Best-practice Funds Transfer Pricing Principles

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Agenda

- The objective and rationale of the internal funds transfer price
- Setting the TLP…
- … and working it into FTP
- Template Commercial Bank FTP regime

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Funds Transfer Pricing - what and why?

- The rate at which the internal funding desk lends or borrows funds to the business lines is usually referred to as the Funds Transfer Price (FTP, or simply TP). FTP is sometimes used synonymously with Term Liquidity Premium (TLP) but the two are in fact distinctly different.

- FTP is designed to ensure that the true costs and benefits of the bank’s cost of liquidity (TLP) are allocated to all products so that measures of true value added are captured, and that the cost of originating liquidity stress onto the balance sheet is recognised, identified and borne by the appropriate business line.

- This *is not necessarily* the same as passing on the bank’s cost of funds (COF).

- A central unit in Group Finance / Treasury/ ALM usually acts as a “clearing house” for interest rate risk and funding rates to the business lines. The business is left to manage products and markets, and the Treasury desk to manage interest rate, basis and funding gap risk (and FX risk).

- At its simplest, a 5-year fixed rate loan generated by a business unit will be charged to the business by Treasury ALM at the 5-year bank COF. But this is to ignore the concept of maturity transformation and replace it with matched funding. So it is *not* as simple as that…
Objectives and rationale

At its most baseline and transparent, an FTP system costs the price/value of funding liquidity at a bank and ensures this cost is captured both internally and externally

To quote Arno Kratky from Commerzbank: “An FTP system measures the value of products (here: liquidity) furnished by a profit centre (business units) to other responsibility centres within a company (e.g. Treasury). Internal exchanges that are measured by transfer prices result in:

- revenue for the responsibility centre furnishing (i.e. selling) the product,
- costs for the responsibility centre receiving (i.e., buying) the product
- the transfer of associated risks and
- correct PnL attribution (no funding-related or yield curve-related artificial PnL gains).”

Thus FTP an important tool to measure genuine SVA profitability and incentivise business lines to do the “right thing”

Inaccurate FTP processes result in skewed risk-taking incentives and misallocation of resources. This might be non-profitable business or in business where rewards are not commensurate with risk taken, and thereby ultimately undermines sustainable business models.
First: defining liquidity risk

- From a macro perspective, liquidity means “unhindered flows among participants in the financial system”. From a bank perspective, liquidity is generally defined as the ability of a financial firm to meet its debt obligations as they fall due, *throughout the cycle*, and without incurring unacceptably large losses. We discern the following forms:

- **Funding Liquidity Risk**
  - Structural Liquidity Risk: the risk of inability of a firm to service its liabilities as they fall due (short term insolvency risk)
  - Liquidity Spread Risk: risk of an adverse move in refinancing conditions when a firm needs to roll-over a shorter funding to refinance longer assets (which arises as a result of a maturity transformation)
  - Contingent Liquidity Risk: the risk of inability to source funds or replace maturing liabilities under any future stressed market conditions

- **Market or Trading Liquidity Risk**
  - the ability to trade in or out of an asset at short notice at fair value and with no material impact on its price
Funds Transfer Pricing

Board / GALCO

Divisions
- Retail
- Private Bank
- Wholesale
- Corporate
- Etc.

Funding

FTP Centre (Treasury/ALM desk)

Risk Transfer

Risk Control:
- Limits
- Liquidity pricing
- Mismatch Gaps

Pricing

Capital Markets

Money Markets

Execution

Markets

Market access Function

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Rationale

- The rate at which funds are lent by Treasury to the internal business lines is a much more critical issue than was supposed prior to the bank crash.

- The example of UBS AG, whose structured credit desk was lent funds at Libid by its internal Treasury is an example of how inaccurate funding rates leads to poor business decision making…

- …and was noted by the bank itself after it was bailed out by the Swiss government.

- In essence we should remember:

  The bank has to earn on its assets what it pays on its liabilities
  or
  The bank can only pay on its liabilities what it earns on its assets.

- The FTP system balances assets and liabilities in the liquidity space.

Thanks to Arno Kratky at Commerzbank for the above expression…
Key standard: a common FTP

Money market desks traditionally are minded to focus more on the asset side of the balance sheet because of the more direct relationship to earnings and profitability.

