

Optimizing Balance Sheet Optimization- Developing consistently excellent strategies

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Abstract:

This paper introduces key concepts in Balance Sheet Optimization (BSO), Funds Transfer Pricing Systems, and Funding Costs. Financial institutions, including banks and hedge funds, participate in complex capital market activities, involving the trading of both derivative and cash instruments. These activities impact the company's asset and liability profile, and effective management of this profile is vital for business success. The paper aims to introduce essential definitions and market practices critical to developing a robust BSO strategy. It also offers practical examples of BSO strategies with simplified data, allowing readers to adapt and expand these strategies into more sophisticated approaches for managing assets and liabilities.

INTRODUCTION

The spring 2023 banking crisis significantly transformed the lending and borrowing landscape, creating greater uncertainty in funding conditions and capital requirements for many financial institutions. The economic downturn negatively impacted the credit quality of numerous firms, resulting in lower profitability, reduced returns on equity (ROE), and higher risk-weighted assets (RWA). This has bolstered policymakers' intent to propose stricter regulations, requiring financial institutions to maintain higher capital levels as a buffer. The upcoming implementation of Basel III in 2025 may force tertiary banks to take swift actions to retain profitability. Ongoing losses and failures in the financial sector have underscored the critical importance of effective risk management, with even large, supposedly "too-big-to-fail" firms facing severe liquidity crises and requiring substantial financial support to survive. The importance of Balance Sheet Optimization and liquidity management has become undeniable. BSO is a core function for every business, particularly for financial services firms. The BSO team plays a crucial role in managing risks associated with mismatches between assets and liabilities. To ensure a balanced asset-liability structure amid current and projected market conditions, the BSO unit must rely on a diverse funding base. This often involves using Funds Transfer Pricing (FTP), especially

when a financial company has multiple divisions or desks, each with distinct funding needs. This paper is divided into five sections. The first section outlines the structure and main components of a financial company's balance sheet, capital management, funding requirements, and relevant regulations. It also discusses financial ratios that help evaluate business objectives and manage risks. The second section provides examples of BSO practices in regulated financial institutions, emphasizing the pressure from regulations and market forces to optimize liquidity, term gaps, and funding costs. Financial firms with large, complex asset and liability portfolios are facing new challenges dictated by market conditions, necessitating a disciplined internal business model to stay within risk limits and meet regulatory and return targets. The third section highlights the operations of financial institutions, the importance of setting risk limits, and establishing clear business objectives. The fourth section explains Funds Transfer Pricing (FTP) and Term Liquidity Premium (TLP), and their role in managing liquidity risk. The final section concludes with a summary of key points.

In financial accounting, a balance sheet provides a snapshot of a company's financial position at a specific moment in time. It is often seen as a reflection of how a firm operates in the market and its level of risk tolerance. A key goal for financial institutions is to achieve a strong return on capital (ROC). In practice, this involves creating and executing strategies designed to meet a target ROC, considering factors like interest rates, credit dynamics, and economic conditions. Since the onset of the 2008 financial crisis, new capital market strategies and business models have been developed to optimize capital usage.

A balance sheet typically categorizes assets, liabilities, and equity into distinct sections, showing their value at a specific date. Various types of assets and liabilities can appear on a balance sheet, and the following are examples of the most common items found on corporate financial statements.

The balance sheet is divided into three main sections: assets, liabilities, and equity.

1. Assets

The first section lists all the things a company owns, categorized by their liquidity—either as current or non-current. Current Assets (those expected to be converted into cash within one year):

Accounts Receivable (less allowances for doubtful accounts)

Cash and Cash Equivalents, Prepaid Expenses, Inventories, Investment Securities (held for trading), Other Current Assets

Non-Current Assets (long-term assets): Property, Plant, and Equipment (PPE) (less accumulated depreciation), Investment Securities (available for sale/held-to-maturity)

Investments in Associates,

Intangible Assets : (e.g., patents, trademarks) (less accumulated amortization), Goodwill

Other Non-Current Assets (e.g., deferred tax assets, lease receivables)

2. Liabilities

The second section lists the company's obligations, which are divided into current and non-current liabilities.

Current Liabilities (debts due within one year): Accounts Payable, Current Income Tax Payable, Current portion of Loans Payable, Short-term Provisions, Other Current Liabilities (e.g., unearned revenue, deposits)

Non-Current Liabilities (debts due after one year): Loans Payable, Issued Debt Securities (e.g., bonds, notes payable), Deferred Tax Liabilities, Provisions (e.g., pension obligations)

Other Non-Current Liabilities (e.g., lease obligations)

3. Equity

The final section of the balance sheet represents the ownership interest of shareholders, showing how the company financed its assets. The total assets equal the combined total of liabilities and equity.

