Bank Liquidity Risk Management

The Liquidity Policy Statement

Extract from “The Principles of Banking”
(John Wiley & Sons Ltd 2012)

Professor Moorad Choudhry, Brunel University
The Liquidity Policy Statement is the go-to reference which explains and demonstrates how a bank’s integrated approach to liquidity management is performed.

Common
• Regulatory focused, not bank-specific
• A “funding statement” rather than Liq Pol
• Motherhood and apple pie

Ideal
• Reflects the Bank’s Liquidity Strategy
• Reflects the Bank’s specific liquidity risk appetite
• A working document updated regularly

Requirement to review and update policy on stress testing and scenario analysis:
• Reliability of its assumptions
• Basis the set is used

Test assumptions on readily available liquidity. These might include:
• Repo – government bonds, bank-name securities, etc
• Sales of such securities
• Sales of less liquid assets

Liquidity Policy Statement

<table>
<thead>
<tr>
<th>Organisational Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roles and Responsibilities</td>
</tr>
<tr>
<td>Procedures</td>
</tr>
<tr>
<td>Methodologies</td>
</tr>
<tr>
<td>Underlying assumptions</td>
</tr>
<tr>
<td>Reporting</td>
</tr>
</tbody>
</table>
The Liquidity Policy Statement is the go-to reference which explains and demonstrates how a bank’s integrated approach to liquidity management is performed.

**Liquidity objective:** To ensure that the bank will always be able to maintain or generate sufficient cash resources to meet its payment obligations in full as they fall due, on acceptable terms.

- Overall tolerance for unmitigated funding liquidity risk
- Tolerance of P&L impact
- Consideration of stakeholders
- Access to funding lines
- Repo agreements
- Liquid assets
- Securitisation / syndication / sale
- Definition of contingency scenario
- Early warning signs
- Contingency action plan
- Roles & responsibilities

1. Define liquidity risk appetite
   - Short-term / tactical liquidity risk
   - Structural liquidity risk
   - Contingency liquidity risk

2. Analyse business and strategy for sources of risk
   - Drivers of stress events
   - Market-wide stress
   - Firm-specific stress
   - Survivability horizon

3. Assess ability to mitigate risk

4. Model impact of liquidity stress
   - Governance
   - Liquidity management (Treasury)
   - Reporting (MI + Regulatory)
   - Predictive liquidity

5. Devise contingency plans

6. Monitor and control liquidity

**External sources consulted:**
- Review of the liquidity requirements for banks, Discussion Paper 07/7, Financial Services Authority, December 2007
- Sound practices for managing liquidity in banking organisations, Basel Committee on Banking Supervision, February 2000
In defining the bank’s appetite for liquidity risk, a bank considers regulatory requirements, internal constraints, external factors and its key stakeholders’ liquidity management objectives.

### Regulatory requirements
- FSA minimum ratios
- Firm, subsidiary and branch liquidity

### Internal constraints
- Capacity to bear cost of funding shocks (P&L)
- Capacity to absorb loss of funding source(s)

### Key stakeholders’ objectives
- Shareholders
- Group structure (if subsidiary)

### Other external factors
- Reputational risk
- Rating agencies

### Liquidity risk appetite
- Maturity mismatch
- Maturity transformation
- Funding source concentration limits
- FX mismatch limit
- Minimum cash buffer

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Objectives</th>
<th>Metrics / targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders (or Group)</td>
<td>Balance growth on both sides of balance sheet, Steady growth, Stability ahead of profits, Preference for customer deposits over wholesale funding, Desire for the bank to be self-sufficient in liquidity</td>
<td>Customer Loan / Deposit ratio &lt; 110%, Inter-group lending &lt; €1bn, Sustainable RoE/RoC/RAROC</td>
</tr>
<tr>
<td>Regulators (FSA + host Regs)</td>
<td>Stability over profits, Ability to withstand liquidity shocks, Monitor and control branch liquidity</td>
<td>FSA Sight – 8 day &gt; 0.00%, FSA Sight – 1 month &gt; -5.00%, Local branch regulations</td>
</tr>
<tr>
<td>Internal management</td>
<td>Develop a needs-based approach to liquidity, Balance prudence and profitability</td>
<td>Maturity mismatch limit, Funding source concentration limits, FX mismatch limit, Minimum cash buffer</td>
</tr>
<tr>
<td>Rating Agencies</td>
<td>Increased focus on liquidity as a result of 2008 crash, Emphasis on funding diversification to withstand market shocks</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Yes?!
Treasury assesses the bank’s exposure to liquidity risk in three main categories and seeks to ensure that appropriate mitigation is effected where possible, and that adequate insurance and **contingency plans** exist to handle the unexpected.

