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Design for Digital

CONTEXTUAL MANAGEMENT OF BALANCE SHEET RISKS

ENRICHING THE ALM FRAMEWORK

Introduction

While liquidity stress testing is not unheard of nor uncommon in the financial community, events over the past couple of years have placed more emphasis on stress testing and its impact on correlated Balance Sheet Risk and the need to take it to higher level.

The Reserve Bank of India on 4th Nov 2019, announced that financial institutions need to adopt better tools to detect liquidity strains early on and stress testing was made integral part of the overall governance and liquidity risk management culture. Financial institutions should have the processes that identify, measure, monitor and, as a result, control their funding and liquidity risk.

Given the attention from both public and regulatory entities, financial institutions are aware of the scrutiny and therefore claim to be able to manage and stress test their liquidity. Whether these efforts through collection of data and stress testing will be sufficient in the face of another crisis, is unknown.

So how can the institutions be better prepared?

Data is the key to knowing intraday and future liquidity positions. While institutions have data within their establishments, the liquidity specific data from both internal and external sources – including current and forecast cash flows, availability and cost of funds, valuation of liquid and noncash assets and liabilities, is not always readily available. Being able to gather information into a single comprehensive view which is relevant and contextual in to any report or stress scenario, is of prime importance.

In addition to intraday data, historical data is useful too, such that the analytics on the past cashflows and trends can be seen as models for future events, or at the very least, act as substantiating evidence for a regulator as to why certain stress scenarios may have been applied for existing liquidity position.

Each scenario may have varying parameters and no single parameter will necessarily suit each stress event, neither will the parameter will meet the expected or advised stress levels by regulatory body (top-down approach). By providing data-substantive rationale (bottom-up) for the parameters used during the stress testing, confirms to the regulators that the most realistic scenario were applied as opposed to 'guesstimate' on what may happen.

The stress testing gives the management the tool to see variety of credible scenarios. Liquidity stress tests will have little benefit unless their results lead to informed business practices.

The source and magnitude of liquidity stress test include low credit quality loans, unsecured intraday credits, deposit run-off, off-balance sheet commitments, over reliance on wholesale funding, and derivative and foreign currency funding.

Combining the power of seamless data aggregation and Balance Sheet Risk Algorithms to manage correlated balance sheet risks

Asset Liability Management (ALM) plays a critical role in weaving together the different business lines in a financial institution. Managing liquidity and the balance sheet are crucial to the existence of a financial institution and sustenance of its operations. It is also essential for seamless growth of the balance sheet in a profitable way.

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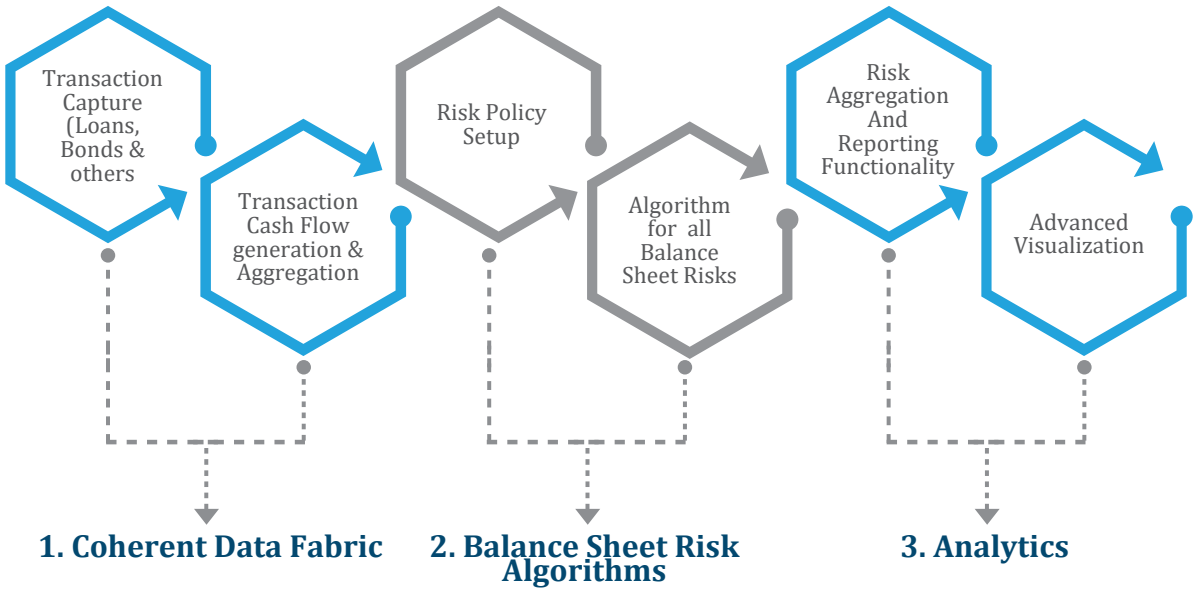
The Intellect Contextual Asset Liability Management 2020 (CALM20) combines the power of Intellect Coherent Data Fabric with Intellect's algo library for all balance sheet risks. This then provides an integrated dynamic ALM view in an interactive dashboard to enable decision-makers and executives to dynamically assess the impact of changes in balance sheet values as well as examine the impact of strategic decisions on the numbers.