Shareholders' Equity: Paid-in Capital, Share Capital (ordinary and preference shares) Share Premium (less treasury shares and unrealized gains on investments), Retained Earnings, Revaluation Reserve, Legal Reserve and Special Reserve, Minority Interest (non-controlling), Accumulated Other Comprehensive Income

A bank usually splits the Balance Sheet into 5 categories: Trading assets, deposit and lendings, balance sheet assets and liabilities, long term assets and fixed assets and treasury and interbank assets.

The balance sheet operates on the principle of double-entry accounting, where assets always equal the sum of liabilities and equity. This is because the company acquires its assets either by borrowing money (liabilities) or by receiving investments from its owners or shareholders (equity). The equation can be expressed as:

Assets = Liabilities + Shareholders' Equity

In simpler terms, shareholders' equity represents the portion of the company's total assets that are financed by the shareholders, rather than through borrowing or other forms of debt. It reflects the capital contributed by the owners, plus any retained earnings (profits reinvested into the business rather than distributed as dividends), as well as any adjustments such as asset revaluation or unrealized gains on investments. In essence, the equity section shows the claim that shareholders have on the company's assets after all outstanding debts are settled, offering a snapshot of the company's financial health and its ability to generate value for its owners. After covering the basic components of a financial company's balance sheet and the key financial ratios used to evaluate profitability and asset quality, the focus will shift to developing a strategy for effective Balance Sheet Optimization. This strategy involves key aspects such as money market operations, hedging strategies, and the creation of a well-structured internal business model. A crucial element of this model is the use of funds transfer pricing during the lending process to ensure proper allocation of capital. Financial institutions operate under strict regulatory oversight. The Basel Committee on Banking Supervision plays a central role in fostering

international cooperation on banking supervision and strengthening global risk management practices. This committee includes representatives from numerous countries, with observers from organizations like the European Banking Authority, the European Central Bank, the European Commission, the Financial Stability Institute, and the International Monetary Fund.

Within a financial institution, capital is allocated across different activities, often divided into two main categories: the banking book and the trading book. The key difference between the two is that assets in the banking book are typically purchased and held until maturity, while assets in the trading book are intended for short-term ownership, usually less than six months. Each of these books follows distinct accounting and regulatory treatment. The banking book operates under the accrual accounting method, recording income and expenses over time, while the trading book uses a mark-to-market approach, adjusting asset values daily to reflect current market conditions and directly affecting the profit and loss statements.

The Basel 3.1 Notice of Proposed Rulemaking (NPR) is a set of proposed changes to banking regulations, focused primarily on the Basel III framework which aims to strengthen the regulatory standards for banks in the wake of the 2008 financial crisis. The changes address various aspects of capital adequacy, liquidity, and risk management, intending to make banks more resilient to financial shocks and improving the stability of the global banking system. The Basel 3.1 NPR incorporates new measures and adjustments to

previously proposed rules, reflecting ongoing refinements and responses to market conditions, regulatory feedback, and lessons learned from the financial crisis.

The Basel III framework was introduced by the Basel Committee on Banking Supervision (BCBS) in response to the financial crises of 2007-2009. The framework aimed to ensure that banks maintain higher capital reserves and improve their ability to withstand financial stresses. Basel III increased capital requirements, introduced new liquidity standards, and set additional risk management protocols for global banks.

Basel 3.1, also known as the Basel III Finalization, refers to the amendments made to the original Basel III framework to address the criticisms and limitations identified during the implementation phase. The Basel 3.1 NPR is a proposed update by U.S. regulators (specifically the Federal Reserve, FDIC, and OCC) to adopt the new Basel 3.1 standards and tailor them to the U.S. banking system's needs. The Basel 3.1 NPR proposal is structured around several key areas: capital requirements, risk-weighted assets (RWA), leverage ratio, liquidity, and the transition to a more stringent approach to the banking system.

Revised Capital Requirements : One of the central elements of Basel 3.1 NPR is the increase in capital requirements. Under the original Basel III framework, banks were required to maintain higher levels of common equity tier 1 (CET1) capital, but Basel 3.1 further refines this. Key aspects include: Increased Capital Conservation Buffer (CCB): Basel 3.1 proposes increasing the Capital Conservation Buffer to 4.5% of risk-weighted

assets (RWA), up from the 2.5% required under Basel III. This buffer ensures banks have sufficient capital to cover unexpected losses, reducing the risk of insolvency during periods of financial stress. CET1 Capital Requirement: The CET1 requirement, which was initially set at 4.5%, would now be accompanied by an additional buffer. The final required CET1 capital would be around 8%, including the combined buffer.

Leverage Ratio: The leverage ratio under Basel 3.1 is tightened to ensure banks are not excessively leveraged relative to their capital. The minimum leverage ratio requirement would be set at 3%, ensuring that banks hold enough capital to absorb losses before reaching insolvency. Total Capital Requirement: The total capital requirement (which includes CET1, Tier 1, and Tier 2 capital) would be increased to ensure that banks maintain an adequate buffer to absorb shocks.

