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Financial Services

VALOORES Financial Services White Paper

Asset Liability Management

Bank's asset and liability management:

Integrating Liquidity Risk management, Funds Transfer Pricing, and Regulatory Reporting capabilities into a seamless enterprise platform.

Abstract Asset–Liability Management functions covers both a prudential component (management of all possible risks and rules and regulation) and an optimization role (management of funding costs, generating results on balance sheet position) within the limits of compliance (implementation and monitoring with internal rules and a regulatory set of rules). As well as intervening in these aspects of current business activities, ALM is also consulted for organic development and external acquisition to analyze and validate funding terms options, conditions of projects, and any risks (ie funding issues in local currencies). For the sake of simplicity, treasury management can be covered and depicted from a corporate perspective by looking at the management of liquidity, funding and financial risk. ALM, on the other hand, is a discipline relevant to banks and financial institutions whose balance sheets present different challenges that must meet regulatory standards. For banking institutions, risk, treasury and ALM are interrelated and collaborate in managing liquidity, interest rate and currency risk at the individual and group level. ALM focuses more on risk analysis and medium- and long-term financing needs, while treasury manages short-term funding (mainly up to one year), including intraday liquidity management, cash clearing and crisis liquidity monitoring. ALM is concerned with the strategic management of the assets (uses of funds) and liabilities (sources of funds) of banks against risks caused by changes in the liquidity position of the bank, interest rates and exchange rates, and against credit risk and contingency risk.

The purpose of this paper is to provide a perspective in enhancing asset quality, quantifying the risks associated with assets and liabilities, and further managing them in order to stabilize short-term profits, long-term earnings, and the long-run sustenance of the bank.

INTRODUCTION

The views and observations presented in this paper are based on the experiences of VALOORES, which have been gained over decades in the banking industries of the local and International Markets. Although the topics of enterprise risk management (ERM) and asset and liability management (ALM) in banks are extremely broad, and each could be the subject of a separate discussion, these subjects are highly interrelated and there is strategic value in looking at them in an integrated manner through Valoores Profitability and ALM platform. Dynamic regulations, with the ensuing growth in global financial markets and new and complex product offerings, have supported the argument for an integrated approach for ERM and ALM.

Although ALM consists of a set of core bank management activities, it is encompassed within the overall ERM framework of the bank. This paper is in no way intended to comprehensively review either subject. Rather, its intention is to illuminate certain key areas that are fundamental to the establishment and development of a robust and sustainable ERM function in banks. A main aim is to focus on the ALM framework based on Valoores platform.

WHAT IS ALM?

The CRO of a bank, irrespective of the bank's size and complexity, is a key member of the management team. He is responsible for defining and implementing risk management strategies, as well as policy and reporting frameworks, for the bank, in order to balance risks and rewards. This ensures that the business is commercially secure/compliant and supports the achievement of the bank's overall strategic objectives by providing a panoramic view of risks at the enterprise (or at a balance sheet) level as a result of his seniority, commercial acumen, technical/functional expertise, leadership, analytical thinking, context-sensitive and audience-specific communication style, and vision/risk-based strategy. This reaffirms that a balance between risk vs reward is maintained between a control function and the businesses in pursuing the strategic objectives of the bank. The Asset & Liability Management Committee (ALCO) is the forum where decisions are made regarding the management of structural mismatch, funding (cost and sources) and capital management, as well as interest rates, liquidity (short and long term) and currency risk management regarding the assets and liabilities of the bank. The CRO is a strategic member of ALCO, and is expected to bring an element of independence and impartiality. His strategic role has three elements: the CRO (1) dispassionately integrates risk management and business-planning processes, in line with the overall strategy; (2) leads a corporate-level discussion of risk preference, focusing on which risk choices will most probably deliver economic profit for the bank; and (3) uses risk analytics to guide investment and strategic decisions along with funds transfer pricing (FTP).

In the eyes of the CRO, ALM is the practice of comprehensively managing the various risks that arise due to mismatches between the assets and liabilities (loans and advances) of the bank. Banks face several risks, such as those associated with assets, interest (or profit

for Islamic financial institutions) fluctuations, and currency exchange risks. Valoores in'ALM is a tool to manage interest/profit rate risk in the banking book and the liquidity risk faced by banks. As mentioned above, ALM also deals with aspects related to credit risk, as this also manages the impact of the entire credit portfolio (including cash, investments and loans) on the balance sheet. The credit risk, specifically in the loan portfolio, is handled by a separate risk management function (the Portfolio Risk Review (PRR) team), which is one of the main data contributors to the ALM team. This is concerned with strategic balance sheet management, including risks caused by changes in interest rates, exchange rates, pricing, volumes, FTP or margins, as well as the liquidity position of the bank. Managing these dynamic risks proactively forms the nucleus of ALM.