Intellect CALM20 value chain encompasses three components. These components makes up the ALM framework for an organization.

1. Coherent Data Fabric
2. Balance Sheet Risk Algorithms
3. Analytics



1. Coherent Data Fabric (CDF)-Seamless data aggregation

CDF provides integration of transactions with CALM20 and generation of cashflows using the time tested cash flow engine.

Having a pre-defined, financial products-specific and time tested analytics data model accelerates implementation by providing a head-start. Further it helps leverage and makes much wider use of data for a wider range of analytics apart from ALM. This is useful especially considering that enterprise-wide time series data at a granular level is stored in CALM20 over time. Intellect has taken this seriously and we facilitate a whole range of financial analysis, including ALM, FTP, profitability, regulatory and economic capital plus Balance Sheet planning, all running on top of integrated unified data model.

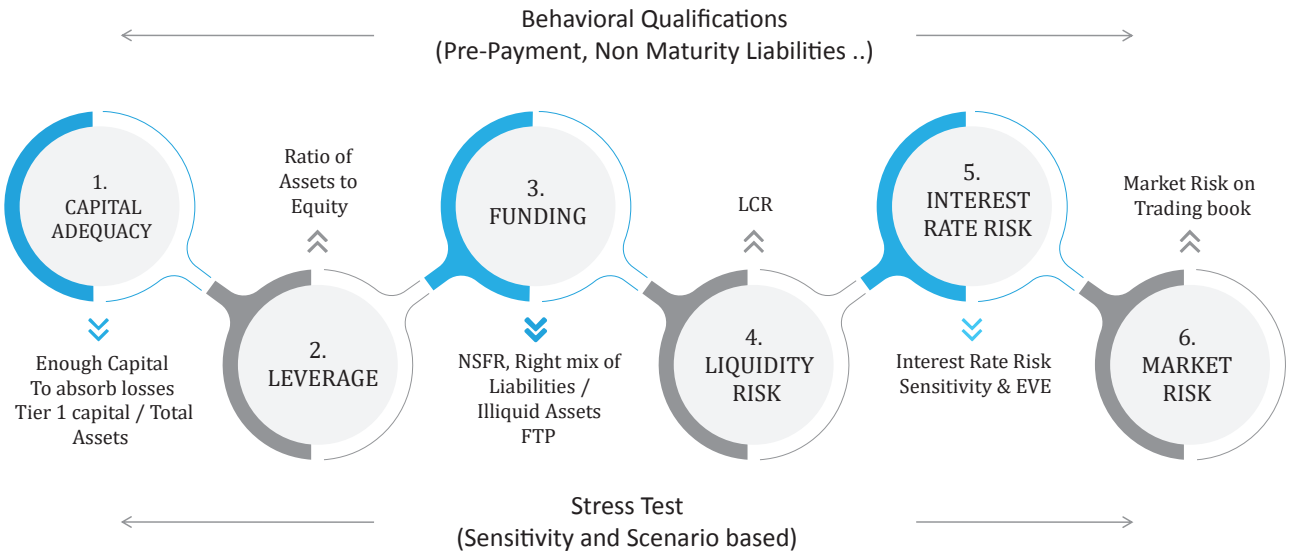
A significant aspect of ALM consists of forecasting and generating future cash flows based on historical data and assumed scenarios. A time tested cash flow engine that's capable of modelling a wide range of financial products on and off the Balance Sheet is a crucial part of an ALM solution. Intellect CALM20 provides extensive cash flow amortization modelling capabilities, the flexibility to define and associate yield curves and even associate unique payment schedules and re-pricing schedules at an instrument level.

