondents make sure the operational risk capital takes account of the most recent events and data. 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 more prevalent. The log-normal distribution remains the most commonly used statistical distribution to model severity.

9.8 Do you model your frequency and severity distribution separately?

No 21%

Yes 79%
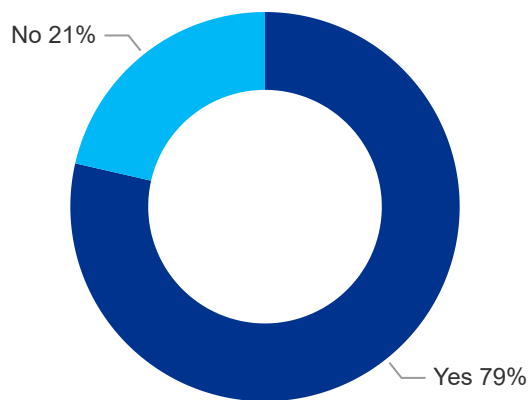
14

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

Poisson	10
Negative Binomial	2
Other	3

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

Log-normal	10
Generalised Pareto	5
Weibull	2
Gamma	1
Generalised Extreme Value	1
Other	5

'Other' includes the Exponential and Bernoulli distributions, and exposure-based scenario analysis using various distributions.

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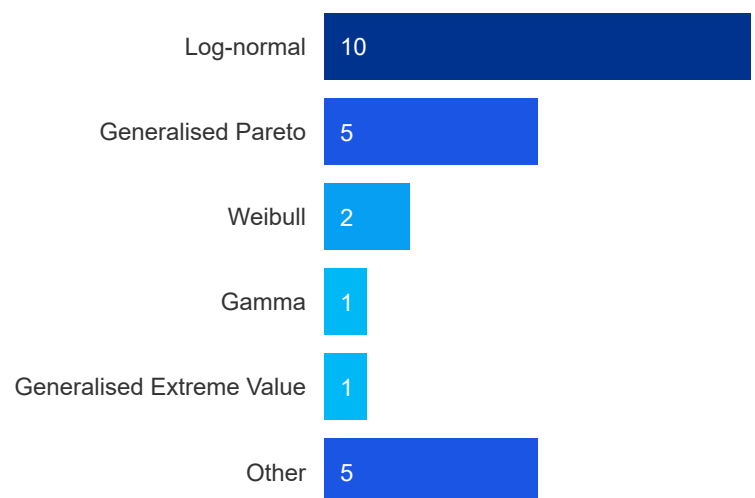
'Other' includes the Normal and Burr distributions, Cubic Spline, exposure-based scenario analysis using various distributions, and the use of an empirical distribution for each individual risk.
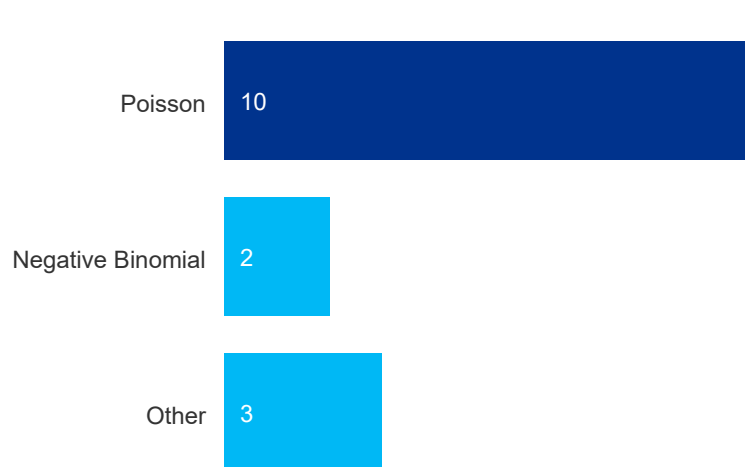
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SF/IM

Correlations, Diversification, and Recoveries

Insurers achieve a high level of diversification between operational risks and between operational risks and other risks. Therefore, operational risk contributes less to the overall capital requirement than might appear from the individual scenarios. The correlation parameters that underpin the diversification benefit are relatively subjective and broadly set using pure expert judgement. Even the alternative approach of using causal driver analysis is underpinned by expert judgement. The setting of correlation parameters and ensuring that the overall diversification allowance is appropriate will remain an area that insurers need to keep under review.

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

Pure expert judgement	8
Combination	3
Causal driver approach	1
Other	1
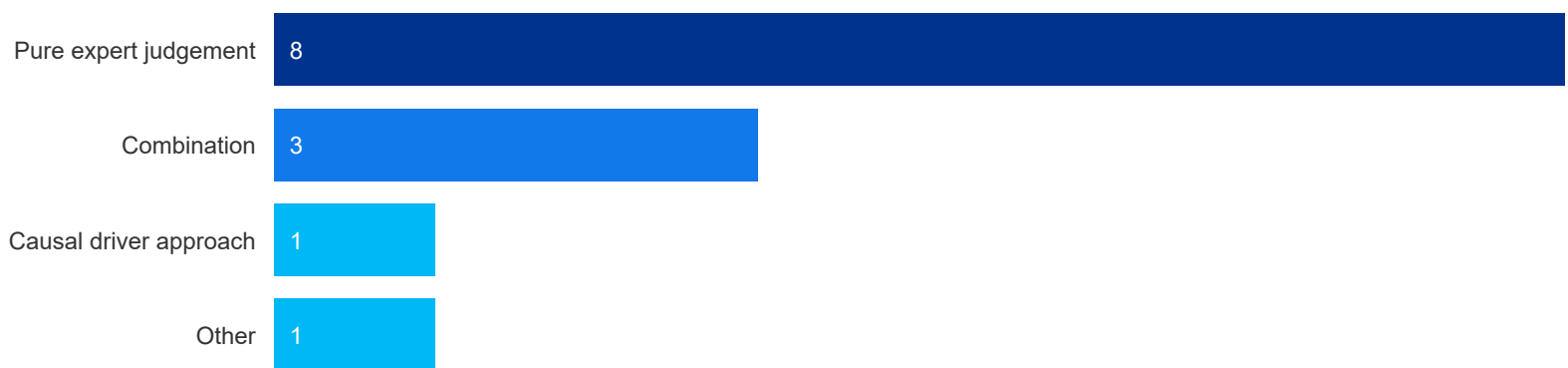
'Other' includes correlation assessments based on qualitative analysis of systemic risk drivers and used in conjunction with a copula.

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9.12 What diversification benefit are you able to achieve (%)?

