# Interest rate risk in the banking book (IRRBB) survey

## Challenger bank survey findings

**January 2024**

EY
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# Executive summary

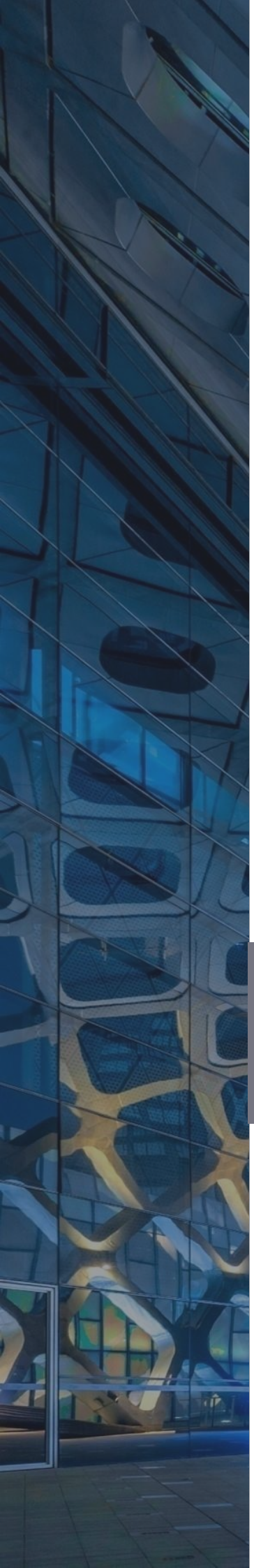
Interest rate risk in the banking book (IRRBB) is a key risk management pillar for banks and is integral to income optimisation across interest rate cycles.

After over a decade of maintaining low-interest rates, central banks have embarked upon significant monetary tightening to address inflationary concerns. In addition, customer behaviour is changing as switching banks becomes easier and fintech innovations continue to evolve.

Recent high-profile bank failures have brought additional focus on IRRBB management from both investors and regulatory supervisors.

Against this industry backdrop, EY teams surveyed 18 UK-based challenger and disruptor banks with an average balance sheet of approximately £10bn at the time. The survey aimed to draw insights from the group's approach to IRRBB across a range of topics, from governance and risk appetite to limits and capital setting. Key findings include:

1. Banks typically set a formal risk appetite for IRRBB, overseen by an asset and liability committee (ALCO) and reviewed yearly.
2. IRRBB limits are set across the economic value of equity (EVE) and earnings at risk (EaR) metrics, including the supervisory outlier test (SOT) sensitivities.
3. When capitalising for IRRBB, banks more commonly use the Prudential Regulation Authority (PRA) standard methodology for IRRBB capitalisation.
4. A combination of value-based and earnings-based metrics are used to monitor IRRBB across gap, basis and option risk, with EaR monitoring typically at a one-year horizon.
5. Banks are investing in their technology, systems and data to model IRRBB better.
6. Banks are generally confident in their ability to capture necessary IRRBB characteristics in their data and reconcile them to the general ledger but lack data lineage processes and documentation.
7. IRRBB modelling is comprehensive across the participant group but still concentrates on shorter time horizons and static modelling.
8. Consequently, firms' longer EaR horizons and dynamic modelling are key development themes.

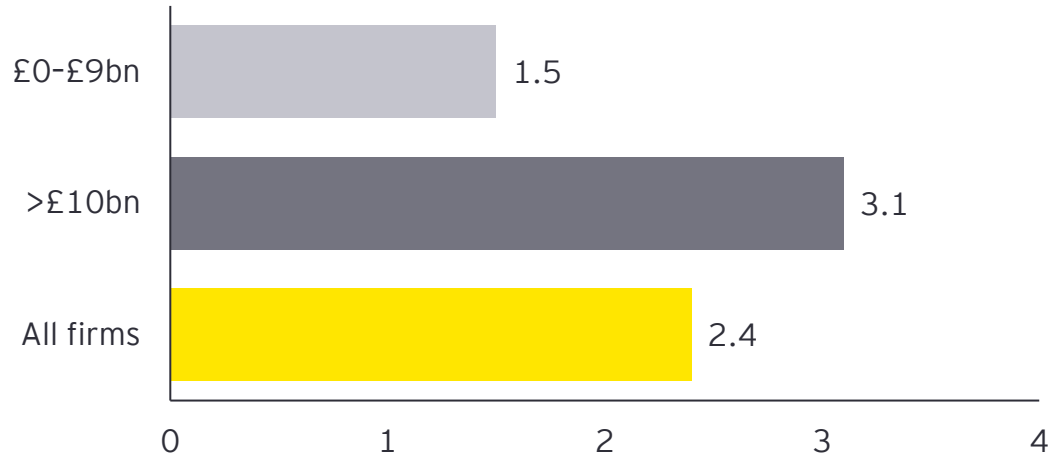


# 1. General information, governance and risk appetite

This section establishes general participant information before exploring how banks govern IRRBB and the risk appetite framework.

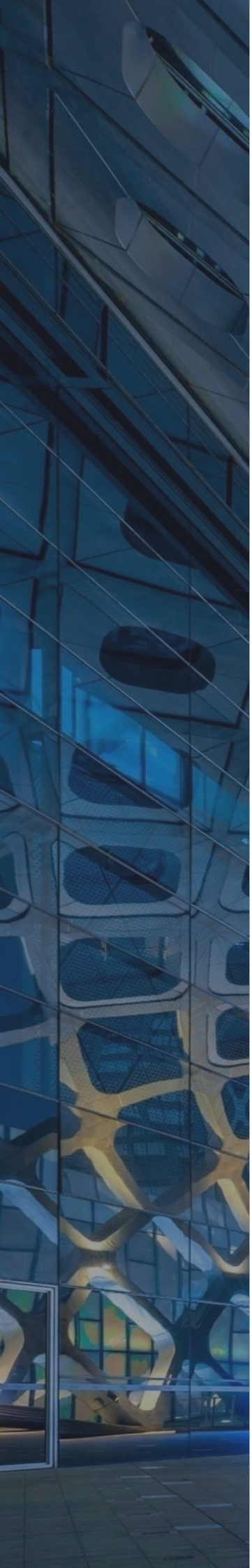
The balance sheet composition across participating firms was overwhelmingly banking book, as expected for the segment and size of the cohort. Over 80% of banks also listed maturity transformation as their primary income strategy, with only a small minority focused on fee income. The 18 banks dedicate an average of 2.4 employees to IRRBB management; as expected, there was a positive correlation between balance sheet size and resourcing, with larger firms tending towards more dedicated employees (see Figure 1).

**Figure 1: Average number of employees dedicated to IRRBB management by balance sheet size**

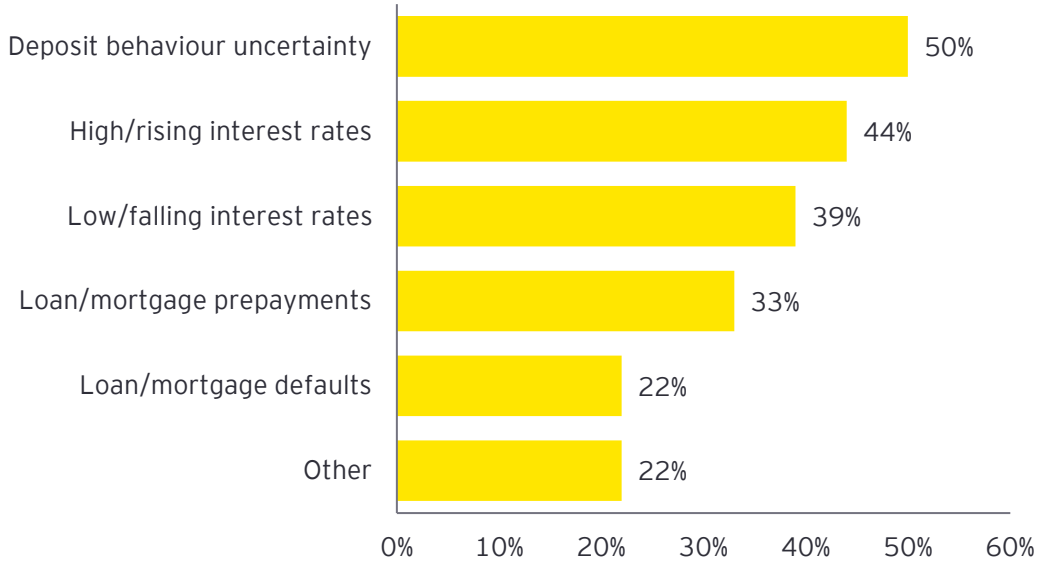



**50% of firms have changed their risk appetite in response to the recent period of global interest rate rises**

When participants considered their primary IRRBB risks, high and rising interest rates and depositor behaviour uncertainty were, as expected, the most common (see Figure 2). Larger firms within the cohort also listed low or falling interest rates as primary risks. The responses indicate risks to both sides of the rate cycle and emphasise the importance of a robust IRRBB approach to navigate the impact on earnings and capital. In addition, 50% of firms have changed their risk appetite in response to the recent period of global interest rate rises.