A robust FTP will help promote “good behaviour” (which, in current market conditions) means: (a) focusing on the liability side of the balance sheet (to improve liquidity position); and (b) lengthening the tenor of our liabilities (to shorten our liquidity gaps).

This can be achieved: (a) by introducing a “liquidity premium” into the FTP and (b) by increasing the liquidity premium as a function of the tenor.

A liquidity-premium-enhanced TP will transfer more earnings to the liability generating activities and force corporate banking to more accurately price (and re-price) loan assets.

More crucially, it will reduce chances of an artificial funding profit helping to drive the investment decision.

<table>
<thead>
<tr>
<th></th>
<th>Old Bid</th>
<th>Old Offer</th>
<th>New Bid</th>
<th>New Offer</th>
<th>Liquidity premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>O/N to 2 weeks:</td>
<td>LIBOR - 12.5 bps</td>
<td>LIBOR</td>
<td>LIBOR</td>
<td>LIBOR + 12.5 bps</td>
<td>+ 12.5 bps</td>
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<tr>
<td>2 weeks to 1 month:</td>
<td>LIBOR - 12.5 bps</td>
<td>LIBOR</td>
<td>LIBOR + 5 bps</td>
<td>LIBOR + 17.5 bps</td>
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<td>&gt; 1 and up to 3 months:</td>
<td>LIBOR - 12.5 bps</td>
<td>LIBOR</td>
<td>LIBOR + 10 bps</td>
<td>LIBOR + 22.5 bps</td>
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<td>&gt; 3 and up to 12 months:</td>
<td>LIBOR - 12.5 bps</td>
<td>LIBOR</td>
<td>LIBOR + 20 bps</td>
<td>LIBOR + 32.5 bps</td>
<td>+ 32.5 bps</td>
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</table>
The issue...

- For example, consider the following asset types:
  - a 3-month interbank loan;
  - a 3-year floating rate corporate loan, fixing quarterly;
  - a 3-year floating-rate corporate loan, fixing weekly;
  - a 3-year fixed-rate loan;
  - a 10-year floating-rate corporate loan fixing monthly;
  - a 15-year floating-rate project finance loan fixing quarterly.

- We have selected these asset types deliberately, to demonstrate the different liquidity pressures that each places on the Treasury funding desk (listed in increasing amount of funding rollover risk).

- Even allowing for different credit risk exposures and capital risk weights, the liquidity impact on the liability funding desk is different for each asset.
The issue...

- The cost at which funds are lent from central Treasury to the bank’s businesses needs to be set at a rate that reflects the true liquidity risk position of each business line.

- If it is unrealistic, there is a risk that transactions are entered into that produce an unrealistic profit. This profit will reflect the artificial funding gain, rather than the true economic value-added of the business.

  [EG., during 2002-2008 UBS structured credit business was able to fund itself at prices better than in the market (which is implicitly inter-bank risk), despite the fact that it was investing in assets of considerably lower liquidity (and credit quality) than inter-bank risk. There was no adjustment for tenor mismatch, to better align term funding to liquidity. A more realistic funding model was viewed as a “constraint on the growth strategy”.*]

* Annual report and accounts 2008
Maturity and margin mis-match

- The FTP regime needs to be fit-for-purpose for the product type and behavioural characteristics…(see Lecture on Retail Bank and Corporate Banking FTP)

- Three types:
  1. Fixed rate fixed maturity asset
     - The re-pricing period = funding period requirement
     - Contractual characteristics so no behavioural modelling required
     - Here: obligor interest rate fixed for 10 years, no amortization no prepayment
     - No optionality in tenor so no modelling necessary
     - This is straightforward for FTP purposes
Maturity and margin mis-match...

(2) Fixed rate asset with revolving or extendible option

- Obligor interest rate fixed for 10 years but loan behaviour reflects amortisation during term with extension option
- …bank has repricing option and can set the new rate at this point
- Margin term < funding term

[Diagram showing the relationship between margin period (contractual), funding period (modelled), and origination dates]
(3) **Term deposit**

- Depositor interest rate fixed for 6 months and contractual maturity 6 month
- Behavioural characteristics required funding term of 2 years – stable funding – but repricing period 6 months
- Repricing term < funding term

![Diagram showing repricing period and funding period](image.png)
Maturity and margin mis-match...