Between Operational Risk
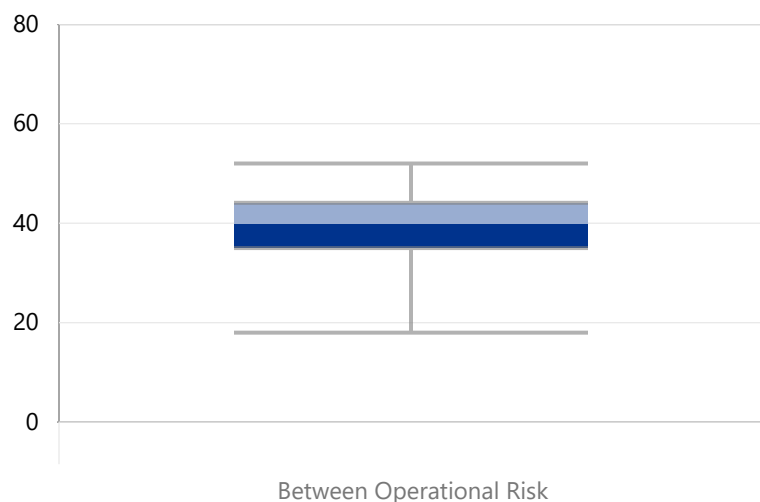
%	
YE20 Median	47
YE21 Median	39

Between Operational Risk and Other Risks
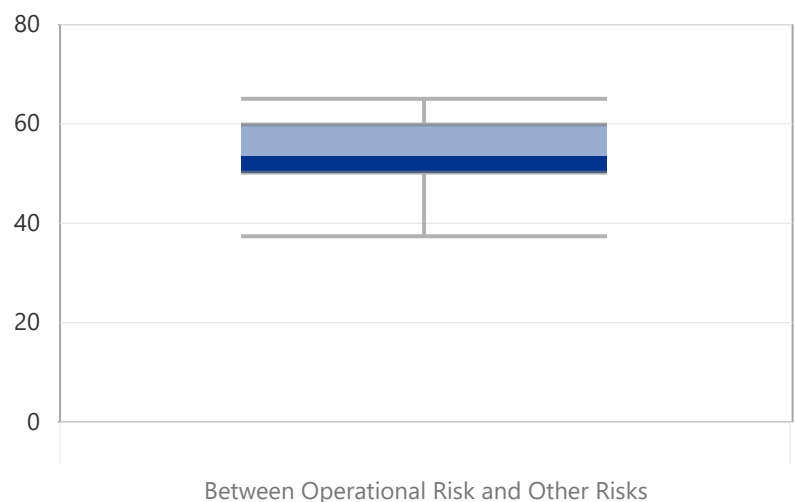
%	
YE20 Median	52
YE21 Median	51

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IM

Dependency and Risk Calibration

In general firms continue to perform their risk calibrations either annually or less frequently depending on the materiality of the risk.

Continued enhancements to the IT infrastructure (both software and hardware), alongside cloud computing solutions, have meant that we are seeing that firms are increasingly able to calibrate their models on-cycle, however this is not yet universal practice.

A majority of firms are looking to increase the amount or improve the quality of the data they are using for calibration and validation,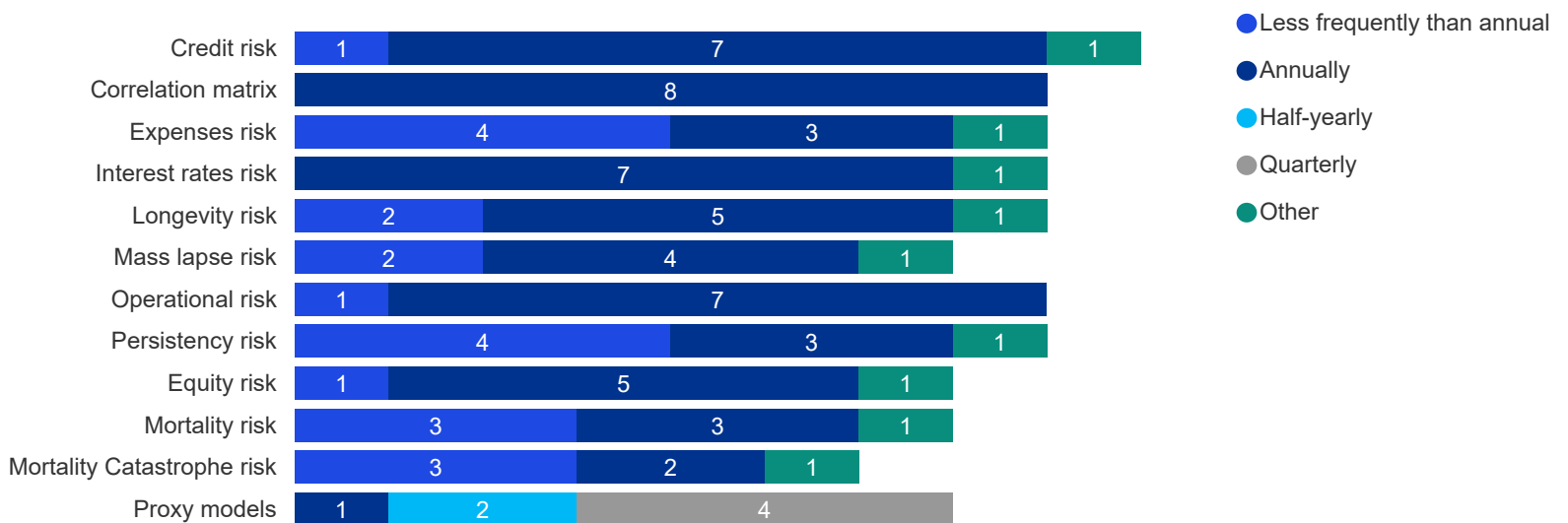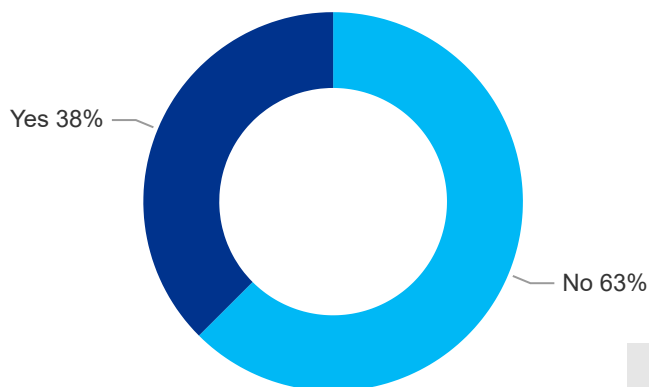 likely in response to the PRA's challenge of proxy models. Matching Adjustment under Stress (MAuS) continues to be an area in which firms are seeking to make improvements, often driven by enhanced modelling capacity. A number of firms are also investigating more complex ways of fitting proxy models, for example making use of automated fitting routines.

10.1 How frequently do you calibrate the following risks?

Legend:
- Less frequently than annual
- Annually
- Half-yearly
- Quarterly
- Other

Risk	Values
Credit risk	1, 7, 1
Correlation matrix	8
Expenses risk	4, 3, 1
Interest rates risk	7, 1
Longevity risk	2, 5, 1
Mass lapse risk	2, 4, 1
Operational risk	1, 7
Persistency risk	4, 3, 1
Equity risk	1, 5, 1
Mortality risk	3, 3, 1
Mortality Catastrophe risk	3, 2, 1
Proxy models	1, 2, 4

10

10.2 Do you calibrate your proxy model off cycle?

Yes 38%
No 63%

8

10.3 Are you planning any other development to your capital model?

Use of more/different data: calibration	5
Use of more/different data: validation	5
Enhance calculation of the MAuS	3
Enhance fitting algorithm without changing form of model	3
Direct integration with credit modelling	2
Improve granularity of drivers	2
Nothing planned	1
Other	1
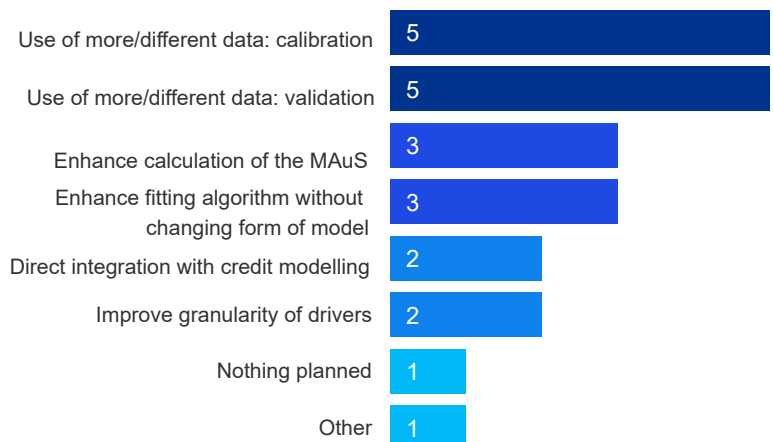
9

'Other' refers to a respondent which does not have a fixed calibration frequency and rather recalibrates the risks in response to monitoring triggers or to address regulatory or business needs.