Revisions to Risk-Weighted Assets (RWA) - The calculation of Risk-Weighted Assets (RWA), which determines the amount of capital a bank must hold against its assets, is one of the most significant changes in Basel 3.1. Basel 3.1 revises the way in which RWA is calculated, particularly for certain asset classes such as credit risk, market risk, and operational risk.

Revised Credit Risk Framework: Basel 3.1 includes modifications to the calculation of RWA for credit risk. This includes more conservative treatment for certain high-risk assets, and a recalibration of risk weights for both sovereign and corporate exposures.

Market Risk: Basel 3.1 revises the framework for market risk by introducing more stringent rules for the calculation of market risk-weighted assets. This is particularly important for

banks engaged in trading activities, as it requires them to hold additional capital against market risks, such as fluctuations in interest rates and foreign exchange.

Operational Risk: Operational risk, which involves losses from failures in internal processes, systems, or external events, is recalibrated under Basel 3.1. The new framework introduces a standardized approach for calculating operational risk capital, replacing the previous models that allowed banks significant flexibility in their assessments.

Liquidity Requirements and Net Stable Funding Ratio (NSFR) -

Another key component of the Basel 3.1 NPR involves refining the liquidity requirements established under the Basel III framework. Basel 3.1 proposes adjustments to the Net Stable Funding Ratio (NSFR) and Liquidity Coverage Ratio (LCR): Liquidity Coverage Ratio (LCR): Basel 3.1 increases the minimum LCR requirement, ensuring that banks have sufficient high-quality liquid assets (HQLAs) to withstand short-term liquidity shocks over a 30-day stress period. This is aimed at improving the resilience of banks to liquidity crises.

Net Stable Funding Ratio (NSFR): The NSFR is a longer-term liquidity measure that assesses whether a bank has sufficient stable funding sources to support its activities over a one-year horizon. Basel 3.1 aims to tighten this requirement to ensure that banks have a stable funding profile that is less reliant on short-term funding sources.

Output Floor: Another significant proposal in Basel 3.1 is the Output Floor, a rule designed to ensure that banks cannot reduce their capital requirements below a certain level based

on internal models. The Output Floor is set at 72.5%, meaning that banks' internal models for calculating RWAs cannot produce lower capital requirements than 72.5% of the requirements that would be calculated under a standardized approach. This adjustment aims to reduce the variability in RWAs across institutions and ensure that no bank is undercapitalized due to overly optimistic risk models.

Enhancements in Supervisory Monitoring and Reporting : Basel 3.1 introduces enhanced requirements for the monitoring, reporting, and disclosure of capital and liquidity positions. These include:

Increased Transparency: The NPR proposes requiring banks to provide more granular disclosures regarding their capital adequacy, liquidity positions, and risk management practices. This is intended to improve the ability of regulators and market participants to assess the financial health of institutions.

Supervisory Stress Testing: Regulators would have more rigorous stress-testing requirements to assess how banks would perform under adverse scenarios. This includes both macroeconomic shocks and firm-specific risks.

The implementation of the Basel 3.1 NPR would have significant implications for banks, regulators, and the financial markets.

Increased Capital Requirements: Banks would be required to maintain higher levels of capital, ensuring they have a stronger cushion to absorb losses. This could reduce the risk

of financial instability but might also lead to reduced profitability for banks in the short term as they adjust to the higher capital standards.

Stronger Risk Management Practices: The changes in risk-weighted assets and liquidity requirements would likely encourage banks to adopt more robust risk management practices, particularly in areas such as credit risk and liquidity management.

Global Consistency: Basel 3.1 aims to enhance global consistency in banking regulations, which could help level the playing field for banks across countries. By harmonizing capital and liquidity requirements, Basel 3.1 reduces the risk of regulatory arbitrage, where banks seek to take advantage of more lenient rules in certain jurisdictions. (Nagesh, A. (2024).

Financial statements are an essential tool for evaluating a company's financial health and performance. These formal documents serve to record and summarize the financial activities of businesses, including banking institutions and trading firms. They provide a comprehensive overview of a company's financial position at any given time and offer insight into its performance over a defined period. Financial statements are crucial for decision-making processes by various stakeholders, such as investors, creditors, regulators, and management. They provide valuable information about how well a company is managing its resources, liabilities, and generating profits, which in turn supports economic decisions such as investments, loans, and strategic planning.

