

THE STATE OF INTEREST RATE RISK MANAGEMENT

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INTRODUCTION

Interest rate risk has always been hovering on the risk periphery of Asian banks, given the historically high rate volatility of many countries in the region. This was starkly demonstrated during the Asian financial crisis of the late 90's where large maturity mismatches contributed to the downfall of many venerable financial institutions. Interest rate levels and volatilities have tempered somewhat since then, helped by a stable macro-economic environment and followed by various macro-prudential measures undertaken by central banks to soften the impact of the global financial crisis. The low rate environment however created new pressures on earnings, and many Asian banks are now dealing with this new challenge whilst in parallel upgrading the supporting risk models.

The interest rate environment has been nothing but extraordinary since the crisis began. Many countries are still at historically low levels of interest rates with a steep yield curve as a result of the crisis. Unorthodox monetary policy responses such as Quantitative Easing in the US has resulted in bouts of large and sustained capital inflows into many Asian economies, which are then faced with the vexing task of deciding whether to keep rates low to maintain growth or raise rates to curb inflationary pressures. The net impact will differ for each country as central banks apply different interventions tailored to their market and banks will need to hedge or manage the duration and repayment risk accordingly. For instance, banks in China are faced with slowing credit growth as reserve requirements have been raised multiple times since 2010. South Korean banks have had to reduce the proportion of short-term foreign debt due to a regulator-imposed levy in 2011 to discourage such borrowing.

In the face of uncertainty around credit growth, the financial markets, the banking environment, and the continuation (and eventual reversal) of unorthodox monetary policies, interest rate risk (IRR) management¹ presents challenges for financial institutions of all sizes. In particular, institutions face the challenge of generating higher net interest income (NII) while maintaining IIR levels within acceptable limits.

Banking regulators also started putting more emphasis on IRR measurement and management. The Bank of Japan noted recently that Japanese banks bear a large amount of interest rate risk relative to their capital, estimating that banks would face a total of *¥6.4 TR (\$78 BN) in losses if interest rates rose by one percentage point*. The Basel III capital and liquidity framework released in December 2010 also had substantial implications for management of the balance sheet and the ALM position via new liquidity rules and change in the treatment of other comprehensive income (OCI) for capital adequacy purposes. In North America, the US regulatory agencies issued a comprehensive guidance document², and Sheila Bair, then-chairwoman of the FDIC stated that “... *interest rates represent the next big risk for depository banks*”.

¹ IRR refers to the risk in the structural interest rate (i.e. ALM) position in this paper, but not to the interest rate risk in the trading book.

² SR 10-1, “Interagency Advisory on Interest Rate Risk”, January 11, 2010.

Our survey of 18 North American banks, with assets totalling approximately \$8.5 TN set out to examine how banks are responding to the uncertainty through their IRR management and measurement practices. The participants cover a diverse group across many dimensions: universal vs. regional, asset-driven vs. liability-driven, US vs. Canadian, large- vs. mid-size, single-currency vs. multi-currency balance sheets, and banks with retail branches vs. wholesale banks. The diverse nature of participants enabled us to robustly identify trends and emerging best practices, many of which are also applicable to Asian banks as they now seek to upgrade their IRR capabilities to global standards and can draw lessons from Western banks' experiences.

Broadly, the survey confirmed our hypotheses from recent client work that banks are responding to the low interest rate environment and the elevated regulatory scrutiny by extensively revisiting past practices focusing on three major issues. First, we have observed a secular shift towards a more balanced approach to managing the IRR, essentially including a 'value-based' view to counter-balance a pure earnings objective. Secondly as a corollary to that, banks are enhancing measurement practices, especially for economic value of equity (EVE). Finally, banks are also rethinking their deposit models given the importance of deposit modelling in a low interest rate environment and possible structural shifts in the deposit markets.

