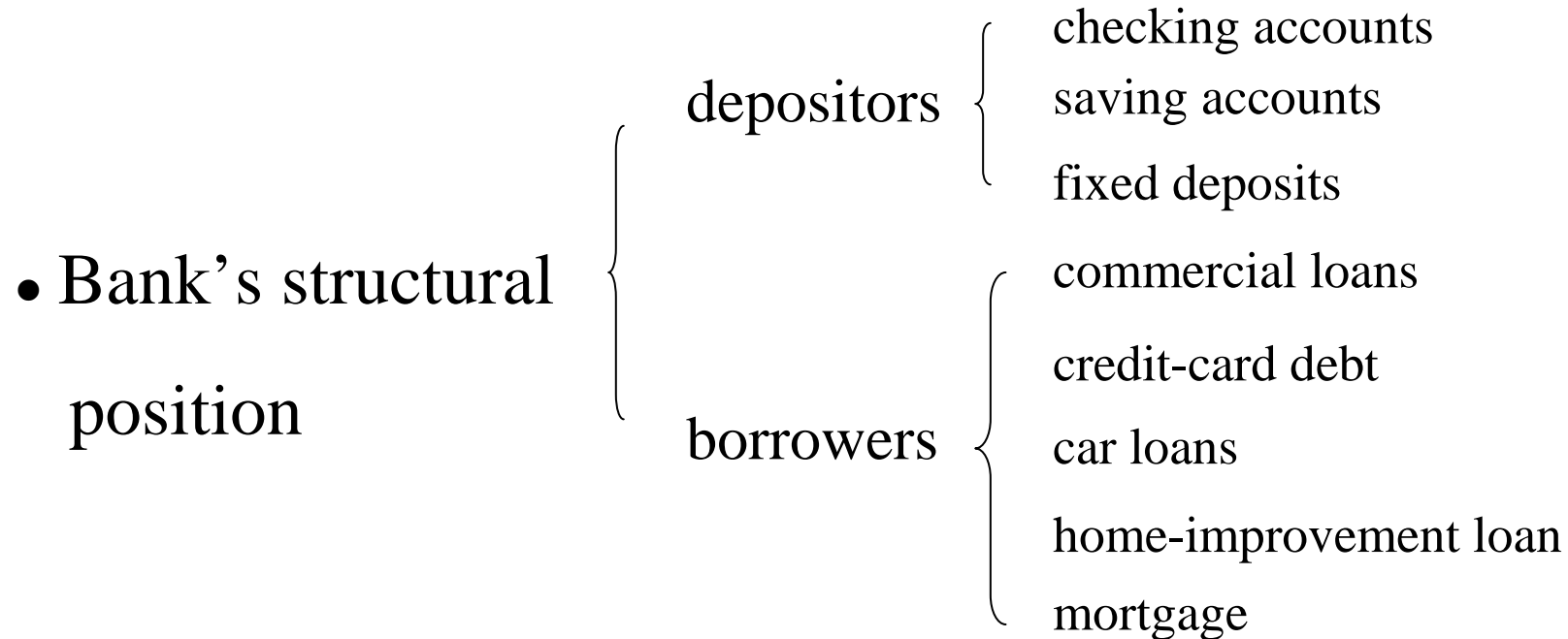

Chapter 12

Introduction to Asset Liability Management

Introduction



- ★ ALM risk is arisen from the difference between the bank's asset and liabilities
- ★ ALM is most important for universal or retail banks and less important for trading or investment banks

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- ALM包括管理
 - Interest rate risk
 - Liquidity risk
 - Funds transfer pricing

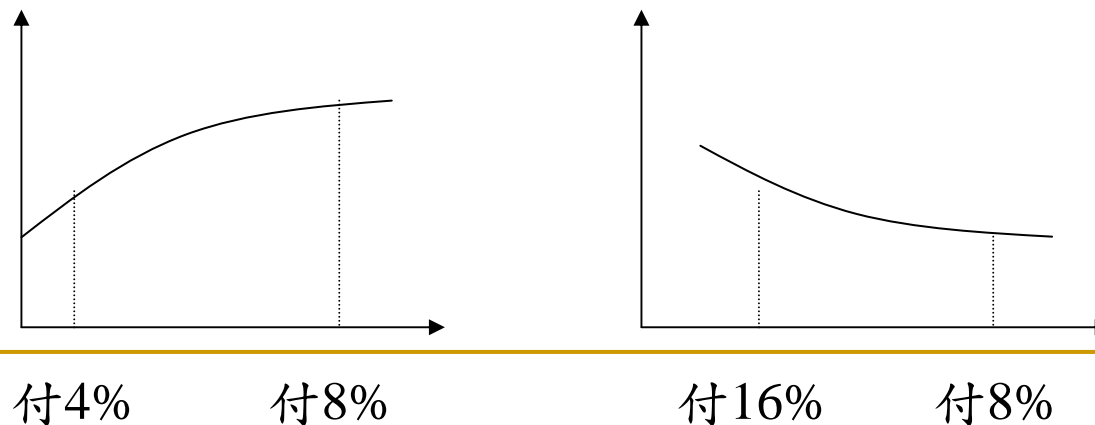
- Interest rate risk: arising from the possibility that profits will change if interest rates change
- Liquidity risk: arising from the possibility of losses due to the bank having insufficient cash on hand to pay customers
- ★ However, different from the aspect of the market risk, here the risks are caused from the mismatch between the bank's asset and liabilities

