Chapter 11 – Interest Rate Risk in the Banking Book

The Role of the Treasury
- A Commercial/retail Only Bank Model
- A Commercial/retail Bank with an Investment Banking Operation Business Model

Treasury Risk
- Asset and Liability Management Activities
- Asset and Liability Management (ALM) Risk

NII Risk in the Banking Book
- Basic NII Risk Model
- Basic NII Risk Management
- Critiques of the Basic NII Risk Model

Equity Risk in the Banking Book
- Hedging Equity Risk
- Critiques of the Duration Gap Model
The Role of the Treasury

- A Commercial/retail Only Bank Model
- A Commercial/retail Bank with an Investment Banking Operation Business Model
To IRR is human, to forgive may not be in the stockholders’, the Board’s or the regulators’ vocabulary.
The Role of the Treasury

<table>
<thead>
<tr>
<th>Standard corporate treasury functions</th>
<th>Bank treasury functions</th>
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<tbody>
<tr>
<td>• Security issuance</td>
<td>• Manage bank’s assets and liabilities, liquidity and capital.</td>
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<td>• Cash forecasting and management</td>
<td>• The exact roles vary significantly depending on the business model adopted by the bank.</td>
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<tr>
<td>• Financial decision-making and insurance</td>
<td>• Most treasury functions take an active role in managing the bank’s balance sheet capital</td>
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Interest Rate Risk in the Banking Book

The Role of the Treasury

- A Commercial/retail Only Bank Model
- A Commercial/retail Bank with an Investment Banking Operation
- Business Model
The collective capital is invested to generate a cash return, the risk of which depends on how the capital is allocated to different types of interest-bearing assets.

- This gives the bank an interest “net position” (it earns interest on the assets and pays interest on the funding) that must be managed to avoid volatile profit and losses as interest rates move.
- Fluctuations in interest rates also create “equity risk” for the bank as the value of its assets and liabilities change.

### Balance Sheet Capital

- **Deposits**
  - Core deposits
  - Sticky deposits
  - Volatile deposits
- **Interbank lending**
  - Own financing
  - Interbank financing
- **Balance sheet equity**
  - Book equity
  - Secondary equity
  - Economic equity
  - Ability to - seek - leverage

### Balance Sheet Assets

- **Cash and reserves**
- **Loans**
- **Investments**
- **Notes**
- **Contingent off-balance sheet assets**

### Profit

- **Income to the bank**
  - Return earned off balance sheet assets
  - Cost of securing and acquiring capital
A typical commercial/retail bank model focuses its asset strategy on commercial and retail loans, and funds the loans using a combination of equity, retained earnings, deposits, publicly issued bonds and interbank loans. While the core risk is credit risk, interest rate fluctuations impact earnings.

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<th>Example – Cash flow effects</th>
<th>Example – Balance sheet effects</th>
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<td>• KappaBank had entered into a number of long-term commercial and retail loans financed by floating rate deposits</td>
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<td>• Interest rates subsequently rose</td>
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<td>• The bank now pays higher interest rates to its depositors and would have to pay higher rates on its debt to the extent the debt interest rate was linked to floating indices, or to the extent the debt used to fund the loans was of a shorter maturity than the loans.</td>
<td>• Fixed rate assets drop in value, although that effect would be offset by a reduction in the value of its fixed rate liabilities</td>
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<td>• The bank could actually end up in a negative cash flow position even in the absence of default</td>
<td>• Floating rate assets and liabilities would not change much in value</td>
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<td></td>
<td>• This affects the value of the equity of the bank, since equity is the difference between assets and liabilities</td>
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Fluctuating asset and liability values impact the economic and book value of the equity.
For that reason, this risk is sometimes called equity risk.

- If fixed rate assets dominated fixed rate liabilities, as would be the case for most commercial/retail banks, rising interest rates would damage the bank’s equity value.
Managing the Interest Rate Risk in the Banking Book

• The net interest rate risk in their banking book is typically managed directly with market counterparties by operating a derivatives trading desks.
  • To protect against the effect of interest rates, the bank would enter interest rate swaps

Managing the risk of increasing interest rates where the assets exceed liabilities

• Enter swap transaction where the bank pays fixed rates and receives floating rates to offset the risk of its fixed rate assets

Managing the risk of decreasing interest rates where the assets exceed liabilities

• Enter swap transaction where the bank pays floating rates and receives fixed rates to offset the risk of its fixed rate assets