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Asset Liability Management: Strategic and Regulatory Issues For Asia Pacific Banks

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Introduction

In this paper, I review current Asset Liability Management (ALM) practices in the Asia Pacific region and discuss the factors driving their evolution towards worldwide best practice. I note that ALM, although aligned with Basel II and market risk management, is a distinct activity crucial for a banks' long term viability. Furthermore, sustainable ALM practice depends on creating real business benefits based on a bank's commitment to a flexible but disciplined ALM process.

Banking Trends in Asia Pacific

Throughout Asia Pacific, several recent trends have emerged: banking consolidation, a competitive landscape of narrowing spreads and yield curve flattening and inversion, increasing market liquidity and integration and increased competition for foreign capital investment. Banks then face the complexity of additional banking regulations. All of this is compounded by the need to take a more comprehensive view of risk and evaluate return opportunities within the bank on the basis of the risk. Banks must understand precisely how they are carrying out their mandate to their increasingly active shareholders.

All of these issues present challenges to Asia Pacific banks. The emphasis is now on the role of risk management in adding business value not merely satisfying regulatory requirements. Let's consider these trends in more detail:

Threatened by foreign entrants and challenged by decreasing margins, many banks seek to increase their market share in existing markets. Volume growth, not improving risk-adjusted returns, has been the first anxious try to protect their revenue targets. The typical result is deteriorating credit quality of asset portfolios, from mortgages to small business loans to credit card lending. Poor credit quality today augers badly for future revenues. Credit risk management and asset and liability management (ALM) will come to the fore as these portfolios demand increasing attention.

Foreign competition also ups the ante for Asia Pacific banks. Fewer banking restrictions means that foreign banks can use their high quality risk management capabilities to identify more precisely the risks that they are taking on in their asset portfolios and decide to either incorporate these risks into their pricing or defer by securitization. Domestic banks unable to do this are left with higher risk, under-priced portfolios by virtue of their risk management limitations.

Squeezed by consolidating volume players, some banks are increasing fee-based revenues from increasingly complex products and services, particularly from their treasury services units, to try to make up for the shortfall, but this has been met with only mixed success. Many banks in Asia Pacific are looking to obtain licenses for advanced derivatives trading for investment and risk management purposes. Again, risk managers, wary of the embedded risks of these products, are more concerned with proactive management of the bank's risk-return profile; they are trying to make these trade-offs more economically clear to institutional stakeholders.

On the regulatory side, most central banks offer compelling capital incentives for institutions demonstrating progress toward compliance with the Basel II Accord and adoption of the IRB approach. The Basel II Capital Accord has been a bellwether for the banking community, a worldwide industry acknowledgement of the importance of governance across the dynamic relationships between capital, risk, and default. While opinions are numerous and varied as to the efficiency and appropriateness of Basel II's somewhat prescriptive set of rules, it is clear that market and financial professionals understand the importance of compliance standards and principles that require and incent a bank to measure and manage consolidated risk and demonstrate capital efficiency to adequately fund and insure this risk, in acceptable levels within a bank's risk appetite.

Many advantages of the advanced approaches to Basel II, notably reduced capital requirements, accrue to the larger banks' ability to take advantage of their scale economies of risk management. Again, this likely fuels consolidation in the banking sector. Although local and regional banks cannot ignore the challenge of Basel II, central banks are slowing its implementation, providing these banks with breathing space to perform the data capture and process change that is so crucial to successful implementation of the advanced approaches.

While IRB approaches are still a goal that may take several years to accomplish, managers have immediate requirements to upgrade risk management practices and identify opportunities for excess returns on a risk-adjusted basis within a comprehensive framework that keeps the principles of Basel II squarely in focus.

What other emerging trends within international banks pose issues for Asia Pacific banks? Risk managers used to only be concerned with risk avoidance and reduction - analyzing rudimentary balance sheet data in a historical context - to make sure that organic banking activities did not produce any top-level risk metrics that exceeded internal risk control limits. This old approach reflected the nature of risk-taking activities within the bank, which favored a "buy and hold" bias. The new trend demonstrates a more flexible response to risk-taking that also incorporates regulatory capital requirements and capital efficiency. The balance sheet is no longer the historical result of accounting entries, but a dynamic and evolving enterprise view of the bank that can be managed and engineered with increasing precision.

