Margin "teach-in"

Interest rate risk management

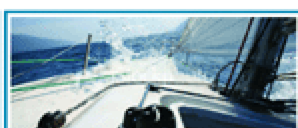
Jaco van der Walt

October 2006

FIRSTRAND
Banking Group

Presentation overview

1. What is interest rate risk?
2. Isolating interest rate risk
3. Interest rate risk measurement
4. Hedging repricing risk with swaps
5. Practical aspects of hedging
6. Managing interest rate risk



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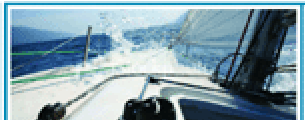
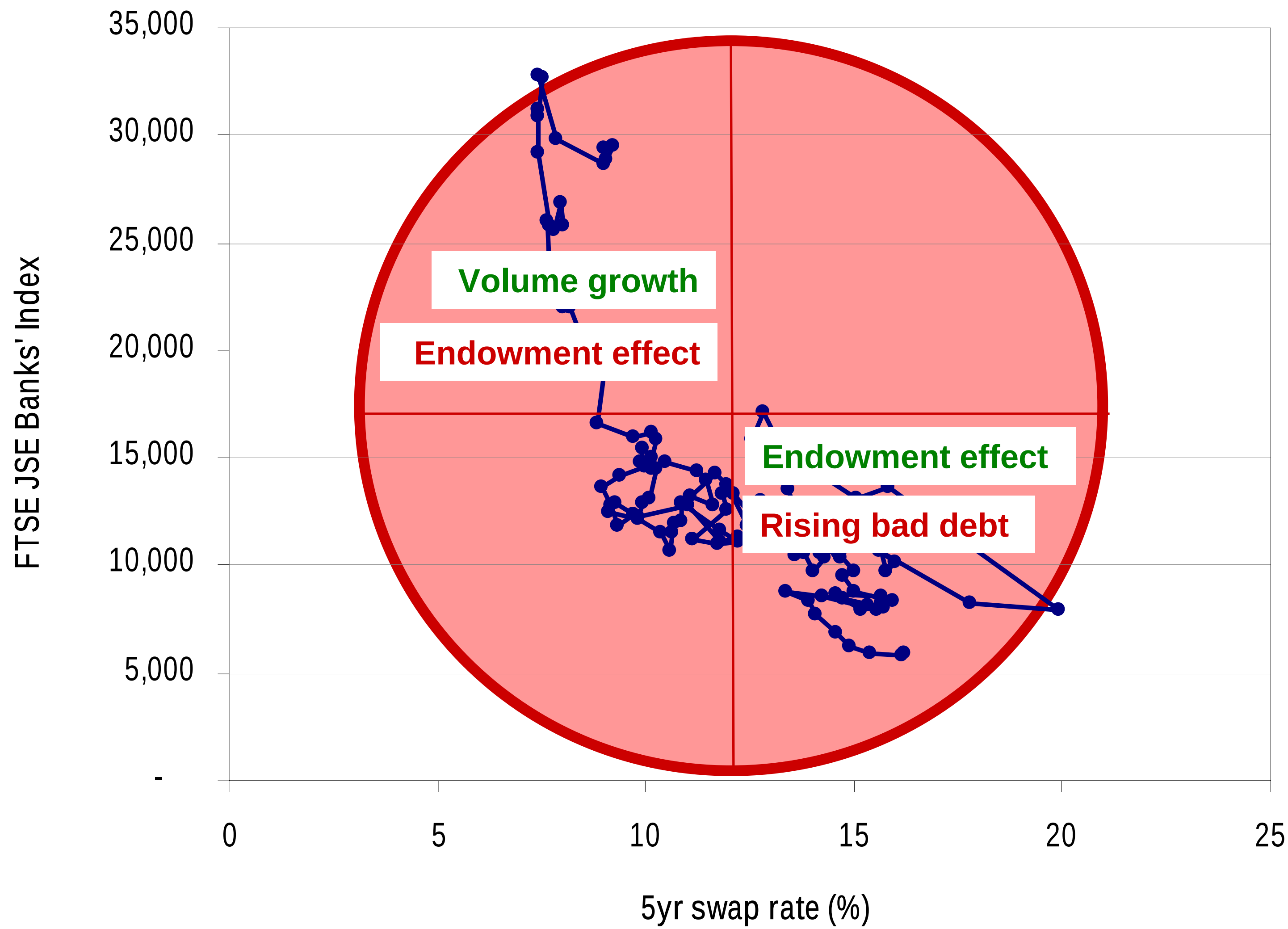


