Implementing the new liquidity risk management frameworks – the lessons learned

September 15th, 2010
Agenda

1) Linking liquidity management and liquidity risk management

2) Setting strategic objectives – Liquidity risk appetite and tolerance

3) Setting up an operational LRM framework
Agenda

1) Linking liquidity management and liquidity risk management

2) Setting strategic objectives – Liquidity risk appetite and tolerance

3) Setting up an operational LRM framework
1. Linking liquidity management and liquidity risk management

Liquidity Management value pyramid*

*Inspired by SWIFT “Liquidity management – Avoiding the severe implications when lacking control over it”
Agenda

1) Linking liquidity management and liquidity risk management

2) Setting strategic objectives – Liquidity risk appetite and tolerance

3) Setting up an operational LRM framework
2. Setting strategic objectives – Liquidity risk appetite and tolerance

Setting strategic objectives – Defining liquidity risk appetite and tolerance

- Business objectives
- Business strategy
- Risk appetite & tolerance
- Global risk strategy
- Liquidity risk strategy

Objective A
Objective B
Objective E

Risk Tolerance 1
Risk Tolerance 2
Risk Tolerance 5

Strategy
Risk Appetite

Risk Appetite = Σ Objective

Σ Risk Tolerances
Agenda

1) Linking liquidity management and liquidity risk management

2) Setting strategic objectives – Liquidity risk appetite and tolerance

3) Setting up an operational LRM framework
3. Setting up an operational LRM framework

Implications of current regulation for bank LRM frameworks

1. **Liquidity Risk strategy**
   Definition of the principles and objectives regarding liquidity risk management

2. **Dimensions of liquidity risk**
   Manage intraday, tactical, and structural dimensions, as well as forex liquidity risk

3. **Exhaustive view of liquidity risk**
   Account for on- and off-balance sheet sources of liquidity risk, incl. behavioural considerations

4. **Stress Testing**
   Analyse impact of different scenarios on bank’s liquidity position

5. **Liquidity buffer**
   Calibrate and maintain adequate liquidity reserve composed of cash and highly liquid assets

6. **Reporting and monitoring**
   Set up adequate reporting and monitoring framework, incl. appropriate limits

7. **Concentration risk**
   Ensure adequate diversification of asset and funding composition

8. **Crisis management**
   Define and implement a Contingency Funding Plan to prepare the bank for potential crisis situations
Operational overview of Liquidity Risk Management

Operating framework & business model

Maturity mismatch analysis
- Cash flow modelling

Stress Testing

Limit setting (strategy)
- Buffer calibration
- CFP Trigger

Macroeconomic environment (Monetary Policy)

3. Setting up an operational LRM framework
3. Setting up an operational LRM framework

Setting up the maturity mismatch analysis

The maturity mismatch analysis is a transposition of a bank’s balance sheet into its cash flow profile.

1. **Contractual cash flows:** Contractual cash flow profile of balance sheet

2. **Assumptions - Outflows:** Estimated amount of potential cash outflows (e.g. non-rolled wholesale funding, drawn credit lines, etc.)

3. **Assumptions - Inflows:** Estimated amount of potential cash inflows (e.g. Inflows from maturing loans not rolled, issuance, etc.)

4. **Funding gap:** When outflows outweigh inflows within a given time bucket, this gap needs to be covered by available liquidity (counterbalancing capacity) or carried over from other periods.

### Table: Known net cash flows and assumptions

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Known net cash flows</th>
<th>Assumptions</th>
<th>Funding gap</th>
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<td></td>
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September 2010
Slide 10
3. Setting up an operational LRM framework

Liquidity risk stress testing – The concept

The contractual maturity mismatch analysis is the basis for designing and implementing stress tests.