As technology and risk management tools have increased in availability, efficiency and integration, the worldwide banking community is acting on the opportunity to refine and expand the scope of risk and ALM methods to the total balance sheet. The trend: integrating risk measurement activities across traditional reporting silos, centrally managing all interest-rate, FX, and liquidity risk in one organizational unit. This unit increasingly places balance sheet management and decision-making ahead of risk mitigation strategies. These risks include the observed and the anticipated risks, for on- and off-balance sheet, and the resulting risk mitigation strategies are not just "buy and hold," but include transferring, selling, and active hedging. This enhanced flexibility to risk management has required more frequent and sophisticated data analysis, more quantitative tools and flexible reporting platforms.

For those that have accumulated incremental success in determining company risks, the results proceed directly to the bottom line: an enhanced understanding and utilization of the bank's risk-return profile to generate excess returns for a given level of risk and a lower volatility of these earnings. Traditional bank measurements, like ROA and ROE, are now recognized as only a part of the picture that relates company performance to the underlying risk. Risk measures like economic capital and risk-adjusted performance measures, such as Risk Adjusted Return on Capital (RAROC) and Shareholder Value Added (SVA), are the new units of risk currency.

In this paper, I will argue that best-practice ALM is an integral part of an enterprise risk management strategy that offers several important benefits to large and small banks looking to begin or refine a disciplined approach to risk management. Rapid consolidation and change in the banking industry has accelerated the evolution of ALM from regulatory reporting function, to interest rate risk management, to total balance sheet management on a consolidated company level. Risk management that complies with the letter and spirit of the ambitious risk frameworks of Basel II requires a nimble, active approach for capturing the nature and sensitivity of risk in the balance sheet. Furthermore, it requires a tool and a process within the bank to extract, analyze, and act upon this information as both a pathway to Basel II compliance and a means to develop a calculated and competitive edge for increasing margins, attracting investment capital, and decreasing the volatility of earnings.

What is ALM and why is it essential for a Bank?

ALM answers three key questions.

- 1) **How much risk does the bank want to take?** This is determined by the ALCO committee to best describe the risk appetite of the bank.
- 2) **How much risk does the bank have now?** This is determined by employing quantitative tools to measure the risks of the bank's assets and liabilities.
- 3) **How do we move from our current risk profile to our target risk profile?** This is determined by assessing the risk-response options available to the bank as part of the ALM process.

ALM is a unique, total balance sheet approach to managing important risks at the enterprise level. ALM deals with the management of all market risks that result from a bank's structural position. This position is primarily created by the bank's intermediation between depositors and borrowers. While ALM is most important for retail and universal banks, a growing trend has seen ALM introduced to trading or investment banks as well. ALM is different from the management of market risk in trading operations because ALM positions are regarded as being comparatively illiquid to the trading portfolio; however, these trading positions could be incorporated into the total balance sheet view of ALM. One example is the growing acceptance in Asia Pacific of Mortgage-Backed Securities (MBS), which could be regarded as either actively traded or held for investment purposes. One common rule of thumb is that positions commonly liquidated within a month are treated as traded instruments in the trading book and captured within the trading book VaR framework. Positions that cannot be quickly liquidated, and any associated hedge instruments, are treated in the ALM framework and called the banking book or accrual book. These positions are separated to prevent the short-term volatility of the trading book volumes and risk sensitivities from adding bias to the long-term process of managing the overall balance sheet risk profile.

It is not critically important where a position is measured as long as it is monitored. A proper ALM system will be able to measure investment positions, like bonds, options, and MBSs as well as forward transactions, even if these positions were transacted at a premium or discount. While the trading book VaR typically has a one-day horizon, ALM risks are managed on longer term horizons, typically monthly, and incorporate more refined assumptions about portfolio-level embedded optionality and customer behavior, as well as forecasted assumptions about new business volumes, rates, and maturity mixes. Most banks hold a significant portion of their business in illiquid positions held over a longer term making an ALM process essential to increased capital efficiency and competitiveness in the market.

By modeling ALM risks, banks are seeking to both minimize risk for a given level of target return and to know how much to charge customers to fund the capital consumed by these risks. Another task of ALM is to determine and minimize the internal interest rates that should be charged between the bank's business units when they lend funds to each other. This concept, called Funds Transfer Pricing (FTP), is the first step toward profitability and performance measurement across product and business lines; it helps the bank determine the component sources of the overall net interest margin.