Share price vs interest rates



Definition of interest rate risk

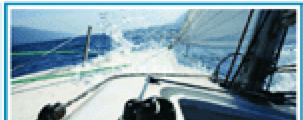
- Interest rate risk is…
  - The sensitivity of the balance sheet and income statement due to unexpected, adverse movements of interest rates

Sources of IRR

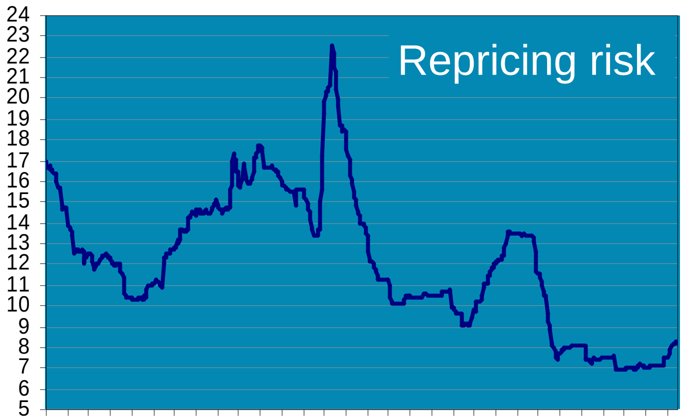
- Repricing risk
- Twist risk
- Basis risk
- Optionality

→ Income statement / Balance sheet → Share price

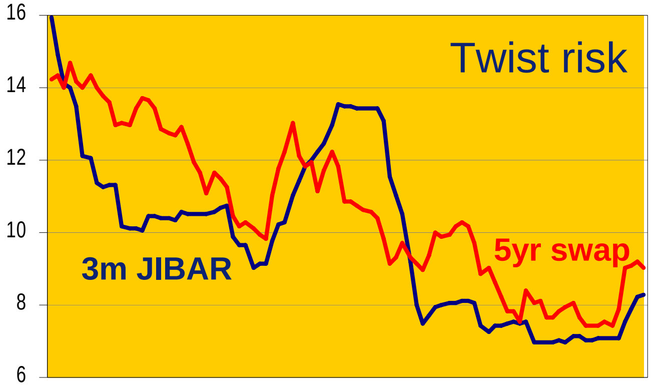
- Basel II
  - Treats the interest rate risk in the banking book as a separate risk type, incorporates it into Pillar II of the Basel II framework
  - Mismatch arises naturally and can be an important source of profitability
- No standardised approach to the treatment of interest rate risk globally



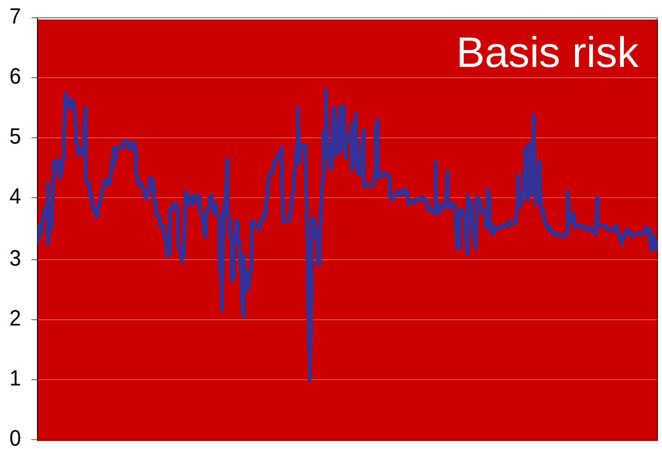
Sources of interest rate risk



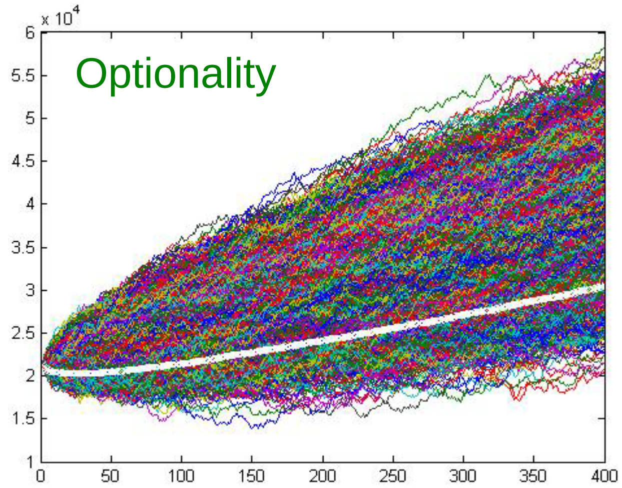
Example: Endowment risk on core deposits