ALM is a risk management technique designed to earn an adequate return while maintaining a comfortable surplus of assets beyond liabilities. It takes into consideration interest rates, earning power and the degree of willingness to take on debt. It can also be known as surplus/contingency management.

HOW CAN ALM BE MANAGED?

Business cycles are becoming aggressive, and global ecosystems and third-party risks are becoming increasingly complex. Regulations are rapidly changing, and compliance enforcement is becoming more stringent. All these factors will continue to create the perfect storm for ALM. In light of these dynamics, adopting an agile ALM framework with a broader perspective is an important step in its management. The framework should set out the broad objectives of the bank's asset/liability portfolio, as established by the Board. This framework governs all ALM policy constraints and helps address new situations where a policy does not yet exist. Although objectives may differ depending on the circumstances, environment or political dynamics of the bank, the observations over the

years as an international banker were that the ALM framework had to address the following minimum strategic objectives:

(1) The bank should manage its asset cash flows in relation to its liability cash flows in a manner that contributes adequately to earnings and limits the risk to the financial margin, to the economic value of equity (EVE) (by managing both mark to market and net interest income) and to liquidity.

(2) Product terms, pricing and balance sheet mix must help manage banks' product demands and the need to protect the equity of the bank.

(3) Most importantly, financial derivatives instruments must only be used to limit interest/profit rate risk and must never be used for speculative investment purposes.

Mismatch of assets and liabilities Banks manage the risks arising from ALM by matching various assets and liabilities according to the maturity pattern, or by matching the duration, by hedging and by securities. The objective of the ALM framework is to properly manage the risks related to changes in interest rates, the mix of balance sheet assets and liabilities, the holding of foreign currencies, and the use of derivatives. These risks are managed in a manner that contributes adequately to earnings while limiting risks to the financial margin.

Proactive management of asset-liability risk is governed through a Board-approved ALM policy along with an enterprise-wide Risk Appetite Framework and Policy (RAF), which sets limits on the asset and liability mix, as well as the level of interest rate and foreign currency risk to which the financial institution is willing to be exposed. These policies should provide guidelines for the pricing, term and maturity of loans and deposits. The use of derivatives, if any, is also controlled by these policies, which should state among other things that derivatives must only be used to limit interest/profit rate risk and must never be used for speculative investment purposes, otherwise there is a potential risk of using them for

short-term gains, where the risk versus reward is not justified. The banks should ensure they have sound business and financial practices by having institutionalized Board-approved ALM and RAF policies, risk and performance measurement techniques, and risk-based compensation practices, as well as risk management procedures that are repeatable, sustainable and can be implemented during stressed scenarios, and that are appropriate to the size and complexity of the bank's balance sheet and operations.

RECENT TRENDS IN BALANCE SHEET MANAGEMENT

Due to the recent trends in balance sheet management, there has been a proliferation of newer and more complex financial products and instruments, which banks have been incorporating into their business models. All these products have some form of risk associated with them. Some are very straightforward and easy to model; others can challenge the most seasoned risk veterans of ALM modelling. In addition to the various global markets developing more complex instruments in which banks can invest (eg Public Offerings of Debt and Equity Securities, Private Placements of Debt and Equity Securities,

Mergers and Acquisitions (M&A), Financial Advisory/ Sponsor Group Finance, and Structured Finance/ Securitization, etc), there has been a notable growth in more sophisticated loan products with embedded options that are increasingly more difficult to model and validate using traditional methods, tools and resources. Examples of such products include hybrid adjustable-rate mortgages (ARMs, for which there is an initial fixed/lockout period before theoretically becoming an adjustable-rate loan), variable-payment loans (the loan's payment characteristics change over time) and home equity loans and lines with multifaceted fixed lockout periods and prepayment penalty structures that can greatly affect repayment activities. Due to the lack of historical data on the behavioral aspects

of these products, they are often a contributing factor to the variance of an ALM model, despite many back-testing processes. The commercial lending arena also has its share of more complex products, including multifaceted prepayment penalty structures and characteristics that can change over time (eg multiple cash flow/ repayment schedules, varying repricing elements such as index, spread, caps and floors).

The world is changing fast for banks' ALM specialists. In times of increased profit and reduced volatility, many have found themselves in a new position — sandwiched between credit risk and finance. Suddenly, everyone wants to manage a piece of the ALM action (eg Finance, Risk, Treasury and other Lines of Business), including those expertly constructed models that were barely noticed before. At the same time, they want to know the potential impact of interest rates, but also a growing number of macroeconomic variables. How, they ask, will the credit losses experienced today affect interest income tomorrow? So why the new interest, from the Credit Risk team in particular? One important reason, among others, is the introduction of International Financial Reporting Standards (IFRS 9), which is drawing Risk, Finance and Treasury closer. In 2018, this new accounting regulation will require banks to plan for possible credit losses far earlier in the lending cycle, rather than after a customer has defaulted.