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SF/IM

Diversification Level

We haven't seen significant re-basing of dependencies between risks (see the correlations section for further detail) and correspondingly, there hasn't been a lot of movement in the diversification benefits achieved. There is an upward trend in the market risk diversification benefit which is largely down to sampling differences but is also potentially driven by increased granularity of credit risk modelling.

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

%	IM/PIM Entity level	IM/PIM MA Fund	SF Entity level
YE20 Median	35	10	23
YE21 Median	37	9	21

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

%	IM/PIM Entity level	IM/PIM MA Fund	SF Entity level
YE20 Median	28	13	22
YE21 Median	39	16	18

10.6 Diversification between risk modules (%)

%	IM/PIM	SF
YE20 Median	36	23
YE21 Median	33	22
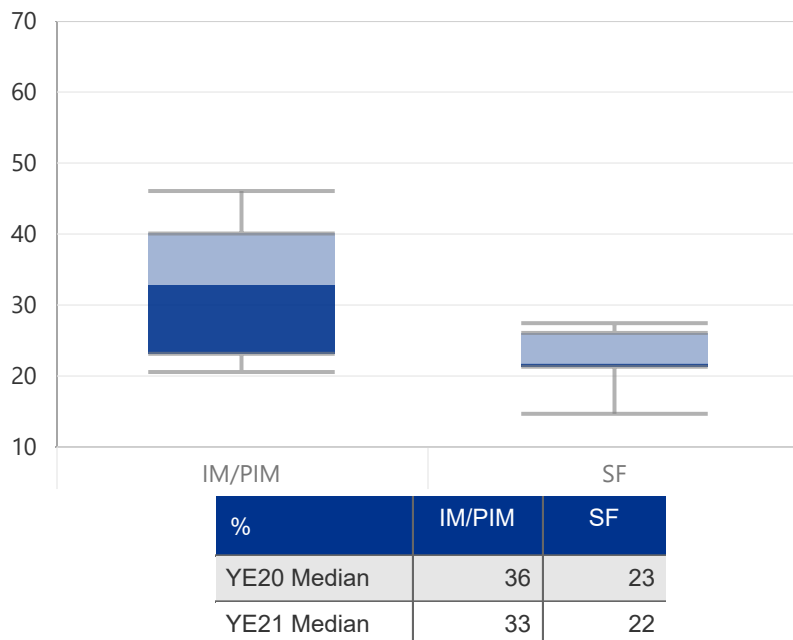
10.7 Total Diversification (%)

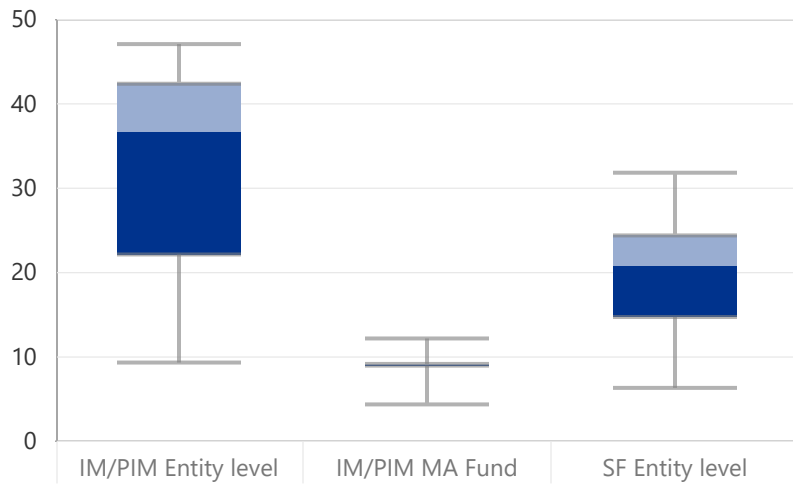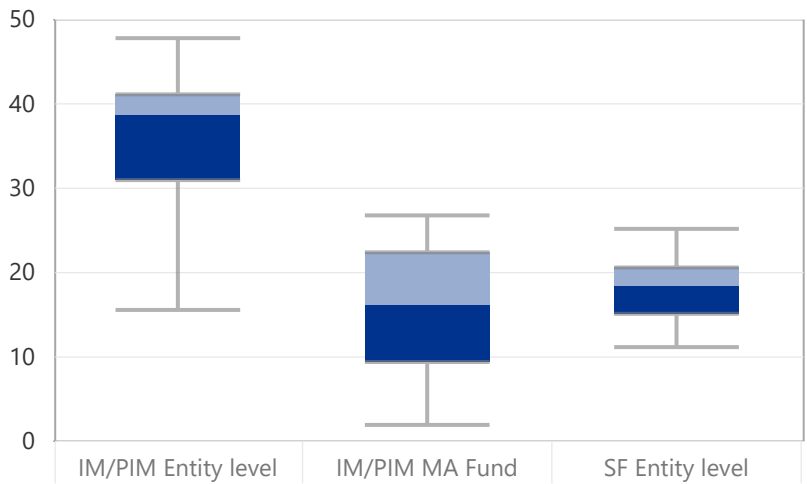| %	IM/PIM	SF
YE20 Median	49	39
YE21 Median	48	36

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SF/IM

Capital Management

The capital buffers 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 a slight reduction in the capital buffer level between the previous year and this year's survey. Some of this is caused due to a different set of respondents in each year. Comparing the responses on a like-for-like basis shows that few respondents have made a change to their capital buffer. However, these are not wholesale changes, and they appear to be refinements only.

11.1 What coverage ratio for SCR do you set as the Risk Appetite (%) at the operating company level?

Level 1 - the level below which immediate action would be taken, for example dividends would not be paid (Amber - Red boundary)

Level 2 - the level which is considered a warning and below which actions would be planned to recover the position (Green - Amber boundary)

%	Level 1	Level 2
YE20 Median	130	142
YE21 Median	123	138

11.2 Do you calibrate your coverage ratio risk appetite using the Level 1 point or the Level 2 point?

- Level 2
- Level 1

32%
68%

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

- t=0 position only
- Projection
- Other

22%
17%
61%
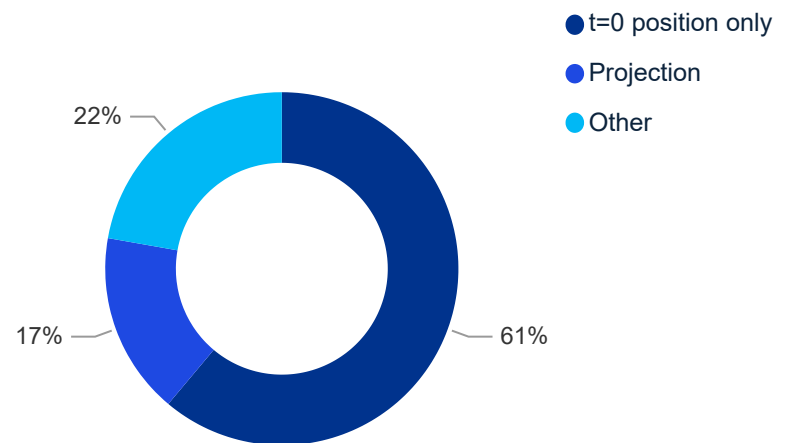
'Other' includes using bespoke approach along with performing projection over a longer period.