## Figure 2: Primary risks considered by banks

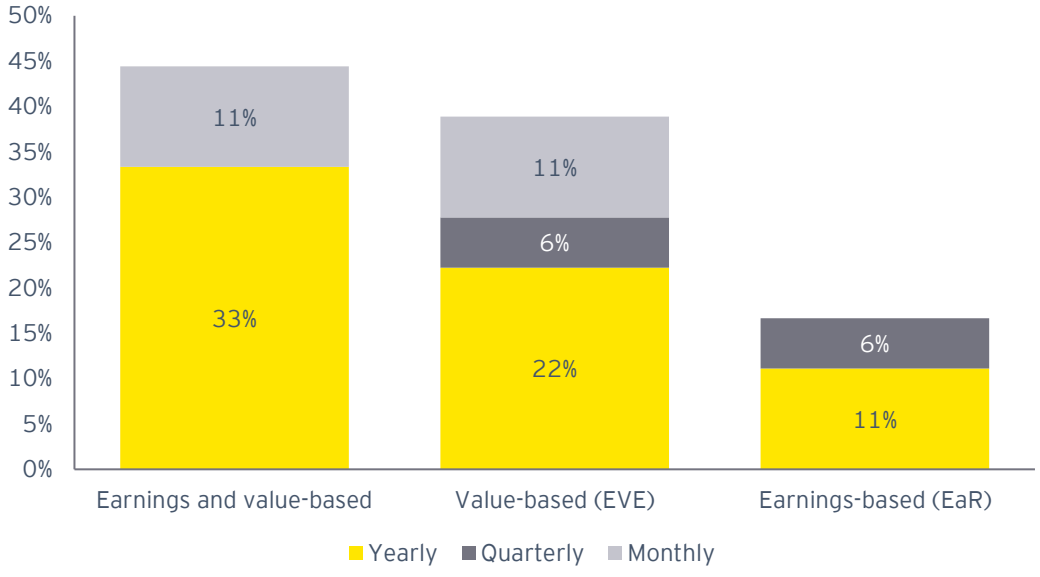


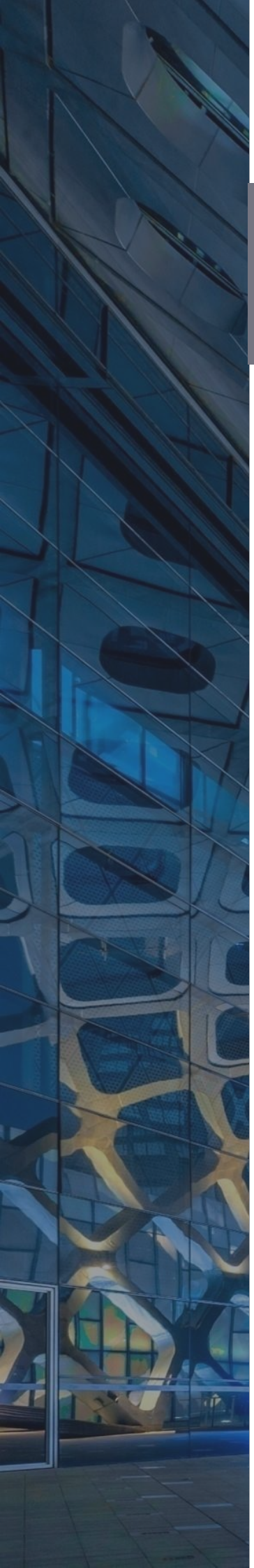

When considering investment areas, key themes relating to technology, systems and data emerged.

All firms surveyed have a formal risk policy for IRRBB (either on a standalone basis or within a broader policy document) and set a formal risk appetite. Primary oversight of IRRBB is via asset-liability committees, with approximately 20% operating with additional board oversight.

IRRBB risk appetite setting typically involves value-based metrics (39% of firms) or a combination of value-based and earnings-based metrics (44%). The review cycle for risk appetite is annual for two-thirds of participants and quarterly or monthly for others (see Figure 3).

## Figure 3 : Risk appetite metrics and review frequency





## 33% of participants monitor credit spread risk in the banking book (CSRBB)

Given the recent and increasing regulatory focus on credit spread risk in the banking book (CSRBB), we explored its inclusion in IRRBB governance. Thirty-three per cent of participants monitor CSRBB, typically relating to the high-quality liquid asset (HQLA) portfolio. Of those who monitor CSRBB, more than half use a VaR approach. Given the direct relationship to market prices, it was not unexpected to see firms scoping CSRBB primarily around fair-value bond assets. However, we expect this to be an evolving area as the industry continues developing its approach to CSRBB.

Hedging capabilities are key for effective IRRBB management. Seventy-eight per cent of firms surveyed have hedge accounting capabilities, whilst over 80% of firms hedging their interest rate risk use natural hedging, interest rate swaps, fixed-rate bonds, or a combination approach.

# 2. Data and models

This section explores the use of data, models and systems to manage IRRBB.

## Data management

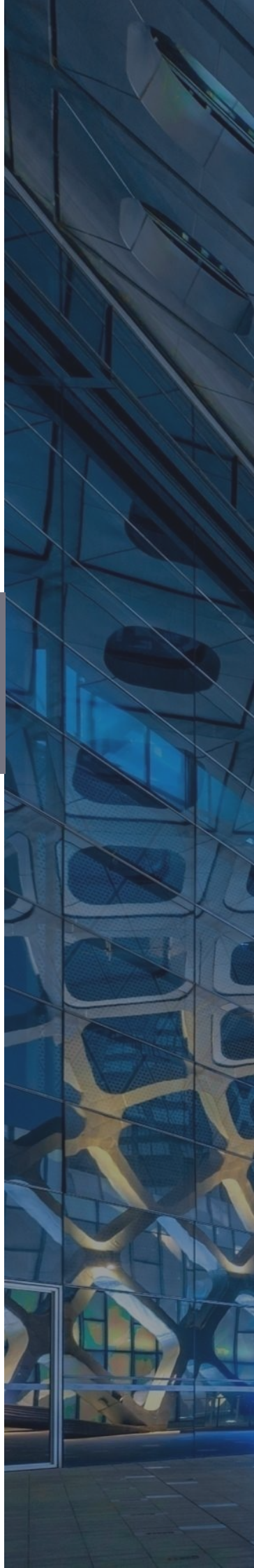
The ability to capture accurate and complete data in a timely manner is integral for robust risk management and a key IRRBB consideration for banks. Effective data capture can better inform hedging decisions, supporting improved earnings and capital optimisation.

Participating banks are broadly confident in reconciling their IRRBB data to the general ledger and statutory returns, with most (72%) rating themselves at least 4 out of 5. Firms were less confident in rating their ability to capture product information from internal transaction systems related to IRRBB characteristics, with 3 out of 5 being the most common response.

> **Most (67%) of participants do not have traceability documented via data lineage or a common data definition**

Despite the relative confidence in data capture and reconciliation, we noted that most (67%) participants do not have traceability documented via data lineage or a common data definition established via critical data elements (CDE) libraries.

Banks use data lineage and CDE libraries to support compliance with BCBS 239 – principles for effective risk data aggregation and risk reporting. The principles laid out in the paper can be useful to all firms regardless of whether compliance is required, as they support timely, accurate and complete risk reporting. This is particularly pertinent for IRRBB, given that business teams can often own product assumptions, whereas the treasury typically owns risk reporting and regulatory submissions. Supplementing data lineage with senior management function (SMF) responsible, accountable, consulted and informed (RACI) matrices would be additionally beneficial; this would provide data accuracy confidence for the SMF accountable for reporting.