2. Balance Sheet Risk Algorithms

Determining risk appetite is difficult. It is both a quantitative and qualitative process and should be undertaken considering the current operating environment, organizations cash flow, strategy and balance sheet capacity. A bank should understand its business portfolio and the likely impact, under different scenarios (including high stress), of associated risks on earnings of each segment – both aggregated and disaggregated.

Intellect CALM20 has an intuitive UI to define risk appetite of the financial institutions. It provides setting liquidity policies and limits in tune with level of risk that the management believes is acceptable and manageable.

BSR Algorithms comprise of Behaviour Quantification, Stress Test (Sensitivity/Scenario based), and Risk Algorithms including static, dynamic and interest rate sensitive gap, market and economic value, duration, NII, liquidity risk, leverage, capital adequacy, leverage, funding and market risk.



The integrated Balance Sheet Risk is depicted in the figure above.

Behavior Modeling: The contractual behavior alone is not adequate in modeling the balance sheet. It is essential to take into consideration behavioral maturity based on historical observations in order that cash flow predictions are more reliable and in tune with demonstrated behavioral trends. This applies to core and non-core parts in current and savings accounts, deposit roll-over assumptions and prepayment assumptions. It is also possible to develop a model for behavioral trends using Intellect's machine learning infrastructure (IDX).

Stress Test: Develop and maintain scenarios, execute analytics in a timely manner, and bring results together for a holistic, enterprise view of risk. This will include compliance and business-specific stress testing for better business management. For example, you will be able to stress-test capital levels when changes are performed to the internal rating based system to assess the impact of regulatory changes on the business.

Risk Algorithms

Different types of balance sheet risks are correlated, and Intellect CALM20 is a single unified platform for all balance sheet risks providing integrated impact covering-

2.1 Capital Adequacy

Intellect CALM20 facilitates banks to monitor regulatory capital requirements on demand.

Capital Adequacy addresses liquidity from a short-term and long-term perspective. The rules require banks to hold enough capital to survive a X-day (Configurable) severe stress scenario. The long-term liquidity aligns the assets and liabilities. Additionally for treasury assets, it uses both Standardized Measurement Methods (SMM) and Internal Models Approach (IMA) approach to arrive at the impact of Market Risk on Capital Adequacy.

2.2 Leverage

Leverage is the ratio of the firm's assets to its liabilities. Leverage ratio in CALM20 is defined as the debt-to-equity ratio. Computing leverage is sophisticated when derivatives are used. Also, correctly interpreting leverage is essential since the risk may be reduced if short positions are used to hedge. For example, interest rate risks can be hedged precisely.

2.3 Funding

Intellect CALM20 takes into consideration assets maturing in short, medium and long time ladders and seeks to balance it vis-à-vis liabilities maturing across short, medium and long term ladders. The gaps reports typically point to funding gaps and excess funds at different points in time.

The Funding Risk is analysed by liquidity stress testing is to find out if institution's funding sources would be enough to withstand unexpected market disruptions given its balance sheet composition, funding profile, and business strategy.

CALM20 generates daily gaps on short-term ladders and ensures that cumulative gaps operate within pre-set limits. It supports in analysing liquidity contingency plan, and liquidity asset buffers.

Fund Transfer Pricing (FTP), helps to ensure the demarcation between market risk and credit risk by passing on the appropriate cost of funds to respective owners of risk.

2.4 Liquidity Risk

Intellect CALM20 stresses the importance of balancing maturities as well as cash flows on either side of balance sheet. It strategizes dynamically on balancing the gaps, issuing timely guidelines to adjust focus on 'right' product types and tenors, and actively involve ALCO in this process.