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Technical Practices Survey 2022
11. Capital Management

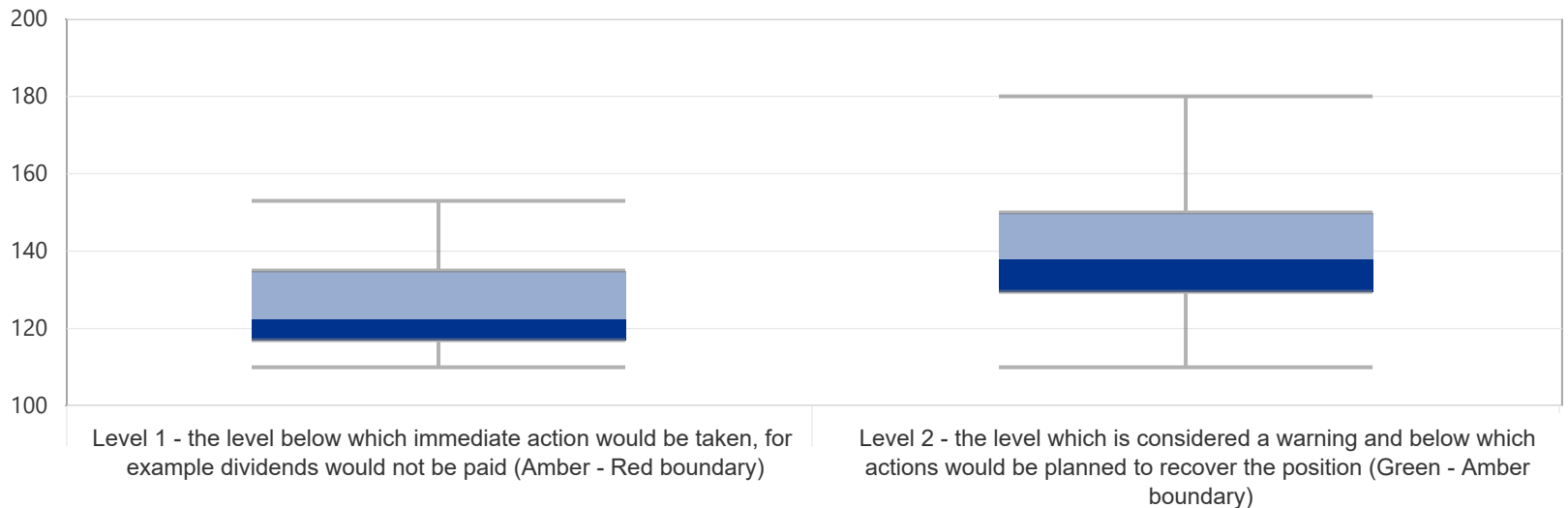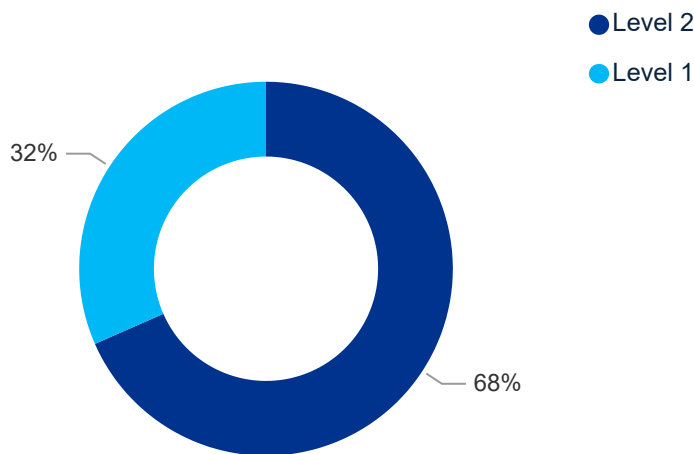| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Capital Management and Recovery and Resolution Plans

There are fewer respondents this year that use a 1-in-10 or 1-in-20 confidence level.. A number of other firms stated that the method was a more comprehensive approach that considered a range of different scenarios.

11.4 If you calibrate your coverage ratio risk appetite using the Risk Appetite level 1 point, what is the underlying confidence level?

- 1-in-20
- 1-in-10
- Other

32%
37%
32%
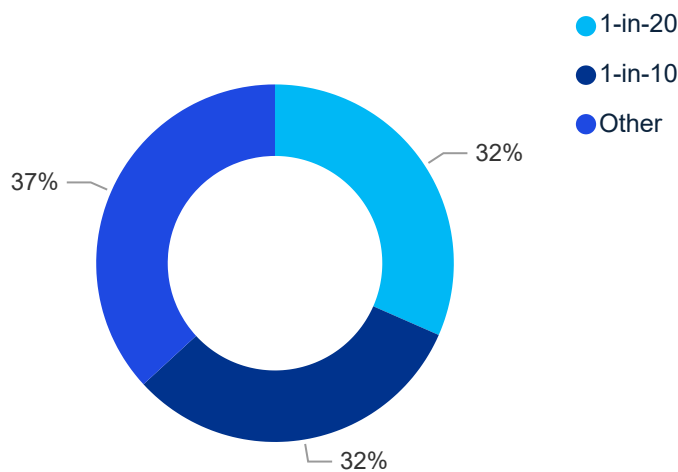
The 'Other' methods included a number of different confidence levels both stronger than 1-in-20 and weaker than 1-in-10

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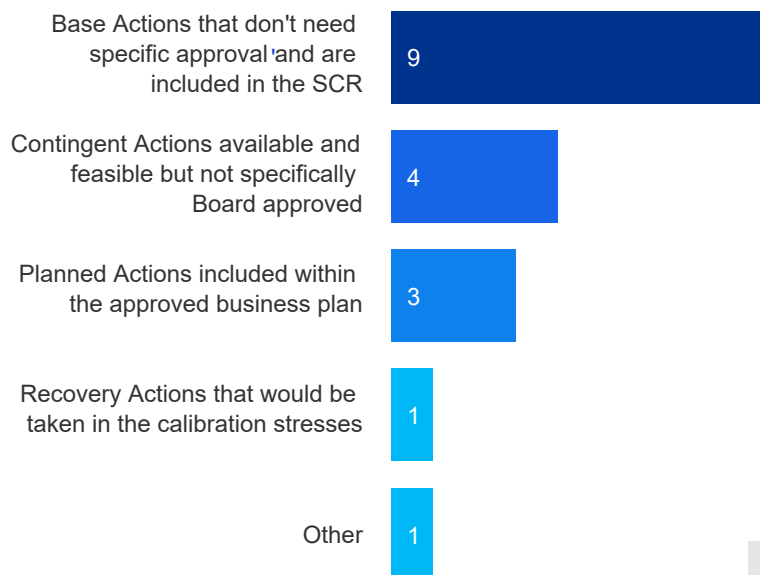**11.5** Which of the following features are considered as part of setting your coverage ratio risk appetite?