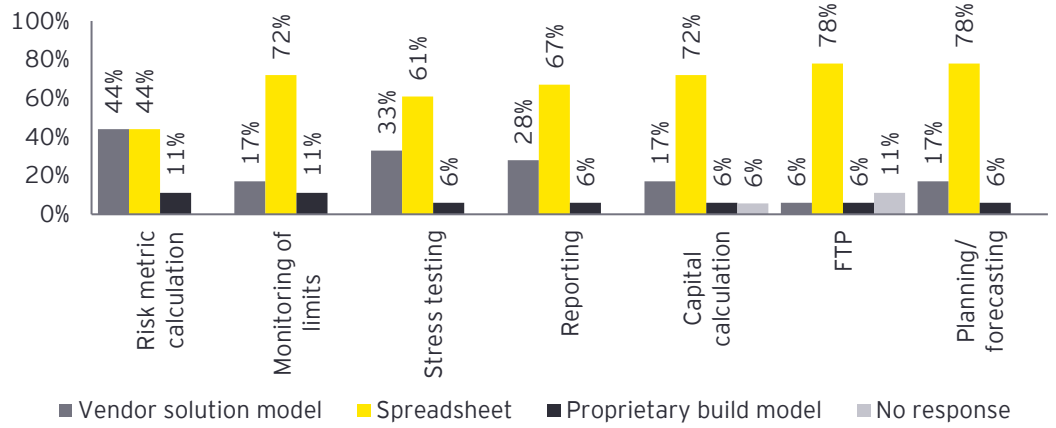


## Models and systems

### There remains a significant reliance on spreadsheets amongst most banks

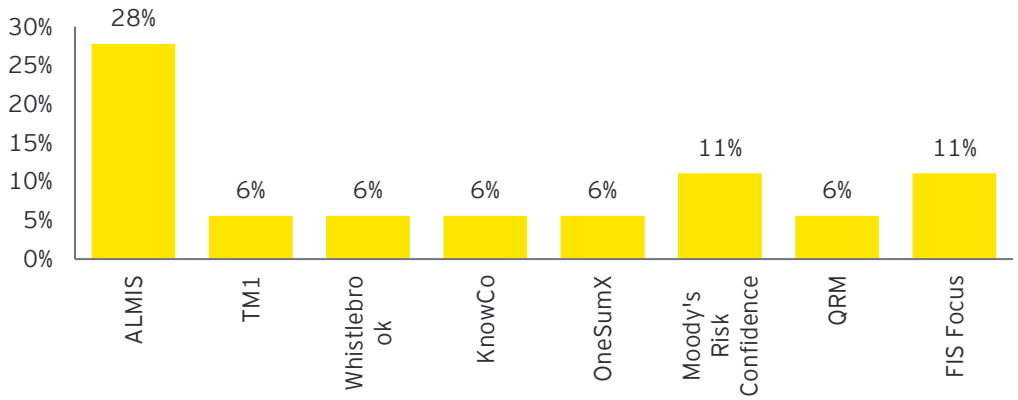
Across all components of IRRBB (risk metrics, monitoring of limits, stress testing, reporting, capital calculation, funds transfer pricing (FTP) and planning and forecasting), there remains a significant reliance on spreadsheets amongst most banks (see Figure 4). Where spreadsheets are used, we would expect governance to be in place for end-user computing (EUC) and clear criteria or governance for, and demarcation between, EUC and models.

**Figure 4: IRRBB technology infrastructure**




Forty-four per cent of the surveyed banks use spreadsheets for IRRBB risk metric calculations, with another 44% using a vendor solution model. Notably, although various solution models are used, ALMIS® is the most popular among participants (see Figure 5), with 50% using cloud-based solutions rather than hosting them on-premise.

**Figure 5: Vendor systems used by participants**



Firms were asked to describe the IT system approaches they use for IRRBB modelling as a percentage of the balance sheet. On average, participants model 44% of the balance sheet using systems, 44% using a manual approach and 12% using a hybrid approach.

## Model validators tend to have broader model validation background – 72% have general model validation experience

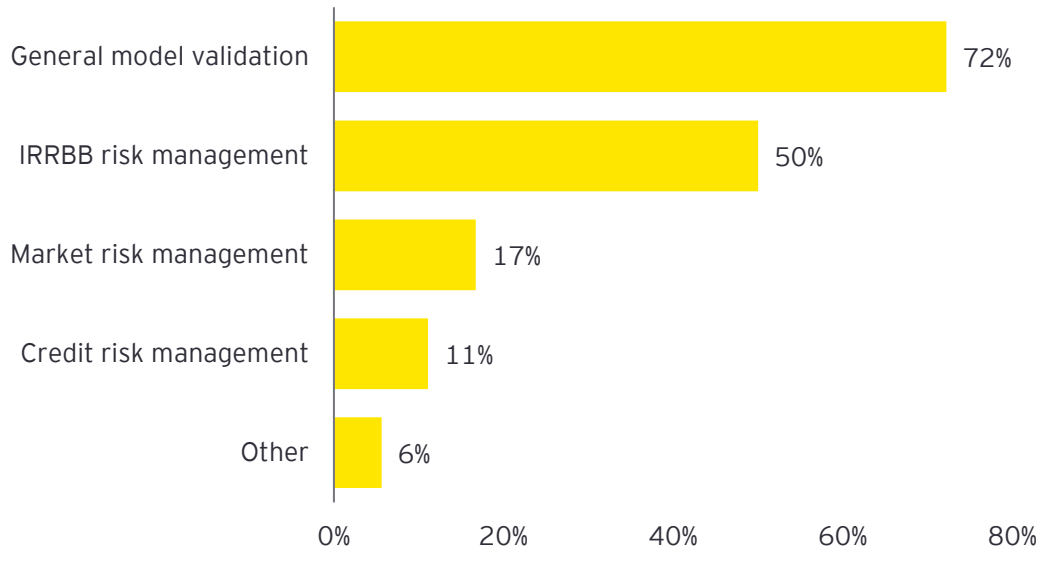
Sixty-one per cent of participants have formal model documentation in place for IRRBB models, with the remainder either planning implementation or recording IRRBB assumptions in other documentation.

Most (72%) of the group review their models at least annually. The remainder of firms tend to review their model periodically or ad hoc.

Model validators tend to have a broader model validation background – 72% have general model validation experience (see Figure 6). IRRBB risk management experience was the next most common type of experience, whilst 6% of firms utilise external support. These results were not a surprise considering the scarcity of IRRBB specialists within the UK market relative to industry focus in the current interest rate environment.

Model validation teams with no direct IRRBB experience may not have the skill set to sufficiently challenge and review model assumptions and appropriateness, especially in a risk area as assumption-heavy as ALM.

**Figure 6: IRRBB model validator experience**



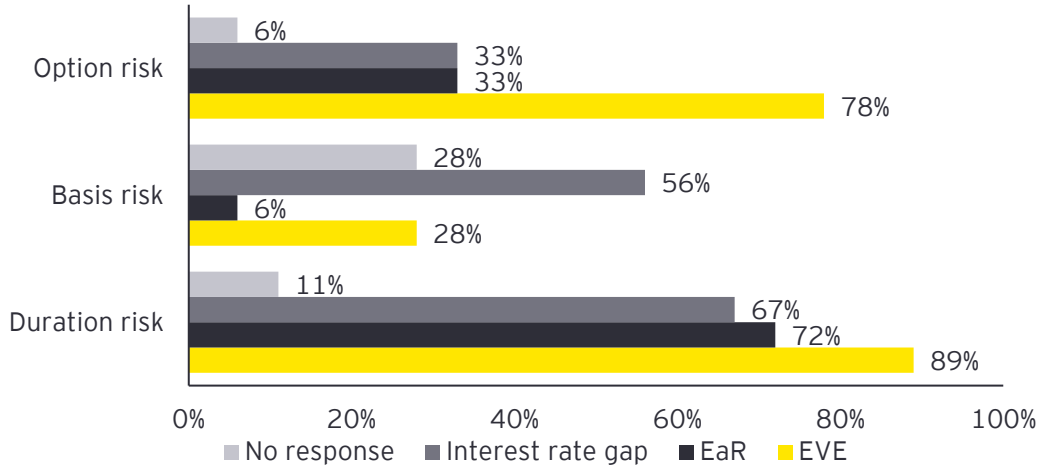
# 3. Metrics, modelling and methodologies

This section examines participant firms' use of modelling to calculate, monitor and report IRRBB. For most banks (72%), IRRBB report production sits within the first line of defence.

## Metrics and monitoring

For gap risk reporting and management information (MI), 89% of participants use value-based metrics, e.g., EVE, and 72% use interest rate gaps (see Figure 7). This differs from approaches used to monitor basis risk, where 56% of participants use earnings-based metrics (e.g., EaR), and 28% use EVE and interest rate gaps. Value-based metrics were the most popular choice for option risk. All firms monitor some form of option risk, with 94% monitoring pipeline or commitment risk and 83% monitoring prepayment risk.

**Figure 7: IRRBB metrics monitored for MI/reporting purposes**




> Where dynamic measurements are used for EaR, the balance sheet size and … composition are the most common dynamic components

EaR is typically measured on a static basis – 61% of firms use static measurement compared with just 22% using dynamic measurement. This trend was similar for interest rate gap measurement, where 50% of firms use a static measurement compared with 22% for dynamic measurement (see Figure 8). This skew towards static modelling is not surprising; it has been more readily implementable by the industry due to its relative simplicity. However, dynamic modelling was noted as a key development area for the cohort.

Where dynamic measurements are used for EaR, the balance sheet size (28%) and composition (22%) are the most common dynamic components. In contrast, the cohort didn't have a significantly preferred approach to EVE and the interest rate gap (see Figure 9).

