Water, water, everywhere...
Michael Veldman, NatWest Markets
Srihari Srivathsa, NatWest Markets
The Rime of the Ancient Mariner

Water, water, every where,

And all the boards did shrink;

Water, water, every where,

Nor any drop to drink.

Samuel Taylor Coleridge, 1798
Introduction | Agenda

- Liquidity management framework
- Factors driving increasing focus
- Sources and uses
- Measurement and management
- Centralised liquidity management
Introduction | Liquidity Framework

- **PLAN**
  - Strategy
  - Risk Identification
  - Risk Appetite

- **PROCESS**
  - Measurement & Monitoring
  - Management
  - Stress and Scenario Testing

- **ACTIONS**
  - Buffers
  - Yield Enhancement
  - Hedging

02 July 2018
Planning
Increased allocations to **illiquid credit**

Closer matching of expected asset and liability **cash flows**

Increased **regulatory burdens** and **market constraints**

Source: LCP, Hymans Robertson, Annual Reports
Strategy | Asset Allocation

Source: SFCRs, Annual Reports; end-Dec 2016

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“Stronger [MA pre-app] liquidity plans included”:

- **definition** of liquidity risk
- monitoring tools, including **stress and scenario testing**
- **cash flow forecasts**
- interaction with wider **liquidity management framework**
Source: Bloomberg, NWM; end-Dec 2016
The PRA’s view is that the paired/grouped assets that result from using FX forwards to hedge non-sterling bond exposures do not provide fixed cash flows.

Firms currently using FX forwards in their MA portfolio should explore longer-dated cross currency swaps or other approaches including portfolio restructures.

Source: PRA
Constraints | Derivatives Markets

• Under legacy CSA, insurer posts bond as collateral

• EMIR, CRD IV driving move toward cash-only margining

Cost of collateral analysis is similar to banks’ Funding Valuation Adjustment
Management of *collateral arrangements* should not undermine the requirement for MA portfolios to be “*identified, organised* and *managed separately* from the firm’s other activities”

Requirements on the MA portfolio resulting from *collateral* or *other arrangements* that restrict the type of assets that can be *posted* as collateral could restrict firms’ ability to *extract surplus* or to use those assets to meet other MA liabilities.
Identification | Sources and Uses

Sources

• Cash
• Gov’t bonds / repo
• Derivative margin calls
• Securities lending
• Contingent collateral facilities
• Revolving credit facilities

Uses

• Operating out flows
• Dividends and financing costs
• Derivative margin calls
• Securities lending
• Contingent funding facilities
Historically, insurer liquidity evaluation has focussed on asset vs. liability cash flows.

Rating agency methodology might focus on asset vs. liability cash flows under stress.

MA cash flow tests effectively cover this off.

For products other than annuities, lapses can present a liquidity risk.
Identification | Contingent Exposures

Does anyone have a liquidity problem at the moment?

Many firms have too much liquidity…

Source: Conference Dinner
Liquidity issues typically arise at times of stress:

Source: iBoxx, Bloomberg, NWM
Process
Measurement | Contingent Exposures

Distribution of projected exposure: 10yr USDGBP XCCY swap

Source: NWM. Exposures based on Monte Carlo simulations calibrated to market data. Such projections are based on assumptions and are not a reliable indicator of actual future exposure.

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Total **liquid resources** may exceed total **liquid assets**

**Liquidity value:**

- amount of liquidity that can be extracted from **any asset**
- e.g. entering into a **repurchase agreement**
- using the asset as collateral to **secure funding** against
Measurement | Liquidity Value

- Amount **advanced** subject to “**haircuts**” reflecting the perceived **riskiness** of the collateral

- **Cost of funding** linked to prevalent market conditions

- **Term structure** reflecting the availability of funding for different terms
• Proportion of **illiquid assets** exceed 50% by year 13 through **organic growth** alone

• **Typical repo tenor**: 3m

• 3-5yrs+ is very rare

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**Measurement | Liquidity Value**

**Projected Market Value**

02 July 2018

**Liquidity Value (time 0)**

Source: NWM
## Management Options

<table>
<thead>
<tr>
<th>CSA</th>
<th>Cash-only</th>
<th>Cash and Gilts</th>
<th>Cash, Gilts and Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liquidity Need</strong></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Shortfall</td>
<td>Cash</td>
<td>Secured Funding</td>
<td>Funding Facility</td>
</tr>
<tr>
<td></td>
<td>Securities Lending</td>
<td></td>
<td>Senior Debt</td>
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<tr>
<td></td>
<td>Liquidity Facility</td>
<td></td>
<td></td>
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<tr>
<td>Surplus</td>
<td>Funding Trades SAA</td>
<td>Securities Lending</td>
<td></td>
</tr>
</tbody>
</table>

- **Eligible collateral**
- **Trading costs**
- **Investment returns**
Actions
Set buffers with reference to:

- the **distribution** of **projected exposure(s)**
- liquidity **risk appetite**
- liquidity **value** of assets held
- other management options

**PIC Annual Report 2017**

- > £8 billion of **highly liquid assets**
  (c.33% of total assets)
- predominantly **gilts** and **cash**
- **collateral requirement** under extreme market moves (1 in 200 year stress scenario) is c.£4 billion

Under this assessment, many firms have **too much liquidity**
Buffers | How Big is Too Big?