Feature	Value
Adjustments for the level of regulatory TMTP	6
Adjustments for pension scheme risks	5
Temporary adjustments for business issues	5
Adjustments for difference between notional and regulatory TMTP	3
Adjustments for economic conditions	3
Other adjustments to the regulatory position	3
Adjustments for capital add-ons	2
Adjustments for restrictions from the capital tiering rules	2
Adjustments for any capital targets in sub-funds	1
Adjustments for fungibility	1

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11.6 Which Management Actions do you allow for in your coverage ratio Risk Appetite calibration?

Action	Value
Base Actions that don't need specific approval and are included in the SCR	9
Contingent Actions available and feasible but not specifically Board approved	4
Planned Actions included within the approved business plan	3
Recovery Actions that would be taken in the calibration stresses	1
Other	1

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

Option	Value
At Level 1 (moving to Risk Appetite being Red)	8
At a defined level below Level 1 but above 100% SCR coverage	5
Based on a defined liquidity trigger	5
Based on a defined operational trigger	3
At a defined level below 100% SCR coverage (but above MCR)	2
No formal triggers set, use Board / Management discretion	2

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SF/IM

Liquidity Risk

Liquidity and short-term cash needs is an area of increasing focus for insurers. Almost all respondents consider more than one time period in their assessment of liquidity risk. There are also a lot of insurers focusing on the very short-term horizons, which is a continuation of a trend seen last year. A few respondents consider much longer-term horizons as part of the overall liquidity framework.

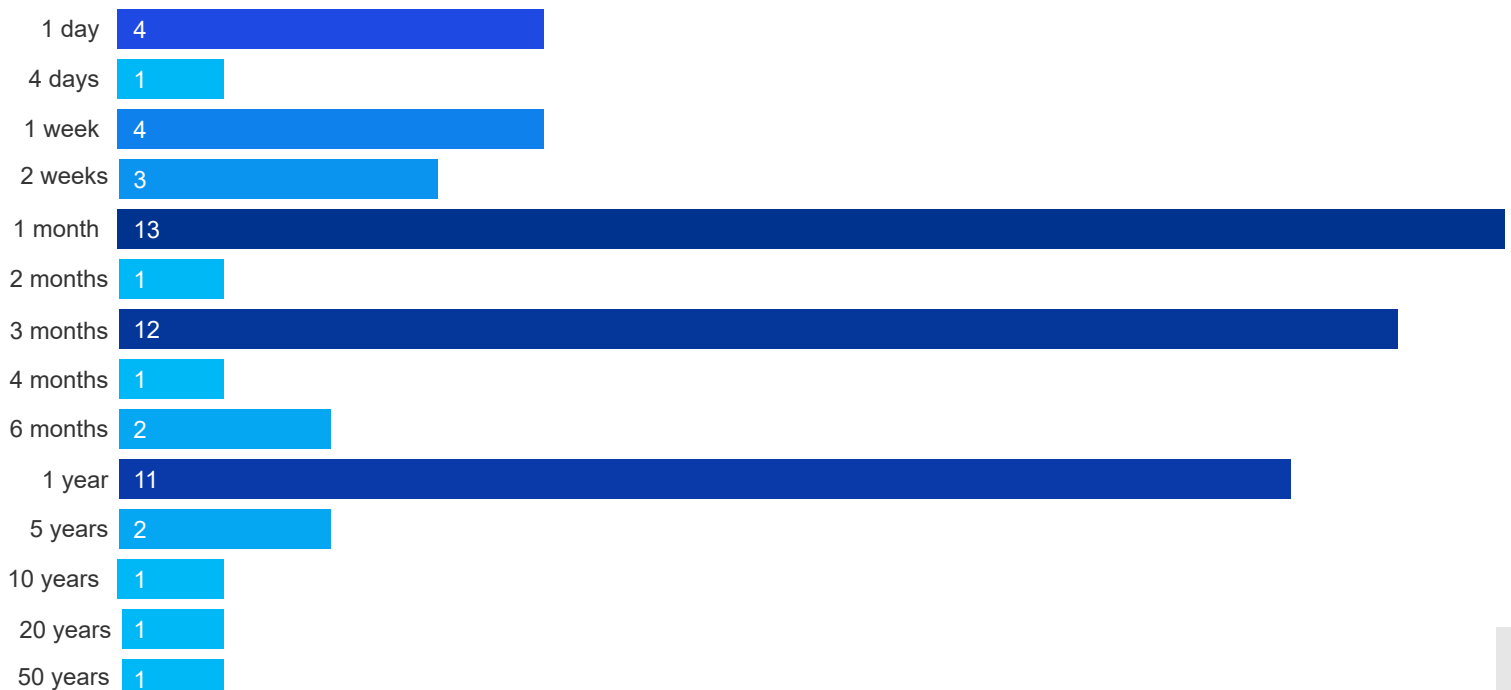**11.8** What is the shortest time horizon you consider for liquidity risk?

Horizon	Value
1 day	4
4 days	1
1 week	4
1 month	9
3 months	1
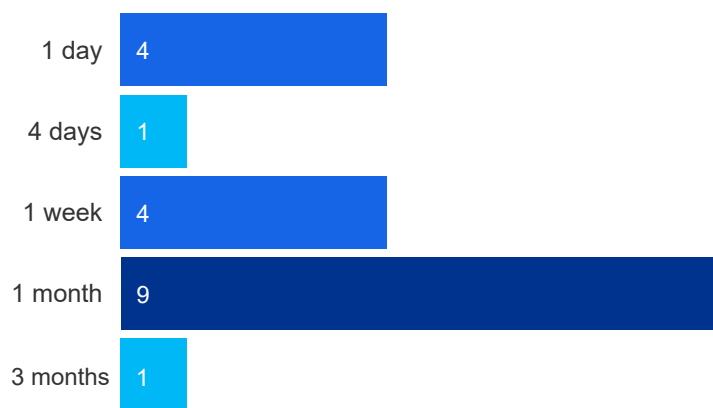
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11.9 How many time horizons are considered in total?

Number	Value
4	7
3	6
2	5
1	2

20

11.10 Which time horizons do you use within your liquidity risk approach?

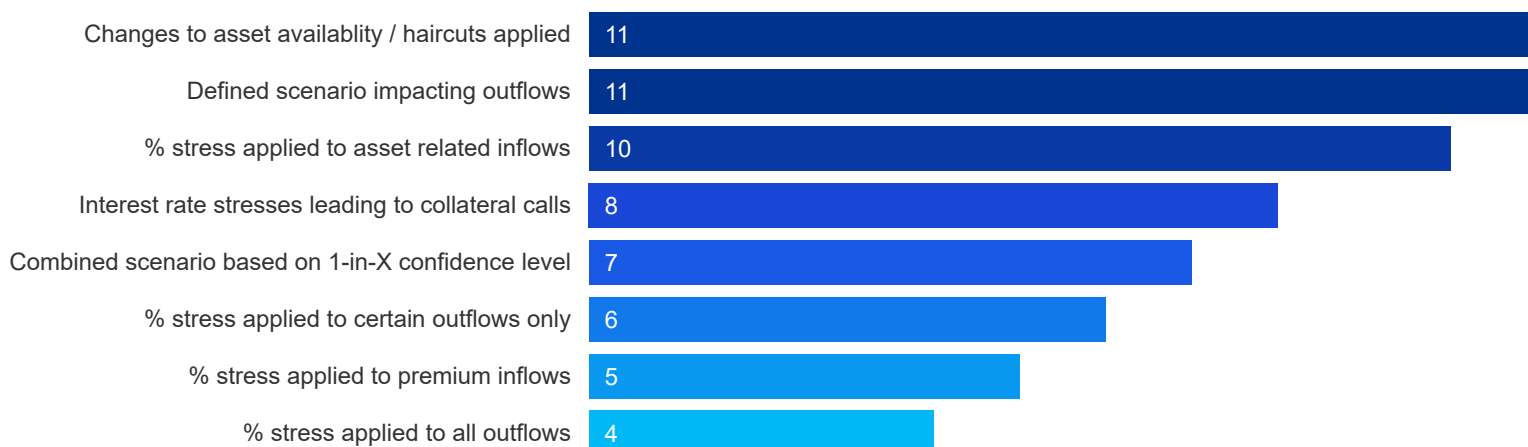| Horizon	Value
1 day	4
4 days	1
1 week	4
2 weeks	3
1 month	13
2 months	1
3 months	12
4 months	1
6 months	2
1 year	11
5 years	2
10 years	1
20 years	1
50 years	1