1. Design of stress scenarios at different degrees of severity

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Severity</th>
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<tbody>
<tr>
<td>• Idiosyncratic, Market-wide and Hybrid</td>
<td>• Mild, Moderate and/or Severe</td>
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</tbody>
</table>

2. Cash flow modeling to simulate:
   i. Behaviour of different counterparties
   ii. Impact of crisis on different market segments

   Parametrisation
   • Assessment of historic data series
   • Expert judgment
   • Development of parametres for respective scenarios & severities

3. Quantification of liquidity buffer

   Liquidity buffer
   • Sum inflows and outflows per time bucket to obtain net funding gap
   • Determine cumulative funding gap over 30 day period
3. Setting up an operational LRM framework

Liquidity risk stress testing – An example

Stress tests can be set up in spreadsheets or be part of tailored LRM tools.

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Known net cash</th>
<th>Assumptions</th>
<th>Funding gap</th>
<th>Liquidity buffer</th>
<th>Net Liquidity position</th>
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<table>
<thead>
<tr>
<th>STRESS - Market-wide</th>
<th>Assumptions</th>
<th>Funding gap</th>
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</table>

**Required size liquidity buffer:** 15000

**Required size liquidity buffer:** 18500

**Stress Scenario – Idiosyncratic:**
- Typically loss of market confidence in an individual bank or banking group, equivalent to a multi-notch downgrade.
- Assumptions to consider
  - i. Reduction in rollover of unsecured wholesale funding
  - ii. Outflow of certain percentage of retail deposits

**Stress Scenario – Systemic:**
- Typically simultaneous tightening of available funding in several markets and uncertainty about, or a general decline in, the value of financial assets
- Assumptions to consider:
  - i. Negative impact on value of certain assets
  - ii. Increased draw on guarantees and credit facilities
Implementing the liquidity buffer

Once the required size of the liquidity buffer has been ascertained, operational obligations and asset eligibility criteria have to be respected in the actual implementation.

**Operational requirements:**

- Assets included in buffer must be:
  i. Available for the treasurer of the bank
  ii. Unencumbered
  iii. Freely available to group entities

- BIS statement that operational requirements to be finalised by the end of the year

**Asset eligibility:**

- Qualitative criteria (CEBS & BIS)
  i. Market-related criteria
  ii. Fundamental criteria
  iii. Central Bank-eligibility

- Quantitative criteria (BIS only)
  i. “Level 1” of buffer restricted to highest-quality assets (e.g. 0% risk-weighted Government bonds, bonds guaranteed by public-sector entities, etc.)
  ii. “Level 2” of buffer restricted to high-quality non-financial corporate and covered bonds
  iii. Strict haircuts specified by the supervisor
3. Setting up an operational LRM framework

Setting up the Contingency Funding Plan

The contingency funding plan is a specific procedure aimed at ensuring a structured management of a potential liquidity crisis.

<table>
<thead>
<tr>
<th>KEY FEATURES</th>
<th>Trigger</th>
<th>Escalation</th>
<th>Remedial actions</th>
<th>Communication</th>
<th>Board approval</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual or automatic deployment of CFP</td>
<td>Convocation of a dedicated crisis committee</td>
<td>Menu of remedies to be used in “mix-and-match” manner</td>
<td>Plan for internal and external communication</td>
<td>Provides Risk Manager and crisis committee with adequate decision-making power to react quickly and also to address delicate matters (e.g. communication plan)</td>
<td>Testing of operational infrastructure (e.g. market access)</td>
<td>Testing of functionality (e.g. practice run)</td>
</tr>
<tr>
<td>Quantitative triggers (e.g. stress tests or spreads)</td>
<td>Pre-defined roles and responsibilities</td>
<td>E.g. asset reduction, liquidity buffer, Central Bank, etc.</td>
<td>Provide trust to market through information and transparency</td>
<td>Close cooperation with internal and external stakeholders</td>
<td>Review and update of CFP-document</td>
<td></td>
</tr>
<tr>
<td>Qualitative triggers (e.g. observed flight to quality)</td>
<td>Clearly defined processes to enable quick decision making</td>
<td>Trigger levels for intensity of actions (e.g. pre-emptive measures)</td>
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</tbody>
</table>
3. Setting up an operational LRM framework

Documenting the liquidity risk management framework

**Liquidity risk strategy**
- Link between liquidity risk & overall risk strategy/business objectives
- Definition of liquidity risk
- Definition of risk appetite & tolerance (strategic objectives regarding liquidity risk)
- Etc.

