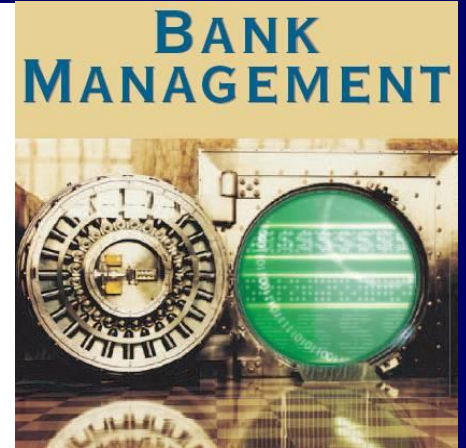


# ANALYZING BANK PERFORMANCE

## Lecture 2



# Balance Sheet

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- **Assets = Liabilities + Equity**
- **Balance sheet figures are calculated at a particular point in time and thus represent stock values.**

# Bank Assets

<http://www2.fdic.gov/ubpr/UbprReport/SearchEngine/Default.asp>

- **Cash and due from banks**
  - Vault cash, deposits held at the Fed and other financial institutions, and cash items in the process of collection.
- **Investment Securities**
  - Securities held to earn interest and help meet liquidity needs.
- **Loans**
  - The major asset, generate the greatest amount of income, exhibit the highest default risk and are relatively illiquid.
- **Other assets**
  - Bank premises and equipment, interest receivable, prepaid expenses, other real estate owned, and customers' liability to the bank

# Adjustments to total loans

*...three adjustments are made to obtain a net loan figure.*

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- 1. Leases are included in gross loans.**
- 2. Unearned income is deducted from gross interest received.**
- 3. Gross loans are reduced by the dollar magnitude of a bank's loan-loss reserve, which exists in recognition that some loans will not be repaid.**

# Bank investments and FASB 115

- **Following FASB 115 a bank, at purchase, must designate the objective behind buying investment securities as either:**
  - **Held-to-maturity securities are recorded on the balance sheet at amortized cost.**
  - **Trading account securities are actively bought and sold, so the bank marks the securities to market (reports them at current market value) on the balance sheet and reports all gains and losses on the income statement.**
  - **Available-for-sale, all other investment securities, are recorded at market value on the balance sheet with a corresponding change to stockholders' equity as unrealized gains and losses on securities holdings; no income statement impact .**

# Bank liabilities

- **Demand deposits**
  - Transactions accounts that pay no interest
- **Negotiable orders of withdrawal (NOWs) and automatic transfers from savings (ATS) accounts**
  - Pay interest set by each bank without federal restrictions
- **Money market deposit accounts (MMDAs)**
  - Pay market rates, but a customer is limited to no more than six checks or automatic transfers each month
- **Savings and time deposits represent the bulk of interest-bearing liabilities at banks.**

# Bank liabilities (continued)

- **Two general time deposits categories exist:**
  - **Time deposits in excess of \$100,000, labeled jumbo certificates of deposit (CDs).**
  - **Small CDs, considered core deposits which tend to be stable deposits that are typically not withdrawn over short periods of time.**
- **Deposits held in foreign offices**
  - **Balances issued by a bank subsidiary located outside the U.S.**
- **Purchased liabilities, (rate-sensitive borrowings):**
  - **Federal Funds purchased**
  - **Repos**
  - **Other borrowings less than one year**

# Core versus volatile funds

- ***Core deposits*** are stable deposits that are not highly interest rate-sensitive.
  - More sensitive to the fees charged, services rendered, and location of the bank.
  - Includes: demand deposits, NOW accounts, MMDAs, and small time deposits.
- ***Large, or volatile, borrowings*** are liabilities that are highly rate-sensitive.
  - Normally issued in uninsured denominations
  - Ability to borrow is asset quality sensitive
  - Includes: large CDs (over 100,000), deposits in foreign offices, federal funds purchased, repurchase agreements, and other borrowings with maturities less than one year.\*

\*The UBPR also includes brokered deposits less than \$100,000 and maturing within one year in the definition of net non-core liabilities