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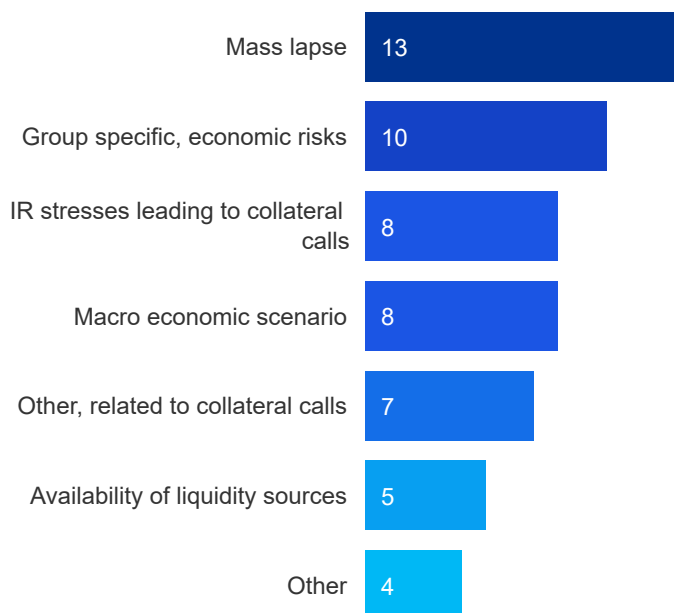| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Liquidity Risk

The understanding of stressed positions and reflecting that not all assets are available at the full market price at all times are commonly allowed for in assessing liquidity. However, the approach taken and factors used still differ widely between companies. The chart below shows that a wide range of stresses are applied in order to give a full picture of liquidity risk. We have also showed some information about the haircuts typically applied to different asset classes, there is a wide variety of approaches here with cash as well getting differing treatment between respondents.

11.11 If your liquidity risk appetite is based on cash assets available in stressed conditions, what stresses do you apply?
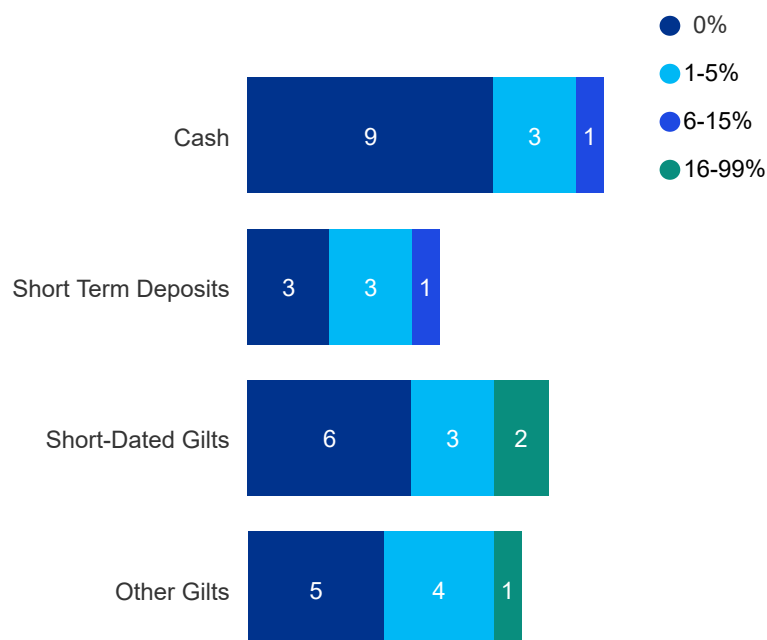
Changes to asset availablity / haircuts applied	11
Defined scenario impacting outflows	11
% stress applied to asset related inflows	10
Interest rate stresses leading to collateral calls	8
Combined scenario based on 1-in-X confidence level	7
% stress applied to certain outflows only	6
% stress applied to premium inflows	5
% stress applied to all outflows	4

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

Mass lapse	13
Group specific, economic risks	10
IR stresses leading to collateral calls	8
Macro economic scenario	8
Other, related to collateral calls	7
Availability of liquidity sources	5
Other	4

'Other' includes a mixture of bespoke approaches

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11.13 What haircuts do you apply to the following asset types in assessing the liquidity risk?

Legend:
- 0% (dark blue)
- 1-5% (cyan)
- 6-15% (blue)
- 16-99% (green)

Asset type	0%	1-5%	6-15%	16-99%
Cash	9	3	1	
Short Term Deposits	3	3	1	
Short-Dated Gilts	6	3		2
Other Gilts	5	4		1

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Technical Practices Survey 2022
12. Tax