The primary risks associated with an ALM process are interest rate risk and funding liquidity risk. ALM could also, to a lesser extent, include currency and commodity price risk and it typically incorporates other important balance sheet drivers into the process, such as funding and capital planning, regulatory constraints, taxation and profitability and growth.

Interest rate risk arises from the possibility that net interest income (NII), net worth (NW), and even non-interest income will change if interest rates change. Interest rate risk also affects the bank's capital-to-asset ratio, new business volumes and product mix, as well as the pricing of assets and liabilities. To manage interest rate risk, the structure of the balance sheet has to be developed in such a way that interest rate movements have a highly correlated effect on assets and liabilities. Of course, this is not always feasible when considering the possible yield curve movements that vary from a parallel shift, twist, inversion, flattening\steepening, to an incremental ramp up\down movement over time. Therefore, it is the domain of the ALCO committee to establish limits and metrics for changes in key income and valuation metrics across a range of interest rate conditions. A detailed description of the four types of interest rate risk is listed in the Appendix.

To mitigate interest rate risks, a bank can respond with a variety of core business decisions on balance sheet solutions that involve product mix and pricing of loans, deposits and other borrowings. Or they may reply that the interest rate risk is due to discretionary business decisions on-balance sheet investment or funding strategies that involve rate characteristics or the maturity mix of wholesale funding or investment strategies. A third reply to interest rate risk would be off-balance sheet items, such as derivatives like interest rate swaps, caps, floors, etc.

Funding liquidity risk arises from the possibility of losses due to the bank having insufficient cash on hand to pay customers. Funding liquidity risk involves several sub-classes, the most obvious being the expected funding requirements for scheduled payments and the average level of net deposit outflows across corporate and retail accounts. However, the ALM framework should also include other types of funding liquidity risk including that arising from unexpected or unscheduled demand above or below the mean. As a course of normal business, a bank should be prepared to fund outflows 2 standard deviations above the mean, as this corresponds to a 2% tail probability and is therefore expected to happen five times per year. Finally, the bank should be prepared for crisis funding, especially during times of general market crisis. One need not look further than famous cases like Continental Illinois (USA, 1984), or the recent case of a Chinese Bank (Taiwan, 2006). It is cases like these that prompted the Basel committee to develop principles for managing funding liquidity risk in an ALM framework using stress-testing techniques and simulations.

Both interest rate risk and funding liquidity risk are due to the differences between the bank's assets and liabilities.

ALM Practices in Asia Pacific

ALM has traditionally been viewed by many banks as primarily a cost centre for regulatory reporting. For these banks, ALM is still a monthly event executed by a single junior analyst out of habit and regulatory necessity. Its workflow process and reporting output is unchanging from month-to-month and year-to-year and typically matches the same workflow process and reporting output originally installed by the ALM group. The emphasis is on processing output for reporting purposes, not analysis for strategic balance sheet management.

Often banks rely on poorly documented internal IT systems understood by only a select few within the organization. Many banks in Asia Pacific use outdated Excel spreadsheet systems comprised of multiple worksheet components (just do not update links!). Dynamic income simulation, if performed at all, is restricted to a minimum number of parallel rate shock scenarios with a small number of risk metrics produced. Embedded optionality in deposit and loan positions is usually ignored. Reporting structures, reporting intervals, and account aggregation are inflexible and static without doing additional in-house development. The resulting challenges of system maintenance, additional risk reporting metrics and process improvement quickly cause operational problems when (inevitably) employee turnover occurs. Moreover, as central banks issue additional regulatory requirements and guidance, these systems are poorly designed and staffed to meet the evolving regulatory landscape in a timely way. In short, the risk management challenges of ALM that exist in a fluid, dynamic, and constantly evolving market climate are treated with a process that is rigidly defined and static.