The IFRS 9 standard will have a massive impact on how banks account for credit losses on their loan portfolios. Provisions for bad debts will be bigger and are likely to be more volatile. This forward-looking approach to credit loss is set to bring the accounting and risk management functions of banks closer than ever. This will consequently make credit risk management an even more integral part of ALM, representing one of the main data contributors to the ALM team. While many of these 'what if' scenarios can be very beneficial to banks and their interest/profit-rate-risk-management process, additional modelling capabilities and efforts are required by risk managers to proactively manage these

risks. These global changes to the banking industry and the products on the balance sheet are greatly affecting the ALM modeler's job in building accurate representations of the financial institution's risk profile and validating the results. Identifying and managing model risk is quickly becoming as important as the model results in ALCO's struggle to remain confident of their risk-measurement processes.

GOVERNANCE AND REVIEW SYSTEM FOR ALM

ALCO should establish the required governance structure to manage risks emanating from ALM in accordance with the RAF limits. It must also ensure that the bank maintains sufficient liquidity, along with a robust review system to continuously review the bank's liquidity developments, which are reported to the Board on a quarterly basis. A bank's Board should annually review and approve the strategies, policies and practices related to the management of ALM as part of the Internal Capital and Liquidity Adequacy Assessment Process (ICLAAP). Based on the industry's best practices, all Basel Pillar 1 and Pillar 2 (including IRRBB) risks, along with Stress Testing, at an enterprise level, and the Treasury middle office function, should be owned by a CRO through ERM and the Market Risk function, respectively. The Market Risk function should have full accountability for managing market risk in the Trading and Banking books. By taking this approach, it augments the vision of a CRO to provide a holistic view of risks at the enterprise level. The role of the Treasurer is to track and monitor the financial operations of a bank together with the following responsibilities:

- developing strategies to raise funds for the bank in business-as-usual and stressed scenarios;
- creating logistics and functionalities for the bank to grow;
- designing and initiating banking products and services to attract customers;

- ensuring effective marketing strategies for banking products and services;
- ensuring compliance with state, federal and banking laws and regulations;
- working in close coordination with the CRO, and reviewing and assessing risks that arise in banking functionalities and activities;
- monitoring and managing all investments and customer deposits.

Banks must have an effective and independent risk management function under the direction of a CRO with sufficient stature, independence, resources and access to the Board. The CRO should report to the Board or Board Risk Committee (BRC), with the same report given to the Chief Executive Officer (CEO) for administration purposes. This is recommended by Basel (Corporate Governance and Internal Controls document) to provide the required independent authority to the control function. The Treasurer is one of the business lines and profit center, and reports to the CEO.

GOVERNANCE ASSESSMENT CRITERIA FOR ALM

- The annual RAF policy is defined and established at the Board level and is communicated to all relevant stakeholders for effective implementation and institutionalization.
- The ERM framework and policy set by the Board is translated into strategies, procedures and measures to manage the risks of ALM that have been articulated in accordance with the RAF policy and checked internally in an independent manner.
- The relevant governance exists for regular evaluation of the liquidity situation and reporting of the evaluation results to the Board, with adequate feedback to the relevant management frameworks.
- The strategies should take into account both normal scenarios and stress circumstances (institution-specific and macro-economic) under which the bank operates (acknowledging

the possibility of a combination of the two).

- The Board should ensure that the effectiveness of risk management at the entity level is consistent and well integrated throughout the group with the division of tasks, powers and responsibilities aimed at managing liquidity risk emanating out of ALM on a group-wide basis.
- The integrity of the ERM function should be adequately safeguarded, and its effectiveness must be independently reviewed annually by the internal audit that carries out this internal control function.

ALCO COMPOSITION AND ITS ROLE

ALCO should comprise the CEO (Chair), the Chief Financial Officer (CFO) (Deputy Chair), the CRO, the Head of ERM, Lines of Business (Corporate, Retail, Private Banking, Treasury, etc) and the Head of Market Risk. The role of ALCO and its impact is assessed proactively by stakeholders to achieve an effective and sustainable governance model. In fulfilling its responsibilities, ALCO will review and recommend the following policies, which will be prepared and implemented by the management (at least annually) for the BRC and the Board:

- Investment Policy
- Liquidity Policy
- Foreign Exchange Policy
- Interest Rate Risk Policy
- Capital Policy
- Asset/Liability Management Policy
- Funds Transfer Pricing Policy

The following sections describe some of the key risks that are managed by ALCO and are duly discussed. These objectives shall be pursued within the framework of the bank's policies.

Liquidity risk

- Monitor the liquidity position and the management activities of the bank, including wholesale funding activities, contingency funding

and any other relevant liquidity measurements the ALCO deems advisable or appropriate.