The related balance sheet optimisation problem in the current environment is quite challenging given the onerous capital and liquidity requirements being phased into the system, low asset growth, NIM pressure and additional compliance challenges. Banks are responding with mostly tactical steps to increase earnings. We believe that an integrated approach to treasury risk management also needs to be a significant part of the solution.

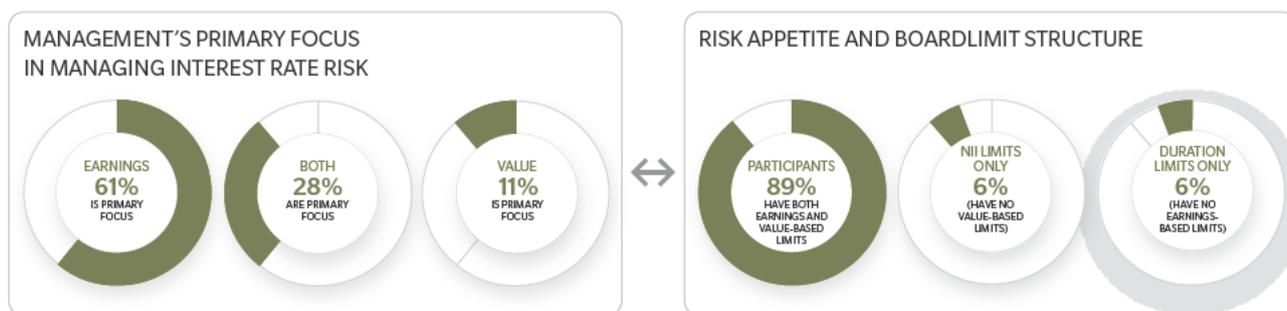
TOWARDS A MORE BALANCED IRR MANAGEMENT

Change in interest rates pose two fundamental risks for banks, namely value of future cash flows and future interest income and expenses. Immunising from both is impossible, and there is a trade-off between managing both risks. Similar to their US counterparts, many Asian banks have historically emphasised earnings-based IRR management (i.e. tighter control on NII volatility) over value-based management (i.e. tighter control on EVE volatility).

As far as the primary focus is concerned, the survey results indicate that the historical pattern still continues to hold with 61%/28%/11% of participants respectively stating earnings, both earnings and value, and value to be the primary focus in managing IRR (Exhibit 1). However, our survey discussions indicate that many of the participants are now considering value more prominently in their ALM strategy. Most institutions that consider earnings as their primary focus indicated that the weight they put on EVE is now significant. One institution that was purely managing IRR based on an earnings perspective is now overhauling the entire framework and moving toward a balanced approach.

This trend is also pronounced in the way that banks articulate their risk appetites. Less than 20% of the banks that choose earnings as their primary focus indicated that their risk appetite statements only refer to NII volatility. Similarly, about 90% of all participants employ Board-level limits for both earnings- and value-based metrics (Exhibit 1).

EXHIBIT 1: WHAT IS YOUR INSTITUTION'S PRIMARY FOCUS IN MANAGING IRR?



Note: Numbers may not add up due to rounding

Source: Oliver Wyman Interest Rate Risk Management Survey (2011)