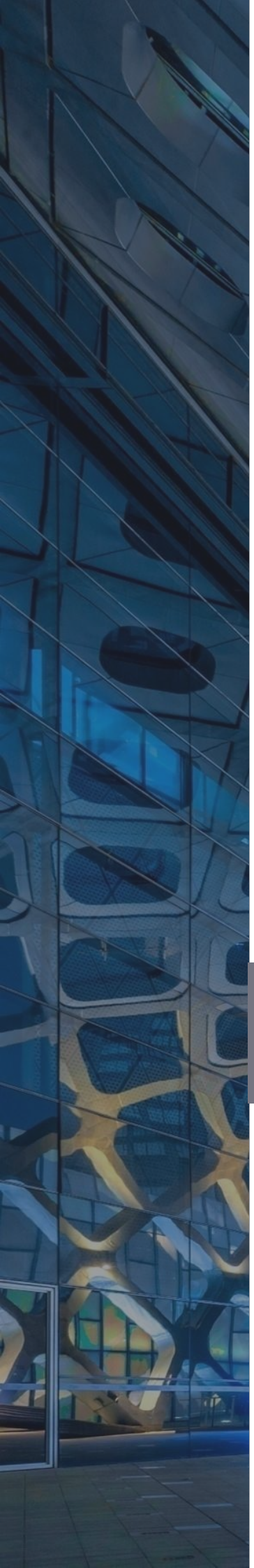


Figure 8: IRRBB measurement balance sheet approach

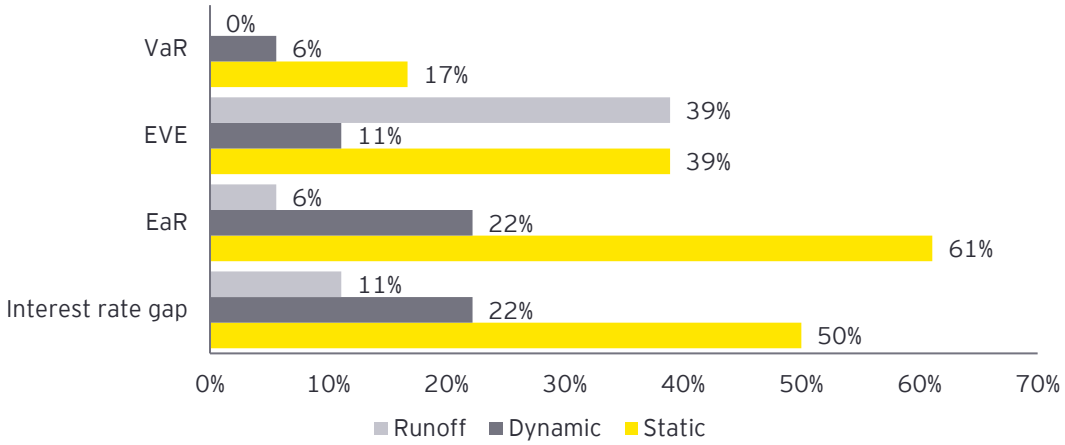
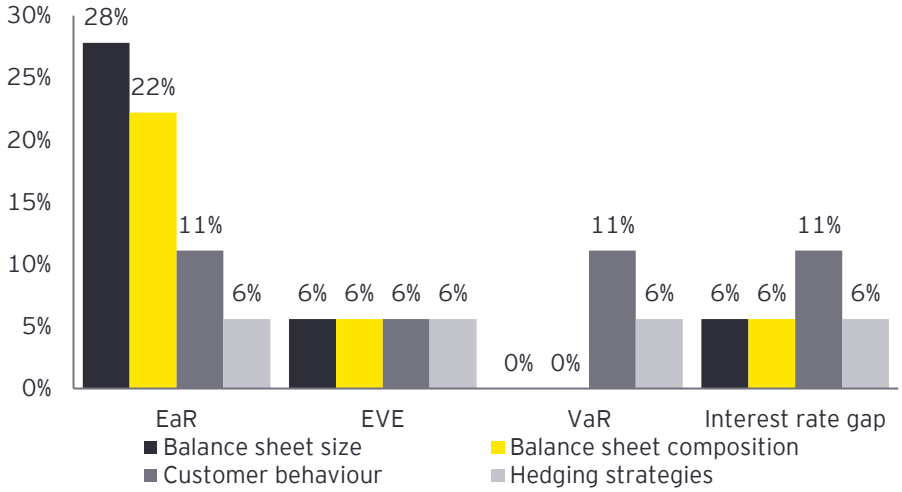



Figure 9: Approach to dynamic measurement for IRRBB metrics




## The majority of firms measure EaR using a one-year horizon

The frequency of IRRBB metric measurement and reporting differs across the group.

Sixty-seven per cent of participating firms measure EaR monthly, and 17% measure daily. The majority of firms (61%) measure EaR using a one-year horizon, whilst 17% use a two-years horizon and 11% use five-years. Longer-term EaR modelling was a common focus area across the group for future development.

Thirty-nine per cent of the cohort monitor value-based metrics monthly, whilst 22% measure them weekly or daily. Although the majority do not measure value at risk (VaR), for those who do, this tends to be monitored monthly (see Figure 10).

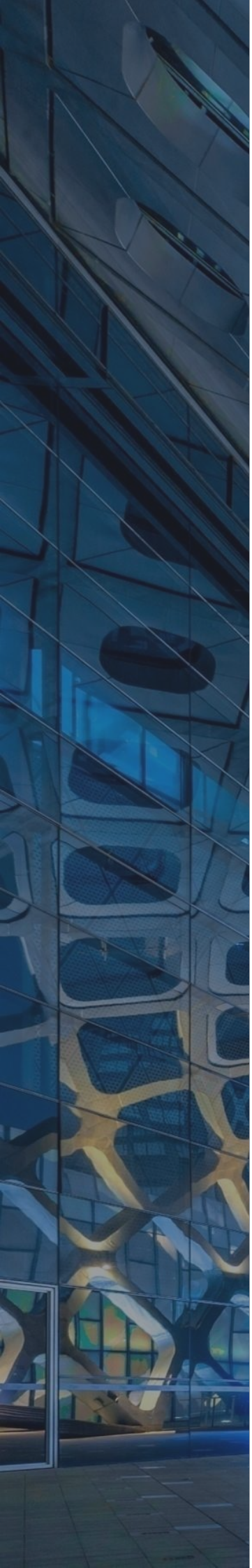
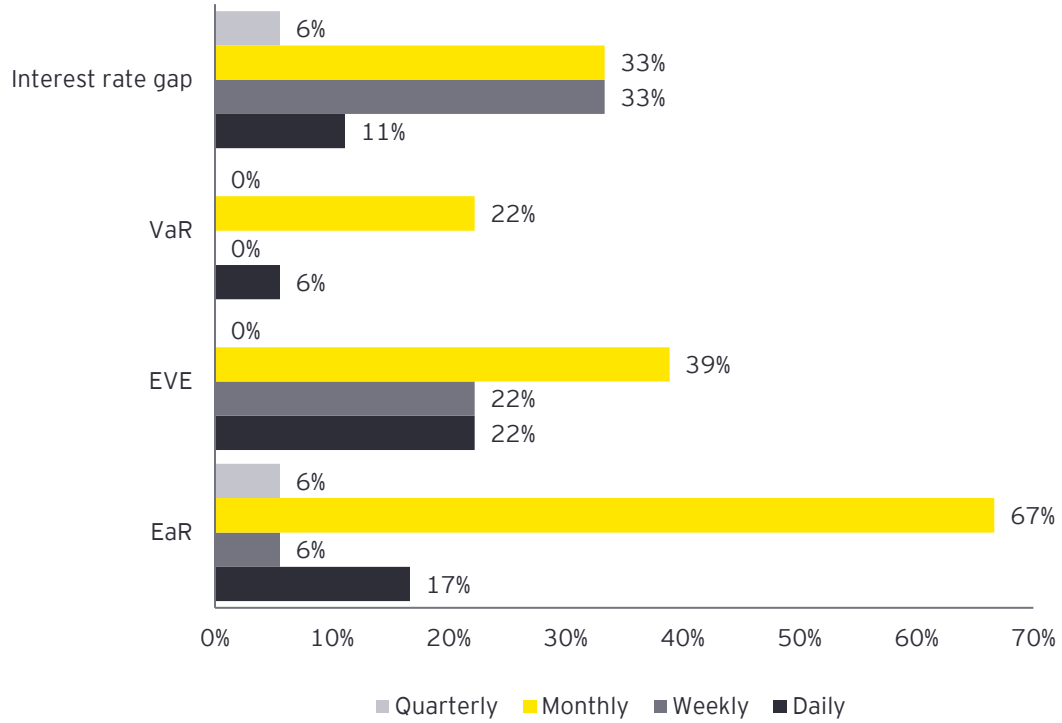


Figure 10: Frequency of IRRBB metric monitoring/reporting




## General modelling methodology

As expected for the cohort's size and primary market, the survey results show that 72% of balance sheets consist of just one currency, with 28% of firms having multi-currency balance sheets. Of the latter, 60% do not model the multiple currencies separately but use the balance sheet currency instead.