The primary purpose of financial statements is to deliver a clear and accurate picture of a company's financial status. These statements usually include the balance sheet, income statement, cash flow statement, and statement of changes in equity. Each of these

documents offers insights into different aspects of the company's operations, such as assets, liabilities, revenues, expenses, and profits. However, these raw figures need to be analyzed and interpreted in the context of business performance. This is where financial ratios come into play. Financial ratios are calculated using the figures from the financial statements and serve as indicators to assess a company's financial health, performance, and overall stability. These ratios allow for the evaluation of various factors such as liquidity, profitability, efficiency, and leverage. Financial analysts, business managers, investors, shareholders, creditors, and other stakeholders often use these ratios to make informed decisions. By calculating and analyzing these ratios, a company can identify areas of strength and potential weaknesses, helping to guide strategic decisions and improve performance.

Key Financial Ratios and Their Use

In the analysis of a company's financial health, several financial ratios are commonly used. These ratios are divided into categories based on the specific aspect of performance they measure, such as liquidity, profitability, or efficiency. Below are some of the key ratios that are vital in assessing the financial position of a business.

1. Liquidity Ratios: Current Ratio

The current ratio is one of the most widely used liquidity ratios, which provides insight into a company's ability to meet its short-term liabilities using its current assets. It is calculated by dividing total current assets by total current liabilities. A higher current ratio indicates a company's stronger ability to cover its short-term obligations. Conversely, a ratio that is too

high might suggest that the company is not utilizing its assets efficiently, while a ratio that is too low could indicate a potential liquidity crisis.

The current ratio is crucial for assessing a company's operational efficiency and financial resilience, especially in times of market volatility or economic uncertainty. In general, a current ratio greater than 1.0 suggests that the company has enough assets to cover its liabilities, though industry standards may vary.

2. Net Interest Income (NII)

Net Interest Income (NII) is a traditional source of revenue for financial institutions, particularly banks. NII represents the difference between the income generated from interest-bearing assets (such as loans and investments) and the cost of servicing liabilities (such as interest payments on deposits and borrowings). The calculation is straightforward: $NII = \text{interest income from assets} - \text{interest expense on liabilities}$. This metric is particularly relevant for banks, as it indicates how effectively they are managing their interest income and the cost of funding. By optimizing the spread between the interest earned on loans and investments and the cost of funding, banks can enhance their profitability. A bank's ability to increase NII over time can be an indicator of its financial health and its capacity to generate sustainable profits from core banking operations.

3. Net Interest Margin (NIM)

The Net Interest Margin (NIM) is a key profitability ratio used to measure the efficiency of a bank or financial institution in generating income from its interest-earning assets. It is calculated as the difference between the interest income earned from assets and the interest expense paid on liabilities, relative to the average value of the institution's interest-earning assets. A higher NIM indicates that a financial institution is better at managing its interest rate spread between the income generated on its assets and the cost of its liabilities. This margin is vital in determining a financial institution's overall profitability, as it reflects how efficiently the bank is utilizing its assets to generate revenue. For example, if a bank increases its interest-earning assets without increasing its cost of funding, it can improve its NIM and profitability.

Example of NIM in Practice: JP Morgan, for instance, reported a net interest margin (NIM) of 2.93% in Q4 2023, an increase from 2.86% in the previous quarter and 2.9% from the same quarter in the previous year. This improvement in NIM demonstrates how the bank was able to optimize its interest income while managing its cost of funding. In this case, despite a slight decrease in the average yield on interest-earning assets (4.04% vs. 4.26% in Q4 2022), Citi's funding costs fell significantly, helping to offset this decline and ultimately improving profitability.

4. Return on Assets (ROA)

The Return on Assets (ROA) is a key profitability ratio that shows how effectively a company uses its assets to generate profits. ROA is calculated by dividing Net Income by Average Total Assets. This ratio is particularly useful for assessing how well a company is utilizing its

asset base to produce earnings. A higher ROA suggests that a company is efficiently using its assets to generate profits. The ratio can vary significantly across industries, with capital-intensive industries generally having a lower ROA due to the need for substantial investments in physical assets. For example, companies in the tech or service sectors, which require fewer physical assets, tend to have higher ROAs than manufacturing companies, which rely on expensive infrastructure and machinery.

Example of ROA in Practice: For instance, a company that generates \$10 billion in net income with \$100 billion in total assets would have an ROA of 10%, meaning it generates 10 cents of profit for every dollar of assets it controls. This metric is valuable for comparing companies within the same industry to gauge their relative efficiency in using their assets.

5. Return on Equity (ROE) : Return on Equity (ROE) is another critical measure of profitability, focusing specifically on the return generated for shareholders. ROE is calculated by dividing Net Income by Shareholders' Equity. This ratio is vital for evaluating how well a company is utilizing the capital invested by its shareholders to generate profits. A higher ROE typically indicates that a company is effectively using shareholder funds to generate earnings. Conversely, a low or declining ROE may suggest inefficient use of equity capital or declining profitability. ROE is often used by investors to compare the profitability of companies within the same industry. A consistently high ROE can be a sign of strong management and operational efficiency, whereas a low ROE may indicate poor financial performance or over-reliance on debt.