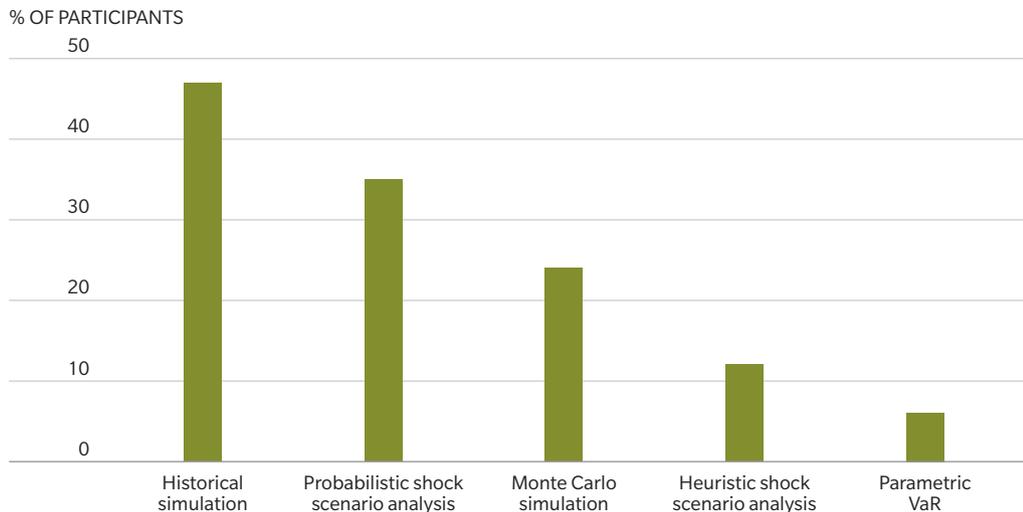
ADVANCES IN MEASUREMENT AND METHODOLOGIES

One of the biggest concerns around the value-based view of IRR compared to the earnings-based view has been the reliance of EVE analysis on many significant modelling assumptions, thereby diminishing the confidence in the results. Banks are increasingly pushing the envelope in refining those assumptions to mitigate this shortcoming.

Our survey had a number of detailed questions on IRR measurement which resulted in extensive discussions with participants. We review the most pertinent methodology issues that practitioners are considering:

1. More advanced scenario generation techniques: Economic capital and stress testing require tail scenarios to generate large hypothetical losses in EVE and the 'historical simulation' technique is emerging as the preferred approach. In fact, all the participants in the survey have standalone economic capital calculations for IRR and almost 90% of respondents define their EC metric as the change in EVE, indicating convergence in the industry across these dimensions (Exhibit 2). The level of Asian banks sophistication is less homogenous in this regard compared to the North American experience but leaders are employing simulation techniques to generate joint scenarios for EVE, economic capital and stress testing calculations

EXHIBIT 2: SCENARIO GENERATION TECHNIQUES USED FOR EVE[‡]



[‡] More than one response possible

Source: Oliver Wyman Interest Rate Risk Management Survey (2011)

Another major trend in scenario generation is the addition of large deterministic shocks. The 2010 US interagency guidance on IRR suggested that “...institutions should regularly assess IRR exposures beyond typical industry conventions, including changes in rates of greater magnitude (e.g. up and down 300 and 400 basis points)...”. Our survey results show that two-thirds of the banks are now using 300bps shocks, and one-third are using 400bps shocks (not mutually exclusive). We view this as recognition of the current interest rate environment

2. **Modelling of multiple yield curves:** About 55% of the participants have significant exposure to multiple currencies and from an IRR point of view, this has significance because yield curves for different currencies move in a correlated fashion. Banks largely use separate yield curves to model exposure in foreign currencies, but only about half of those tailor the scenarios to particular yield curves and/or incorporate the necessary correlations into the analysis. The aforementioned historical simulation approach is also conducive for analysis in a multiple yield curve environment since the correlations are already embedded in the historical data. This would be highly relevant for Asian and Australian regional banks to consider as they grow across new markets
3. **Management intervention:** Treasury units typically manage IRR in an active manner through market transactions to mitigate risks by bringing companies within their risk tolerance and appetite. We found that half of the banks in the survey take management intervention into consideration for IRR measurement purposes via explicit modelling. This can be as simple as applying a haircut to the results, or as complex as incorporating dynamic hedging rules into the mechanics of the EVE and NII models
4. **More realistic balance sheet modelling:** Typically NII analysis uses a dynamic balance sheet with new business volume assumptions, while EVE analysis uses a static balance sheet view in run-off model. Many banks consider this to be one of the weaknesses of the value-based approach. We have found that some banks are now beginning to incorporate dynamic modelling assumptions into their EVA framework. This also exacerbates the importance of a rigorous approach to modelling the management intervention.