# Stockholders equity

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- **Subordinated notes and debentures:**
  - **Notes and bonds with maturities in excess of one year.**
- **Stockholders' equity**
  - **Ownership interest in the bank.**
  - **Common and preferred stock are listed at par**
  - **Surplus account represents the amount of proceeds received by the bank in excess of par when it issued the stock.**
  - **Retained earnings equals accumulated net income not paid out as cash dividends**

# The income statement

- **Interest income (II)**
- **Interest expense (IE)**
  - **Interest income less interest expense equals net interest income (NII)**
- **Loan-loss provisions (PL)**
  - **represent management's estimate of potential lost revenue from bad loans**
- **Noninterest income (OI)**
- **Noninterest expense (OE)**
  - **noninterest expense usually exceeds noninterest income such that the difference is labeled the bank's burden**
- **Securities gains or losses (SG)**
- **Taxes**

# Interest income

*...the sum of interest and loan fees earned on all of a bank's assets.*

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- **Interest income includes interest from:**
  1. **Loans and leases**
  2. **Deposits held at other institutions,**
  3. **Investment securities**
    - **Taxable and municipal securities**
  4. **Trading account securities**

# Noninterest income

*...has increased significantly and consists of fees & other revenues for services*

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- **Fiduciary activities**
- **Deposit service charges**
- **Trading revenue, venture cap., securitize inc.**
- **Investment banking, advisory inc.**
- **Insurance commissions & fees**
- **Net servicing fees**
- **Loan & lease net gains (losses)**
- **Other net gains (losses)**
- **Other noninterest income**

# Noninterest expense

*...composed primarily of:*

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## ■ Personnel expense:

- Salaries and fringe benefits paid to bank employees

## ■ Occupancy expense :

- Rent and depreciation on equipment and premises, and

## ■ Other operating expenses:

- Utilities
- Deposit insurance premiums

# Noninterest expense

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- **Expenses and loan losses directly affect the balance sheet.**
- **The greater the size of loan portfolio, the greater is operating overhead and PLL.**
- **Consumer loans are usually smaller and hence more costly (non-interest) per dollar of loans.**

# Return on equity (ROE = NI / TE)

*... the basic measure of stockholders' returns*

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- ROE is composed of two parts:
  - Return on Assets (ROA = NI / TA),
    - represents the returns to the assets the bank has invested in
  - Equity Multiplier (EM = TA / TE),
    - the degree of financial leverage employed by the bank

# Return on assets ( $ROA = NI / TA$ )

*...can be decomposed into two parts:*

- *Asset Utilization (AU) → income generation*
- *Expense Ratio (ER) → expense control*

$$\begin{aligned} \blacksquare \text{ ROA} &= \text{AU} - \text{ER} \\ &= (\text{TR} / \text{TA}) - (\text{TE} / \text{TA}) \end{aligned}$$

**Where:**

**TR = total revenue or total operating income**  
**= Int. inc. + Non-int. inc. + SG and**

**TE = total expenses**  
**= Int. exp. + Non-int. exp. + PLL + Taxes**

**ROA is driven by the bank's ability to:**  
*...generate income (AU) and control expenses (ER)*

- **Income generation (AU) can be found on the UBPR (page 1) as:**

$$AU = \frac{\text{Int. Inc.}}{TA} + \frac{\text{Non. int. Inc.}}{TA} + \frac{\text{Sec gains (losses)}}{TA}$$

- **Expense Control (ER) can be found on the UBPR (page 1) as:**

$$ER^* = \frac{\text{Int. Exp.}}{TA} + \frac{\text{Non - int . Exp.}}{TA} + \frac{\text{PLL}}{TA}$$

- **Note, ER\* does not include taxes.**

# Bank Performance Model

Returns to Shareholders  
 $ROE = NI / TE$

INCOME

Interest

Rate

Composition (mix)

Volume

Non Interest

Fees and Serv Charge

Trust

Other

Return to the Bank  
 $ROA = NI / TA$

Interest

Rate

Composition (mix)