- How do we treat these for FTP purposes?
- Apply the behavioural or modelled properties and charge/pay appropriate tenor FTP rate
  - *Again... do we set COF or TLP as FTP?*
- The foregoing suggests we need to understand the
  - Maturity characteristics
  - Funding requirements
  - Repricing characteristics
- ..of all our products, assets and liabilities
- The behavioural tenor and repricing tenor sets tone for the appropriate FTP
- FTP operates in a dynamic environment: another key driver is current state
  - 80% LDR versus 120% LDR
First...some clarity on terms

- Internal funding rate – paid or received by Treasury or central ALM desk or funds transfer price (FTP). The actual rate, usually but not always quoted as spread over 1-mo or 3-mo Libor, sometimes quoted as fixed rate for each tenor updated daily/weekly/monthly, paid by business line for raising funds for loans or received by business line for depositing funds raised as liabilities.

- Term liquidity premium (TLP). The rate paid by business line over the short-term funding rate (say, 3-mo Libor) that reflects the liquidity risk generated when committing the balance sheet to term lending.

- Cost of funds (COF). The cost of funds paid by the bank as a legal entity when it raises liabilities externally, both customer and wholesale. Clearly there may be many COF rates for each tenor, reflecting different types of funding.

- Short-term funding rate (STFR) the rate at which no TLP need be applied (usually Libor-flat for sub-1-year).

\[
\text{FTP} \neq \text{TLP} \neq \text{COF}
\]
But there’s more than one way to...

- Some banks think the “FTP” price should be a “matched funding” basis price...
  - So if I am originating a 5-year corporate loan, the FTP for the corporate bank is the 5-year funding rate or the bank’s 5-year cost of funds (COF)
  - [Calculating COF is itself not straightforward, unless the business unit is completely self-funded and/or the bank has only one “type” of funding]
  - Is this realistic?
  - What is FTP designed to achieve? What is the point of it?

- An alternative approach to the matched FTP basis: a flat “FTP” yield curve after the 5-year tenor
- Explain....
For review

What is the primary objective of the FTP regime: managing all liquidity risk or just liquidity spread risk?

For later review (see Lecture 5): should the cost of holding the liquidity buffer (now required by regulatory fiat) be incorporated within the FTP regime? Or treated separately? If latter, how do we ensure effective alignment of the two mechanisms?

Is any deviation between “risk steering” (where your FTP modelling considers all liquidity risk) and “price steering” (where we consider only liquidity spread risk) acceptable or should both steering frameworks be consistent with regard to modelling?
What is the “TLP”?  

- The point of the “TLP” is to add on a “liquidity premium” for assets that are illiquid or not instantly liquid. Equally, to “reward” business lines for raising “term” funding

- Therefore, strictly speaking one is pricing *liquidity* here. This is *distinct* from the bank’s COF

- TLP as liquidity premium is not a straightforward calculation: one may need to use an average of a number of proxies

- The proxies might include:
  - The Funded versus the Unfunded for the bank
  - CDS versus ASW; Swap versus Bond
  - Risk-free versus Swap curve; Risk-free versus own bond curve
  - Swap versus own Bond curve
  - Difference between Pay Fixed on Term Swap, and Pay Fixed on same tenor OIS Swap
  - Cost of funds difference from 1, 2, 5 years outwards – the difference between them, up to next tenor borrowing rate
  - New issue premium over current secondary market yields
Incorporating TLP...

• Theory:
  - Costs and benefits are allocated to all products
  - At bank’s COF?

• The business is left to manage products and markets, Treasury to manage interest rate and funding gap risk (and FX risk)

• So we add the TLP to 3-month COF or STFR (say, 3-mo Libor if bank funds Libor-flat in short-date tenor)

• Banks are in the business of maturity transformation...
  – Asset tenor: contractual or behavioural terms?
  – The question therefore is “What is a fair COF curve for pricing?”
Calculating the TLP – worked example

We illustrate how to arrive at an estimated market-implied TLP value using various proxy indicator inputs, in this case to determine a range for the 5-year TLP for a specific banking institution.