Even worse, a large percentage of banks still perform no regular analysis at all, or they rely on measurements purely from historical results to approximate a view of the perceived risk exposures in the balance sheet. The reality at these banks is that output from such a primitive process is summarily dismissed or ignored during Asset Liability Committee (ALCO) Meetings. Few banks are willing to base strategic decision-making and risk-response from risk profiles of the balance sheet that are not complete or relevant. Lacking the ALM process to manage the interest rate term structure and optimize the risk-return profile, these banks have become warehouses of risk, collecting interest-rate and liquidity sensitivities resulting from an unmanaged organic risk-taking process.

Of those institutions that do run a formal software system, many still operate the original assumptions for forecasting and planning, and reporting requirements from the initial implementation. Here the ALM investment is restricted to the execution of the system and not to the process of managing the ALM model - analyzing critical output, and driving better decision-making by integrating risk *measurement* to the risk *management* response as defined by the risk policy and appetite of the bank. This leads to a vicious cycle as internal teams fail to develop the capabilities to change and manage model assumptions and reporting criteria, or perform any evaluation of model risk or assumptions risk through back-testing and stress testing exercises. ALM system capabilities inevitably decline as they are not updated, usually due to the bank's fear of the unknown.

ALM and Basel II

Pillar II of the 2004 Basel Accord describes principles to promote soundness and fairness in the supervisory process for bank capital management. The goal is to ensure that a bank has a rigorous process for accurate calculating of all risk exposures and sufficient capital is reserved to cover these risks.

Interest rate risk in the accrual book and funding liquidity risk have received significant attention in the Basel framework. While the Basel Committee has issued a series of principles to guide the development of the ALM process as part of Pillar II compliance process, many of the central banks across the Asia Pacific region have addressed interest rate risk in the banking book with more specific recommendations. Central banks from Taiwan, India, Malaysia, Japan, and many other countries have issued guidelines for ALM to meet the important principles for promoting a disciplined approach to ALM.

Such ALM guidelines make sense when one examines the nature of the banking industry in Asia Pacific. While banks are gradually developing more complex products and bringing additional hedging instruments into their portfolios, the preponderance of the business for the retail bank in Asia Pacific is "vanilla" financial instruments like loans, mortgages, deposits, and straightforward investments, such as bonds and government securities.

This section will build the case that ALM is a critical component of Basel compliance and a natural starting point for a quick win toward Pillar II compliance, particularly for banks in Asia Pacific.

The first reason is that in a typical Asian bank, ALM balance sheet risk generally comprises a much higher percentage of the total institutional risk when compared to the typical U.S, European, or Australian bank. Banks in the U.S., for example, have generally been running an ALM system for many years. This commitment and the follow-on experience has resulted in a greater ability to manage the interest rate term structure, garner a lower cost of asset funding and execute an efficient risk response in the course of balance sheet management. The second reason is that banks in Asia Pacific are evolving toward more complex instruments, derivative products and hedging strategies. Assumptions about customer behavior and options models are critical to properly measuring and assessing these new risks.

While credit risk is still dominant at most banks, the reality is that building an internal credit risk database and reporting system could take years. It may require an overhaul of the bank's core banking or general ledger systems or require a re-calibration of the bank's enterprise-wide risk data dictionary to be incorporated into the arduous process of historical data collection and synthesis.

Many banks in Asia Pacific who are serious about developing an internal credit risk database have already started but unless the historical data is already available in some form, most Chief Risk Officers (CROs) believe it will take 2-4 years to collect sufficient historical default and recovery data to reliably estimate probabilities of default (PDs) and losses given default (LGDs).

For banks looking for a quick win on the road to Pillar II compliance while they begin the hard work on the credit side, a basic ALM process system, sufficient to cover the total on and off-balance sheet positions, can typically be developed, implemented and tested in 4-12 months, depending on the size, transaction volumes and complexity of the bank. Moreover, it offers immediate benefits to banks looking to improve margins and better manage capital efficiency.

ALM is an appropriate starting point for better risk management practices in Asia Pacific because it mirrors the business that dominates Asian banks. Most banks house most of the risk in their banking book in illiquid positions, like mortgages, and hold onto maturity fixed income investments. For example, retail banks make money by earning a margin on held-to-maturity assets, above the cost of funding that is paid to depositors. While bank profits may be attributed to the investment portfolio, it is the ability to deliver investment capital from the banking book that allows investment capital to be deployed. Without a sound management of the profit margin in the banking book, a bank might be harvesting capital that could be much better optimized for the amount of underlying risk.