- ALM vs. VaR

流動性大 (trading instruments)→ 用 VaR (day by day)
(within a month)

流動性小 (ALM instruments)→ 用 ALM (monthly basis)

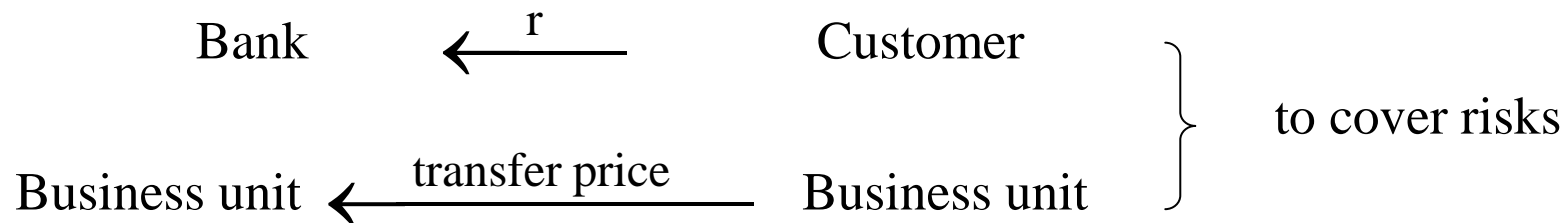
- Interest rate risk: Savings and loan (S&L), which is the most famous example of ALM risk



- Funding Liquidity Risk

- “run on the bank” (擠兌)，在開發中國家，政府會辦 deposit insurance
- 若銀行很依賴短期銀行間借貸，而借錢給它之銀行對它之信用喪失信心而抽銀根（類似1997亞洲金融風暴中，銀行與企業間所發生之問題）