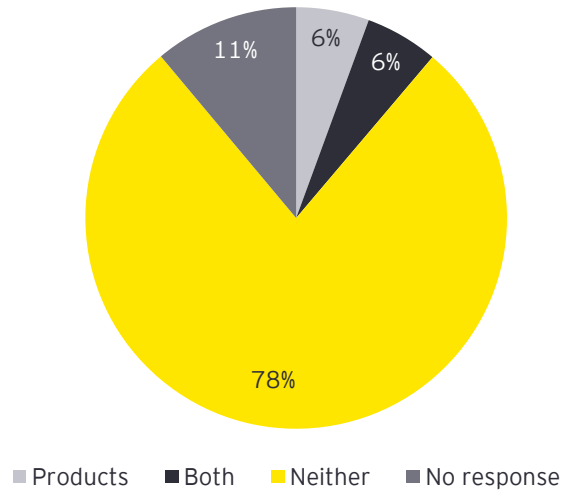
Regarding interest rate curves used for discounting, the majority (72%) of participating firms use swap curves, which provide a reasonable proxy for isolating interest rate risk, and 22% use a differentiated product or a single blended funding curve. Sixty-one per cent of firms either include commercial margin in the discount curve and cash flow or exclude from both. A consistent approach to cash flows and the discount curve facilitates accurate valuations and consistency with regulatory approaches to IRRBB discounting (see Figure 11).

**Figure 11: Commercial margins and spread components in relation to the discount curve and cash flows**

| | Excluded from cash flows | Included in cash flows |
|---|---|---|
| Excluded from the discount curve | 44% | 22% |
| Included in the discount curve | 6% | 17% |

As expected, given the maturity of London Interbank Offered Rate (LIBOR) cessation programmes, 78% of firms do not use Interbank Offered Rates (IBOR) rates in products or reference rates. Only 6% use IBOR in products or reference rates (see Figure 12). Whilst the cessation of LIBOR has shifted the focus of basis risk monitoring, the growth of term risk-free interest rates may be a new area of interest for risk management and monitoring.

**Figure 12: Current use of IBOR rates**



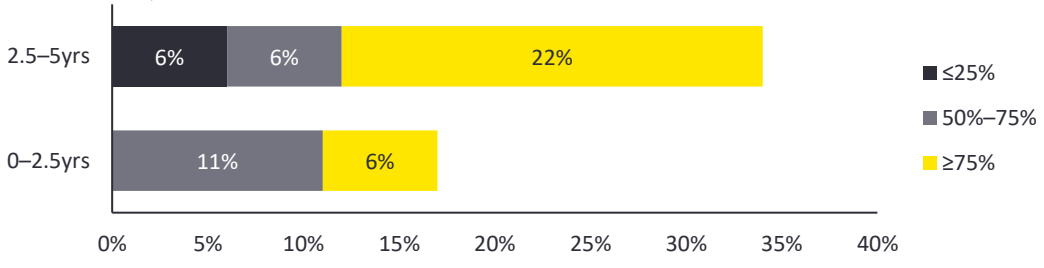

For new business or volume growth assumptions used, whilst only a 50% response rate was received, 22% of the cohort use scenario-specific assumptions (i.e., dependent on rates), whilst 22% do not. Regarding the use of product floors, half of firms use product floors at the product level, 22% at the portfolio level and 22% do not apply them.

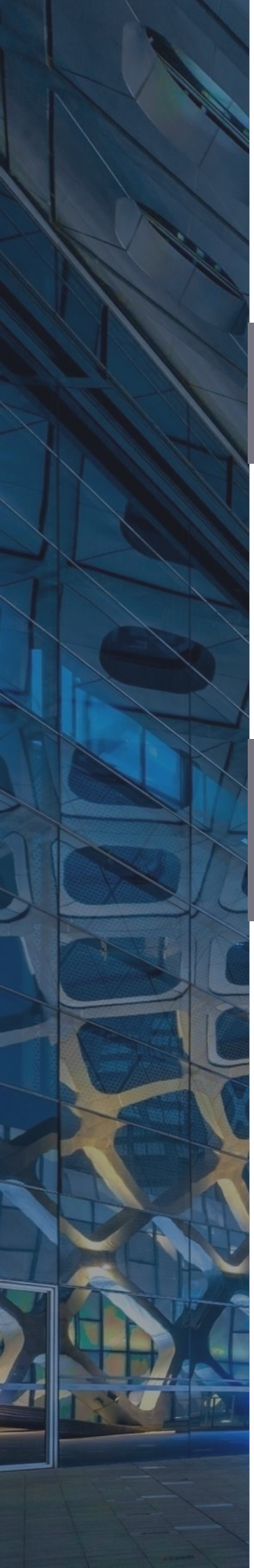
## Equity modelling

**61% of firms include their own equity in their behavioural modelling**

Behavioural modelling of equity can support the optimisation of economic value whilst stabilising short-term (NII) volatility. The survey results show that 61% of firms include their own equity in their behavioural modelling. If equity is modelled, most firms set an equity behaviour at 2.5–5 years vs. 0–2.5 years (see Figure 13). Participants also typically behaviouralise most of their equity balance, 75%–100% being the most common individual response.

**Figure 13: Equity modelling by benchmark duration (y-axis) and percentage of total balance behaviouralised (stack breakdown)**





## Non-maturing product modelling

Sixty-seven per cent of firms confirmed they had exposures without a contractual repricing date (e.g., non-maturing deposits) on the balance sheet, with 50% modelling those exposures.

> The range of benchmark durations was broadly split between 0–2.5 years and 2.5–5 years

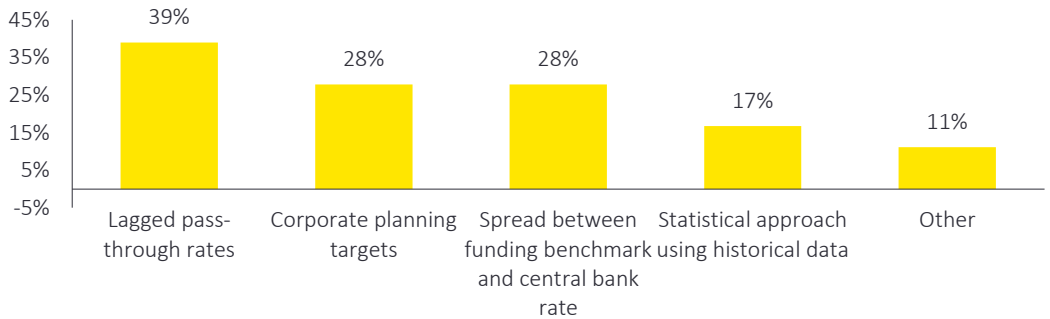
With core vs. non-core splits and behavioural life, most are determined by modelling and qualitative approaches combined. Assumptions relating to core vs. non-core splits and behavioural life are static, where firms respond within the same interest rate forecast horizon and across interest rate scenarios. Regarding core exposures, the range of benchmark durations was broadly split between 0–2.5 years (33% of participants) and 2.5–5 years (28% of participants).

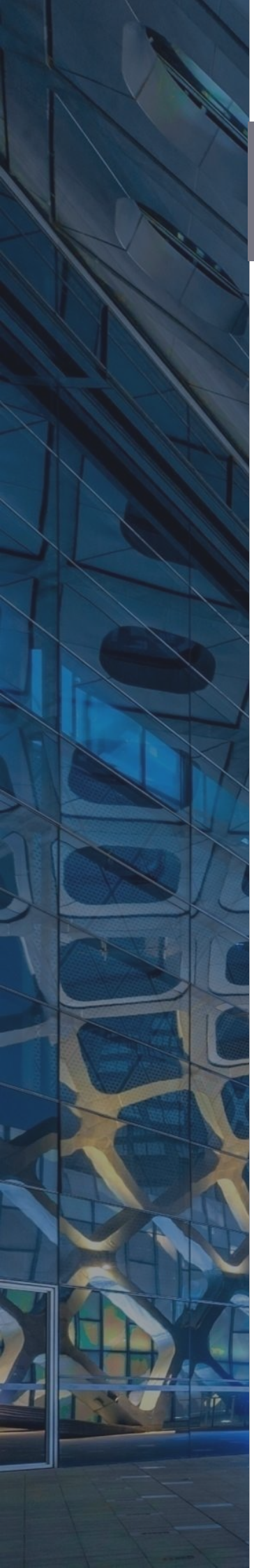
## Managed rate product modelling

> Lagged pass-through rates [were] the most common factor used to determine the beta for managed products

Seventy-eight per cent of firms confirmed they had managed rate products on the balance sheet, with lagged rates being the most common factor used to determine the pass-through rates for managed-rate products (see Figure 14). Whilst this approach has merits, firms should consider retaining the option to apply qualitative overlays for any approach using historical data. Corporate planning targets and the spread between the funding benchmark and central bank rate were also common considerations.