The calculated value would be the spread added to 3-month FTP* to adjust to the 5-year FTP for (say) the corporate bank originating a 5-year fixed term vanilla loan.

We assume the 3-month FTP is 3-month Libor.

Our bank is an hypothetical A-rated commercial bank operating in retail, corporate and some wholesale space in multi-currency environment.

Market rates overleaf.

* We assume 3-mo (indeed, < 1-year) TLP is 0 bps. Therefore 3-mo FTP is assumed to be 3-mo COF, which is further assumed to be 3-month Libor-flat.
Unless dealing with a risk-free issuer ("AAA"), the observed curve for any specific issuer reflects the credit risk premium for that issuer over the risk-free rate, and the term liquidity premium for borrowing over a longer period.

To extract a pure TLP, we need to strip out the liquidity premium element from the credit premium element.
## Rates assessment

<table>
<thead>
<tr>
<th>Market rates 15 October 2012</th>
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</thead>
<tbody>
<tr>
<td><strong>CDS 5-year EUR</strong></td>
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<tr>
<td>Senior debt</td>
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<tr>
<td>Subordinated</td>
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<tr>
<td><strong>Asset swaps (actual bonds) EUR</strong></td>
</tr>
<tr>
<td>19 month</td>
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<tr>
<td>33 months</td>
</tr>
<tr>
<td>43 month</td>
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<tr>
<td>51 month</td>
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<tr>
<td>5-year interpolated</td>
</tr>
<tr>
<td>84 month</td>
</tr>
<tr>
<td>89 month</td>
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<tr>
<td><strong>Swap versus Bond (5-year EUR)</strong></td>
</tr>
<tr>
<td>Swap</td>
</tr>
<tr>
<td>Bond</td>
</tr>
</tbody>
</table>

- **CDS-ASW**
  - [Note that “AS” refers to asset-swap spread and is therefore a floating spread over 3-month Libor]
  - Here a (pre-crash style) positive basis that doesn’t tell us anything - a pity!
- **Swap versus Bond**
  - Implies 5-year TLP of 8 bps in EUR
Rates assessment...

<table>
<thead>
<tr>
<th>Market rates 15 October 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk-free versus Swap (5-year)</strong></td>
</tr>
<tr>
<td>USD risk-free</td>
</tr>
<tr>
<td>EUR risk-free</td>
</tr>
<tr>
<td>USD Swap</td>
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<tr>
<td>EUR Swap</td>
</tr>
</tbody>
</table>

- Implies a 5-year TLP for this bank of 13 bps in USD...
- ...and 43 bps in EUR

**ALSO:**

- Consider Risk-free versus ASW
- Here for EUR gives (103 – 52) or 51 bps
## Rates assessment

### Market rates 15 October 2012

<table>
<thead>
<tr>
<th>Pay-fixed in Swap versus pay-fixed OIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USD 5-year</strong></td>
</tr>
<tr>
<td>Vanilla</td>
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<tr>
<td>OIS</td>
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<tr>
<td><strong>EUR 5-year</strong></td>
</tr>
<tr>
<td>Vanilla</td>
</tr>
<tr>
<td>OIS</td>
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</tbody>
</table>

### Cost of funds term structure (EUR)

<table>
<thead>
<tr>
<th>3-month</th>
<th>50 bps</th>
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</thead>
<tbody>
<tr>
<td>1-year</td>
<td>61 bps</td>
</tr>
<tr>
<td>2-year</td>
<td>79 bps</td>
</tr>
<tr>
<td>5-year</td>
<td>103 bps</td>
</tr>
</tbody>
</table>

### New issue premium (5-year EUR)

<table>
<thead>
<tr>
<th>New issue</th>
<th>132 bps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary market ASW</td>
<td>103 bps</td>
</tr>
</tbody>
</table>

- Implies 5-year TLP in USD of 25 bps and in EUR of 39 bps
- Implies 5-year TLP of 53 bps (as well as a 1-year TLP of 11 bps and a 2-year TLP of 29 bps) *
- Implies a 5-year TLP of 29 bps