Capital represents a relatively small amount of shareholder equity that is used as leverage to support a much larger portfolio of assets—often by a factor of 10 to 20 times. This capital is typically not directly invested or lent to customers; instead, it serves as collateral to secure borrowing, which is then used to fund loans that generate revenue. Before the 2008 financial crisis, many financial institutions operated with high levels of leverage, meaning they used a small base of capital to back a large volume of assets.

While lower equity and higher debt might seem like a way to boost returns, this approach carries significant risks. With less equity, financial institutions have a smaller buffer to absorb defaults or investment losses. This reduction in liquidity increases the vulnerability of these institutions to sudden cash withdrawals or difficulties in refinancing debt. For instance, Lehman Brothers, in its final year before collapse, reported a staggering leverage ratio of 30.7 times—meaning it held \$691 billion in assets against just \$22 billion in shareholder equity.

To mitigate such risks, modern banking regulations set limits on how much leverage financial institutions can take on. These rules are designed to ensure that banks are not overexposed to high-risk investments and that they maintain sufficient capital to withstand losses while still being able to meet withdrawal demands. One of the main frameworks governing capital requirements is the Basel Accord, developed by the Basel Committee on Banking Supervision at the Bank for International Settlements (BIS). Basel III, which was

implemented after 2012, introduced stricter capital standards to address the shortcomings revealed during the global financial crisis.

The Basel III framework specifies that banks must hold a certain percentage of their assets in capital to serve as a financial cushion. This capital is divided into two main categories: Tier 1 and Tier 2. Tier 1 capital is considered the more crucial of the two, primarily comprising shareholder equity and disclosed reserves. Tier 2 capital, or supplementary capital, includes items such as undisclosed reserves, revaluation reserves, general provisions, hybrid instruments, and subordinated debt. These requirements are designed to ensure that banks have enough capital to absorb financial shocks and remain solvent during periods of economic strain.

The term "gap" refers to the difference in the timing between when a financial institution's assets mature and when its liabilities mature. This gap typically arises from the nature of banking operations, where banks often borrow short-term at lower interest rates and lend long-term at higher rates. This practice aligns with the general shape of the yield curve, which typically slopes upwards: banks borrow money for short periods at lower interest rates and lend it for longer periods at higher rates, creating a natural maturity mismatch.

A liquidity crisis occurs when funding sources suddenly dry up, leading to financial strain. To prepare for such events, liquidity stress tests are used to estimate potential funding shortfalls and determine the institution's ability to manage them under extreme conditions. These tests provide important metrics that show how the bank would perform under stress scenarios, helping to identify potential vulnerabilities.

At the core of a financial institution's strategy, the management board plays a critical role in establishing the organization's financial policies, target capital ratios, and leverage ratios. Annually, the board also sets the institution's expected return targets, which are closely tied to the institution's overall risk tolerance. These risk exposures could involve various categories such as credit risk, directional gap risk, inflation risk, and sector-specific risks. It's crucial that the board sends a clear message aligned with the risk appetite of both the management team and the shareholders. This guidance is then translated into actionable strategies by different business units, each operating within defined risk and trading limits.

Several key limits help maintain financial stability, including:

Funding Gap Limit: This defines the maximum allowable mismatch in the maturity of assets and liabilities that the institution can sustain.

Leverage Limit: This determines the maximum multiplier of the institution's base capital that can be used.

Funding Limits: These set restrictions on how much of the institution's assets can be funded through specific types of liabilities.

The target returns must be sustainable throughout the business cycle, clearly understood, and aligned with shareholders' expectations. These returns are typically expressed through key financial ratios such as Return on Assets (ROA), Return on Equity (ROE), and Return on Capital (ROC).

To mitigate or manage risk exposure, financial institutions often use derivatives. The purpose of this risk management strategy is to allow the institution to expand its business activities while remaining within acceptable risk limits, as defined by the board's return targets.

An essential component of managing returns across different business lines is the concept of Funds Transfer Pricing (FTP). FTP refers to the cost at which a business unit within a financial institution, typically the Treasury, provides funds to other business units. The importance of FTP is twofold:

Enforcing Discipline: By assigning an internal cost to funds, FTP ensures that business units are held accountable for the cost of capital they use, promoting efficient capital allocation.

Impact on Business Returns: The FTP directly affects the profitability of business units, as it determines the cost of funds used to generate income.

A well-structured FTP strategy, along with clear return targets and an optimal capital allocation policy, forms the foundation for high-level risk management within a financial institution. It ensures that the business units operate efficiently, manage risk appropriately, and contribute to the institution's overall financial health while adhering to the strategic objectives set by the management board.

