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POINT OF VIEW

INTEREST RATE RISK MANAGEMENT: GETTING AHEAD OF THE CURVE

NORTH AMERICAN BANK PERSPECTIVE

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EXECUTIVE SUMMARY

Management of Interest Rate Risk in the Banking Book (IRRBB) is starting to receive much more attention, after a long period in which other regulatory and risk management issues dominated the headlines. This shift results from:

- **Market environment:** Interest rates have been at historical lows for a long time, and started to rise in the US, while interest rates in other geographies continue to decline to new record depths – including negative rates in several countries in Europe and Japan. The stark divergence in monetary policies, recent market volatility, and unknown customer behavior in response to rate changes combine to create significant uncertainties in risk taking, as well as added pressure on the bottom line.
- **Regulatory pressures:** The Basel Committee on Banking Supervision (BCBS) recently issued Standards for IRRBB[1] for the first time in more than a decade. The IRRBB standards introduce a strengthened Pillar 2 approach (i.e. supervisory review process) and set out supervisory expectations for banks' identification, measurement, monitoring and control of IRRBB. Moreover, US supervisory focus has sharpened on IRRBB as well as how it aligns with other regulatory frameworks like Comprehensive Capital Analysis and Review (CCAR) and Liquidity Coverage Ratio (LCR), and additional emerging guidance such as Net Stable Funding Ratio (NSFR) and Funds Transfer Pricing, which will impact structural ALM position and IRRBB.

These complex market and regulatory changes will need to be carefully managed, mostly by a generation of practitioners who have not managed interest rate risk through similar challenges.

This paper discusses the state of the industry and key enhancements banks need to focus on based on Oliver Wyman's extensive industry work and surveys of the North American banking industry run by Oliver Wyman in 2011 and 2015[2], from which we can draw lessons on the evolution of IRRBB practices. Even though the focus is the North American banks, many of the same observations apply to global peers.

Among the North American banks, we observe two themes that are particularly crucial for the banks to be ready for the increased regulatory scrutiny and changing market conditions: i) enhancement of IRRBB analytics and integration with other key management decisions frameworks and ii) improvement of IRRBB governance by focusing on model risk management, limit frameworks and clear delineation of roles and responsibilities. The IRRBB standards issued by the BCBS introduce a tighter outlier test and much more detailed disclosure requirements[3], which will likely force banks to pay closer attention to the assumptions and management techniques used for IRRBB.

Our expectation is that there will be continued and increased pressure by the regulators for banks to enhance IRRBB analytics and governance, broadly similar to the trends we have observed in the evolution of CCAR, liquidity management and resolution and recovery planning frameworks. In order to be best positioned for the market and regulatory requirements, we urge banks to focus on the following key tasks:

1 See https://www.bis.org/bcbs/publ/d368.pdf, issued on April 21, 2016

2 Our 2015 IRRBB survey covered 20 North American banks with assets totaling $9.5 TN; our 2011 IRRBB survey 18 North American banks with assets totaling $9.0 TN. A summary report for the 2011 survey titled "The State of Interest Rate Risk Management" is available on Oliver Wyman's website.

3 See page 6 of this paper for further details.

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- Develop and follow a comprehensive quantitative approach including:
  - Net Interest Income (NII) and Economic Value of Equity (EVE) projections under multiple macroeconomic scenarios over a multi-year horizon, incorporating historical analysis and sensitivity analysis.
  - Customer behavior analysis such as deposit balances and re-pricing based on both statistical models calibrated from historical data and "what if" scenarios that consider a wider range of hypothetical scenarios.
- Align potential commonalities of the assumptions and engine of the IRRBB framework with key balance sheet management frameworks such as capital and liquidity management.
- Apply a robust model risk management framework to all IRRBB models and assumptions.
- As part of strong governance around IRRBB, regularly review and calibrate interest rate risk limits and educate senior management and the Board on inherent strengths and weaknesses of metrics used.
- Clearly articulate the boundaries between 1st line and 2nd line responsibilities for effective and efficient execution.

With these improvements, banks will have the capabilities for good decision-making in a cost-effective manner – which should be a high priority in light of the current regulatory and market changes and continued depressed bank profitability.