There are several important considerations in developing a balance sheet model, which include:

- Architecture: Does the model allow for easy distributed and/or grid compute to leverage technology? Is the model easily scaleable? Is the technology based on component architecture, such as a service-oriented architecture?
- Modularity: Does the model port well into other systems to take advantage of possible points of integration? Are reporting dimensions dynamic, and does the model allow for on-the-fly changes?
- System Reporting: Is it relatively easy to get assumptions into the model and customizable information out? Are tools available for multidimensional analysis?
- Basel Reporting: Can I cover all of the required regulatory reporting requirements? Can I embed my ALCO policy and reporting limits directly into reporting? Can back-testing and stress-testing be easily initiated and completed?
- Usability: Does the model make the performing of calculations relatively easy?
- Scheduling: Can processes be batch controlled and automated?
- Benchmarking: Can the model be easily benchmarked and tested against known quantities?
- Data: Does the system integrate with a best-of-breed data cleansing, transformation and aggregation tool for position data? Can this tool "fill" and "validate" data? Is it easy to import market data for scenario simulation?
- System support: Is the system supported and maintained internally as a strategic decision making tool? Is the system updated periodically by the vendor? Does the bank (and vendor) have a demonstrated commitment to present and *future* reporting requirements?
- System Maintenance: Is it easy to make changes? Is it easy to create and distribute new reports at the end-user level? Are version upgrades easy to accomplish?

Developing an ALM process is a clear demonstration to local bank regulators of the institution's intent to demonstrate progress on all Pillar II risk measurement processes. Developing an ALM process with the points above, gives a bank the best chance to satisfy Pillar II and local regulatory requirements as they continue to evolve and become more refined.

Note that each of these issues is a general rule of thumb for developing an ALM process that gives the institution an immediate value driver of the process. Depending on the size and structure of the bank, these considerations may be given different weight and importance. For large banks, modularity, computational precision and system power may take precedence, whereas a small bank will prefer usability and a low total cost of ownership and maintenance.

Making ALM useful to the Bank

Regulatory reporting is important and the ability to capture full reporting requirements in an effortless way in the ALM system should be an important consideration. Adopting an ALM system earns goodwill with bank regulators and avoids unnecessary capital charges for not fully covering interest rate risk exposures. The real value in an ALM system is the expected improvement and benefit to operating margins, increased efficiency and precision in risk management processes. ALM is the first step on the important road to developing business line and product profitability measures on a risk-adjusted basis.

With an ALM system, the bank has the ability to simulate not only stress scenarios, such as a 200 basis point increase in interest rates, but also non-parallel shifts, twists and inversions. Many of the tragic stories from financial institutions who failed to properly employ an ALM system stem from assumptions about market correlations that simply cannot be relied upon during extreme conditions. A properly devised ALM process will contain not only regulatory scenarios executed on a periodic basis, but also a series of strategic scenarios based on current market conditions or evolving bank activity trends that suggest increased risk mitigation or vulnerability.

Most ALM processes in Asia-Pacific assume that the world remains constant and that the only independent variables in an ALM scenario simulation are market indices. Real world observation tells us that customer behavior is not only sensitive to interest rates but also to marketing strategies, product re-pricing, competitor action and external macroeconomic factors. Too often banks assume that modeling such dynamics is an unwieldy and impossible task because it gives no better indication of future customer behavior than "back of the envelope" approaches. Here again the trade-off is between the effort expended to model customer behavior and the value it gives in income and earnings simulation. This much is clear: without an attempt to measure the "value" of implicit customer optionality, like mortgage prepayment or savings withdrawals\deposits, the banks are likely to under-price or overprice the cost\profit of these products.

A general rule of thumb in ALM modeling is to keep model assumptions as simple, straightforward and auditable as possible. If a given process of assumptions development and maintenance produces the opposite result, the ALCO committee should be very keen to get involved and ask the business team some pointed questions. This approach represents a role change for ALCO committee members from primary reviewers of ALM policy, analysis and strategy to active participants who guide the risk management team toward appropriate strategies for maximizing the link between model assumptions, review and utility and overall risk management strategy.