Why is Treasury so important:

An efficient organizational structure is essential for a financial institution to effectively manage the various risks it encounters. Over the years, the significance of a dedicated risk management function within banks has grown substantially, becoming one of the most integral components of a successful financial business model. At the heart of this risk management structure is the Asset and Liability Management (ALM) function, which is typically centralized within the Treasury department. In many institutions, the ALM desk works closely with the risk management team to oversee and mitigate risks across the organization. The Treasury's central role in managing risk is pivotal, and a well-structured Treasury unit is responsible for distributing risk management duties throughout the entire institution. This unit continually collects and reviews risk reports from various departments within the company to monitor and control the institution's overall exposure. The centralized Treasury unit (CTU) serves as the backbone for ensuring that risk management practices are cohesive and standardized across all areas of the institution. Within the Treasury, a designated risk manager may be responsible for overseeing the ALM function, which includes managing interest rate and liquidity risks across all of the institution's trading activities. It is critical that individual business units—whether they be involved in special situations, project finance, structured finance, or private banking—do not take on significant liquidity or interest rate risks without oversight. If these risks were to be managed separately by each department, senior management would face considerable difficulty in controlling and monitoring the organization's overall risk exposure. Instead, the ALM desk manages interest rate risks at an aggregated level, pooling risks from various desks within the bank. In addition to managing interest rate risks, other types of risks generated by individual business lines, such as credit risk, are also handled at a consolidated level. These risks are often managed by a distinct risk management desk that ensures

all risks within the institution are appropriately accounted for. The CTU plays a critical role in defining and enforcing risk policies, which set specific limits on the exposure to various risk factors, including interest rate risk, liquidity risk, and credit risk. These policies are designed to ensure that risks are controlled within acceptable boundaries, preventing any individual unit or business line from taking on excessive risk that could jeopardize the institution's stability. A key aspect of risk management in the banking sector revolves around managing the interest rate exposure associated with the bank's asset and liability portfolio. This exposure arises because interest rates fluctuate continuously, creating risks for the institution as the value of assets and liabilities can change in response to rate movements. The primary risk the bank faces is related to floating rate assets and liabilities, where interest rates are reset periodically, potentially leading to mismatches between the rates at which assets and liabilities are funded. Additionally, the secondary risk involves liquidity management, as assets must be financed on a continuous rolling basis unless their terms and amounts match exactly with corresponding liabilities. When assets are held at a fixed interest rate, any increase in market interest rates leads to a decrease in the net present value (NPV) of those assets, which in turn reduces their value to the bank. Conversely, when interest rates decrease, the NPV of fixed-rate assets increases, enhancing their value. Floating-rate assets, however, present a lower level of interest rate risk since their rates are periodically adjusted in line with market conditions. Therefore, the risk exposure to movements in the yield curve is less significant for these assets. The fluctuations in interest rates affect the prices of both fixed and floating rate assets, creating ripple effects across the bank's balance sheet. These rate dynamics can lead to liquidity stress if the bank is unable to effectively manage its funding sources or if mismatches between the maturities of assets and liabilities occur. Furthermore, the changes in asset values due to interest rate movements also affect the overall leverage of the balance sheet, as the cost of borrowing may change, which in turn influences the bank's capital structure and risk profile. To illustrate these

concepts, let's consider an example in which a financial institution holds \$100 worth of assets. These assets are financed by \$80 worth of debt and \$20 in equity, giving the bank a target leverage ratio of 5:1. This means that for every dollar of equity, the institution has \$5 worth of assets. If the interest rates rise, the NPV of the fixed-rate assets decreases, and the institution may face a reduction in the overall value of its assets. This could lead to an increase in leverage and, potentially, liquidity strain if the bank is unable to adjust its funding arrangements. On the other hand, if interest rates fall, the NPV of the assets would rise, improving the value of the bank's balance sheet and enhancing liquidity. This example highlights the importance of effective risk management, particularly in terms of how the Treasury handles interest rate exposure and liquidity management. The centralized management of these risks through the ALM desk ensures that all activities across the bank are aligned with the institution's broader risk tolerance and strategic objectives. By continuously monitoring and managing these risks, the Treasury can help maintain financial stability, optimize returns, and minimize the negative impact of interest rate fluctuations on the bank's overall performance.

If the asset price increases by 1% to 101, the leverage ratio will drop to approximately 4.8 (calculated as 101/21), assuming that the debt remains relatively unchanged despite small fluctuations in total assets. To maintain the target leverage ratio of 5, the firm would need to take on additional debt to restore the balance. Conversely, if the asset price declines from 105 to 102, the equity value will decrease, resulting in a higher leverage ratio of 5.6 (calculated as 102/18), exceeding the target leverage of 5. This situation would force the firm to sell assets to reduce debt and restore the desired leverage. This dynamic illustrates the pro-cyclical nature of leverage, which tends to be high during economic booms and lower during recessions. Consequently, fluctuations in asset prices have a direct impact on

liquidity. In periods of rising asset prices, liquidity tends to be abundant, while in downturns, liquidity may become scarce. Financial institutions must closely monitor and actively manage these risks and their asset-liability management (ALM) profiles to withstand sudden market liquidity shocks and ensure adequate funding for their assets.