STATE OF THE INDUSTRY AND CHALLENGES AHEAD

With regulatory and market changes ahead, banks are facing a variety of challenges on which they need to focus to optimize the value and efficiency of IRRBB approaches. We observe two themes that are particularly crucial for the banks to be ready for the increased scrutiny: i) enhancement of IRRBB analytics and integration with other decision frameworks and ii) improvement of overall IRRBB governance.

Oliver Wyman's extensive work on IRRBB and our recent surveys of the North American banking industry show that banks are well aware of these challenges and they are looking to further build out their capabilities. Comparisons between our 2011 and 2015 surveys enable us to observe the evolution of the industry post-crisis. Select exhibits from our 2015 survey are shown through the remainder of this paper to illustrate leading practices in the industry.

ENHANCEMENT OF IRRBB ANALYTICS AND INTEGRATION WITH OTHER KEY MANAGEMENT DECISION FRAMEWORKS

One of the key trends we observe at the best practice banks is that they continuously invest in development and improvement of **IRRBB analytics.** These improvements cover more granular and robust modeling of assets and liabilities for IRRBB purposes, deployment of more efficient engines that are capable of running multiple scenarios quickly, better use of data for parameter calibration, and continuous review and refinement of modeling approaches and assumptions.

Moreover, best practice institutions develop and follow a flexible model-driven approach that incorporates historical analysis, sensitivity analysis, and NII and EVE projections under many scenarios over a multi-year time horizon. Investing in these capabilities allows banks to better manage the complexity and uncertainty of the markets, and meet core regulatory expectations. The introduction of the enhanced disclosure requirements and other requirements laid out in the Basel Committee's Standards for IRRBB will inevitably heighten scrutiny around methodologies and underlying assumptions.

According to our survey, roughly two thirds of the participants manage their earnings and value strategy to a variety of scenarios including parallel shocks, steepening/flattening, ramps and historical rate hikes/cuts as well as CCAR scenarios. More advanced institutions consider the impact of credible emerging scenarios (e.g. Euro-break up, bullish dollar curve) to understand effects and identify management actions. The vast majority of the participants indicated that they will continue to focus on advancing IRRBB analytics – a sign that best practice is continuously improving.

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In parallel to enhancing IRRBB analytics, best practice banks are actively working to **integrate IRRBB analytics with related key management frameworks** as much as possible. Recently, exacerbated by various regulatory pushes, a complex web of different but related analytical frameworks have been developed at most banks. As various pieces of this puzzle have neared maturity individually, the push now is to ensure conceptual consistency, direct integration where possible, more efficiencies, and ultimately better decision-making.

More specifically, the IRRBB measurement and management framework shares data, processes, systems and methodologies with many key management applications, as summarized in the Exhibit 1.

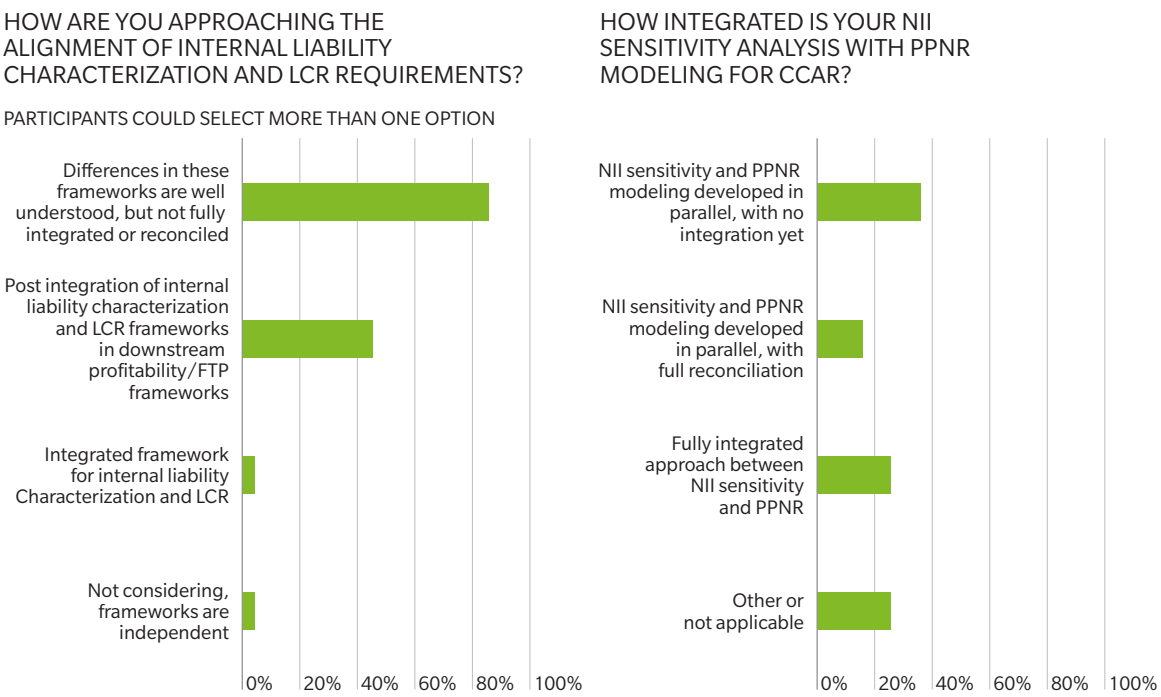
Exhibit 1: Balance sheet management framework overlaps