For their part, the analysts running the system will be called upon to know and explain the assumption sensitivities of greatest importance to the model and how these assumptions can be measured in a reliable, and visible way. An increasing part of the ALCO process then becomes model review and analysis with oversight from the ALCO committee to avoid any unwanted model bias. This is precisely the process that does not occur at many banks who are simply running basic and minimal scenario simulation, based on unchanging model assumptions from cycle to cycle that are unlikely to represent the most probable observations for market, new business and customer behavior factors. After several months of this, the bank knows that the model does not represent simulations upon which actionable decision-making from the model should be based. The final step is often disregarding the results of the system other than for reporting purposes.

The real question is whether an enhanced approach to ALM is worth the expense, hassle and effort. Several studies have been performed indicating that the effect on after-tax return on assets (ROA) is on the order of 10-15 basis points, and that these results are likely to be encountered and maintained in the initial part of the system "launch" phase. By having access to the required information for strategic hedging and business strategy development, and having the expectation that the system can produce reporting with actionable, intelligent decision response to it, a

bank can quickly control its interest rate, currency and funding risk exposures at a more granular and precise unit of measure.

From an institutional perspective these gains in financial performance are not externally derived. They are the result of having timely, current information available to risk managers as part of an ALM process built to support the ALM decision-making process in the most efficient way.

Conclusion

Banks are faced with a myriad of risk management challenges. In particular, Basel II and market risk prey on the bank's limited attention and limited resources. ALM is often lost beneath the immediate and the urgent, despite offering banks the ability to enhance their risk-return profile in a manner that is most consistent with the business concentration and risk inherent in their balance sheets.

ALM is an integral part of Basel II Pillar 2 requirements. The additional capital charges for an inadequate ALM capability could obliterate the hard won advantages of advanced approaches. ALM is more than market risk; it focuses on the sustainable management of all the bank's assets and liabilities - not just those in the trading book. This paper argues that ALM, rather than being merely a reporting requirement, is a cornerstone of integrated risk management. ALM can provide the conduit for business value provided people and systems work dynamically to respond to the strategic and tactical challenges of real banking.

Appendix I

Types of Interest Rate Risk.

Table-2: Sources of Interest Rate Risk	
Risk Type	Definition
Repricing Mismatch Risk	The most commonly discussed and well understood form of interest rate risk; repricing risk is the measure of risk related to timing mismatches associated with repricing events. Banks intentionally accept mismatch risk in order to improve earnings. Repricing mismatch risk is often, but not always, reflected in a bank's current earnings performance; however, a bank may be creating repricing imbalances that will not be manifested in earnings until sometime in the future. For example: A bank uses a 10-year no-call 2-year funding vehicle to leverage a 10-year bullet-bond purchase. Repricing risk is minimal in years 0 through 2, but exposed for years 3 through 10. A bank that focuses only on short-term repricing gaps may be induced to take on increased interest rate risk by extending maturities to improve yield. When evaluating repricing mismatch risk, therefore, it is essential that the bank consider not only near-term gaps but also long-term repricing gaps. It should also be noted that repricing mismatch can be a cause of hedge ineffectiveness when attempting to apply FAS 133 and IAS-39.
Yield Curve Risk	Yield-curve risk – often confused with basis risk – addresses changes in the relationship between interest rates of different maturities of the same index or market (e.g., a three-month Treasury versus a five-year Treasury). These relationships change when the slope of the yield curve for a given market flattens, steepens, or becomes inverted (i.e., negatively sloped) during an interest rate cycle, which can create significant behavioral incentives across the bank's product market. For example: when long-term and short-term rates are relatively equivalent, the volume of adjustable rate lending may be reduced and long-term fixed-rate lending may increase, as the costs are relatively equal. However, when differences emerge, the incentives can shift, creating important behavioral patterns that should be modeled and captured in the bank's A/L risk management process. Many banks assume scenarios that simply address parallel or proportional curve shift and thus do not effectively measure yield curve risk. The extent to which a bank is mismatched along the term structure will increase its exposure to yield curve risks. Certain complex investments can be particularly vulnerable to changes in the shape of the yield curve, including <i>structured products</i> such as dual index notes.
Basis Risk	Basis risk arises from the non-parallel responses in the adjustment of interest rates among two or more rate indices, or "bases". For example: the index of a variable rate loan that re-prices monthly may be based on a "prime", which changes infrequently, and funded by 30-day certificates of deposit that are based on a LIBOR index, and changes quite frequently. As the loans are based on the "prime" index and the CDs on the LIBOR index, <i>even though maturity is matched</i> , there is still a potential basis risk exposure. Another common form of basis risk is the relationship between non-maturity deposit rates and market rates. The manner in which these deposit basis risks are captured should clearly show the range of exposure to error related to model assumptions made around this risk factor. Many industry practitioners view basis risk as the most significant type of interest rate risk, likely due to the basis risks embedded with non-maturity accounts ¹
Option Risk	Option risk arises when a bank or a bank's customer has the right (not the obligation) to alter the level and timing of the cash flows of an asset, liability, or other instrument. An <i>option</i> gives the option owner the right to buy (call option) or sell (put option) a financial instrument at a specified price (strike price) over a specified period of time. For the seller (or <i>writer</i>) of an option, there is an obligation to perform if the option holder exercises the option. The option owner's ability to choose whether to exercise the option creates an asymmetric performance pattern. Generally, option owners will exercise their right only when it is to their benefit. As a result, an option owner faces limited downside risk (the premium or amount paid for the option) and theoretically unlimited upside reward. The option seller faces theoretically unlimited downside risk (an option is usually exercised at a disadvantageous time for the option seller) and limited upside reward (if the holder does not exercise the option). This is one of the most difficult risks to capture from both an earnings and valuation perspective within the context of a bank's treasury risk management activities.