Funding liquidity refers to an institution's ability to meet its financial obligations as they come due. Funding liquidity risk arises when an organization may become unable to settle its obligations. A drop in asset prices increases funding liquidity risk, which in turn raises the cost of obtaining funds. The recent financial crises have underscored the need for improvements in managing liquidity risks and enhancing the funding liquidity of financial institutions. As a result, one of the primary responsibilities of the ALM desk is to manage the bank's overall interest rate exposures across all its operating units. In practice, there will always be some degree of mismatch between the assets and liabilities of a bank—whether in a simple or more complex model—due to the differing objectives of various business units within the institution.

Equating Balance Sheet Optimization and Funding and Liquidity Management

The concept of funding liquidity refers to the ease with which borrowers can access external funding. If an organization faces difficulty borrowing funds when needed, it could experience a liquidity shock. Such a shock may arise from various factors, including clients withdrawing excess free cash, liquid portfolios being pulled out, or an inability to roll over debt. Clients may "run" or withdraw their assets if they become concerned about the firm's

liquidity. There are typically two conditions that trigger a client run: first, the client perceives a threat to the financial stability of the organization, and second, as withdrawals increase, the firm's liquidity is weakened, which exacerbates the situation and may lead to further withdrawals. Therefore, it is crucial for financial institutions to mitigate the effects of such runs on their liquidity and reduce their reliance on funding that is prone to these types of withdrawals. They must also work to minimize customer incentives to pull out their funds in the first place.

To meet client expectations and ensure liquidity stability, financial institutions must manage asset-liability management (ALM) gap risk effectively. They should maintain an adequate liquidity buffer to meet asset obligations. Additionally, regulations from the Bank for International Settlements (BIS) and competitive pressures from the market drive the need for firms to optimize their funding charge functions. The goal for financial institutions is to secure funding at the lowest possible cost, whether it is obtained from the foreign exchange market, over-the-counter (OTC) markets, or through other prime brokers. At the same time, they must ensure that the funding charge covers or exceeds their operational costs, thereby ensuring profitability while maintaining sufficient liquidity. For instance, prime brokers earn fees or spreads from financing clients' long and short positions in cash and securities. Dealers rely on clients' assets in two key ways: by offering cash loans to one client funded by the cash of another client, or by using clients' securities as collateral to secure the broker's own borrowings. If a client decides to withdraw their assets, the broker must replace them with other uncommitted assets. An asset/liability mismatch occurs if the broker is unable to replace the withdrawn assets. In such a scenario, the broker would

have to sell assets in the market or raise new capital, both of which can be costly. While it is common for financial organizations to use clients' assets to fund their activities, this practice makes the firm vulnerable to runs. If a broker is unable to substitute the withdrawn assets from alternative sources, its credibility is undermined, making it more expensive to obtain new funding. When clients become aware of such liquidity issues, they are likely to withdraw their assets before the organization collapses. A "run" happens when a significant number of clients withdraw their funds, fearing the organization may become insolvent. As the run progresses, the risk of default increases, which encourages even more withdrawals. This can create a cycle that destabilizes the organization to the point of bankruptcy. The withdrawals experienced by Lehman Brothers' customers during the financial crisis are a prime example of how runs by prime brokerage clients contributed to the collapse of financial institutions. The role of large brokers is crucial in the financial system, and the potential for client runs remains a significant concern. It is, therefore, essential for financial institutions to actively work to reduce customer incentives to withdraw funds and to mitigate the impacts of such runs on their liquidity. The effects of client runs should be carefully analyzed, and institutions must account for the risk of such events in their funding strategies. As previously mentioned, funding liquidity is the ability to meet financial obligations when they come due. Funding liquidity risk refers to the potential inability of an organization to settle its obligations when required. A decline in asset prices increases the risk of funding liquidity, which leads to higher costs when securing funds. The financial crises have clearly demonstrated that more needs to be done to reduce liquidity risks and strengthen the funding liquidity of financial institutions.

Optimization vs Internalization

To optimize credit charges and manage ALM Gap risk effectively, financial firms need to implement a profitable risk-taking strategy that is based on the actual cost of funding. This is easier to achieve when firms establish a dedicated department, such as Treasury, to manage all risks associated with the organization. Treasury is responsible for properly allocating these risks to the firm's various products and services, as discussed in Section 4.1. Centralizing risk management within the Treasury ensures that responsibility for managing all risks is consolidated. To enhance risk understanding and improve management, banks should adopt a critical process known as Funds Transfer Pricing (FTP).