Volume

EXPENSES

Overhead

Salaries and Benefits

Occupancy

Other

Degree of Leverage  
 $EM = 1 / (TE / TA)$

Prov. for LL

Taxes

# Expense ratio ( $ER = \text{Exp} / \text{TA}$ )

*... the ability to control expenses.*

- **Interest expense / TA**
  - **Cost per liability (avg. rate paid)**
    - **Int. exp. liab. (j) / \$ amt. liab. (j)**
  - **Composition of liabilities**
    - **\$ amt. of liab. (j) / TA**
  - **Volume of int. bearing debt and equity**
- **Non-interest expense / TA**
  - **Salaries and employee benefits / TA**
  - **Occupancy expense / TA**
  - **Other operating expense / TA**
- **Provisions for loan losses / TA**
- **Taxes / TA**

# Asset utilization ( $AU = TR / TA$ ):

*... the ability to generate income.*

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- **Interest Income / TA**
  - **Asset yields (avg. rate earned)**
    - Interest income asset (i) / \$ amount of asset (i)
  - **Composition of assets (mix)**
    - \$ amount asset (i) / TA
  - **Volume of Earning Assets**
    - Earning assets / TA
- **Noninterest income / TA**
  - **Fees and Service Charges**
  - **Securities Gains (Losses)**
  - **Other income**

# Aggregate profitability measures

- **Net interest margin**
  - $\text{NIM} = \text{NII} / \text{Earning Assets (EA)}$
- **Spread**
  - $\text{Spread} = (\text{Int Inc} / \text{EA}) - (\text{Int Exp} / \text{Int bear. Liab.})$
- **Earnings base**
  - $\text{EB} = \text{EA} / \text{TA}$
- **Burden / TA**
  - $(\text{Noninterest Exp.} - \text{Noninterest Income}) / \text{TA}$
- **Efficiency ratio**
  - $\text{Non int. Exp.} / (\text{Net int. Inc.} + \text{Non-int. Inc.})$

# Fundamental risks :

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- **Credit risk**
- **Liquidity risk**
- **Market risk**
- **Operational risk**
- **Capital or solvency risk**
- **Legal risk**
- **Reputational risk**

# Credit risk

*...the potential variation in net income and market value of equity resulting from nonpayment or delayed payment on loans and securities*

- **Three Questions need to be addressed:**
  1. **What has been the loss experience?**
  2. **What amount of losses do we expect?**
  3. **How prepared is the bank?**

# Credit ratios to consider

- **What has been the loss experience?**
  - **Net loss to average total LN&LS**
  - **Gross losses to average total LN&LS**
  - **Recoveries to avg. total LN&LS**
  - **Recoveries to prior period losses**
  - **Net losses by type of LN&LS**
- **What amount of losses do we expect?**
  - **Non-current LN&LS to total loans**
  - **Total Past/Due LN&LS - including nonaccrual**
  - **Non-current & restruc LN&LS / Gross LN&LS**
  - **Current - Non-current & restruc/ Gr LN&LS**
  - **Past due loans by loan type**

# Credit ratios to consider (continued)

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- **How prepared are we?**
  - **Provision for loan loss to: average assets and average total LN&LS**
  - **LN&LS Allowance to: net losses and total LN&LS**
  - **Earnings coverage of net loss**

# Liquidity risk

*...the variation in net income and market value of equity caused by a bank's difficulty in ~~obtaining cash~~ at a reasonable cost from either the sale of assets or new borrowings*

## ■ Banks can acquire liquidity in two distinct ways:

### 1. By liquidation of assets

- Composition of loans & investments
- Maturity of loans & investments
- Percent of loans and investments pledged as collateral

### 2. By borrowing

- Core deposits
- Volatile deposits
- Asset quality & stockholders' equity

# Market risk

*...the risk to a financial institution's condition resulting from adverse movements in market rates or prices*

- **Market risk arises from changes in:**
  - **Interest rates**
  - **Foreign exchange rates**
  - **Equity, commodity and security prices**

# Interest rate risk

*...the potential variability in a bank's net interest income and market value of equity due to changes in the level of market interest rates*

## Example: \$10,000 Car loan

|                               |             |
|-------------------------------|-------------|
| 4 year fixed-rate car loan at | 8.5%        |
| 1 year CD at                  | <u>4.5%</u> |
| Spread                        | 4.0%        |

## But for How long?

### ■ Funding GAP

$$\text{GAP} = \$\text{RSA} - \$\text{RSL},$$

where \$RSA = \$ amount of assets expected to reprice in a give period of time.