Appendix II

ALM and Market Risk

One question that banks in Asia-Pacific ask is how an ALM system compares to a Market Risk Trading system. The perception is widely held that a Trading System is “where the money is”, while the ALM process is a cost center. Nothing could be further from the truth.

A market risk trading system is used to manage trading activities around established trading limits, counter-party controls, and basic risk analysis at the point of transaction. It is the process that allows a bank to responsibly acquire and divest of position in its investment portfolio in response to arbitrage opportunities, the changing market climate, and risk positions the bank would like to assume.

An ALM system is concerned with the longer-term view: of market sensitivity, funding liquidity, and the interest term structure sensitivities in the accrual book. Whereas Market Risk Management (MRM) is primarily concerned with one-day Value at Risk (VaR) in the investment book, ALM is concerned with the VaR and Earnings at Risk (EAR) in the positions intended for holding until maturity. A Market Risk system looks at a short-term risk of very liquid positions. An ALM system looks at the longer term risk of relatively illiquid positions. A Market Risk system is looking primarily at the impact of market conditions on investment positions. An ALM system is looking at not only market conditions, but also customer prepayment and deposit behavior, explicit and implicit embedded optionality, and new business planning, funding, and forecasting. The ALM system is concerned with both on- and off-balance sheet positions. Typically, it easily covers normal investment positions. In practice, worldwide ALM practitioners include their investment book in the ALM balance sheet simulations.

As an analogy, think of the balance sheet as the human body. Market Risk Management is akin to eating properly (enough, but not too much) as a critical activity to staying alive. Though concerned with just basic survival, no one would argue with the importance of this activity. ALM, to continue with the analogy, would be concerned not only with staying alive, but with eating healthy for the long term (getting enough vegetables, essential vitamins and minerals, but not too much salt or fat) as well as exercising the mind and body for a durable long-term approach to healthy living.

Which is more critical to overall quality of life? Each is critical and related to the other. So too it is with MRM and ALM. They support each other in the goal of managing the overall health of the balance sheet, but they do so with unique perspectives, time horizons, and areas of focus.

As a result, ALM should be viewed as a process and not an event. You cannot live a healthy life in one day. It is the disciplined commitment to a healthy balance sheet that offers banks in Asia-Pacific a strategic opportunity. ALM would be like going to a doctor every month (or more frequently) for an annual check-up. The immediacy and frequency of the feedback gives the bank a clear picture of how changing events affected the balance sheet in the past cycle, use back-testing methods to see how accurate their internal models proved to be and to give a basis of analysis for how to improve the ALM model in the future.

At the same time, the bank can use a variety of market, customer, and new business planning scenarios in unique simulations to isolate and quantify earnings opportunities and vulnerabilities. The ability to take action from this feedback is precisely where banks experience the payoff to their operating margins, increased capital efficiency, and decreased earnings volatility.