Recognizing the importance of FTP in mitigating enterprise risk has generated renewed interest in this technique, both within regulatory frameworks and industry practices. Following the market volatility that began in 2007, FTP has been identified as a key factor that allowed certain banks to better navigate market turbulence. However, implementing FTP can be complex due to the intricate internal control systems in place at many banks.

While the advantages of FTP are clear, accommodating the specific needs of various business lines within large organizations can be challenging, requiring the FTP system to reflect the unique characteristics of the firm's funds and objectives. Through the FTP system, the risks associated with ALM gaps are explicitly charged to the relevant business lines, products, and customers, with all risks centrally accounted for within the Treasury. The internal funding structure of the bank plays a crucial role in establishing clear criteria for issuing funding charges related to the liquidity risk placed on the balance sheet by each

business unit. If the funding rate is set unrealistically low in the presence of an ALM gap, the bank may struggle to manage risk exposure effectively. Conversely, an excessively high funding rate could adversely affect planned return targets, leading to lower actual returns.

FTP is a vital element in a bank's profitability measurement process, enabling banks to:

Centralize the management of interest rate risk. Provide consistent pricing guidance for products across business lines. Set profitability targets for individual business units.

Measure profitability separately from interest rate risk. Being able to assess risk-adjusted profitability is essential for strategic decision-making in large, complex institutions.

Although the benefits of FTP are widely acknowledged, establishing a proper FTP curve is not always straightforward, as it depends on the organization's complexity, global return targets, and BSO gaps. The FTP process involves defining a yield curve, which may differ from the bank's ideal funding curve (the COF curve), to account for contingent risks associated with the BSO profile. A well-calibrated internal FTP curve enhances the bank's self-sufficiency in funding and reduces liquidity gaps. This FTP curve should reflect the liquidity characteristics of the assets tied to various businesses and accurately represent the true cost of funding. A uniform cost of funds would fail to address the liquidity challenges of pooled assets on the balance sheet. The FTP concept should include at least two components: the direct cost of funds (derived from the interest rate curve) and the indirect cost of liquidity.

The liquidity cost consists of several sub-costs:

Liquidity mismatch cost: This arises from differences in the liquidity and interest rate tenors.

Contingent liquidity risk cost: The expense of holding liquid assets as a buffer to cover unexpected liquidity gaps and the risks of funding roll-overs.

Diversified liquidity risk cost: This includes costs related to specific currency or jurisdictional risks, as well as risks from capital controls.

In firms with established funding policies, business lines pay or receive the relevant FTP rate when interacting with the Treasury. Large financial institutions with diverse business operations may have multiple pricing curves, but typically, there is one reference funding curve, determined by the bank's unsecured cost of funding (COF) curve. The Treasury then applies the appropriate FTP charge to each business unit. While this is a basic form of FTP implementation, it's important to recognize that different business units may have different COF curves.

To build an effective FTP curve, it is essential to reflect the true cost of liquidity for the bank—essentially, the extra borrowing costs associated with raising longer-term funds due to liquidity needs. The starting point is the rate at which the bank can raise funds, typically represented by its primary issuance. From this curve, the credit component must be stripped away to focus solely on the term and liquidity premiums. Various proxies for liquidity can be used, such as the difference between the funded and unfunded rate for the bank or the credit default swap (CDS) basis. The CDS basis, in theory, reflects the cost of borrowing cash and the liquidity premium that the bank incurs over its pure credit risk.

Conclusion

The ongoing global financial-economical-geopolitical crisis has significantly altered the landscape for lending and borrowing, leading to heightened uncertainty in funding conditions and capital requirements for many financial institutions. Since the financial turmoil of 2008, the focus for banks and financial firms has shifted toward improving productivity and profitability. Shareholders now demand higher returns, placing organizations under pressure to boost their profitability, optimize capital efficiency, and ensure they can weather liquidity crises. Given the various risks they face, financial institutions must develop a strategy that allows for profitable risk-taking. These risks, and their associated costs, must be properly allocated to the products and services offered to clients. Establishing a centralized unit, such as a Treasury, is essential for optimizing this function and achieving organizational goals. The Treasury will be accountable for identifying, managing, and reporting on these risks. By optimizing credit charge functions, financial firms can secure long-term benefits, address asset/liability mismatches, better understand their funding requirements (both unsecured and long-term), ensure stability during liquidity crises, and reduce reliance on unsecured funding. In this context, a robust Balance Sheet Management function with a clear mandate for optimization and funding and liquidity refinement becomes vital for financial organizations, as it enables them to maximize returns on capital, mitigate risks, and remain competitive in an increasingly challenging market.

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