	OVERLAP WITH IRRBB MANAGEMENT
CCAR	Net interest income calculations, baseline balance and rate projections, baseline value projections, systems and governance framework.
Balance Sheet and P&L optimization	Interest income and interest expense expectations, expectations on non-maturity deposits and behavioral options, strategic decisions on asset-liability mismatch.
FTP framework and profitability/ performance measurement	Consistency of behavioral assumptions, deposit maturity and re-pricing characterization, mismatch unit mandate and allocation of mismatch benefits.
LCR and other liquidity frameworks	Assumptions around stressed outflows, notably related to deposit run-off, collateral, and off-balance sheet behavior.

The applications above constitute a web of partially overlapping frameworks. It is important to bridge the gaps between these applications for optimal balance sheet positioning and good decision making. Moreover, given the increased demand on analytics and reporting, consistency among these frameworks is needed for increased efficiency, shorter turnaround times, and to avoid potentially contradictory outcomes. In particular, leveraging consistent data and systems infrastructure across applications can lead to major cost efficiencies. We expect increased regulatory scrutiny will cause banks to improve robustness of their analytics, data and consistency across these related frameworks. This expected focus on IRRBB analytics and the heightened expectations will be similar to the evolution of most recent regulatory focus areas.

One prime example of this framework consistency and quantitative robustness challenge is deposit characterization underlying IRRBB analysis. The objective of deposit characterization is to identify expected behavior of indeterminate deposits along multiple dimensions: i) determination of the core portion that will stay with the bank for the longer run, ii) pricing sensitivity of deposits to changing interest rates and iii) expected maturity of deposit accounts. This is critical as deposits constitute the main form of funding for most banks. The industry has not yet fully figured out the alignment of IRRBB deposit characterization with LCR requirements or Pre-Provision Net Revenue (PPNR) modeling under CCAR, as seen in the survey results in Exhibit 2; however best practice banks are investing in these capabilities.

Exhibit 2: Alignment of IRRBB deposit characterization with LCR and CCAR



Source: Oliver Wyman analysis.

In addition to the above challenges, there is a growing concern among practitioners that the existing deposit characterization approach might not be good enough as we enter a rising rate environment for the first time in nearly a decade. Most of the existing deposit models have been calibrated using data from near-zero rate environments where bank balance sheets have been flooded with deposits. It is anybody's guess as to how quickly "hot money" will leave bank balance sheets for more lucrative investment opportunities, in particular in light of diverging monetary policies. We recommend well designed "what if" scenario analysis as an integral part of IRRBB discussions.

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BCBS STANDARDS FOR IRRBB

PROPOSED REGULATORY CHANGES TURN UP THE HEAT ON IRRBB MANAGEMENT

In April 2016, BCBS issued Standards for Interest Rate Risk in the Banking Book. The standards, issued for the first time in more than a decade, introduced a strengthened Pillar 2 approach and set out supervisory expectations for banks' identification, measurement, monitoring and control of IRRBB as well as its supervision.