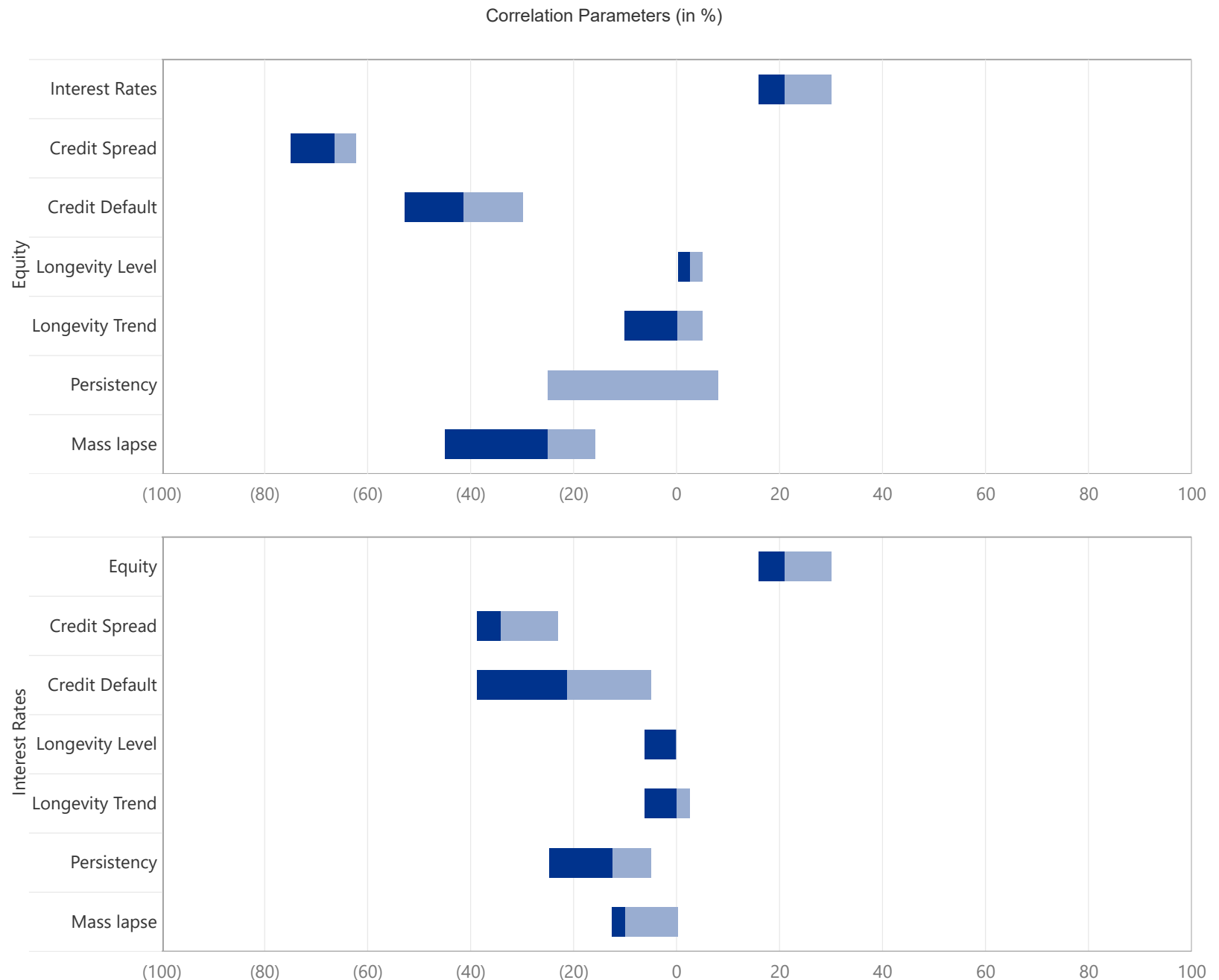| 1. Balance Sheet	2. Hot Topics	3. SF Specific Risks	4. Market Risk (excl. Credit)	5. Interest Rate Risk	6. Credit Risk
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SF/IM

Loss Absorbing Capacity of Deferred Tax (LACDT)

In this section we consider the extent to which the Solvency Capital Requirement (SCR) is mitigated by the LACDT.

Offsetting with deferred tax liabilities and prior year tax liabilities remains the most common basis to support firms' LACDT. In addition, four firms indicated that they have relied on future profits from future new business to support their YE21 LACDT. One respondent allowed for the release of Risk Margin on closed books or products and a further three permitted this in their methodology but did not rely on it in practice.

12.1 Which of the following sources of future income or profits support your YE21 LACDT?

Source	Actually used	Permitted
Offset with deferred tax liabilities	15	16
Offset with prior year current tax liabilities	7	11
Taxable profits on future long-term new business	4	6
Investment return on excess capital	2	5
Release of some or all of the RM for closed books	1	4
Yield on debt in excess of the post-stress RFR	2	3
Post-shock management actions	1	2
Reverse effect of overly prudent SII assumptions	1	2
General insurance or non-insurance entities income		2
Yield on equity in excess of the post-stress RFR		2
Modified business with some/all of above		1
Post-shock tax planning		1

● Actually used to support YE 2021 LACDT ● Permitted in our methodology

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The chart below indicates that almost half of respondents were able to recognise all or almost all of their potential LACDT.