These advances are also important steps to pre-empt or respond to a low interest rate environment and elevated regulatory scrutiny, but if appropriately implemented will also support improvements in management decision-making processes.

DEPOSIT CHARACTERISATION: GUARDING AGAINST A FUNDAMENTAL SHIFT

In response to both market and regulatory pressures, Western banks are doing extensive work in deposit modelling, particularly on indeterminate maturity deposits. One of our survey questions gauged how comfortable the participants were with the cash flow modelling across major balance sheet items. We found that banks are *'generally comfortable'*, except for deposits – for which about one-third of participants outright indicated that they were *'not comfortable'*.

In particular North American institutions (including some that stated that they are *'generally comfortable'* with their deposit models) are concerned that their models may not behave well in the current environment. The primary reason for this is that the models have been built based on historical customer behaviour from typical economic cycles, and the current environment presents many structural differences and possible paradigm shifts – raising concerns about the applicability of historical data and assumptions.

The challenge in Asia is somewhat different, although the need for more accurate deposit characterisation is no less important. Many banks in Asia have yet to develop the type of sophisticated deposit models that most US banks have. Instead most banks still rely on simpler techniques such as maturity ladder bucketing of deposits, with little or no adjustments for optionality or account attrition. We expect that the development of sophisticated deposit modelling techniques in Asian banks will receive greater importance and scrutiny in the near future. This will be driven by increased competition for retail deposits, especially with the new Basel III rules on liquidity and local funding just around the corner. This trend is already occurring in Australia where the battle for retail deposits has begun in earnest. Other regions like China and South-East Asia may still be relatively rich in retail deposits but leading banks are pre-empting the impending squeeze by significantly upgrading their capabilities.

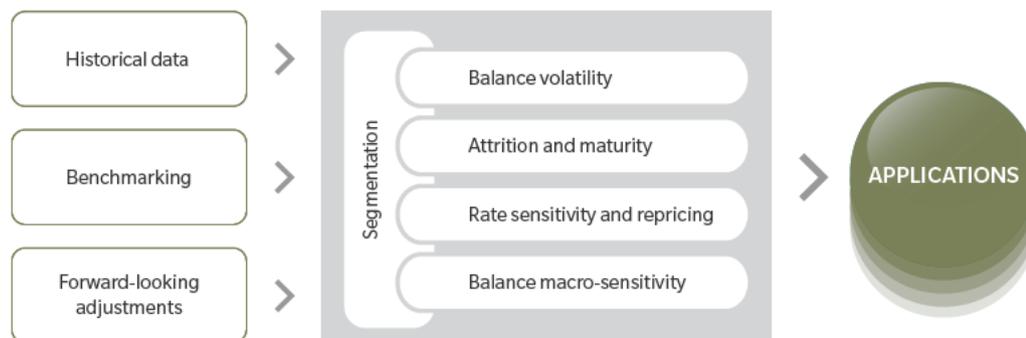
In some ways, it may be the smaller banks that will see a more urgent need to upgrade their capabilities. Customer desire for deposit safety could result in a possible bifurcation of deposit behaviour, where deposits are attracted away from small- and medium-sized banks to larger or even state-owned banks that are perceived to be more conservative and of lower risk. Even the presence of a deposit insurance scheme may not prevent such *'flights-to-quality'* as demonstrated by the bank run on Bank of East Asia in Hong Kong in 2008, which was widely attributed to (unfounded) rumours that the bank was in distress after the failure of Lehman Brothers.

Banks with robust deposit modelling capabilities generally use some combination of segmentation, balance stability, rate re-pricing, balance sensitivity and account attrition analyses. The Oliver Wyman Deposit Characterisation framework (Exhibit 3) illustrates the typical approach, which merges the analytics and benchmarks with forward-looking amendments. The forward-looking adjustments are important to accurately capture specific behavioural traits of particular products. However, in the current environment the amendments are critical due to a number of additional reasons including:

- Possible secular change in deposits’ attractiveness to consumers as an asset class due to the increase in savings rate and shifts in expected risk-return trade-off for alternative assets
- Historically low interest rates (both real and nominal)
- Combined impact on opportunity costs to depositors of holding deposits amid possibly large rate shocks vs. possibly higher volatility
- Changes to deposit insurance schemes (both temporary and permanent)
- Changes in banks’ administration of deposit pricing given the current banking and interest rate environment.