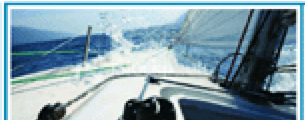
Example: Curve inversion for fixed rate loans



Example: Prime-JIBAR or swap spreads



Example: Prepayments on fixed rate loans



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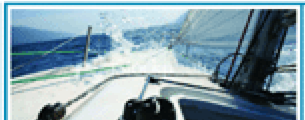
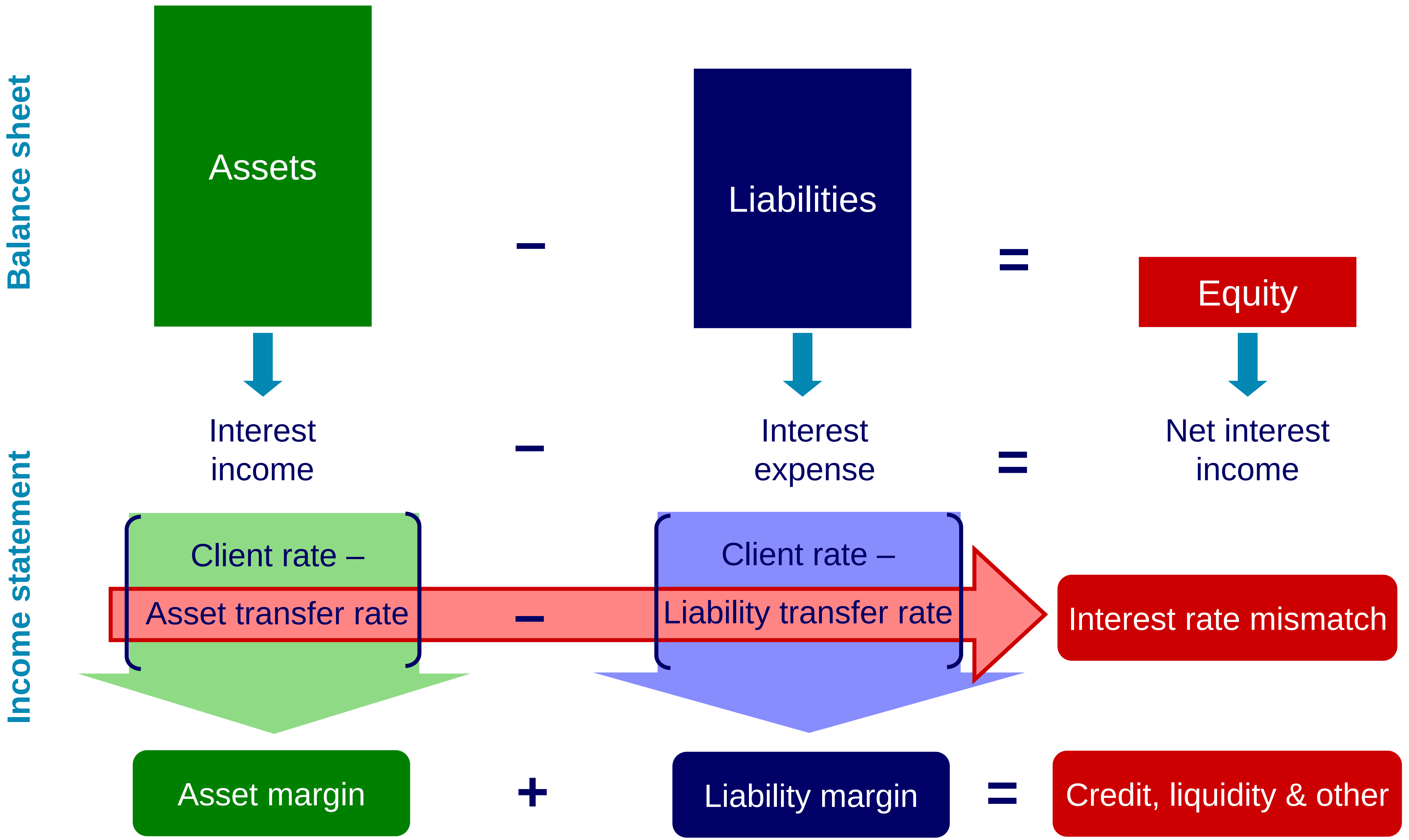
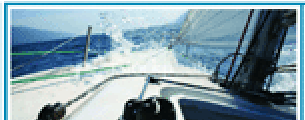
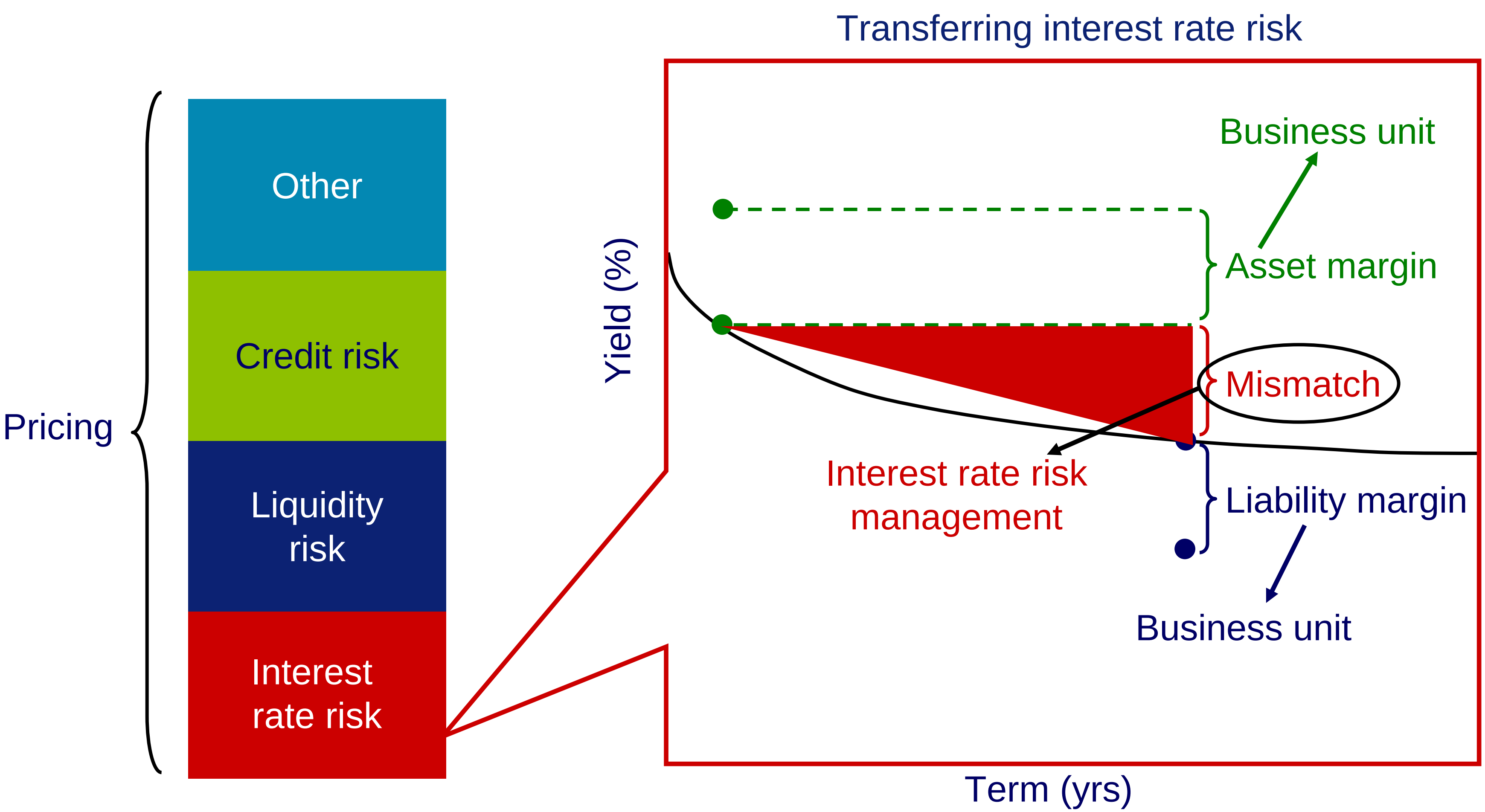