- Approve liquidity risk tolerances by reviewing how the bank's inability to meet its obligations when due may affect the bank's earnings, capital and/or operations. Interest rate risk

- Monitor the management of interest rate risk activities and the bank's overall interest rate risk profile.

- Monitor the sensitivity of the bank's earnings under varying interest rate scenarios and potential changes in market interest rates.

- Monitor trends in the economy in general and interest rates in particular with a view to limiting any potential adverse impact on the bank's earnings.

- Approve interest rate risk tolerances by reviewing how movements in interest rates may adversely affect the bank's earnings and capital using the bank's projected earnings and capital as a benchmark.

Capital risk

- Monitor the capital position of the bank and the capital management activities undertaken by the bank to ensure that capital levels are maintained in accordance with regulatory requirements and management directives.

- Monitor capital allocation to various lines of business.

Market risk (investments and derivatives)

- Monitor the management's investment activities, such as purchase, sale, exchange and other disposition of the investments of the bank, including a review of management reports concerning current equity and debt security investment positions.

- Monitor compliance with both external regulations and the ALM Policy governing the bank's investments and categories of investments, including requirements relating to composition, diversification, credit risk and yield.

- Review the status of the securities portfolios, including performance, appreciation or depreciation, quality, maturity profile and any actions taken by management with respect thereof.

- Review and determine whether to approve the holdings of investment securities (including prudent investments) that are subject to the ALCO's authority to approve under the ALM Policy or Board of Directors' resolutions.

- Review significant financial risk exposures facing the bank generally, and in its investment portfolios in particular, and the steps management is taking to monitor and control such exposures.

- Monitor compliance with the provisions of the ALM Policy and applicable standards relating to the management of counterparty credit risk, including, but not limited to, reviewing limits on counterparty exposure and reviewing limits on individual transactions based on risk.

- Approve objectives for the composition of on- and off-balance sheet positions.

- Review and approve procedures and systems the management has established to implement the Board's objectives and limits for each portfolio, taking into account applicable laws, regulations and current accounting standards for each part of the portfolio.

Other risks

- Monitor management of the bank's treasury functions, including its operations and funds management processes.

- Review ALM Policy limits relating to interest rate risk, liquidity and capital levels.

- Monitor compliance with both external regulations and the ALM Policy with respect to the asset and liability management processes of the bank.

- Review the scope and results of internal audit reports assessing the implementation of the bank's investment and asset/liability management policies.

HOW TO MANAGE RISKS EMANATING FROM ALM

The effects of current operating plans and market updates on assets and liabilities should be carried out vis-à-vis the Board-approved strategy. Analyzing the operational plan in terms

of Asset and Liability Mix, Currency, Growth and by legacy back and front book yield along with margins is vital for short- and long-term planning purposes. Variances that have been observed between actual results and plans that were initially projected and the underlying reason(s) therefor should be analyzed. Any potential risks to structural funding should be analyzed in terms of the timing of the maturity of key cash inflows and outflows. It is also important to analyze and discuss with key stakeholders the stress scenarios that are used to assess the sensitivities and vulnerabilities of the bank's liquidity position to potential risks as regards the current portfolios and planned asset growth.

Liquidity and funding risk: Key risk ratios (e.g. the Loan to Deposit Ratio (LDR), the Net Stable Funding Ratio (NSFR), the Liquidity Coverage Ratio (LCR) at balance sheet level and at individual currency level, the Top Depositors to Total Deposits Ratio for assessing deposit concentrations, the Corporate/Institutional Deposits to Total Deposits Ratio, etc) should be discussed and assessed proactively for any corrective actions, where deemed necessary. This will include the following:

- An analysis of excess/short liquidity that the bank holds, including the key avenues where liquidity is committed for the long term.
- An analysis of the Liquidity and Funding Matrix by currency (if there are major currency concentrations), as well as analysis of a rolling forecast of the Funding and Liquidity Matrix, and the baseline business growth plan.
- To the extent possible, an analysis of the future wholesale refinancing risk showing the maturity profiles of secured and unsecured sources of funding. If possible, a peer analysis should also accompany the bank's own analysis in order to assess potential refinancing risk stress points in the market and the bank's exposure to market-wide refinancing risk.
- Ensuring that the definition of 'liquid assets' (used by the Treasury) is consistent with the regulatory guidelines in order to maintain

consistency and avoid unwarranted regulatory risk.

- Assessment of the impact of medium- to long-term funding on Net Interest Income (NII) should also be undertaken.