<table>
<thead>
<tr>
<th>Type of liquidity risk</th>
<th>BAU actions</th>
<th>Example Mitigation / insurance</th>
</tr>
</thead>
</table>
| **Short-term tactical liquidity risk**                     | • Monitoring and controlling operational liquidity  
• Understanding the business pipeline and predicted funding requirements | • Developing a broad range of effective FI / Money Market counterparty relationships to diversify sources of funding  
• Increasing customer deposits to reduce reliance on wholesale funding  
• Maintaining a pool of highly rated, liquid assets for repo / sale purposes |
| **Structural liquidity risk**                              | • Monitoring and influencing strategy development to take account of liquidity  
• Maintaining an appropriate balance between risk and profit in respect of maturity transformation | • Reducing FX structural mismatch to reduce reliance on FX-swap markets  
• Active portfolio management (securitisation / syndication / sale) to match asset growth to funding capacity  
• **Diversification of funding channels**, maturities and investor classes (e.g. MTN programme, CD issuance, different geographies, range of currencies) |
| **Contingency liquidity risk**                             | • N/A                                    | • Implementing an effective contingency plan with clearly defined roles and responsibilities, which is tested frequently |

*The risk that the Bank’s liquid assets are insufficient to meet its short-term commitments.*

*The risk that the Bank’s business model (and consequently, its balance sheet) develops in a way that causes difficulty attracting adequate funding on reasonable terms and/or The risk that the structure of the balance sheet is unduly exposed to disruption in its funding markets.*

*The risk that the Bank experiences unexpected and/or acute liquidity shocks.*
Plan dynamics: where a bank’s business model has changed over time (eg., the loan portfolio has grown considerably in size and/or average tenor while customer deposits have remained steady) leading to a structural imbalance….

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 3</th>
<th>End-year 3 (budgeted)</th>
<th>Year 4 (forecast)</th>
</tr>
</thead>
</table>
| • Customer loans - €682mn  
  • Customer deposits – €1,431mn  
  • Customer loan / deposit ratio - 48%  
  • Average asset tenor – x months  
  • Average liability tenor – y months  
  • Liquidity ratio (8 days) – 13.48%  
  • Liquidity ratio (1 month) – 8.45%  
  • FX mismatch – principally between USD deposits and EUR lending.  | • Customer loans - €1,995mn  
  • Customer deposits – €1,735mn  
  • Customer loan / deposit ratio - 115%  
  • Average asset tenor – x months  
  • Average liability tenor – y months  
  • Liquidity ratio (8 days) – 16.25%  
  • Liquidity ratio (1 month) – 0.99%  
  • FX mismatch – principally between USD deposits and GBP lending.  | • Customer loans - €2,500mn  
  • Customer deposits – €2,300mn  
  • Customer loan / deposit ratio - 109%  
  • Average asset tenor – x months  
  • Average liability tenor – y months  
  • Liquidity ratio (8 days) – 2%  
  • Liquidity ratio (1 month) – 2%  
  • FX mismatch – mitigated.  | ? |

**Liquidity risks in pre-crash business model**

- FX mismatch
- Depositor concentration
- Excessive maturity transformation
- Lack of funding diversification
- Lack of insurance options

**Liquidity risks in post-crash business model**

- Maintained reliance on institutional deposits
- Cannibalisation of NIBL deposits
- Regulatory requirements (Basel III)
- Securitisation risk: disappearing markets
Beware of changes in the composition of the balance sheet, which determine the bank’s short and long term funding requirements, and can be met in variety of ways depending on size and urgency.

**Underlying change**  
- Call on guarantee  
- Loan drawdown  
- Change in repo criteria  
- Mark-to-market reduction in value of assets  
- Increased haircut on assets  
- Unavailability of repo facilities  
- Withdrawal of customer deposits  
- Withdrawal of corporate deposits  
- Withdrawal of inter-group deposits  
- Withdrawal of inter-bank deposits  
- FX rate changes  
- Change in FX composition of B/S

**Change on balance sheet**  
- Increase in assets  
- Reduction in value of marketable assets  
- Decrease in liabilities  
- FX mismatch

**Options**  
- Increase liabilities  
- Repo assets  
- Reduce assets  
- Utilise FX swap

**Actions**  
- Raise customer deposits  
- Raise institutional deposits  
- Raise inter-bank deposits  
- Raise inter-group deposits  
- Utilise committed lines  
- Issue MTNs  
- Issue equity / sub-debt  
- Use repo and tri-party repo  
- Utilise Central Bank repo  
- Sell assets  
- Syndicate assets  
- Securitise assets  
- Swap liquid assets between currencies

* = Stress scenario  
* = Structural funding option
Structural liquidity management should be carried out by ALCO, within the parameters set out in this LPS. Tactical liquidity management is performed by Treasury under delegated authority from ALCO (Head of Treasury is member of ALCO).