* Note this is the 5-year TLP and not the o/n - 3-month TLP
For the 1-year TLP we would use 1-year swap, etc
Setting the TLP

- From the foregoing, we have 6 inputs for 5-year TLP in EUR in range of
  - 8 bps to...
  - ...53 bps
  - Average of the range is **37.2 bps**, Median is 41 bps, Mode is...N/A
  - Stripping out the outliers, average is **40.5 bps**
- The actual figure set is a matter of individual judgement, influenced by where the bank wants to go – this is where the Funding Policy comes into use.
- The funding policy (see later lecture) sets the tone of internal funding.
- The rate here could be set in the middle or at the highest...
- Your call!

**NOTE:** this may seem low for a 5-year TLP (and in Oct 2011 for this bank the figure was over 110 bps). It obviously reflects a position of surplus liquidity at macro level and/or no wholesale issuance at specific entity level...

**BUT** it is still ~40% of the total credit spread – the 5Y FRN price is 103 bps. So how high would one expect TLP to be anyway?
Calculating TLP...

- What about banks that don’t have these market indicators?
- Recourse to
  - Market rates (eg., Risk-free versus Swap)
  - Peer bank rates if available
  - Proxies such as customer deposit rates, which do not, practically, incorporate the bank’s credit risk element in the rate.
- An informed estimate at least drives a logical, robust debate and enforces the discipline – the concept of an FTP regime that addresses liquidity and funding risk, and more accurate returns analysis.
Debating point

- What is the optimum FTP regime for your bank?
- Are we happy to set the “liquidity premium” over the short-term cost of funds based on the proxy calculation?
- Should the FTP be the matched tenor COF rate?
Practical aspects of FTP
Retail banking FTP

- The retail bank is stable funded
- Hence the FTP tenor can, almost always, be set safely at less than the contractual tenor AND often the expected life (EL) tenor. This preserves competitive position
- So here FTP = TLP and not COF
  - For mortgages we assume here all are capital and repayment products; ie., no interest-only mortgages
- Tenors quoted can be behavioural or contractual
- See overleaf…
- Does TLP tenor change for “introducer” mortgages as opposed to organic mortgages? (These will need to be ultra-competitive…)
- FTP regime: should it be Gross or Net of assets and liabilities?
  - One could net off eg., 3Y fixed-rate deposits against behavioural 3Y assets and charge FTP pay or receive on the net amount
  - IRRM: hedge the net IR gap
Sidebar: **product range and TLP**

- Retail banking products that would attract TLP (pay or receive)
- **Assets**
  - Mortgages
  - Personal term loans (car loans, etc)
  - Any other? Credit cards depends on behavioural tenor set
- **Liabilities**
  - Current accounts
  - Call accounts; sight deposits
  - Notice accounts
  - Term deposits
  - Any other?
Retail FTP regime...

**FTP should reflect:**
- Actual rates paid by both sides
- Competitive position
- Actual match funded or not
  - eg., Barclays Bank treats current account balances as 10Y tenor
  - RBS 5Y
  - too long for prudent liquidity risk management?
- Ensure products priced properly
  - in our example, deposits pay 150bps, so loans must earn over this
Common bank FTP – how I WOULDN’T do it

Product type:
- Term loans
- Interest-only loans
- Repayment loans

NB. Corporate loans frequently reprice every 3M or 6M where floating, less incentive to repay

...Variable tenor (Revolver)
...lower amortising profile

Retail FTP regime...

- For the floating rate asset, FTP is
  - 3M Libor + TLP
  - TLP tenor is...3Y? 5Y? 7Y?
  - Theoretically you set to EL of the product
  - But this may be uncompetitive, so most common is 2Y-3Y

- For the fixed rate asset, FTP is
  - 3M Libor + TLP converted to a FIXED rate
  - TLP tenor matches product life (eg., 2Y fixed rate in a mortgage that moves to floating variable or can be re-fixed at new rate after 2 years)
  - But again competitive position is key

Debating point: Competition strongly influences pricing. What if every other bank has got it wrong?!
Retail FTP regime...