- Funds Transfer Pricing

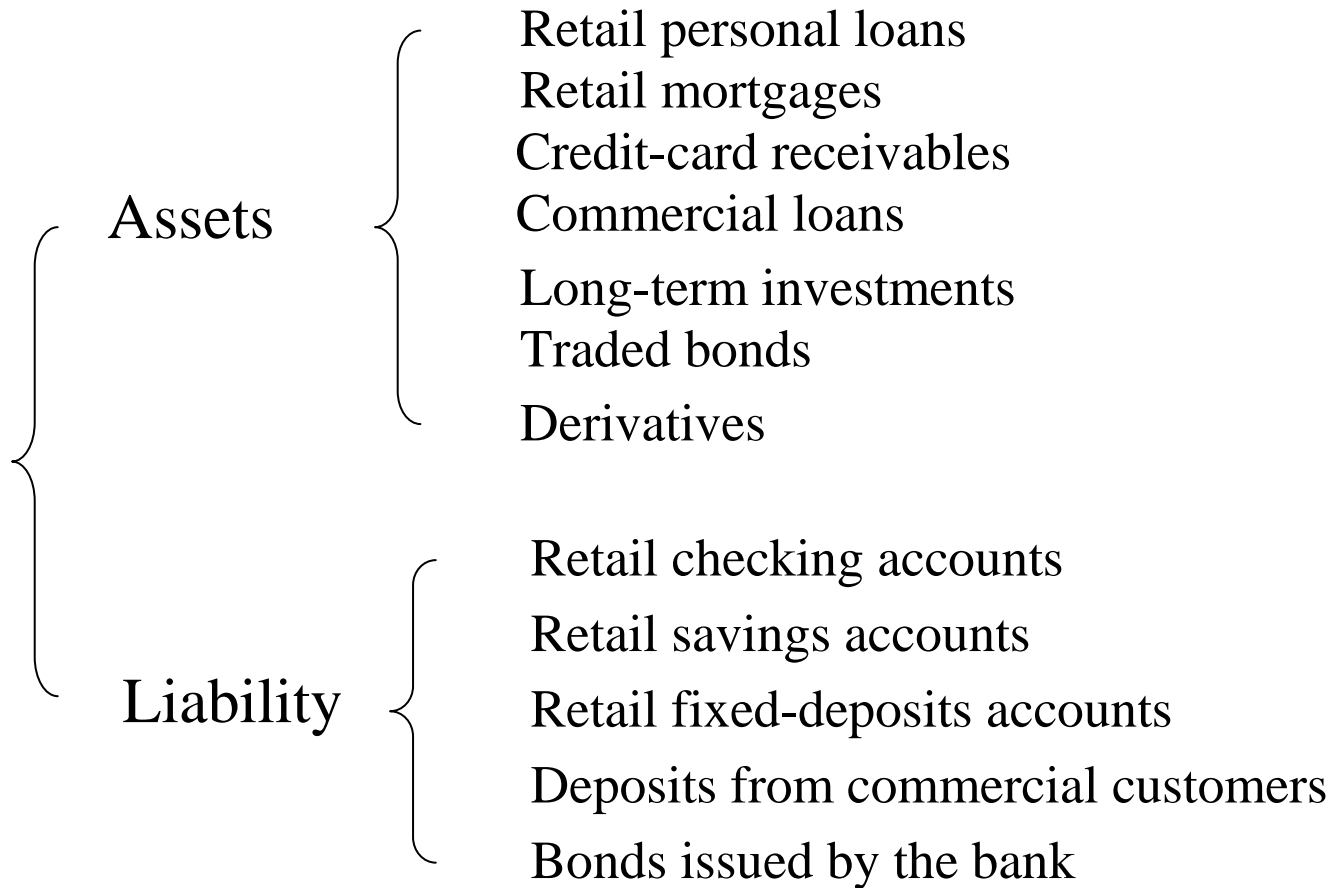


Sources of Interest-Rate Risk

- ALM oversees the management of the long-term, structural interest-rate position (banking book)
- All other market risks are typically managed by the trading room (trading book)
- 最常見之 structural interest-rate risk 是銀行收遠天期 fix，付近天期 float，asset 與 liability 之收入與支出可能 mismatch，例如：p.178 Figure 12-1

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- 管理ALM risk比管理bond portfolio之market risk難(此為trading room之工作)，因為除了market rate改變之外，還要考慮顧客之行為所引起之indeterminate maturity problem，例如顧客可能隨時要來提款 (put option)，或是隨時多還房貸 (prepayment)
 - 除此之外，retail products還有一項特色，顧客付的rate，通常為銀行的prime rate (or administered rate) 加上一個spread，但prime rate的變化通常跟market rate變化並非完全相關，例如，prime rate一季調一次，market rate每天都在變
- * Basis risk: difference between the yield from prime-based assets and the yield on market-based liability
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Main Product Classes held in ALM Portfolios



- Retail Personal Loans

- Equal Installments

- Fixed

- ◆ prepayment risk (significant for mortgage)

- ◆ prepayment penalty

- Float

- ◆ Capped r (however, bank should pay float r for the liability, or say, deposit)

- Retail Mortgage

- 在美國，利率固定且期間長，在發展中國家，期間短且可能只有頭幾年固定
- PSA, CPR, SMM (prepayment rate is a function of T)
- Logistic function (prepayment rate is a function of r) p.183 Table 12-1, p.184 Figure 12-4, 12-5 (PO), and 12-6 (IO)
- In reality, the value of an MBS is even more complex because customer payments are also path dependent
- $MBS(r)$, $MBS(\text{prepayment})$, $\text{prepayment}(r,t) \Rightarrow$ Valuation of mortgage-backed securities is highly complex

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- Credit-Card Receivables
 - Issued by a bank itself or via investing credit-card-receivable backed securities
 - The value of credit-card receivables depends on:
 1. Default rate (10%~20%) (the same as credit risk)
 2. Difference between market rates and the card rates
 3. Revolving outstanding (it can be modeled as an ALM risk similar to the modeling of prepayments for mortgages)

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- Commercial Loans
 - Bond + prepayment options
 - Long-Term Investments
 - Real estate or long-term investment owned by the bank
 - ◆ Sensitivity of r for a real estate is difficult to estimate
 - ◆ Market index as a proxy to study the sensitivity of r
 - Bank's excess funds (strategic investment)
 - Traded Bonds, swaps, and options
 - Parking money or holding for hedging
-

- Retail Checking and Savings Accounts

- Those are also known as demand deposit accounts (DDA)
 - Contractual maturity is zero and interests payments are close to zero
 - In practice the balance for DDA is relatively stable, and banks can rely on having most of this money for months or years
 - The balance for DDA is affected by r (p.187-188 example)
 - ◆ r 上升，對債務人(銀行)好，但存款人也會提出部分款項去做其他較高報酬率之投資 (r 上升，balance下降)
 - Deposit accounts (or money market accounts) pay a small amount of floating-rate interest and its NPV is less sensitive to changes in market rates
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- Retail Fixed Deposits
 - Not to withdraw for a given period
 - The prevailing market rates is as the new rate to redeposit
 - Similar to a short-term bond
 - Deposits from Commercial Customers
 - 大額存款，利率約為interbank rate
 - Bonds issued by the Bank
 - To adjust their interest-rate position, raise funds, or modify the capital structure
 - Useful benchmark in determining the bank's true cost of debt (而非用存款利率當資金成本)
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