### Tactical liquidity management process

**Business As Usual**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsibility</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess funding requirement</td>
<td>Treasury</td>
<td>Daily</td>
</tr>
<tr>
<td>Use BAU funding</td>
<td>Treasury</td>
<td>Daily</td>
</tr>
<tr>
<td>Use mitigation options</td>
<td>Treasury</td>
<td>Daily</td>
</tr>
<tr>
<td>Use liquidity insurance tools</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
<tr>
<td>Engage emergency plan</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

- **Maturity mismatch framework**
- **FX mismatch**
- **Asset / Liability liquidity ladder**
- **Funding concentration**

- **Customer deposits**
- **Institutional deposits**
- **Inter-bank placements**
- **Inter-group placements**
- **FX swaps**

- **Committed lines**
- **Bi/tri-lateral repo**
- **Central Bank repo**
- **ECP…**
- **Cash securitisation.**

- **Stop new lending**
- **Call to Group for additional help**
- **Sale of Govts, FRNs**
- **Sale of CDs**
- **Sale of AFS portfolio**
- **Sale of HTM portfolio**
- **“Sale” of Corporate Loans**
- **Liquidation of other assets**

### Structural liquidity management process

**Responsibility: ALCO**

**Frequency: Monthly**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsibility</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyse business strategies</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
<tr>
<td>Forecast future funding require</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
<tr>
<td>Model portfolio management impact</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
<tr>
<td>Evaluate potential funding sources</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
<tr>
<td>Launch strategic funding programme</td>
<td>ALCO</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

- **Corporate lending growth**
- **Deposit growth**
- **Capital markets activity**
- **Liability concentration**

- **Mismatch per currency per time bucket**
- **Diversification requirement**
- **Funding cost**

- **Asset reduction through sales / syndication / securitisation**

- **Increased deposits**
- **Wholesale funding**
- **MTN programme**
- **CD/ECP issuance**
- **Securitisation**
- **Originate to CP conduit**

- **Select option(s) based on analysis of costs and effort vs. funding diversification and strategic benefit to Bank and Group**
In line with the regulatory approach set out by its Regulatory Authority, a Bank should use scenario analysis and stress testing to assess its potential vulnerability in the face of changes to its liquidity situation.

### Business Model Analysis
- The first step is to assess the current and planned business mix to identify the likely changes in the bank’s liquidity profile.
- Analysis to include:
  - Asset / liability growth
  - Currency mix
  - Maturity profile
  - Sources of funds

### Scenario Analysis
- Having assessed the business model, scenarios are selected which represent potential challenges to the bank’s liquidity.
- Three types of scenario are used:
  - BAU with seasonal fluctuations
  - Bank-specific funding crisis
  - Systemic liquidity crisis

### Stress Testing
- The scenarios used are then analysed to identify the specific shocks (stresses) which might impact the bank’s liquidity.
- These shocks are then factored into a stress test model which calculates the impact of each scenario.
- Results are analysed to determine mitigation and contingency plans.

The process is iterative, with mitigation and contingency plans fed back into the business model to inform the next round of analysis and testing.
Sometimes even the best laid plans face unexpected challenges: a Bank should develop its contingency plans to ensure their continued operation in a liquidity crisis.

### Underlying principles:
1. Predict potential problems
2. Mitigate the problem where possible
3. Use insurance options if necessary
4. Have a robust contingency plan

### The following aspects of a contingency plan should be monitored / tested on a regular basis:
- Daily mark-to-market of FRN, AFS and CD portfolios
- Daily monitoring of deposit pricing and cash premium
- Assess and update inter-bank lines to guesstimate available capacity
- Central Bank facility
- Bi-lateral Repo facilities
- Collateral funding requirement impact

For subsidiaries, plans should be shared with the Group Treasurer to ensure strategic alignment with the Group.
Each aspect of the bank’s liquidity management process is allocated to one or more parties. In each case, primary responsibility must be clearly defined (here represented by a green tick).