- FTP regime must reflect both sides of the balance sheet. Below slide reflects:
  - Basis risk inherent in the business model
  - Where does hedging cost sit? CSA collateral funding cost of the derivative hedge? Treasury? Passed on to the business line through FTP or month-end adjustment?

![Diagram showing FTP regime]

- Retail Customer
  - Asset
    - Cash loan (e.g., mortgage)
      - Legal 25Y
      - EL 7Y
  - Liability
    - Cash deposit
      - Behavioural tenor / FDR

- Retail Business Line
  - £ Cash in/out
  - £ Cash out
  - Either
    - Floating rate - "Base rate" linked
    - Fixed rate (fixed product term 1Y-5Y)

- Retail Customer
  - Liability
    - Floating rate - "market" rate linked to Libor
    - Fixed rate deposits

Also the FX element where necessary…

NOTE: 1-2 bps bid-offer spread…

Origination process creates Base-Libor basis risk (managed by Treasury)
Illustration

- **Liability: MTA balance agreed as 5-year behavioural tenor**
  - MTA treated as “floating rate” liability
  - Notional balance £X stated on internal ticket (this may be “haircut” to [%] of actual aggregate balance as determined by behavioural profile)
  - Current 5-yr TLP [ ] bps
    - (Curve or grid updated weekly / monthly / quarterly as desired)
  - FTP is STFR + TLP spread on £X shown in month-end management accts

- **Asset: 2-year standby liquidity facility**
  - Assume it will be drawn down to max term so FTP is STFR + 2-year TLP on floating basis

- **Asset: 25-year legal maturity resi mortgage, dealt at 3-year fixed rate**
  - Assume 3-year behavioural profile so FTP is STFR + 3-year TLP at fixed rate equivalent
  - Assume re-fixed in 3 years and retained on balance sheet, reprice then
Retail FTP regime...

Conclusions

- In a Retail Bank, FTP is not necessarily that relevant, particularly if we are essentially (behaviourally) match funded and running a deposits surplus

Key objective

- Keep the Banking Book at zero FTP risk (gap liquidity risk) and zero interest-rate risk
- Neutralising the business line of both above risks and centralising in Treasury/ALM
Behaviouralisation – first principles

- Observe month-end spot and average balances over time to build a picture of behavioural tenor
  - Note behaviour at expected outflow points like quarter- and month-ends
  - Note behaviour at times of stress
- See examples overleaf…
- This approach satisfies the regulator
- Your call as to how conservative you wish to be…
# Account balances - MTA

<table>
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<tr>
<th>Type</th>
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<th>Jan-13</th>
<th>Feb-13</th>
<th>Mar-13</th>
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<< take back over many years...
# Account balances – Depo / inst acc savings

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<th>Feb-13</th>
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Case study: behaviouralisation

Belgian Retail Bank
Retail bank: liability tenor behaviouralisation

What approach should be adopted to set behavioural tenor for Retail Bank liabilities with 1-day contractual tenor:

- No wholesale funding
- No explicit maturity on many liabilities
  - Sight deposits
  - Call accounts
- Setting the appropriate tenor for FTP
- Interest-rate reference for these deposits? It isn’t “Libor”…
  - Not explicit
  - Linked to competitors rates
  - Variable rate, credited to accounts annually
Behaviouralisation...

- Group accounts by cohort
  - By opening date
  - By product
  - By customer type

- Graph the aggregate balances over time by cohort
- Set behavioural tenor according to actual observation
**Behaviouralisation...**

- Track by cohort
- Granular account level

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<th>Mar-08</th>
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</table>
Behaviouralisation...

Graphical observation to set tenor

![Graphical representation of balance EUR bln over time with different cohorts]

- Cohort 1
- Cohort 2
- Cohort 3
- Cohort 4
- Cohort 5
- Cohort 6
Conclusions

- There is no “one size fits all”
- The imperative is that business lines are charged the correct cost of liquidity
- This then feeds into correct customer pricing
- And reporting of genuine PnL reporting and hence SVA
- We are pricing liquidity as well as the bank’s COF – these each have different uses and applications
- Vitally important for a consistent curve to be applied across the business…
- …unless special circumstances dictate different FTP curves for each business line
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