Isolating interest rate risk





Separating credit, liquidity and interest rate risk



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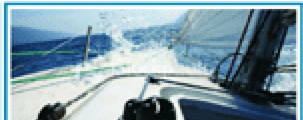


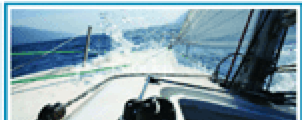
Measurement of interest rate risk

Most banks mainly focus on repricing risk

Risk = Exposure x Volatility

- Earnings perspective
  - Cash flows
  - Risk measures
    - Repricing gap
    - NII (or NI) sensitivity
    - Earnings at risk
- Economic value perspective
  - PV of cash flows
  - Risk measures
    - EV sensitivity
    - Effective duration of equity
    - Economic value at risk

Assumptions are key (no standardisation)



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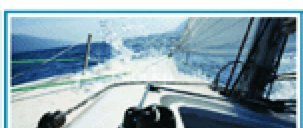
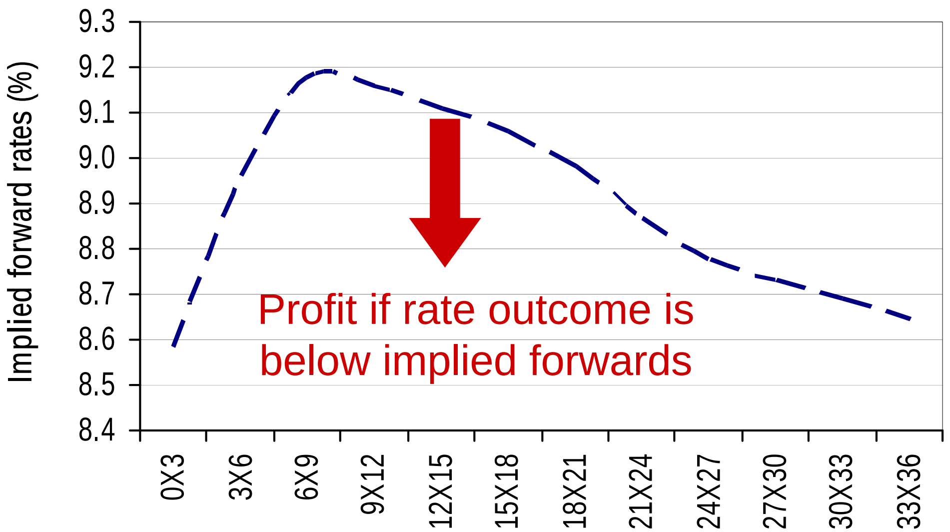
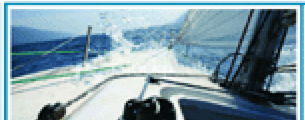


Hedging repricing risk with swaps

- Drop in level of rates is the main source of earnings risk facing SA banks
- Assets reprice as rates drop, but rates on core deposits have a floor
- Can hedge this risk by selling swaps (receive fixed, pay floating)
- Only profit if rates drop by more than implied forwards
- Apply cash flow hedging to reduce volatility of income (IAS32, IAS39)
- Hedges must be unwound if rates rise