**Liquidity risk policy**
- Organisation, roles & responsibilities
- Structure of monitoring & reporting framework
- Principles cross-border liquidity management
- Etc.

**Contingency funding plan**
- Definition of crisis situation
- Definition of triggers to initiate CFP
- Structure of escalation procedures, roles & responsibilities
- Definition of possible countermeasures
- Etc.
3. Setting up an operational LRM framework

Post crisis liquidity risk management – Key challenges for banks

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Questions and Answers
LIQUIDITY RISK MANAGEMENT ASSISTANCE

<table>
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<th>Country</th>
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<th>Name of client</th>
<th>Date</th>
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<tr>
<td>Luxembourg</td>
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**Detailed description of project**

In the first phase of this project, we assisted the Bank in a review of its Liquidity Risk Management framework. Based on interviews with employees throughout the Bank and a review of existing documentation, we performed an in-depth analysis of the current state of the Bank’s liquidity risk management framework in light of current and prospective regulatory requirements as well as market best practice. Upon completion of the analysis, we developed recommendations and respective tailored action plans on how to address any identified gaps in a structured manner.

In a second phase, the Bank asked us to assist in the implementation of several elements related to its Liquidity Risk Management framework, notably the required documentation (liquidity risk strategy, liquidity risk policy and contingency funding plan) as well as in calibrating a liquidity buffer and defining the respective processes. In close collaboration with the treasury and risk management departments, we assisted the Bank in drafting its liquidity risk documentation, which included coordination with group headquarters located abroad. Furthermore, we supported the Bank in calibrating its liquidity buffer in a way compliant with the principles set forth by the CEBS in its “Guidelines on liquidity buffers and survival periods”.

In a third phase, we are currently assisting the Bank in a variety of aspects, amongst others in a conceptual analysis of its maturity mismatch analysis as well as in implementing a framework for monitoring its funding capacity and in managing concentrations regarding liquidity risk.

**Type of services provided**

- Analysis of regulatory compliance of liquidity risk management framework
- Development of recommendations and action plans on how to address identified gaps
- Assistance in drafting liquidity risk documentation
- Support in defining and calibrating liquidity buffer
- Assistance in conceptual analysis of Liquidity Risk Management methodology

ASSISTANCE IN IMPLEMENTATION OF LIQUIDITY RISK MANAGEMENT FRAMEWORK

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<td>Luxembourg</td>
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<td>British Bank</td>
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**Detailed description of project**

The scope of this project is to implement an integral liquidity risk management framework at a Luxembourg subsidiary of a British Bank. In a first step, we are currently setting up the maturity mismatch analysis, which is designed to be the centrepiece of the Bank’s liquidity risk management framework and as such transposes the Bank’s balance sheet into its cash flow profile. In this phase of the project, we first mapped the balance sheet into different cash flow categories and then extracted the cash flows from the systems into the respective categories. In a subsequent step, we performed statistical analysis on historical data series in order to derive a basis for behavioural modelling of different categories (e.g. retail and wholesale deposits).

In the next phase, we will design and implement the respective monitoring and reporting framework and design the contingency funding plan. In the last phase, we will draft the required documentation to formalise the liquidity risk management framework.

**Type of services provided**

- Design and implementation of maturity mismatch analysis
- Stress testing and calibration of liquidity buffer
- Definition of monitoring and reporting framework
- Design of contingency funding plan
- Drafting of liquidity risk management documentation
In case of any further questions, please do not hesitate to contact:

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Thank you for your attention