Interest/profit rate risk across banking book (IRRBB/PRRBB) and NII sensitivity

An important element of ALM is the measurement of interest/profit rate risk on an institution's earnings and capital due to changes in interest rates. Basel recommends using an EVE measure, where interest rate risk exposure is measured against several interest rate shock scenarios (ie parallel upward and downward shifts in the yield curve, steepening, flattening, as well as short-term up and down interest rate shocks). These scenarios are designed to be sensitive to local economic conditions and also reflective of measures of global interest rate volatility. The proposed method recognises that not all banking book positions are easily amenable to standardisation, given the uncertainty about the timing of cash flows due to behavioural aspects and embedded options (eg non-maturity deposits, loan prepayment). This method provides the flexibility to allow banks to use internal parameter estimates for certain products, subject to constraints as well as supervisory review and approval. One of the primary causes is mismatches in the terms of a bank's deposits and loans. Interest/profit rate risk exposure can lead to significant operating losses, and deterioration of capital, and therefore must be measured periodically and, where appropriate, managed effectively.

In most banks, the interaction of portfolio volumes, rates, maturities and yield curves is so complex that it cannot be left to intuitive judgment to quantify the interest/profit rate risk. The following techniques are thus proposed to accurately measure interest/profit rate risk:

- Gap (matching) schedule analysis: In a gap schedule analysis, all the institution's

balance sheet items (both on and off) are placed into a series of 'time buckets'. Balance sheet items are placed into the time bucket, which corresponds to the amount of time remaining before the interest rates on that item are repriced.

- **Gap ratio analysis:** This is a simple measure of balance sheet mismatch. It is a very focused measure, as it only measures the level of mismatch for one particular time bucket. The gap ratio is defined as the ratio of net assets (or liabilities and equity) within a particular time bucket divided by the greater of their two amounts.

- **Earnings shock test:** This measures the extent to which a 'likely change' in interest rates (both higher and lower) affects a bank's net interest margin.

- **Dynamic gap analysis:** Estimates of early prepayments of personal loans can be accounted for in the gap schedule using the average term historically experienced on these types of open loans, rather than their contractual maturity dates. Subjective estimates for new business cash flows can also be included. A gap schedule that takes into account these types of assumptions is commonly referred to as a 'dynamic gap schedule'.

- **Simulation analysis:** The analytical process of calculating earning outcomes for alternative interest rate scenarios is termed 'simulation'. The simulation technique, which is a type of income sensitivity analysis, is most efficiently and conveniently performed by computer, although it can also be performed manually.

- **Dollar duration analysis for banks that have operations in dollars:** Duration is a portfolio valuation technique that measures the life of an asset or liability based on the present value of its cash flows. The duration technique provides an estimate of the rise or decline in the market value of equity of a portfolio, under various interest rate scenarios.

For effective management of IRRBB/PRRBB, an analysis of interest/profit rate risk based on the following should also be presented by the

Head of Market Risk to the CRO on a monthly basis:

- EVE method
- Value at risk (VaR)
- NII sensitivity
- Basis risk
- Scenario-based stress testing

The CRO will also review whether any of the 'soft limits' established in the RAF around each of the measuring techniques listed above have been breached. If yes, Market Risk should discuss and find out the reasons for this, and the frequency of such breaches, and provide a clear action plan and timelines with the concerned line of business to bring the breached limits back in line with the RAF.

The CRO will seek an independent view from Market Risk Management Function on the prevailing interest rate scenario and corroborate the view expressed by the Treasurer with the same.

The CRO will also seek from the Treasury and Market Risk an analysis on Pre-Settlement Risk (PSR) and Pipeline Risk relating to option risks faced by a bank when it is in the process of writing fixed rate assets and liabilities from an earnings volatility and funding perspective.

Funds transfer pricing (FTP)

The CRO will ensure that the FTP mechanism is well understood by all stakeholders, particularly by the relevant Lines of Business in the context of interest rate and liquidity risk.

Furthermore, the key highlights of the Funds Transfer Mechanism are explained in each ALCO and the impact(s) of its implementation is/are also deliberated in ALCO.

The CRO will also ensure that the borrowing rates of Treasury remain within the established RAF Policy limits and that borrowing is not taking place at rates that make the lending business unviable for the bank.

The Treasurer should be asked to explain his

view on the overall market liquidity in the financial market and how this is expected to impact the bank's borrowing cost and eventually the FTP.

It should be ensured that the FTP mechanism used by the bank also takes into consideration the off-balance sheet exposures.

Stress testing

The CRO will ensure that stress testing is carried out on multiple scenarios ranging from mild to severe impacts.

The CRO will also seek reverse-stress-testing-based analysis of the bank's portfolio to assess the levels at which the Business Model would become unviable.

The CRO will ensure that the stress scenarios have taken into consideration the possibility of continued negative net interest income for a period of two to three years and its impact on the bank's ability to sustain such a scenario for a small subsection of the balance sheet.

Contingency funding plan (CFP)

The CRO will ensure that the CFP is discussed on a quarterly basis (or as deemed necessary) within ALCO and that the assumptions in the CFP remain valid.