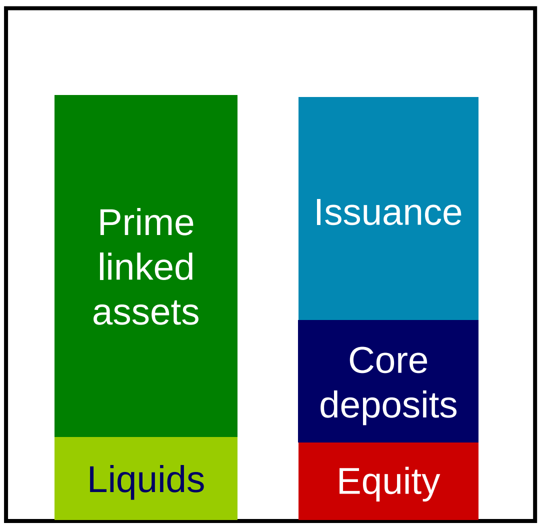




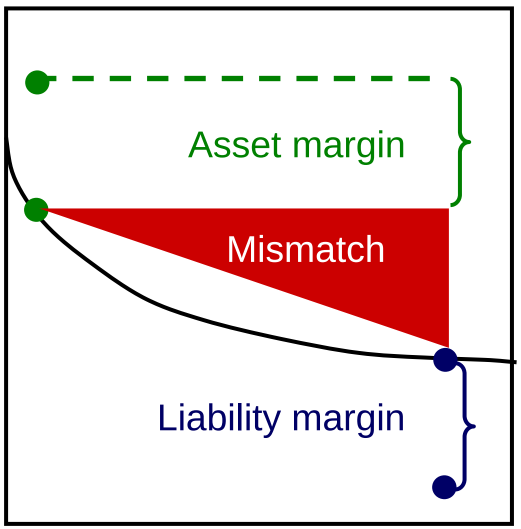
Practical example: repricing risk

Earnings at risk due to level shift

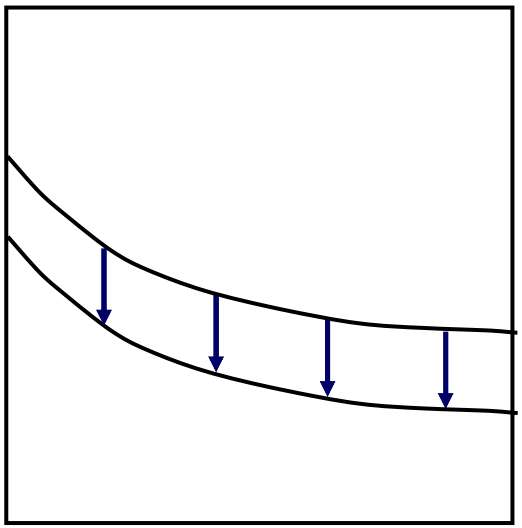
Balance sheet



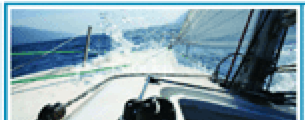
Interest rate mismatch



Example: Level shift



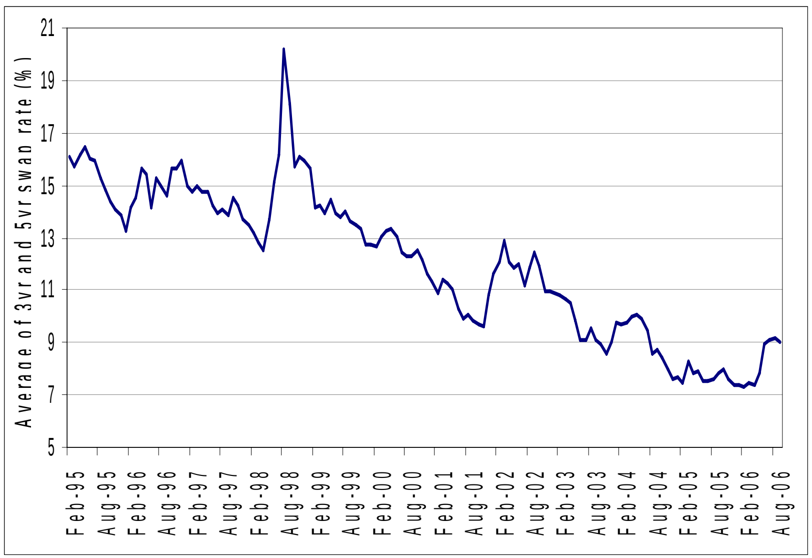
Risk = Exposure x Volatility



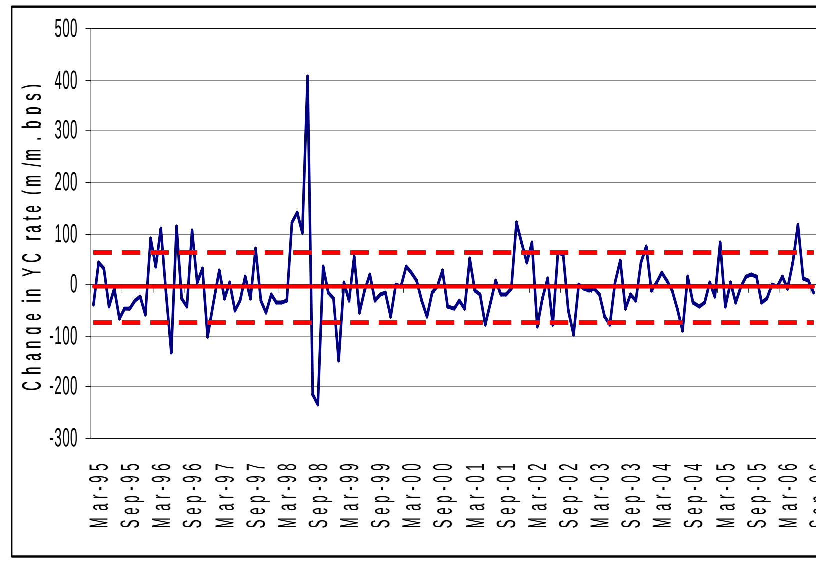
Driver of repricing risk (volatility)