We believe that deposit modelling is likely to constitute one of the most important input to making accurate ALM decisions in the current and expected market and regulatory environment in Asia. From an NII point of view, deposit pricing is critical to earnings given market pressure from historically low interest rates. From an EVE point of view, the modelled behaviour of deposits determines the bank’s overall ALM position. In one client situation, we found that the earnings impact of mischaracterising deposit behaviour was of the order of 2% of the mischaracterised deposits over 10 years.

EXHIBIT 3: OLIVER WYMAN DEPOSIT CHARACTERISATION FRAMEWORK



IMPLICATIONS FOR BALANCE SHEET MANAGEMENT

In addition to the complexity of setting an objective for managing the ALM position and the IRR, there are myriad constraints imposed on the balance sheet optimisation problem faced by treasury organisations. For example, liquidity risk management represents a significant constraint given that new regulations will likely transform the funding and liquid assets of banks. Isolated approaches to ALM and liquidity risk management would result in a suboptimal answer to this problem.

Banks are trying to fully comprehend the economics of the 'new normal', and to find ways to generate earnings in an environment marked by low interest rates and lack of credit growth. In particular, many banks are doing the following:

- Incentivising loan growth through incorporating subsidies into FTP frameworks or by offering longer maturity loans. In South Korea for instance, average mortgage contractual life has increased from 20 years in 2007 to 25 years in 2012
- Growing riskier businesses such as small business and expanding lending into niche lending segments such as equipment financing
- Revisiting the composition and duration of investment portfolios as well as the HTM vs. AFS accounting designation. Japanese banks for instance have been growing and lengthening the maturities of their JGB portfolios
- Optimising funding costs through taking on long-term debt at low interest rates
- Increasing the amount and stability of non-interest income in earnings.

In addition to these arguably tactical initiatives, we believe that an integrated treasury management approach is crucial to achieving these goals while balancing multiple capital, liquidity and balance sheet funding constraints. An integrated approach with clearly delineated objectives and constraints provides a robust platform to navigate the new environment. For example, the framework should clearly link to the stress testing capabilities that many institutions are rapidly building, as well as recognise the constraints imposed by liquidity risk management. Additionally, it would provide a much simpler overview of the impact of future plans on overall financial resource consumption.

PRESSURE POINTS FOR ASIAN BANKS

We are already seeing a growing interest in these topics amongst Asian banks. Furthermore, increased competition for retail deposits together with impending regulatory changes will only serve to bring IRR management to the forefront of risk management. Asian banks also need to decide how best to respond to an eventual rise in global interest rates and corresponding changes in the level of interest rate volatility in each of their domestic markets in the medium term. The short-term outlook for many Asian banks remains largely positive. This presents a unique opportunity for Asian banks to start upgrading their IRR management capabilities and financial resource optimisation. For those considering doing so, we recommend rethinking the existing management and measurement approaches in light of the current environment, learning from the experience of their North American and European counterparts:

- Evaluate whether the pendulum has swung too far toward one side in IRR management, and introduce both earnings and value views into making strategic decisions
- Revisit and upgrade deposit characterisation models and extract hard dollar value from applications of the improved analytics
- Upgrade pricing to fully account for possible paths of rates including potential responses to the continuation and reversal of unorthodox monetary policies globally
- Reconsider the embedded simplifications around modelling of the portfolio and the cash flows
- Enhance methodologies around interest rate scenarios, e.g. consider efficient use of the richness in the historical data
- Evaluate the implications for balance sheet management and build capabilities for an integrated approach to treasury management with explicit linkages to improved emerging stress testing and strategic planning frameworks.

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