The CRO will seek the latest testing report of the CFP to ensure that the assumptions therein have been tested and liquidity provision sources remain available to the bank under varied levels of stress.

The CRO will require Treasury and Market Risk to use the CFP for the purposes of reverse stress testing.

The CRO will review and discuss in detail the different levels of contingency, as have been defined in the CFP, and also the resolution plan to address each level of contingency.

POLICY MANAGEMENT

ALM and RAF policies

Based on the industry's best practices, it is recommended that the banks adopt an ALM

policy and an RAF that address the following, at a minimum:

- Limits on the maximum size of major asset/liability categories
- FTP and Capital Management/Allocation pricing loans and deposits
- correlating maturities and terms
- controlling interest/profit rate risk and establishing interest/profit rate risk measurement techniques
- controlling foreign currency risk
- controlling the use of derivatives, management analysis and expert consultation for derivative transactions

The above recommended objectives of ALM and RAF policies have assisted banks to proactively manage a variety of risks. The following are some useful suggestions on forming a good ALM policy based on industry best practices:

- Outline the role and duties of the Board of Directors and the ALCO, and who should be on the ALCO.
- Provide for ongoing education for the Board and the ALCO.
- Address all risks (not just interest rate risk).
- Place all measurements in an appendix to the policy for ease of making any changes.
- The measurements should be ranges (or a minimum or maximum), rather than an absolute number.
- When establishing a reporting mechanism for ALM, the reports should address all the guidelines in the ALM policy. Coordinate the references of the ALM policy to the other policies of the bank (Lending, Investments, Operations, etc).
- The ALM policy should be guided in a way to deal with exceptions through corrective action under extraordinary circumstances.

Balance sheet mix

The ALM policy, together with the RAF, will

establish portfolio limits on the mix of balance sheet liabilities (such as deposits and other types of funding), as a percentage of total assets, considering the differential costs and volatility of these types of funds. Similarly, prudent portfolio limits on the mix of balance sheet assets (eg loans by credit category, financial instruments, etc.) should be set by policy considering differential levels of risk and return, as shown, for example in Table 1.

This recommended practice may not be practical for smaller, less complex banks that have a limited customer base and a simple balance sheet without much product diversification (eg savings and personal loans), or that do not have sufficient financial resources to effectively promote diversification. If this is the case, the ALM and RAF policies should state that an appropriate mix of deposits and other liabilities will be maintained to reflect customer expectations and to correlate (by term and pricing) with the mix of assets held. The mix of assets (loans, investments) return should be guided by risk-based annual planning targets, lending license constraints and regulatory restrictions on investments.

Table 1: Proposed Board-approved ALM/RAF policies on the limits of the size of specified asset/liability categories

Categories	Policy limits as a percentage of total assets (%)
Assets	
Large corporate loans	20
Small and Medium Enterprises (SME) or commercial	10
Segment loans	
Personal loans	20
Residential mortgages	20
Financial investments (including assets held for liquidity)	20
Other investments	7
Capital assets	3
Total Liabilities	100
Non-interest bearing savings accounts (NIBS)	30
Term deposits	35
Demand deposits	20
Foreign currency	3
Brokered deposits	10
Liquidity borrowings	2
Total	100

Note: The sample limits on the maximum size of certain balance sheet categories in order to diversify risks and returns are indicative only and are offered for illustrative purposes.

MANAGING LIABILITIES

The attempt, here, is to provide direction on setting policy constraints on the size and type of deposits and borrowings so as to minimize the cost of funds and maximize opportunities to finance growth. Sources of funds for a bank can be summarized into three types: capital, deposits and borrowings.

Strategy

The following are the various strategies that management can adopt in building its liability base, taking into consideration the management of liquidity risk.

- Attract loans to meet deposit supply.
- Attract funds to meet loan demand.
- Adopt a mixed approach in order to match the maturity structure of liabilities with that of assets at the most economical rate.

The first approach, reflecting deposit-driven growth, generally results in limited satisfaction of banks' long-term lending needs due to the depositor's preference for short-term instruments. The approach may result in excessive liquidity and reduced earnings for the bank.

The second approach, which reflects asset-driven growth, results in higher than average funding costs because of the need to guarantee financing to borrowers, which may necessitate funding by external borrowings.

Both strategies may cause an unfavorable divergence from market rates.

Due to the major disadvantages inherent in deposit- and asset-driven strategies, a compromise approach to liability management is recommended. The bank should rely on natural deposit growth, fostered through competitive 'at market' interest rates, in order to influence loan pricing and growth.