Risk = Exposure x **Volatility**

Level of curve



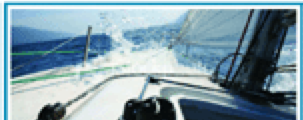
Changes in level



Monthly average: -5bps

Monthly std dev: 67bps

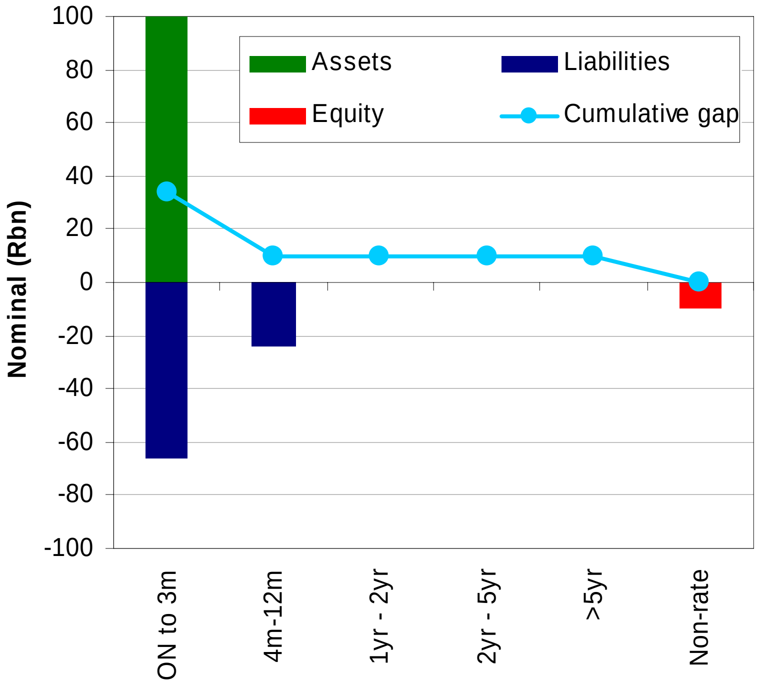
Annualised std dev: 232bps



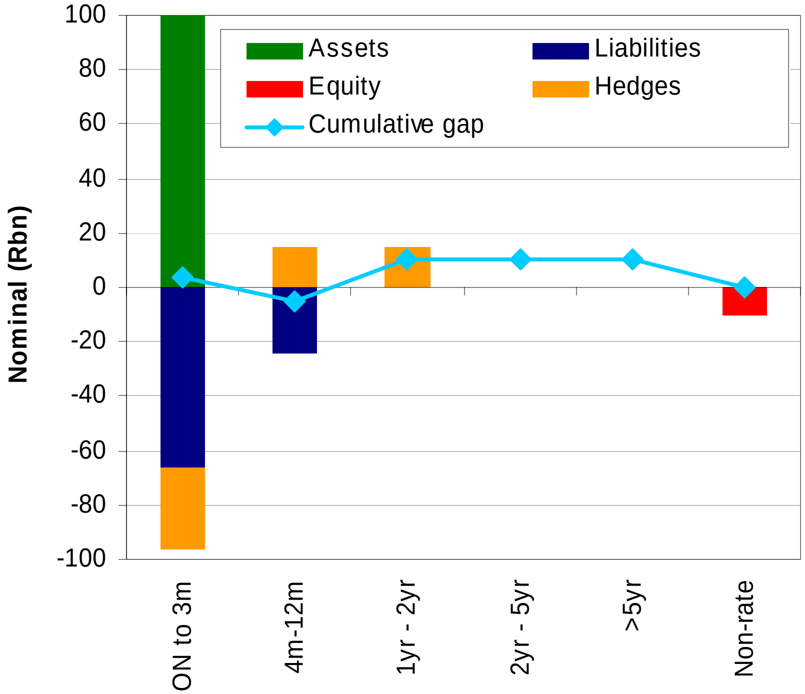
Exposure to repricing risk (gap)