### ■ In this example:

$$\text{GAP}_{1\text{yr}} = \$0 - \$10,000 = - \$10,000$$

This is a negative GAP.

# Foreign exchange risk

*... the risk to a financial institution's condition resulting from adverse movements in foreign exchange rates*

- Foreign exchange risk arises from changes in foreign exchange rates that affect the values of assets, liabilities, and off-balance sheet activities denominated in currencies different from the bank's domestic (home) currency.
- This risk is also often found in off-balance sheet loan commitments and guarantees denominated in foreign currencies; foreign currency translation risk

# Equity and security price risk

*...change in market prices, interest rates and foreign exchange rates affect the market values of equities, fixed income securities, foreign currency holdings, and associated derivative and other off-balance sheet contracts.*

- **Large banks must conduct *value-at-risk analysis* to assess the risk of loss with their trading account portfolios.**

# Operational risk

*...measures the cost efficiency of the bank's activities; i.e., expense control or productivity; also measures whether the bank has the proper procedures and systems in place .*

- **Typical ratios focus on:**
  - total assets per employee
  - total personnel expense per employee
  - Non-interest expense ratio
- **There is no meaningful way to estimate the likelihood of fraud or other contingencies from published data.**
- **A bank's operating risk is closely related to its operating policies and processes and whether it has adequate controls.**

# Operational risk ratios: PNC and Community National

| <i>RISK RATIOS</i>                     | <i>Pg #</i> | <i>PNC BANK, NATIONAL ASSOCIATION</i> |             |             |               |             |             | <i>COMMUNITY NATIONAL BANK</i> |             |             |               |             |             |
|----------------------------------------|-------------|---------------------------------------|-------------|-------------|---------------|-------------|-------------|--------------------------------|-------------|-------------|---------------|-------------|-------------|
|                                        |             | <i>Dec-03</i>                         |             |             | <i>Dec-04</i> |             |             | <i>Dec-03</i>                  |             |             | <i>Dec-04</i> |             |             |
|                                        |             | <i>CALC</i>                           | <i>BANK</i> | <i>PG 1</i> | <i>CALC</i>   | <i>BANK</i> | <i>PG 1</i> | <i>CALC</i>                    | <i>BANK</i> | <i>PG 4</i> | <i>CALC</i>   | <i>BANK</i> | <i>PG 4</i> |
| <b>Operational Risk</b>                |             |                                       |             |             |               |             |             |                                |             |             |               |             |             |
| Total Assets / Number of employees     | 3           | \$4.09                                | \$ 4.02     | \$ 5.17     | \$4.71        | \$ 4.44     | \$ 6.09     | \$3.00                         | \$ 2.75     | \$ 2.95     | \$2.98        | \$ 2.84     | \$ 3.08     |
| Personnel expense / number of employee | 3           | 73.43x                                | 72.06x      | 60.48x      | 90.68x        | 85.48x      | 65.26x      | 65.46x                         | 60.03x      | 48.27x      | 61.47x        | 58.58x      | 50.10x      |
| Efficiency ratio                       | 3           | 60.93%                                | 60.86%      | 57.73%      | 68.01%        | 67.97%      | 57.92%      | 82.72%                         | 82.75%      | 66.06%      | 75.35%        | 75.34%      | 65.99%      |

# Capital risk

*... closely tied to asset quality and a bank's overall risk profile*

- **The more risk taken, the greater is the amount of capital required.**
- **Appropriate risk measures include all the risk measures discussed earlier as well as ratios measuring the ratio of:**
  - **Tier 1 capital and total risk based capital to risk weighted assets**
  - **Equity capital to total assets**
  - **Dividend payout, and growth rate in tier 1 capital**