Diversification

In addition to minimizing the cost of its deposit base, the bank must promote the stability of its

deposits. In this regard, policy should encourage placing certain targets with Lines of Business for the diversification of customers' deposits by origin and term structure. Operational policies should encourage funding not to be unduly concentrated with respect to the following factors:

- market source of deposit (eg commercial versus personal)
- deposit term to maturity
- foreign currency

Concentrated funding sources expose the bank to potential liquidity problems due to unexpected deposit withdrawals with undue run-off rates. Banks with excessive funding concentrations should maintain additional liquid assets and focus on diversifying them, as described above.

Borrowings

In addition to the deposit base, banks may rely on bank borrowing to finance their asset portfolio. Because external borrowing may be a more expensive source of funding, policy should require limited reliance on such borrowings, and observance of the regulatory ceiling on league/bank borrowing. External loans should always be viewed as temporary financing. Lines of credit with other financial institutions, however, should be established in order to regulate operational liquidity, but not under stressed scenarios.

Capital planning and budgeting with three years rolling forecast

Annually, management and the Board must develop a business plan that summarizes the bank's goals and objectives for the next three years as a rolling forecast both on assets and liabilities.

This three-year rolling business plan includes a strategic financial plan that addresses each area of risk management, including asset/liability management. As part of the strategic financial plan, the Board must set financial targets for

each Line of Business related to asset/liability management along with a clear direction and strategy on the long-term wholesale deposits.

Risk measurement and Board reporting

Multiple silos, along with required data availability and inconsistency, are the biggest challenges facing each of the Risk and ALM functions. Periodic model validation with micro- and macroeconomic data is another challenge to be focused upon in order to achieve accurate predictive modelling. Establishing a Risk Data Warehouse with a Business Intelligence Competency Center (BICC) would address this.

It is recommended that the Risk Management of the bank measure the performance and risk level of the bank's asset/liability management activities, and report these findings to the Board.

RISK MEASUREMENT

Building synergy between Risk and ALM functions is always a win-win relationship for the bank. The ALM discipline can facilitate and augment the following risk and performance measures for sound business and financial practices, along with providing a single moment of truth:

- measurement of overall balance sheet mix
- measurement of asset, liability and capital variances
- measurement of operational cash flows
- measurement of financial margin
- measurement or projection of the impact of interest movements
- measurement of the level of unhedged foreign currency funds
- assessment of the appropriateness of financial derivatives held

The bank must meet the ALM measurement requirements set out in the regulations. These measurements should be compared to financial targets in the annual business plan and the

budget so that the management can determine whether the bank is meeting its goals. Management may also assess whether there are material variances from the plan that need to be addressed. Comparison of these measurements against historical performance, where possible, can also identify significant trends that may need to be addressed by management.

Similarly, the Risk function can acknowledge the fact that any factor that impacts the value of a balance sheet account or earnings should be measured/monitored in the ALM process.

Given the integration and synergy required in managing Risk and ALM, is it practical for the CRO and Treasurer to interchange their roles? Although there are certain outliers and exceptions, the roles of the CRO and Treasurer require two distinct approaches and outlooks along with a unique bent of mind and skillsets. As the CRO is based in a control function, unlike the Treasurer, he will be significantly more conservative when it comes to asset building. Having said this, being a Treasurer is a specialized function where a thorough understanding of nonlinear products and markets is an absolute necessity. In a similar way, a Treasurer coming from a profit-driven background can be too liberal acting in the capacity of a CRO, but as the regulations are currently becoming very dynamic, the CRO's role is highly technical in nature and becoming equally complex, and a dedicated and refined skillset is required along with a capacity to be a constant learner and voracious reader. In light of this, the CRO and Treasurer should work in a synergistic manner, facilitating each other's data needs while addressing their own.

In most banks there are duplications with respect to data repositories and reporting that can be avoided between Risk and ALM functions. This can be addressed by taking advantage of the Basel Committee on Banking Supervision (BCBS) 239 implementation where a single moment of truth along with risk data aggregation and risk reporting is the need of the moment.

BOARD REPORTING

The metrics established through ALM and RAF policies should be reported to the Board so that the Board can monitor ALM activities to ensure adherence to regulatory requirements and the strategic business plan, as well as to the RAF. Material variances from plan and their causes, as well as the management’s plan to correct those variances, should be included in the report. Management should also provide the Board with a summary on compliance with ALM policy and relevant regulatory requirements. The Board reporting of the ALM portfolio is quarterly.

Template and sample content for reporting

The Sample Board Report on ALM management discussed in Table 2 can be used to monitor the bank’s ALM activities, ensure regulatory compliance, and report findings to the Board. The report compares the important measures of asset and liability portfolio mix, interest/profit rate risk, foreign exchange risk and derivatives use. The proposed template can be adopted or amended for use by a bank.

Information contained in the report can be expressed on a monthly/quarterly basis, a year-to-date basis, or both, depending on the preferences of the Board and the frequency of reporting as per the balance sheet structure and business model.

The frequency, form and content of Board reports on ALM activities should be set out in the ALM or RAF policies.