**Figure 14: Choice of factors determining pass-through rates for managed-rate products**

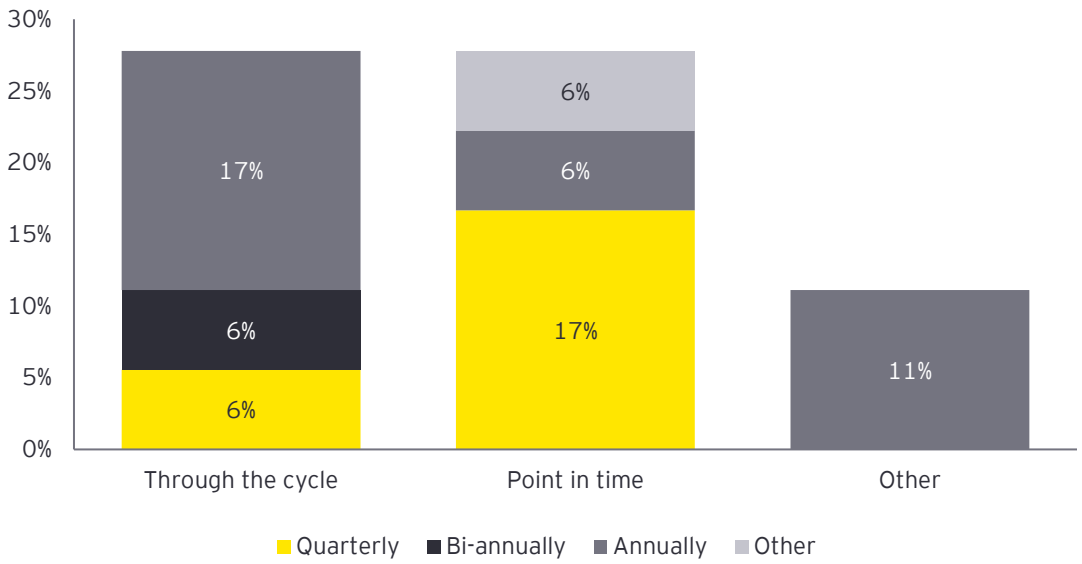




## Those adopting a point-in-time assessment tend to review pass-through rates quarterly

Where managed rate products are subject to pass-through rates, 50% of firms noted that these differ across product sets. The group was split between assessing pass-through rates with a point-in-time approach, as at a specific date, or through the cycle, taking an average rate over the economic/interest rate cycle (see Figure 15). As expected, those adopting a point-in-time assessment tended to review pass-through rates more frequently.

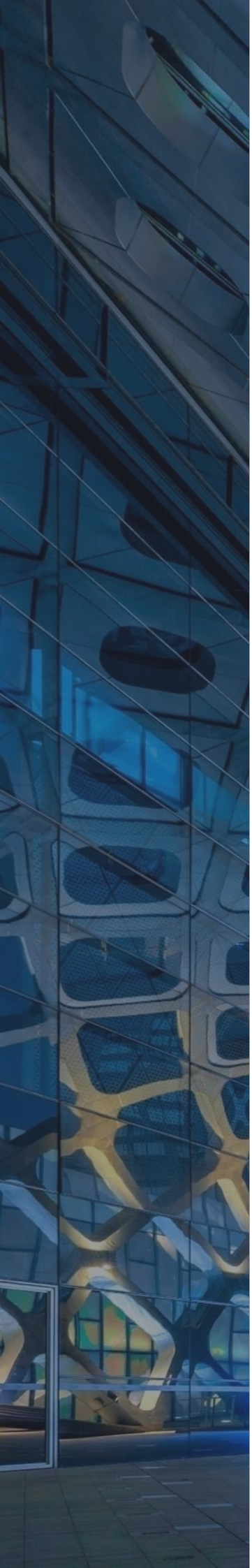
**Figure 15: Frequency and assessment of pass-through rates**



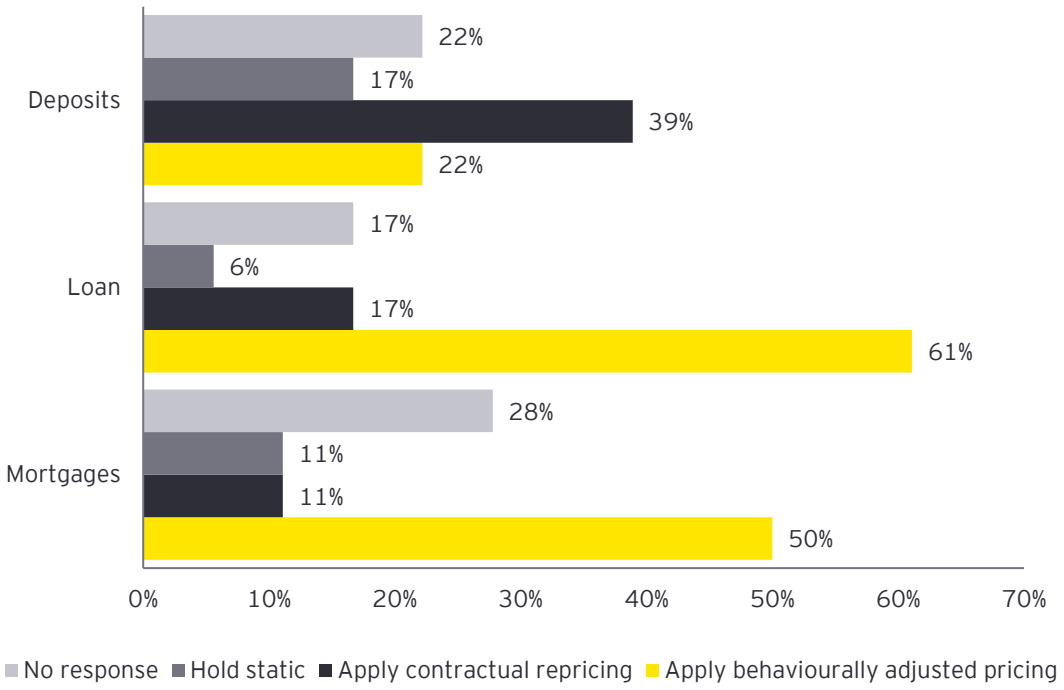

## Fixed-rate product modelling

All firms surveyed confirmed they have fixed-rate products on the balance sheet. Sixty-one per cent of participants apply behavioural adjustments to loans and 50% to their mortgages. We expect these adjustments to account for prepayment and pipeline risk. Fewer firms apply behavioural adjustments to their deposits (see Figure 16). Considering the risk of early withdrawal when modelling, fixed-rate deposits may support more effective IRRBB management.

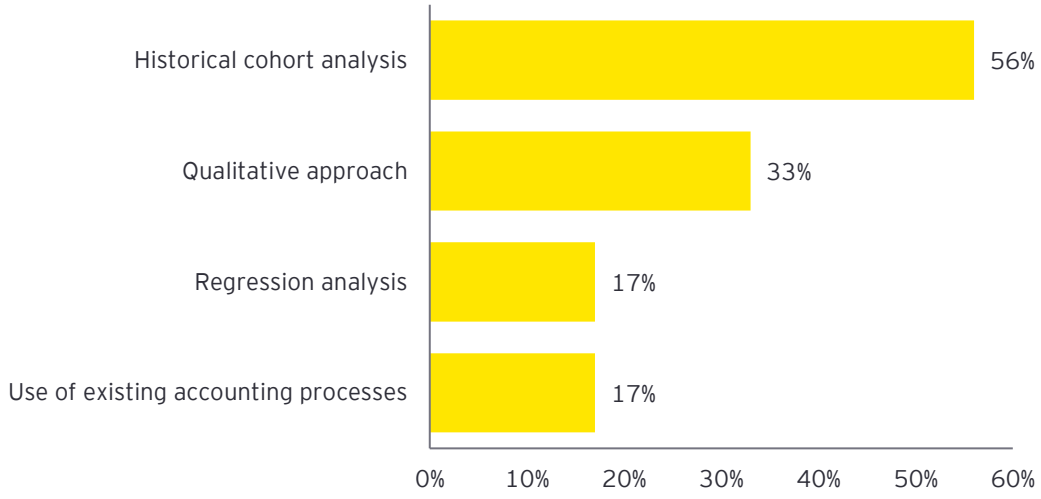
Historical cohort analysis was the most popular approach when behavioural adjustments were applied to fixed-dated products (see Figure 17). Whilst this is understandable given the approach's relative simplicity, as with other product modelling approaches, a more forward-looking approach may help firms better manage their interest rate risk.