<table>
<thead>
<tr>
<th></th>
<th>Define liquidity risk appetite</th>
<th>Risk analysis</th>
<th>Risk mitigation planning</th>
<th>Stress testing</th>
<th>Contingency planning</th>
<th>Operational liquidity management</th>
<th>Monitoring and reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Board of Directors</strong></td>
<td></td>
<td>R, A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td><strong>Executive Committee</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td><strong>ALCO</strong></td>
<td>C</td>
<td>R, R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>Finance (Regulatory Reporting / MI)</strong></td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>C</td>
<td>I</td>
<td>I</td>
<td>R</td>
</tr>
<tr>
<td><strong>Treasury / Money Markets desk</strong></td>
<td>I</td>
<td>I</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>R</td>
</tr>
<tr>
<td><strong>SBUs</strong></td>
<td>I</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>

**Frequency**
- Annual
- Quarterly
- Annual
- Monthly
- Annual
- Daily
- Daily, Monthly

**Primary responsibility**
- R = Responsible
- A = Accountable
- C = Consulted
- I = Informed
Example: four frameworks to monitor and control current and future liquidity risk...

Maturity mismatch

**Purpose:** To measure the net funding requirement (or surplus) per maturity bucket. This is the main regulatory requirement for liquidity measurement.

**Measure:** Measures the net cash flow for each maturity bucket.

**Analysis:** In the short-term, when commitments (cash outflows) exceed liquid assets (cash inflows) the Money Markets desk need to raise additional funding. In the longer-term, structural imbalances, ALCO will determine the appropriate funding strategy.

<table>
<thead>
<tr>
<th>Maturity Mismatch Ladder</th>
<th>Sight</th>
<th>6 Day</th>
<th>1 month</th>
<th>3 mo</th>
<th>6 mo</th>
<th>1 year</th>
<th>3 years</th>
<th>5 years</th>
<th>5 years+</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflows</td>
<td>805</td>
<td>383</td>
<td>273</td>
<td>268</td>
<td>143</td>
<td>129</td>
<td>276</td>
<td>657</td>
<td>742</td>
<td>3,675</td>
</tr>
<tr>
<td>Outflows</td>
<td>980</td>
<td>813</td>
<td>838</td>
<td>1,563</td>
<td>277</td>
<td>52</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>4,533</td>
</tr>
<tr>
<td>Mismatch</td>
<td>(175)</td>
<td>(430)</td>
<td>(570)</td>
<td>(1,295)</td>
<td>(134)</td>
<td>77</td>
<td>265</td>
<td>657</td>
<td>742</td>
<td>(858)</td>
</tr>
</tbody>
</table>

FX mismatch

**Purpose:** To measure the gap between funding and lending in each currency.

**Measure:** Funding minus lending, per currency.

**Analysis:** By measuring FX mismatch, the bank gains an understanding of its exposure to the risk that FX swap markets become illiquid which could force a large open FX position or make it difficult to meet commitments in a particular currency.

Funding concentration

**Purpose:** To measure the relative concentration of each funding source.

**Measure:** % concentration of each funding source per maturity bucket.

**Analysis:** Analysing funding concentration risk allows the bank to develop effective diversification strategies.

<table>
<thead>
<tr>
<th>Currency</th>
<th>USD</th>
<th>EUR</th>
<th>GBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>956</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EUR</td>
<td>(150)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GBP</td>
<td>(450)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
LPS should NOT ignore the detail:
the operational aspect of liquidity management is cash / collateral management

<table>
<thead>
<tr>
<th>Cash / collateral management</th>
<th>Responsibility: Treasury (Money Markets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency: Daily</td>
<td></td>
</tr>
</tbody>
</table>

**Cash management objective**
- Treasury aim should be to be average flat or long on cash (around 2% of total liabilities)
- Cash on hand must cover correspondent banks

**Daily cash process**
- Check deal cash flows for key dates (i.e. regulatory buckets)
- Strip out deals which don’t affect liquidity (e.g. loan rollovers)
- Add in behavioural adjustments (retail deposits)

**Limitations on a Bank’s ability to manage cash**
- Cash inflow is based on “reverse enquiry” – i.e. counterparties approach the banks for bids for deposits
- Access to funds (and ability to place surplus funds) is limited by
  - (a) counterparties appetite for the Bank’s risk
  - (b) the Bank’s limits for our counterparties

**Collateral**
- Collateral management must be active and daily and managed within Treasury (stock loans and borrowing; CSA collateral funding and forecasting)
- Consider the clearing service at Euroclear, BoNY or ClearStream to enable more efficient use of collateral
Effective Regulatory and Management reporting is key to successful liquidity management