SYSTEMS AND INFORMATION CHALLENGES/REQUIREMENTS IN MANAGING ALM

Stronger and proactive balance sheet risk management in the evolving economic landscape presents huge challenges for asset and liability management. Recent financial turmoil and tighter liquidity in the global market place has placed greater emphasis on liquidity management with tighter regulations and reporting requirements. Common data and indicators used by asset and liability managers need to be quickly shared with risk departments for sophisticated client behavior modelling and balance-sheet amortizing assumptions. At the same time, asset and liability managers need to focus on interest/profit rate risk management, with the increasing demand for more dynamic simulations and a better understanding of the sources of profitability through FTP. Treasury and risk managers and ALCOs need a robust and comprehensive balance sheet management solution to meet these evolving and dynamic needs.

In the wake of the mismanagement that brought down some of the largest financial institutions, the use of common systems and models for ERM and ALM has emerged as an essential requirement for any bank. Conversely, successful ERM of ALM can be deceptively elusive without access to timely, accurate and comprehensive risk information from throughout the enterprise by use of common sustainable systems and models.

Table 2: Sample Board report on asset/liability management

Part I: Asset/liability mix					
Total assets (in million \$)					
Asset/liability categories	Actual volume	Mix as a % of assets	Limits per policy	Target mix	Variance from plan
Large corporates Financing	\$	%	%	%	%

Part II: Asset/liability growth

Asset/liability categories	Volume (this year)	Volume (last year)	Growth from last year	Projected growth	Variance from plan
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Part III: Operational cash flows (if available, attach a cash flow statement with this report)

	Cash in-flows	Cash out-flows	Planned In-flows	Planned out-flows	Variance from Plan
This quarter	\$	\$	\$	\$	%

Part IV: Financial margin

Financial margin (as a % of total assets)	Actual	Per plan	Variance from plan	Last year	Last quarter
This quarter	%	%	%	%	%
Year to Date	%	%	%	%	

Part V: Exposure to interest/profit rate risk

For example, what is the bank's exposure to a 1% or 2% change in interest rates, on a shock test basis, as at the period ending date of this report
 (Optional: If the bank uses an alternative shock test:)
 Other measures of interest/Profit rate risk exposure, based on a methodology documented in operational procedures?

Part VI: Exposure to foreign currency risk

	Volume \$	As a percent of total assets
How much foreign currency is held as deposits by the bank?	\$	%
How much of this foreign currency is not hedged by loans or derivative instruments?	\$	%

Part VII: Use of derivatives

Derivative transactions currently held by the bank	Notional \$ value	Purpose of the derivative instrument
	\$	
	\$	

Part VIII: Corrective action/strategies

Variance	Corrective action/strategy
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Data are a corporate asset, the value of which is not restricted to what it offers to specific business units. The large data repositories that ERIM demands — and the reuse of common data within those repositories — are forcing improvements in overall data integrity, as well as changes and additions that benefit the banks. This extends ERIM beyond risk management to providing new and important insights into Risk and ALM via the wider perspective of enterprise information management (EIM). At the core of EIM is the essential idea that data must be consistently modelled across the organization in a comprehensive, flexible blueprint — a logical data model (LDM) — that reflects the way the bank uses its data for risk management of ALM. Furthermore, to tailor the information in the LDM to ALM, EIM then requires semantic models for risk management, which represent information as the business users of a Treasury function use it.

CONCLUSION

As described in the previous sections, it is important to focus on enhanced strategic decision-making and improved financial performance, together with a robust governance model and review system. Consolidated risk data for accurate and consistent data are critical to achieving sound ALM. At the core of the solution is the Risk DataMart which, through a vigorous data warehouse, enables multi-user and multi-geographical site connection to a single platform, streamlining simulation and reporting techniques across all legal entities and business units, and providing the ability to aggregate risk data and carry out proactive risk reporting. The infrastructure should have comprehensive data-handling capabilities to offer financial institutions a cost-effective, integrated solution that helps improve data quality. ERM should monitor risks and improve the performance of ALM through vigorous and flexible scenario analytics allowing the risk function to monitor interest/profit-rate risk, covering client behavior modeling, new business and stochastic scenarios. The stress-testing engine should allow risk managers to manage liquidity by calculating the liquidity gap. Risk managers should also keep an eye out for maturing and non-maturing instruments in the balance sheet through the FTP framework, giving a clearer understanding of the organization's sources of profitability. Risk managers should check the pulse through a comprehensive risk management analytics framework covering gap reports, cash-flow and FTP reports, balance sheet and income statements, earnings at risk (EaR), value at risk (VaR) and EVE (economic value of equity) reports, etc. As the business model evolves, ALM managers should proactively identify and add new variables to the above reports, and modify the analytics to meet the ever changing regulatory reporting needs.