## Figure 16: Treatment of fixed-rate maturity products




## Figure 17: Behavioural adjustment approach for fixed-rate products



# 4. Stress and scenario testing

## 61% of firms include IRRBB in their overall stress testing programme – the remainder consider this risk separately

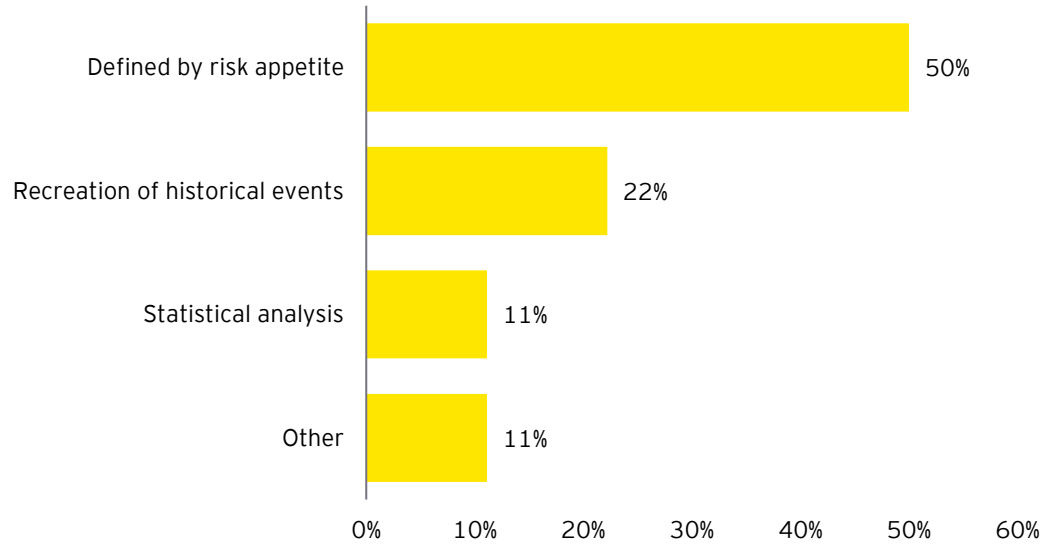
This section explores stress testing and IRRBB scenario management. Regarding overall stress testing programmes, 61% of firms include IRRBB in their overall stress testing programme – the remainder consider this risk separately.

Regarding the six SOT scenarios outlined in the PRA rulebook, 89% of firms are fully in line with the requirements, with the remainder partially in line.

In addition to the scenarios prescribed for the SOT, 67% of firms also model parallel shifts, 28% short-rate and long-rate shocks, 22% gradual shifts and 17% yield curve rotation shifts, whilst 22% model no other shocks for risk management purposes. For these additional scenarios, 50% of participants determine the magnitude of interest rate shocks through their defined risk appetite, whereas 22% recreate historical events (see Figure 18). Supplementing the SOT requirements allows banks to create adaptable scenarios that can be tailored to changing market environments.

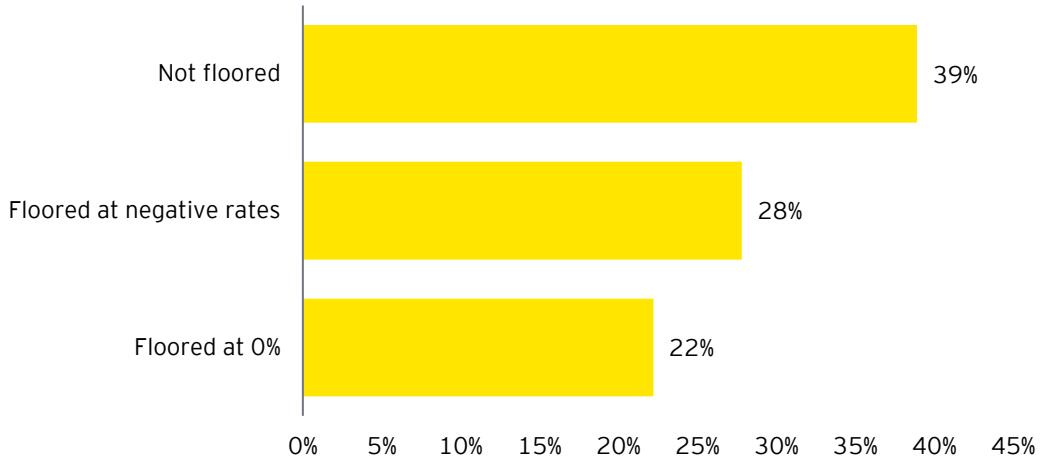
As expected for a cohort with a largely single-currency balance sheet, 56% of participants do not include currency-specific shocks for these additional scenarios.

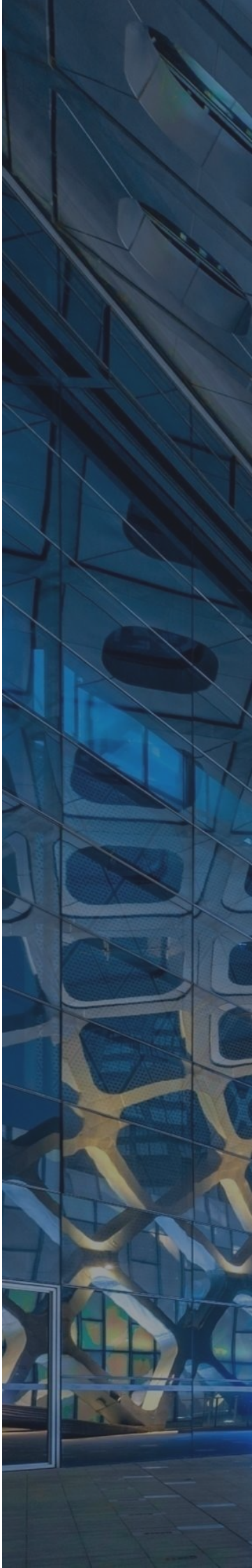
**Figure 18: Approach to determine the magnitude of interest rate shocks for internal management scenarios**



When considering floors for additional interest rate scenario shocks, 39% of participants deviated from the SOT scenarios with no floors. In comparison, 50% of firms floored their additional scenarios at negative or zero interest rates (see Figure 19). Different flooring approaches may result in similar IRRBB sensitivities at current interest rate levels, but they may become a more pertinent consideration in a falling rate environment.

**Figure 19: Flooring of interest rate shocks for internal scenarios**



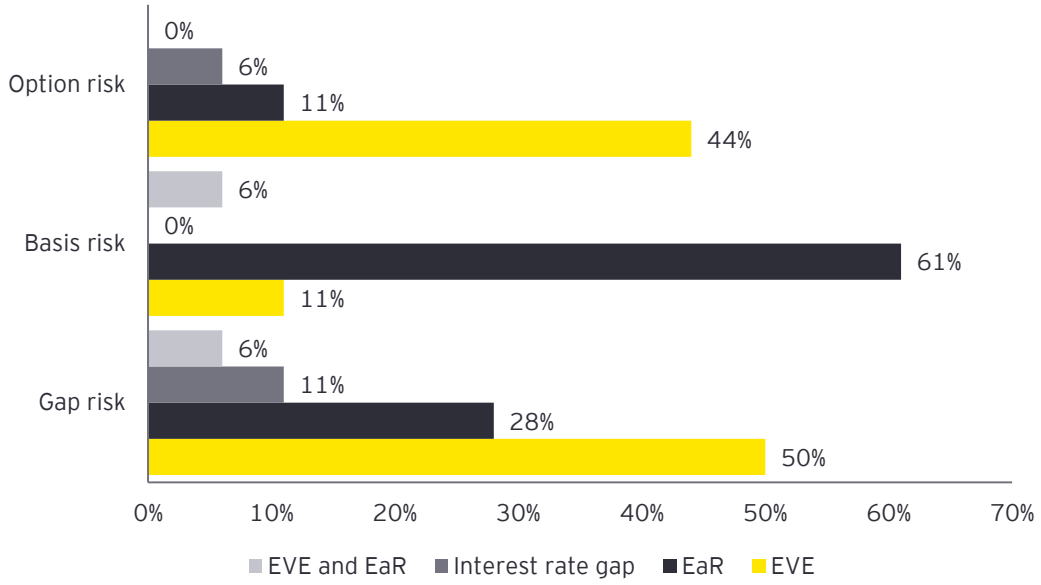
# 5. Limits and capital

This section considers IRRBB limit setting with a focus on the choice of metrics. Capital setting with respect to the PRA's Pillar 2 capital guidance is also explored.

## Limits

When considering gap risk, half of the group have formal limits set against EVE metrics, with 28% setting formal limits against EaR. This is aligned with the risk appetite setting, which is skewed towards EVE. In contrast, for basis risk, 61% of participants set formal limits against EaR metrics (see Figure 20), in line with their MI and reporting approaches.

**Figure 20: Formal limit setting against IRRBB risk types**



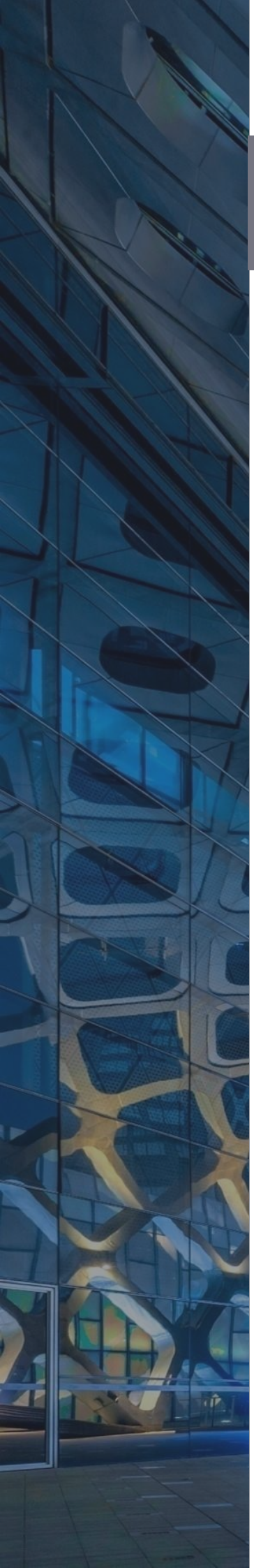

> **Over 60% of participants do not consider management actions in their IRRBB policy for limit breaches**

Just over half of the participants (56%) set formal limits on the six SOT scenarios. Setting limits can help integrate this regulatory threshold into decision-making and risk management.