The revised standards, which were published for consultation in June 2015, are expected to be implemented by 2018. The standards reflect many elements of the feedback from the industry to the 2015 Consultative Document; in particular: i) the Pillar 1 approach is out of consideration and enhanced Pillar 2 approach is the suggested approach for IRRBB supervision and ii) banks have the option to use their internal measurement systems to calculate the sensitivity metrics. However, supervisors have an option to mandate banks to follow the standardized framework for IRRBB disclosures, which includes certain punitive components.

The Standards for IRRBB cover the enhanced requirements over 12 principles: Nine principles are directed to banks including identification of IRRBB, sound methodologies, risk appetite and limits, internal reporting, external disclosures, data, controls and model risk management. Three principles are directed to supervisors, and focus on review of soundness of banks' IRRBB management, collaboration among supervisors and identification of outlier banks. Key highlights of the standards include:

- **IRRBB management process:** Greater guidance has been provided on the expectations for a bank's IRRBB management process, in particular the development of shock and stress scenarios to be applied to the measurement of IRRBB and the key behavioral and modeling assumptions which banks should consider in their measurement of IRRBB. The guidance notes the importance of Credit Spread Risk in the Banking Book (CSRBB) and urges banks to properly monitor and assess CSRBB; however, the standards focus mainly on IRRBB.
- **Governance:** Models used to measure IRRBB should be comprehensive and covered by governance processes for model risk management, including a validation function that is independent of the development process. Measurement outcomes of IRRBB and hedging strategies should be reported to the governing body or its delegates on a regular basis. Moreover, banks must implement policy limits that target maintaining IRRBB exposures consistent with their risk appetite.
- **Enhanced disclosure requirements:** The disclosure requirements have been standardized and enhanced to promote greater consistency, transparency and comparability in the measurement and management of IRRBB. Banks must disclose, among other requirements, the impact of interest rate shocks on change in economic value of equity (ΔEVE) and change in net interest income (ΔNII), computed based on a set of prescribed interest rate shock scenarios.
- **Supervisory review:** The supervisory review process has been updated to elaborate on the factors which supervisors should consider when assessing the banks' level and management of IRRBB exposures. Supervisors could also mandate the banks under their respective jurisdictions to follow the standardized framework for IRRBB (e.g. if they find that the bank's internal measurement system does not adequately capture IRRBB). The standardized framework has been updated to enhance risk capture.
- **Outlier test:** The threshold for the identification of an "outlier bank" has also been tightened; the outlier test(s) applied by supervisors should at least include comparison of the bank's ΔEVE with 15% of its Tier 1 capital, under a set of prescribed interest rate shock scenarios.

ENHANCEMENT OF IRRBB GOVERNANCE

A second key trend we observe is a heightened focus from regulators and practitioners on governance of IRRBB measurement and management processes. Particular attention is being put toward enhancing model risk management, limit setting and clearly delineating roles and responsibilities between first and second lines of defense.

Model risk management has been a key focus area for the industry for the past few years, and we expect IRRBB models to be held to this elevated standard as indicated by the Standards for IRRBB. Inherently, there are numerous assumptions underlying IRRBB analysis, and without appropriate transparency and governance, the usefulness of the analysis can be compromised (or in extreme cases, become misleading). Examples of critical assumptions underpinning IRRBB measures include items such as baseline interest rate expectations, balance sheet forecasts (and sensitivity to interest rate scenarios), deposit duration, prepayment assumptions, and discount curve construction.

With increasing focus on model risk management and reporting across all key frameworks, most institutions have significantly enhanced their governance around IRRBB practices. This includes heightened focus on assumptions management and validation, more sensitivity analysis, and better understanding of model uncertainties.

We expect that the industry will continue to enhance their model risk management practices and pay particular attention to the review, validation and update of the approaches and assumptions.

Exhibit 3: IRRBB model and assumption governance best practices

86%	81%	67%
Systematically track and document all assumptions and test sensitivity for all major assumptions periodically	Analyze impact of major changes to IRRBB model assumptions; require approval of change by committee body for major assumptions	Backtest IRRBB models and independently validate IRRBB models on an annual basis, with detailed report and remediation steps circulated to management

Limit setting and monitoring is another key component of a well-defined governance framework. As evidenced by the comparisons over time of Oliver Wyman surveys on IRRBB management practices, Board level limits used to manage IRRBB have been changing in line with the stream of regulatory rules and their impact on IRRBB management. Traditionally, NII sensitivity or value (e.g. EVE or DV01) sensitivity to interest rate shocks have been the main limits used by Boards (or Board sub-committees). However, recently, many banks have introduced limits on sensitivity of Other Comprehensive Income (OCI) or Basel III regulatory capital ratios to interest rate shocks to be tracked alongside the traditional limits. This is reflective of the evolving regulatory landscape with the implementation of Basel III and direct capital implications of interest rate and credit spread changes in the Available-For-Sale (AFS) book, as well as larger securities portfolios across the industry due to liquidity regulations which increase the materiality of the issue.