Risk = **Exposure** x Volatility

Gap before hedges



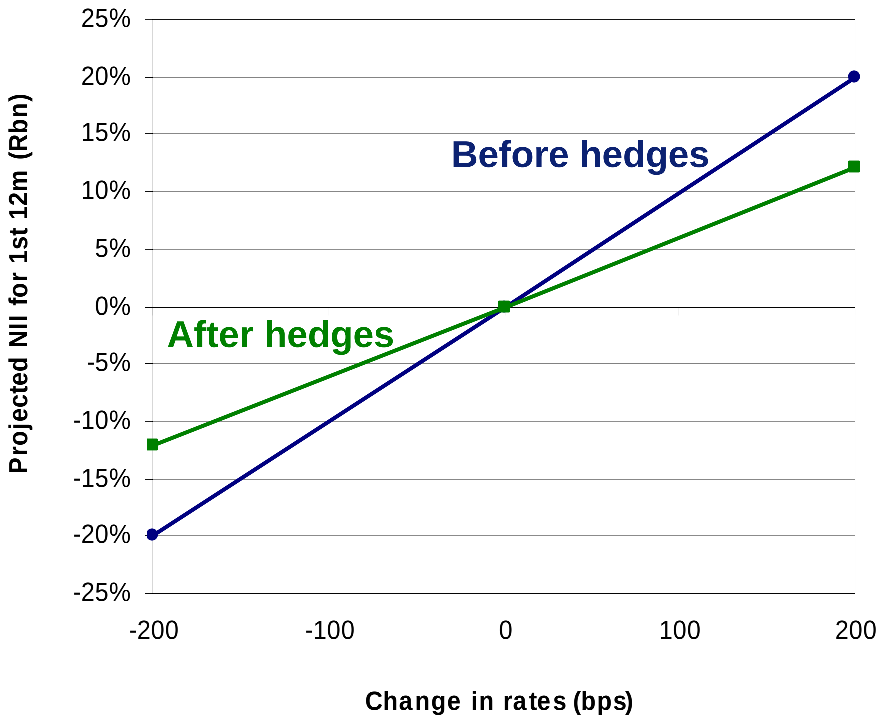
Gap after hedges

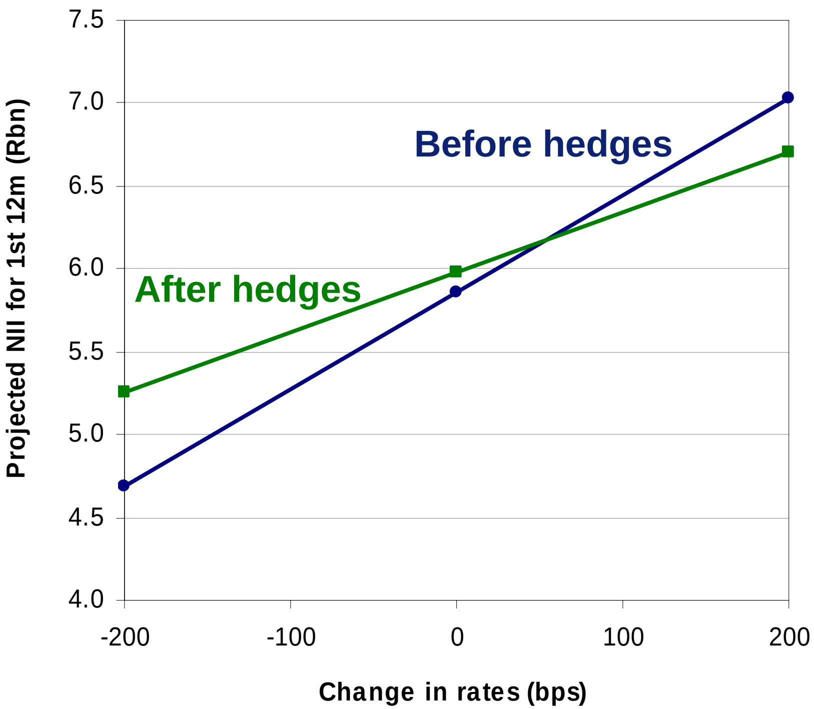


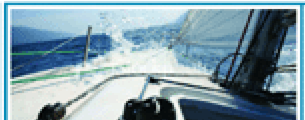
Receive swaps to protect against rate cuts

Earnings sensitivity to repricing risk

Risk = Exposure x Volatility







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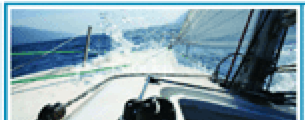
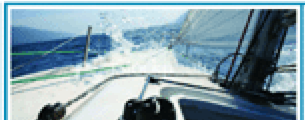


Practical aspects of hedging (1)

- Repricing risk
  - Manifests heavily in endowment effect through core deposits and capital
  - Hedge instruments include:
    - Swaps and FRAs
    - Liquid assets (government securities)
    - Options are seldom used to hedge repricing risk by SA banks
  - Not all SA banks hedge this risk actively
  - Some international banks target a rolling average

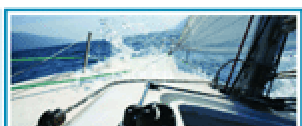
- Basis risk (1)
  - Prime-JIBAR basis
    - Not enough liquidity in prime basis swaps to hedge prime books
    - Some banks use replicating portfolio technology
    - Risk generally retained in business units and priced accordingly



Practical aspects of hedging (2)

- Basis risk (2)
  - Swap-government basis
    - Manifests itself predominantly in the liquid asset portfolio if longer bonds are included
    - This risk is generally actively managed

- Option risk
  - Exists mainly due to prepayments in fixed rate products (e.g. auto loans)
  - Generally hedged on a macro basis according to the prepayment tendency
  - Increasing number of new products contain embedded optionality



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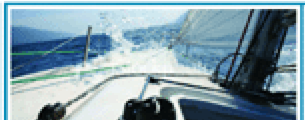


Managing interest rate risk

Interest rate risk management processes

Frameworks & mandates

Modelling & analytics

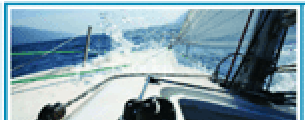
Transfer economic risk (FTP)

View / macroeconomics

Hedging strategies &
portfolio management

Governance & risk management

Reporting



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