<table>
<thead>
<tr>
<th>Category</th>
<th>Report</th>
<th>Measures</th>
<th>Audience / Frequency</th>
</tr>
</thead>
</table>
| **Regulatory**        | • Consolidated basis - FSA Form LR is the key daily report this is based around the maturity mismatch framework.  
                         • Daily Liquidity Report  
                         • FSA 048 report          | Maturity mismatch  
                         • Sight – 8 days > 0.00%  
                         • Sight – 1 month > -5.00% | • DLR = Daily to management  
                         • Monthly submission to FSA |
|                       |                                                                        |                                                                         |                             |
| **Branch liquidity**  | • Copy of monthly reports send to each host regulator (tbc)            | Liquidity Metrics (see Lecture 3 presentation)                           | Monthly to management       |
|                       |                                                                        |                                                                         |                             |
| **Management Reporting** | Leading and lagging risk indicators to provide a 360° view of the bank's liquidity.  
                            | • Maturity mismatch framework  
                            | • FX mismatch  
                            | • Asset / Liability liquidity ladder  
                            | • Funding concentration | Maturity transformation  
                            | • Average asset tenor < 24x average liability tenor | Daily to Finance + Treasury  
                            | Funding source concentration limits  
                            | • No individual counterparty > 5% of funding  
                            | • No source > 25% (except customer deposits)  
                            | • Customer deposits > 33% of funding | Monthly to management |
|                       |                                                                        | FX mismatch limit  
                            | • No mismatch > 25% of currency volume (G7)  
                            | • No mismatch > €10mn for non-G7 currencies |                           |
|                       |                                                                        | Minimum cash buffer  
                            | • Cash buffer > 2% of liabilities at all times |                           |
The Liquidity Risk Appetite Statement

● A formal policy document approved at (G)ALCO

● Risk Appetite
  – The bank’s liquidity risk appetite establishes the level and type of risks that it is able and willing to take to meet its strategic objectives and its wider obligations to shareholders.
  – It is set by the Board via quantitative targets and qualitative measures, aimed at ensuring the strategic risk objectives of:
    – (1) Maintaining through-the-cycle capital adequacy
    – (2) Ensuring through-the-cycle stable and efficient access to funding and liquidity
    – (3) Delivering stable earnings
    – (4) Maintaining stakeholder confidence

● Liquidity risk appetite
  – As part of the bank’s risk appetite framework the liquidity risk appetite is set as follows:
    – (1) LAB to cover minimum [110%] of the 90-day stress outflows identified as part of the ILAA
    – (2) the bank must meet this risk appetite target by the end of [Q1] [2015]
The Liquidity Risk Appetite Statement…

- **Cascading risk appetite**
  - Treasury (or Group Treasury) is responsible for managing the LAB and for cascading the bank’s liquidity risk appetite
  - As part of this cascade, liquidity stressed outflow targets (LSOTs) are set for all legal entities, subsidiaries and business lines listed in [Appendix].
  - LSOTs describe the maximum level of outflows under stress that each business line should not exceed
  - Individual LSOTs are derived by applying individual 90-day ILAA stress outflow assumptions (as established during the ILAA) to the projected balance sheet in place at each stage of the annual/semi-annual/quartely budget cycle
  - The total of all LSOTs will be compared to the LAB to monitor and ensure the bank remains within appetite. As such it is important that business lines do not exceed their LSOTs. In the event an LSOT is exceeded, corrective action must be agreed with (G)ALCO. This action can include review of individual LSOT or increase in LAB

- **Control level**
  - Utilisation of LSOTs is monitored on monthly basis by Treasury.
  - Treasury notifies any breach of LSOTs to (G)ALCO
  - Overleaf illustration of bank liquidity risk appetite cascade…
The Liquidity Risk Appetite Statement…

- Illustration of bank liquidity risk appetite cascade

<table>
<thead>
<tr>
<th>90-day stressed outflows (actual)</th>
<th>Investment banking</th>
<th>Corporate banking</th>
<th>Retail banking</th>
<th>Private banking</th>
<th>Treasury</th>
<th>Total outflows</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-day stressed outflows (actual)</td>
<td>Dec-12</td>
<td>-22.4</td>
<td>-10.1</td>
<td>-11.1</td>
<td>-3.4</td>
<td>-9.2</td>
</tr>
<tr>
<td>LSOTs</td>
<td>Dec-13</td>
<td>-15.5</td>
<td>-8.5</td>
<td>-16.5</td>
<td>-3.5</td>
<td>-8.5</td>
</tr>
<tr>
<td>LSOTs</td>
<td>Dec-14</td>
<td>-11.5</td>
<td>-8.5</td>
<td>-16.5</td>
<td>-3.5</td>
<td>-7.5</td>
</tr>
</tbody>
</table>
Bibliography

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