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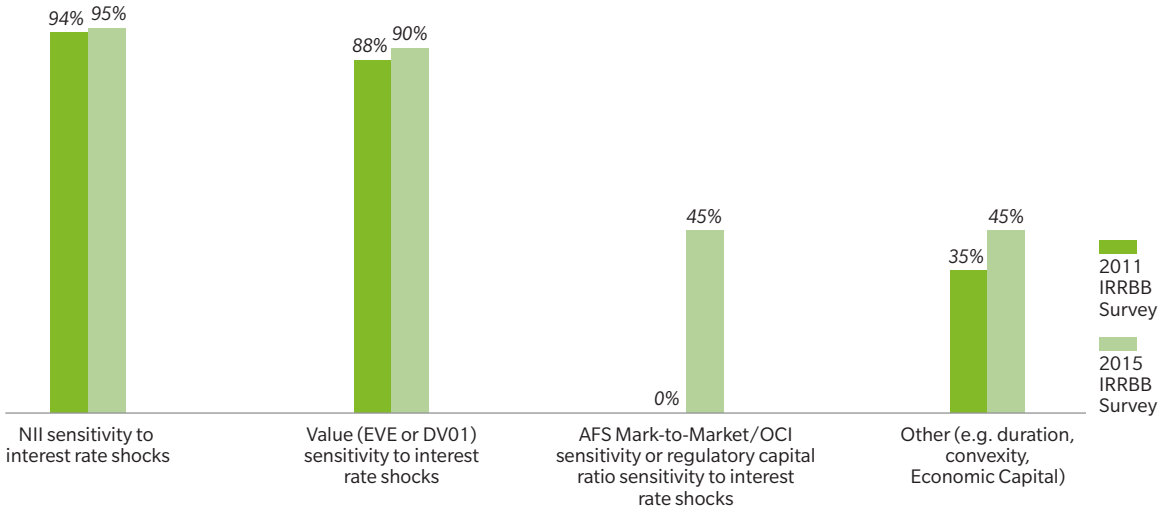
Furthermore, there is increasing pressure on Boards to see a broader range of IRRBB metrics and limits, such as key rate durations and convexity, given the acknowledgment that all measures have some inherent limitations.

Exhibit 4: Limits used for monitoring IRRBB by the Board (or Board sub-committee)