12.2 How much of the potential LACDT do you recognise in your SCR?

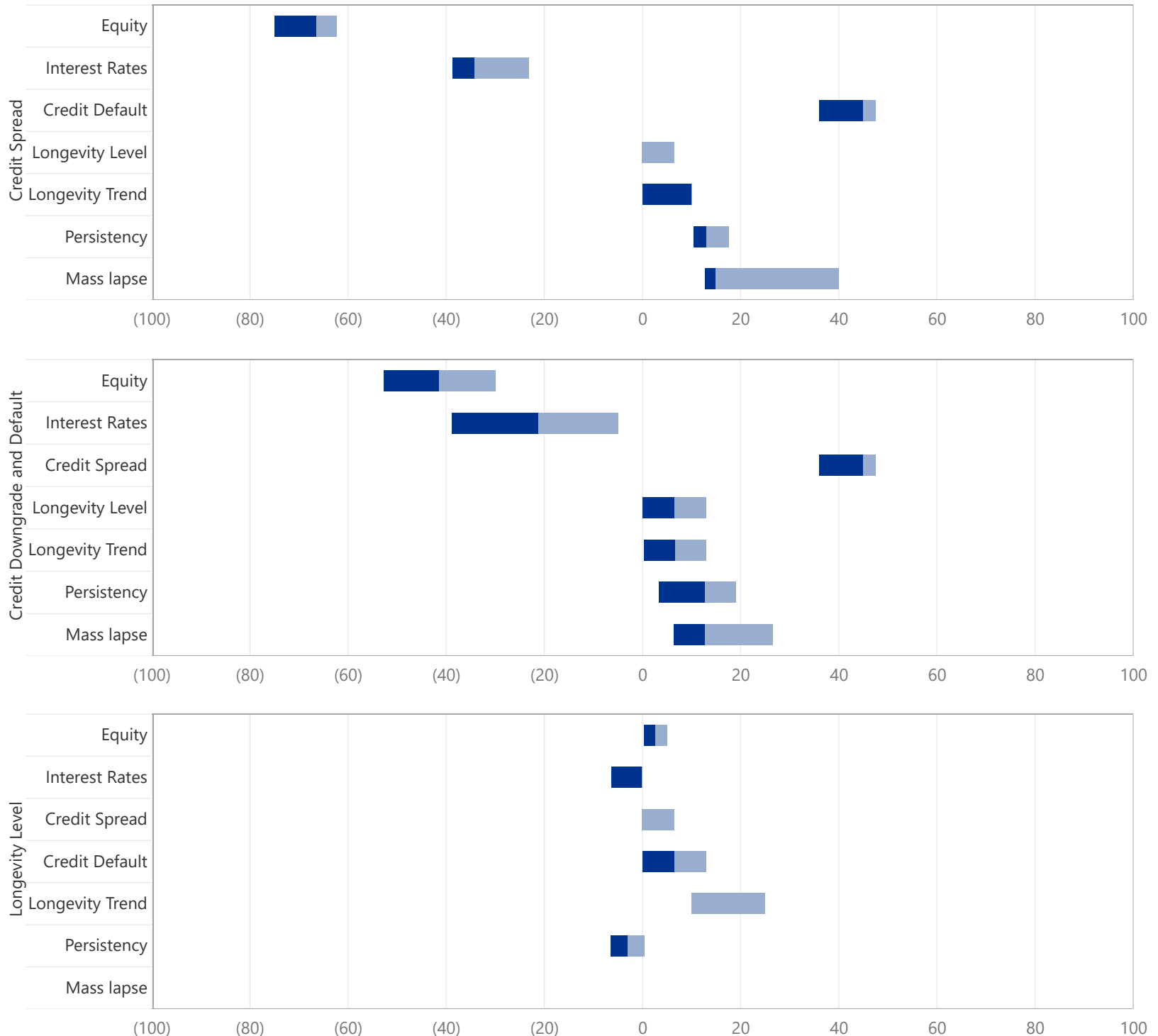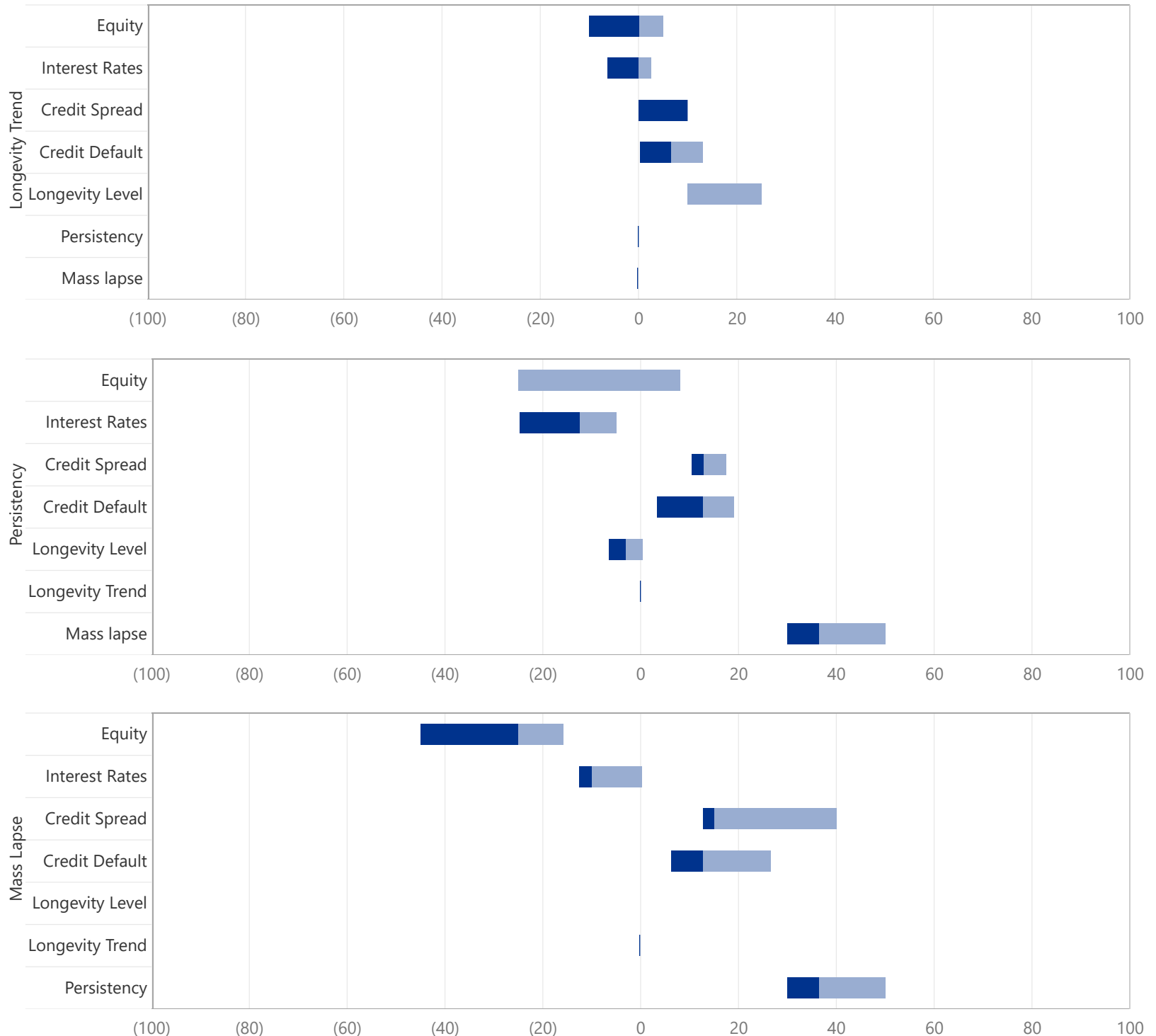| Range	Count
Over 95%	10
75% to 95%	2
50% to 75%	4
Less than 25%	2
Nil	1

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IM

Correlation Parameters

Correlation parameters have always been a difficult area to benchmark due to the lack of consistency in approaches and sign conventions amongst respondents. In order to facilitate better comparability for the correlation pairs, data submitted have been amended where required to appropriately align sign conventions amongst respondents. We have also removed the whiskers to more clearly indicate the range of correlation parameters.

In order to focus on the key correlations, we reduced the number of risks in this year's survey. When conducting analysis on respondents and correlation pairs which are common across both years, there are very few significant differences between responses. In fact, almost half of the respondents have not changed their correlations at all. Only one respondent has significantly changed any of their correlations, increasing correlations in relation to credit spreads and defaults for all combinations.

Correlation Parameters (in %)

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IM

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Correlation Parameters (in %)

Glossary

ABS	Asset-backed Security	**LTAS**	Long Term Average Spreads
ALM	Asset and Liability Management	**LTE**	Long Term Equity
BE	Best Estimate	**LTGM**	Long Term Guarantee Measure
BEL	Best Estimate Liability	**LTM**	Lifetime Mortgages
bps	Basis Points	**MA**	Matching Adjustment
CEV	Constant Elasticity of Variance	**MAP**	Matching Adjustment Portfolio
CMI	Continuous Mortality Investigation	**MAuS**	Matching Adjustment under Stress
CoC	Cost of Capital	**MCR**	Minimum Capital Requirement
CoD	Cost of Downgrade	**NNEG**	Non-negative Equity Guarantee
CoGs	Cost of Guarantees	**Non-MAP**	Non-Matching Adjustment Portfolio
CRA	Credit Risk Adjustment	**ORSA**	Own Risk and Solvency Assessment
DTA	Deferred Tax Assets	**P1**	Pillar 1
ECAI	External Credit Assessment Institutions	**P2**	Pillar 2
EIOPA	European Insurance and Occupational Pensions Authority	**PCA**	Principal Component Analysis
EoL	Expectation of Life	**PIM**	Partial Internal Model
EM	Emerging Markets	**PoD**	Probability of Default
ERM	Equity Release Mortgages	**PRA**	Prudential Regulation Authority
EVT	Effective Value Test	**PY**	Prior Year
FS	Fundamental Spread	**RFR**	Risk Free Rate
FX	Foreign Exchange	**RM**	Risk Margin
IFRS	International Financial Reporting Standards	**SCR**	Solvency Capital Requirement
ILP	Illiquidity Premium	**SF**	Standard Formula
IM	Internal Model	**TMTP**	Transitional Measure on Technical Provisions
IMAP	Internal Model Approval Process	**TPS**	Technical Practices Survey
LACDT	Loss Absorbing Capacity of Deferred Tax	**UL**	Unit-linked
LGD	Loss Given Default	**VA**	Volatility Adjustment
LTA	Long Term Average	**WP**	With Profits

The survey requires a large investment of resources on our part, in particular the analysis and interpretation of the data. 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 21 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.

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 Ashik Salecha, Jo Thorpe, Abhishek Mittal and Charlotte Nugent for their hard work in managing the survey.

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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:

- Aviva
- Countrywide Assured
- Forester Life
- HSBC Life
- Irish Life
- Just Group
- Legal & General
- M&G
- NFU Mutual
- Phoenix
- Quilter

- Rothesay
- Royal London Mutual
- Scottish Equitable
- Scottish Friendly
- St. James's Place
- Sun Life Assurance Company of Canada
- Unum
- Utmost
- Wesleyan Assurance
- Zurich Assurance

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