Liquid asset buffers:
- are a **drag on returns**
- should be **minimised**

Particular focus should be paid to:
- exploring **alternative sources** of liquidity
- deploying **excess** liquidity

There is a trade-off between **drag reduction** and the **cost of alternative options**
Options for deploying **excess liquidity** include:

- **securities lending** trades
- **contingent** liquidity / funding **facilities**
- updating SAA / reallocating into less liquid credit

Contingent exposures result in variable surplus / shortfall.
Hedging | “Outsourced” Management

Example*
Assuming cash-only CSA:

Contingent Liquidity Facility (CLF) | Contingent Funding Facility (CFF)

Contingent Liquidity Facility (CLF)

<table>
<thead>
<tr>
<th>Derivative MM</th>
<th>Collateral posted under CSA</th>
<th>Less liquid collateral posted</th>
<th>Δ Value of Reference Instrument</th>
</tr>
</thead>
</table>

Contingent Funding Facility (CFF)

<table>
<thead>
<tr>
<th>Derivative MM</th>
<th>Collateral received under CSA</th>
<th>Liquid collateral posted</th>
<th>Less liquid collateral posted</th>
</tr>
</thead>
</table>

*For illustrative purposes only
Hedging | Central Liquidity Management

Funds Transfer Pricing (FTP)

• BUs buy / sell liquidity from central Treasury

• Identifies BUs that generate and those that consume liquidity

Treasury

• Charges BUs for cost of centrally held liquidity buffers (via FTP)

• Access to revolving credit facilities (RCFs)

• Controls group net funding requirement: sourced from / lent into market – could be contingent on specific exposures
Hedging | Central Treasury Model

- Allows for **diversification** of liquidity requirement intra-group
- Single point of **market access** to trade surplus / shortfall
- Access to group-wide **liquidity facilities** and **backstops** (e.g. RCF)
- Incentivises BUs to place **greater value** on liquidity consumption / generation
Concluding Remarks
Concluding Remarks | Summary

• Liquidity management is currently a hot topic

• A clear metric for measurement and risk appetite is key

• Hedging tail risks may be cost or operationally efficient

• Treasury functions may need to become more active
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Illiquidity Premium

...intended to compensate an investor for:

- the added uncertainty of tying up capital for longer periods of time, and
- the risk that the illiquid asset cannot be sold quickly enough (within a reasonable time period) to prevent or minimise a loss

Source: M&G
Article 77b

Assets must be bond-like with cash flows that:

• …materially replicate the expected cash flows of the liabilities
• …are fixed (at portfolio level), not simply “very predictable”

Source: Solvency II Directive
Article 77c

[Matching Adjustment is] … equal to the difference of the following:

(i) the AER … where applied to the cash flows … results in a value that is equal to the value … of the portfolio of assigned assets;

(ii) the AER … where applied to the cash flows … results in a value that is equal to the value of the best estimate of the portfolio of insurance or reinsurance obligations … using the basic risk-free interest rate term structure

… must not include the fundamental spread reflecting the risks retained

Source: Solvency II Directive
Cash Flow Matching Tests

Firms should ensure compliance with the following tests:

1. **Discounted cash flow shortfall test**: must not exceed 3% of best estimate liabilities (under basic risk-free rate i.e. excluding MA)

2. **99.5th %ile VaR test**: (undiversified) for **interest rates**, **inflation** and **current risk** must not exceed 1% of best estimate liabilities (under basic risk-free rate including MA)

3. **Notional swap test**: a hypothetical portfolio of interest rate swaps must be able to ensure cash flows are perfectly matched without requiring additional cash injection

Source: PRA, 09-Mar-2015
CRD IV | Liquidity Risk

• **Liquidity** is arguably the **biggest** risk faced by banks

• Two **regulatory** metrics under CRD IV:

  - **Liquidity Coverage Ratio (LCR)**
    \[
    \text{Liquidity Coverage Ratio (LCR)} = \frac{\text{High Quality Liquid Assets (HQLA)}}{\text{30-day Net Cash Outflows}}
    \]

  - **Net Stable Funding Ratio (LCR)**
    \[
    \text{Net Stable Funding Ratio (LCR)} = \frac{\text{Available Stable Funding}}{\text{Required Stable Funding}}
    \]
## CRD IV | NSFR Example Weights

<table>
<thead>
<tr>
<th>Asset</th>
<th>Maturity</th>
<th>RSF Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential mortgages</td>
<td>&gt; 1 year</td>
<td>65%</td>
</tr>
<tr>
<td>Corporate loans</td>
<td>&gt; 1 year</td>
<td>85%</td>
</tr>
<tr>
<td>AAA-AA Corporate bonds</td>
<td>All (unencumbered)</td>
<td>15%</td>
</tr>
<tr>
<td>A-BBB Corporate bonds</td>
<td>All (unencumbered)</td>
<td>50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liability</th>
<th>Maturity</th>
<th>ASF Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail deposits</td>
<td>&lt; 1 year</td>
<td>90-95%</td>
</tr>
<tr>
<td>Regulatory capital</td>
<td>All (excl. T2 &lt; 1 year)</td>
<td>100%</td>
</tr>
<tr>
<td>Funding / Other capital</td>
<td>&lt; 1 year</td>
<td>0-50%</td>
</tr>
<tr>
<td>Funding / Other capital</td>
<td>&gt; 1 year</td>
<td>100%</td>
</tr>
</tbody>
</table>
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