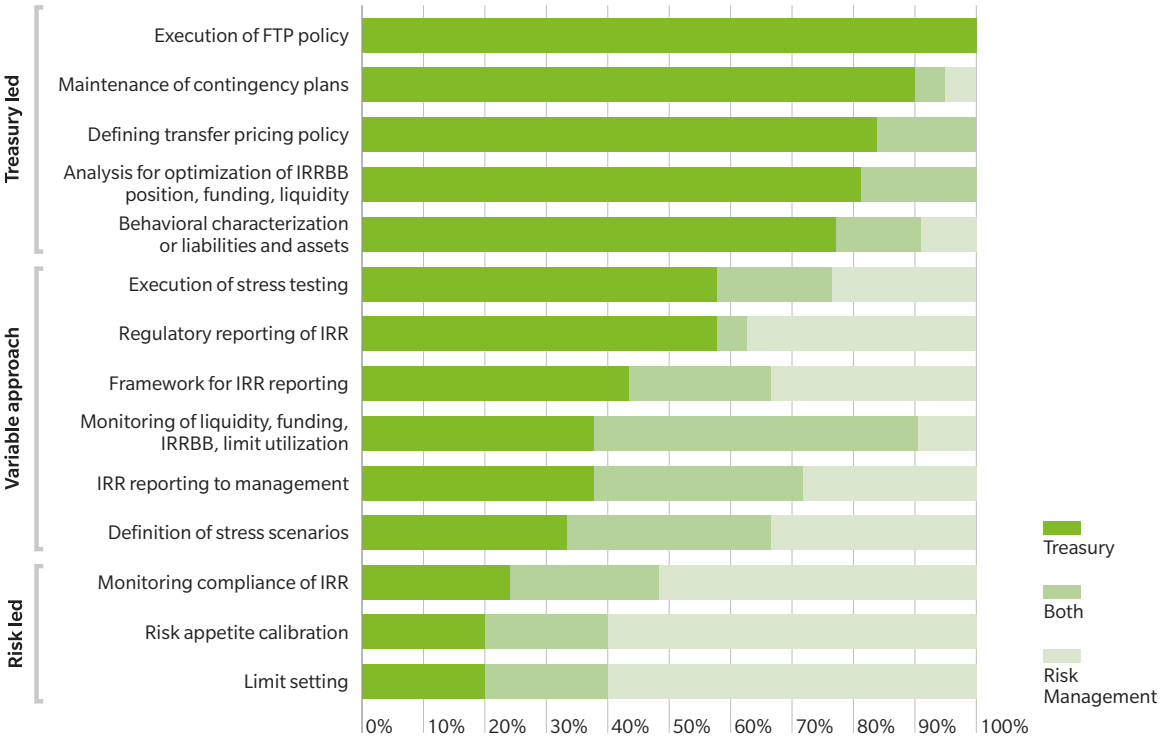
Source: Oliver Wyman analysis.

With the changes in the regulatory requirements for IRRBB, primary metrics and limits will likely continue to evolve. Other best practices include the following in addition to continuous review of metrics and limits used by the senior management and the Board:

- Increased quantitative rigor behind IRRBB limit framework calibration.
- More focus at Board level on more holistic decision making, e.g. how to balance risk and return sides of the equation.
- Heightened emphasis on IRRBB education for senior stakeholders, which is crucial for effective Board governance.

In addition to model risk management and limit setting, we expect regulators and practitioners to pay more attention to the **clear delineation of lines of defense.** Mostly due to the specialized knowledge and expertise required to carry out interest rate risk management activities, there is close coordination between Treasury and Risk Management at most institutions. At times, this results in roles and responsibilities between these two groups getting blurred. Most institutions have been working to more clearly articulate the boundaries between 1st line and 2nd line responsibilities. While there are differences due to institutional preferences and idiosyncrasies, the trend has been for Treasury to lead execution of IRRBB strategy whereas Risk Management leads limit setting and limit compliance, serving as a challenge function. At most institutions, reporting and stress testing activities may be led by either Treasury or Risk Management based on the available capacity.

Exhibit 5: Roles and responsibilities split between Treasury and Risk Management



Source: Oliver Wyman analysis.

Depending on the workload assigned to Treasury units, average FTEs vary considerably among survey participants. Staffing needs, particularly for analytically-oriented staff with interest rate risk and/or liquidity risk management expertise, have continued to increase over the past few years and filling these positions has been a major challenge across the industry. Clear responsibility assignment to individuals has helped firms ensure effective and efficient execution in light of staffing constraints.

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CONCLUSION

With increasing focus both by supervisors and practitioners, strong IRRBB management that is integrated with broader risk/return decision making frameworks is more important than ever. In light of the Standards for IRRBB, market changes and continued depressed bank profitability, we urge banks to improve their IRRBB approaches across several dimensions to follow current and future best practices:

- Develop and follow a comprehensive quantitative approach including expanded NII and EVE projections capabilities and more sophisticated customer behavior analysis.
- Align potential commonalities of the assumptions and engine of the IRRBB framework with key balance sheet management frameworks such as capital and liquidity management.
- Apply a robust model risk management framework to all IRRBB models and assumptions.
- Strengthen governance of IRRBB processes, including Board-level oversight and clear articulation of responsibilities across the three lines of defense.

The above items are crucial to good decision-making in a cost-effective manner for IRRBB – in particular given that decision makers have not lived through a similarly complex regulatory and market environment. Based on our ongoing work with clients in these areas, we believe that the many challenges imposed by the current environment also ultimately present opportunities for a more integrated approach to treasury risk management, and a catalyst for balance sheet risk-return optimization.

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