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Macaulay's duration is traditionally accepted as a good measure of 'length' of portfolio or a measure of centre of gravity of discounted cash-flows over life of an asset (or liability).

Dynamic gap reports helps to simulate future gap positions for assumed business volumes and exercise of options (e.g., prepayments). In addition to proposed new volumes, prepayment transactions and assumed deposit roll-overs, the ALM manager would like to include a proposed hedge transaction.

ALM practitioners prefer to focus on the ratio of assets and liabilities exceeding one year and often want to set acceptable limits around this. Where there are operative limits, the ALCO meetings will usually monitor the ratio, and the institution constantly endeavour to stay within a comfortable level around this limit. This along with liquidity gaps help to bring in any imbalances and help maintain a structurally sound balance sheet.

It also covers maturity ladder, concentration of funding by counterparty, concentration of funding by product type, concentration of counterbalancing capacity by issuer/counterparty, prices of various lengths of funding, rollover of funding, forecasting of LCR and NSFR. Additionally, it covers cash flow projections under different scenarios and generate the necessary stressed regulatory required buffers and contingent liquidity metrics.

2.5 Interest Rate Risk

CALM20 seeks to monitor interest rate sensitivity by generating so-called interest rate sensitive gap reports, which provide a cash flow laddering based on re-pricing profile and frequency of interest rate sensitive assets and liabilities.

The assets and liabilities of the Bank / FI could re-price at different dates and might be of a different tenor. For example, a loan on the asset side could re-price at three-monthly intervals whereas the deposit could be at a fixed interest rate or a variable rate, but re-pricing half-yearly. Even if the loan and deposit re-price similarly, the re-pricing dates do not synchronize.

Modified duration seeks to measure net present value of a loan portfolio (or simply bond price) under different interest rate conditions. For example, one seeks to analyse by how much percentage the bond price will be affected by a basis point up and down move in interest rates. The resulting outputs help us determine the modified duration or simply interest rate sensitivity of the net present value or bond price.

DV01 seeks to calculate the dollar value by which the market value is affected by a basis point expected movement in the interest rates. It's common to find leading banks setting internal limits around this measure to manage interest rate risk in the balance sheet.

Financial institutions can assessing the impact of interest rate changes, new business, change in product-mix and roll-over of deposits on net interest income. Income statements that allow for comparison of net interest income under different scenarios are immensely helpful in understanding the impact of mild market movements and shocks on the income statement as well as balance sheet.

2.6 Market Risk on Trading book

Market liquidity risk which is oriented around price changes and P&L impacts. Intellect CALM20 supports various VaR methodologies like Parametric, Historic and Monte Carlo. The VaR could be stressed, incremental, conditional or on full revaluation basis. It helps in assessing the impact on capital adequacy and Funds Transfer Pricing because of Market Risk.

3. Analytics

Interactive dashboards enable decision-makers assess the impact of changes in balance sheet values as well as examine the impact of strategic decisions on the numbers. Dynamic visualizations help banks explore large portfolios, drill down to granular results and create customized dashboards.

Conclusion

Given the increasingly stringent risk-based regulation facing financial institutions, their need to optimize capital and funding, it could be argued that the need for effective ALM analysis has never been greater. However, the traditional ALM modelling approach is flawed; accuracy is compromised and the use of disparate systems leads to inconsistencies and increased reconciliation costs. Most importantly, it does not engender the confidence of senior decision-makers.

The next generation of ALM modelling, delivered in a common framework enables a consistent approach to modelling assets and liabilities, is here. Intellect CALM20 provides a complete overview of both sides of the balance sheet in a single platform offering a powerful, strategic decision-making tool that can drive competitive advantage and add significant value to the business.

Author

Mr. Venkatesh Srinivasan is an industry veteran with 30+ years of experience in the banking industry with over 20 years of techno-functional expertise. Being in leadership roles across treasury, business operations and product management, Venkatesh has been responsible for strategy & advisory, project delivery management, product engineering, client relationship management and led the treasury & capital markets business at Intellect Design Arena owning the P& L and growth of the vertical. He has rich experience in large implementations for G-SIB banks in Europe, US, Middle East and the Indian Sub-continent along with rich domain expertise across risk & treasury functions.

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