# Definitions of capital

- **Tier 1 capital is:**
  - **Total common equity capital plus noncumulative preferred stock, plus minority interest in unconsolidated subsidiaries, less ineligible intangibles.**
- **Risk-weighted assets are:**
  - **The total of risk-adjusted assets where the risk weights are based on four risk classes of assets.**
- **Importantly, a bank's dividend policy affects its capital risk by influencing retained earnings.**

# Legal risk

*...the potential that unenforceable contracts, lawsuits, or adverse judgments can disrupt or otherwise negatively affect the operations or condition of the banking organization*

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- **Legal risk includes:**
  - **Compliance risks**
  - **Strategic risks**
  - **General liability issues**

# Reputational risk

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- **Reputational risk is the potential that negative publicity regarding an institution's business practices, whether true or not, will cause a decline in the customer base, costly litigation, or revenue reductions.**

# Strategies for Maximizing Shareholder Wealth

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- **Asset Management**
  - **Composition and Volume**
- **Liability Management**
  - **Composition and Volume**
- **Management of off-balance sheet activities**
- **Net interest margin management**
- **Credit risk management**
- **Liquidity management**
- **Management of non-interest expense**
- **Securities gains/losses management**
- **Tax management**

# CAMELS

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- **Capital Adequacy**
  - Measures bank's ability to maintain capital commensurate with the bank's risk
- **Asset Quality**
  - Reflects the amount of credit risk with the loan and investment portfolios
- **Management Quality**
  - Reflects management's ability to identify, measure, monitor, and control risks

# CAMELS (continued)

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## ■ Earnings

- Reflects the quantity, trend, and quality of earnings

## ■ Liquidity

- Reflects the sources of liquidity and funds management practices

## ■ Sensitivity to market risk

- Reflects the degree to which changes in market prices and rates adversely affect earnings and capital

# CAMELS Ratings

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- **Regulators assign a rating of 1 (best) to 5 (worst) in each of the six categories and an overall composite rating**
  - **1 or 2 indicates a fundamentally sound bank**
  - **3 indicates that a bank shows some underlying weakness that should be corrected**
  - **4 or 5 indicates a problem bank**

# Average Performance Characteristics of Banks by Business Concentration and Size

- ROE and ROA (up to \$10 billion in assets) increases with bank size
- Employees per dollar of assets decreases with bank size
- Larger banks have lower efficiency ratios than smaller banks
- Smaller banks:
  - have proportionately more core deposits and fewer volatile liabilities than larger banks
  - have a proportionately larger earnings base than larger banks
  - have proportionately lower charge-offs than larger banks

# Performance Characteristics of Banks by Business Concentration and Size

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- **Wholesale Banks**
  - **Focus on loans for the largest commercial customers and purchase substantial funds from corporate and government depositors**
- **Retail Banks**
  - **Focus on consumer, small business, mortgage, and agriculture loans and obtain deposits from individuals and small businesses**

# Financial Statement Manipulation

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- **Off-balance sheet activities**
  - **Enron and “Special-Purpose Vehicles”**
- **Window dressing**
  - **Eliminate Fed borrowing prior to financial statement reporting date**
  - **Increase asset size prior to year-end**
- **Preferred stock**
  - **Meets capital requirements but causes NIM, NI, ROE, and ROA to be overstated**

# Financial Statement Manipulation (continued)

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- **Non-performing loans**
  - **Banks may lend borrower funds to make payments on past due loans, understating non-performance status**
- **Allowance for loan losses**
  - **Management discretion and IRS regulations may be in conflict**

# Financial Statement Manipulation (continued)

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- **Securities gains and losses**
  - **Banks often classify all investment securities as “available for sale,” overstating any true “gains or losses”**
- **Non-recurring sales of assets**
  - **This type of transaction is not part of the bank’s daily activities and typically cannot be repeated; thus it overstates earnings**