Over 60% of the cohort do not consider management actions in the IRRBB policy for limit breaches. In light of recent bank failures and volatility in the interest rate markets, we expect firms to consider management actions in governance.

## Capital

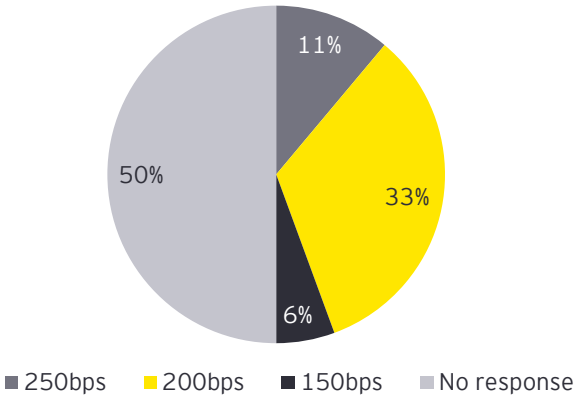
When setting IRRBB capital, 89% of firms review their approach yearly.



## 67% of firms use the PRA's standard methodology to set IRRBB Pillar 2A capital

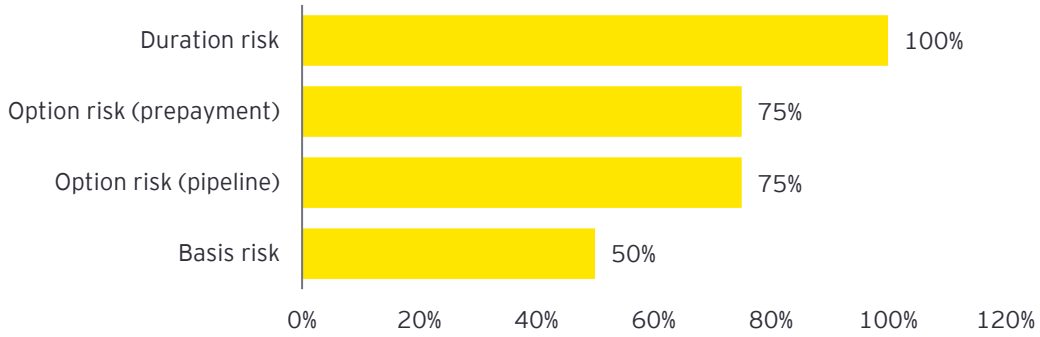
Some 67% of firms use the PRA's standard methodology to set IRRBB Pillar 2A capital, with 200bps being the most commonly used shock (see Figure 21). Regulatory guidance refers to smaller and less complex firms being subject to the standard approach. Given the participant group has an average balance sheet size of £10bn with a reasonable distribution, this result is not unexpected. For firms using the standard methodology, 33% consider basis risk despite the PRA themselves not assessing this risk.

**Figure 21: Basis point shocks used for the standard methodology to set IRRBB Pillar 2A capital outlined by the PRA**

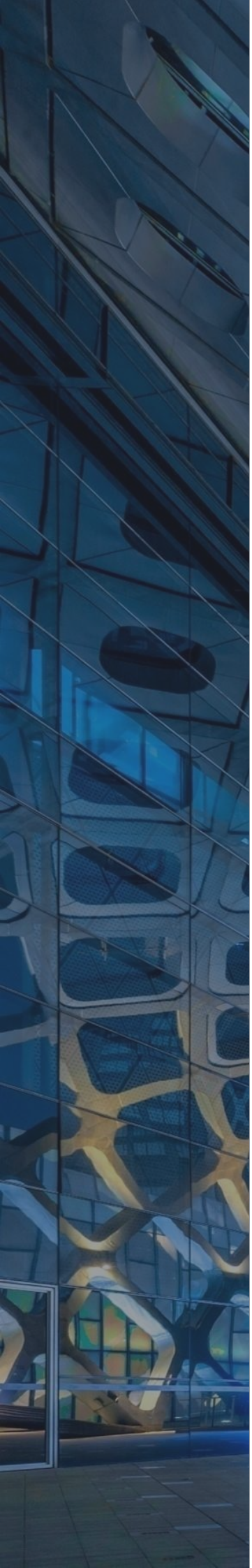



For firms not using the PRA method, internal models are typically utilised; 50% determine capital requirements using EVE, whilst the other 50% use multiple IRRBB metrics. All firms using an internal approach consider at least duration risk (see Figure 22), with additional capital held for option and basis risk where appropriate.

**Figure 22: Considerations when determining capital requirements using internal assessments**




When considering IRRBB across Pillar 2A and 2B, 44% of firms recalibrate the capital buffer if stress testing results show a material reduction in EaR/EVE results.



# Definitions

| | |
|---|---|
| **IRRBB** | Interest rate in the banking book (IRRBB) is the risk of losses arising from changes in interest rates associated with the banking book. |
| **CSRBB** | Credit spread risk in the banking book (CSRBB) is the risk driven by changes in the market price of the credit risk, for liquidity and for potentially other characteristics of credit risk sensitive instruments, which are not captured by another existing prudential framework such as IRRBB or by expected credit/default risk.<br>CSRBB captures the risk of an instrument's changing spread whilst assuming the same level of creditworthiness, i.e., how the credit spread moves within a certain credit rating or probability of default range. |
| **Gap risk** | Gap risk arises when the repricing of banking book products (assets and liabilities) is mismatched across time buckets. |
| **Basis risk** | Basis risk is generated by banking book items that reprice in relation to different reference rates. The most common and material basis risks seen within UK banks derive from products repricing against the BoE base rate (policy rates) and sterling overnight index average (SONIA) (market rate). |
| **Option risk** | Option risk arises from the discretion that customers and counterparties have in respect of their contractual relations with banks in the form of financial instruments. Embedded options are diverse and firm-specific and include prepayment risk on fixed-rate loans and deposits and switching risk on non-interest-bearing current accounts. |
| **Economic value (EV) measure** | Economic value (EV) measures the change in the net present value of interest rate-sensitive instruments. This is measured over their remaining life, resulting from interest rate movements in the case of IRRBB and credit spread changes in the case of CSRBB. |
| **EVE** | Economic value of equity (EVE) is a specific form of EV measure where equity is excluded from the cash flows. |
| **EaR** | Earnings at risk (EaR) is the risk to a bank's earnings arising from changes to interest rates. |
| **VaR** | Value at risk (VaR) is a measure of potential loss in the value of the portfolio. For example, 99% VaR is the loss that is expected to be exceeded at only 1% of the time. |
| **Run-off balance sheet** | A balance sheet including on- and off-balance sheet items where existing non-trading book positions amortise and are not replaced by any new business. |
| **Dynamic balance sheet** | A balance sheet including on- and off-balance sheet items incorporating future business expectations, adjusted for the relevant scenario in a consistent manner. |
| **Constant balance sheet** | A balance sheet that includes on- and off-balance sheet items in which the total size and composition are maintained by replacing maturing or repricing cash flows with new cash flows with comparable features regarding the amount, repricing period and spread components. |
| **NMDs** | Non-maturating deposits (NMDs) are customer deposits with no contractual maturity or repricing. |
| **Beta or pass-through rate** | The proportion of an interest rate change that is passed on to customers. |

# How EY teams can help

## EY teams help provide clients with access to the following knowledge:

**Treasury risk management practitioners,** including former risk managers, finance professionals, treasurers and regulators with deep knowledge and extensive experience working with many leading financial institutions.

**A range of relevant engagements at global and domestic banks** where EY teams have provided or are currently implementing broad treasury risk enhancements across areas including IRRBB, liquidity, FTP and trade processing. These engagements cover both business and functional as well as data and technology aspects.

**Tools, accelerators, and enablers to** leverage during assessment and implementation, shaped by our lessons learned, issue resolution and leading practices from similar engagements. This allows clients to pre-emptively address challenges, accelerate timeframes and ensure confident delivery.

## EY teams have a range of service offerings across IRRBB

| | | |
|---|---|---|
| Framework assessment and benchmarking | Strategy implementation | Data, technology and solution architecture rationalisation |
| Target state framework development | Model analytics and validation | Vendor solution implementation |
| Control framework support | Regulatory compliance support | Regulatory reporting support/S166 readiness |

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