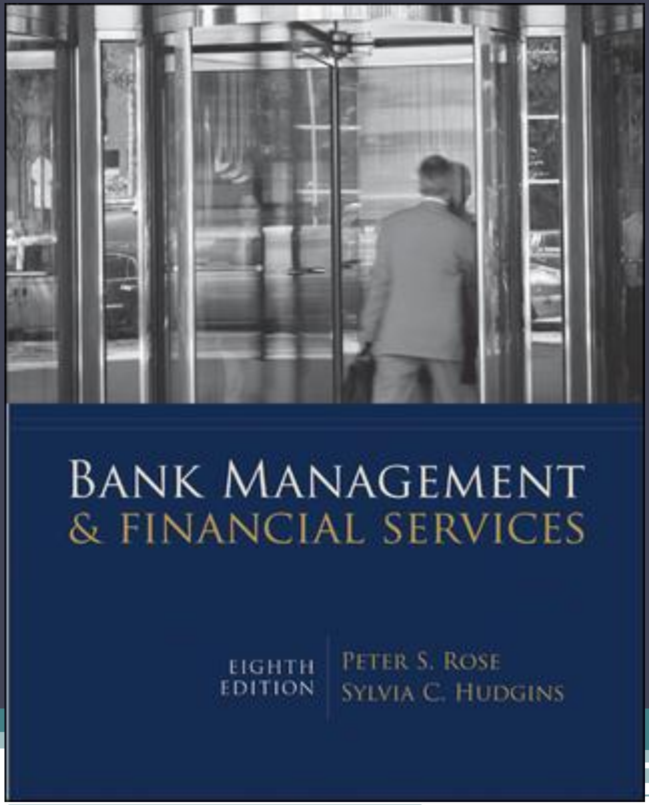
Chapter Six



Measuring and Evaluating the Performance of Banks and Their Principal Competitors

McGraw-Hill/Irwin

Key Topics

- Stock Values and Profitability Ratios
- Measuring Credit, Liquidity, and Other Risks
- Measuring Operating Efficiency
- Performance of Competing Financial Firms
- Size and Location Effects
- The UBPR and Comparing Performance

Value of the Bank's Stock

$$\begin{array}{c}\text{Value of}\\\text{stock}\\(P_o)\end{array} = \frac{\begin{array}{c}\text{Expected stream of future}\\\text{stockholder dividends}\end{array}}{\begin{array}{c}\text{Discount factor (based on}\\\text{the minimum required market}\\\text{rate of return on equity capital}\\\text{given each financial firm's}\\\text{perceived level of risk)}\end{array}} = \sum_{t=0}^{\infty} \frac{E(D_t)}{(1+r)^t}$$

Value of a Bank's Stock Rises When:

- Expected Dividends Increase
- Risk of the Bank Falls
- Market Interest Rates Decrease
- Combination of Expected Dividend Increase and Risk Decline

Value of Bank's Stock if Earnings Growth is Constant

$$P_0 = \frac{D_1}{r - g}$$

Key Profitability Ratios in Banking

$$\text{Return on Equity Capital (ROE)} = \frac{\text{Net Income}}{\text{Total Equity Capital}}$$

$$\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}}$$

$$\text{Net Interest Margin} = \frac{\begin{array}{l}\text{(Interest income}\\ \text{- Interest expense)}\end{array}}{\text{Total Assets}} = \frac{\text{Net Interest Income}}{\text{Total Assets}}$$

$$\text{Net Noninterest Margin} = \frac{\begin{array}{l}\text{Noninterest revenue}\\ \text{- PLLL}\\ \text{- Noninterest expenses}\end{array}}{\text{Total Assets}} = \frac{\text{Net Noninterest Income}}{\text{Total Assets}}$$

Key Profitability Ratios in Banking (cont.)

$$\text{Net Bank Operating Margin} = \frac{\text{Total Operating Revenues} - \text{Total Operating Expenses}}{\text{Total Assets}}$$

$$\text{Earnings Per Share (EPS)} = \frac{\text{Net Income After Taxes}}{\text{Common Equity Shares Outstanding}}$$

$$\text{Earnings Spread} = \frac{\text{Total Interest Income}}{\text{Total Earning Assets}} - \frac{\text{Total Interest Expense}}{\text{Total Interest Bearing Liability}}$$

Breaking Down ROE

ROE = Net Income/ Total Equity Capital

ROA =
Net Income/Total Assets

x

Equity Multiplier =
Total Assets/Equity Capital

Net Profit Margin =
Net Income/Total Operating Revenue

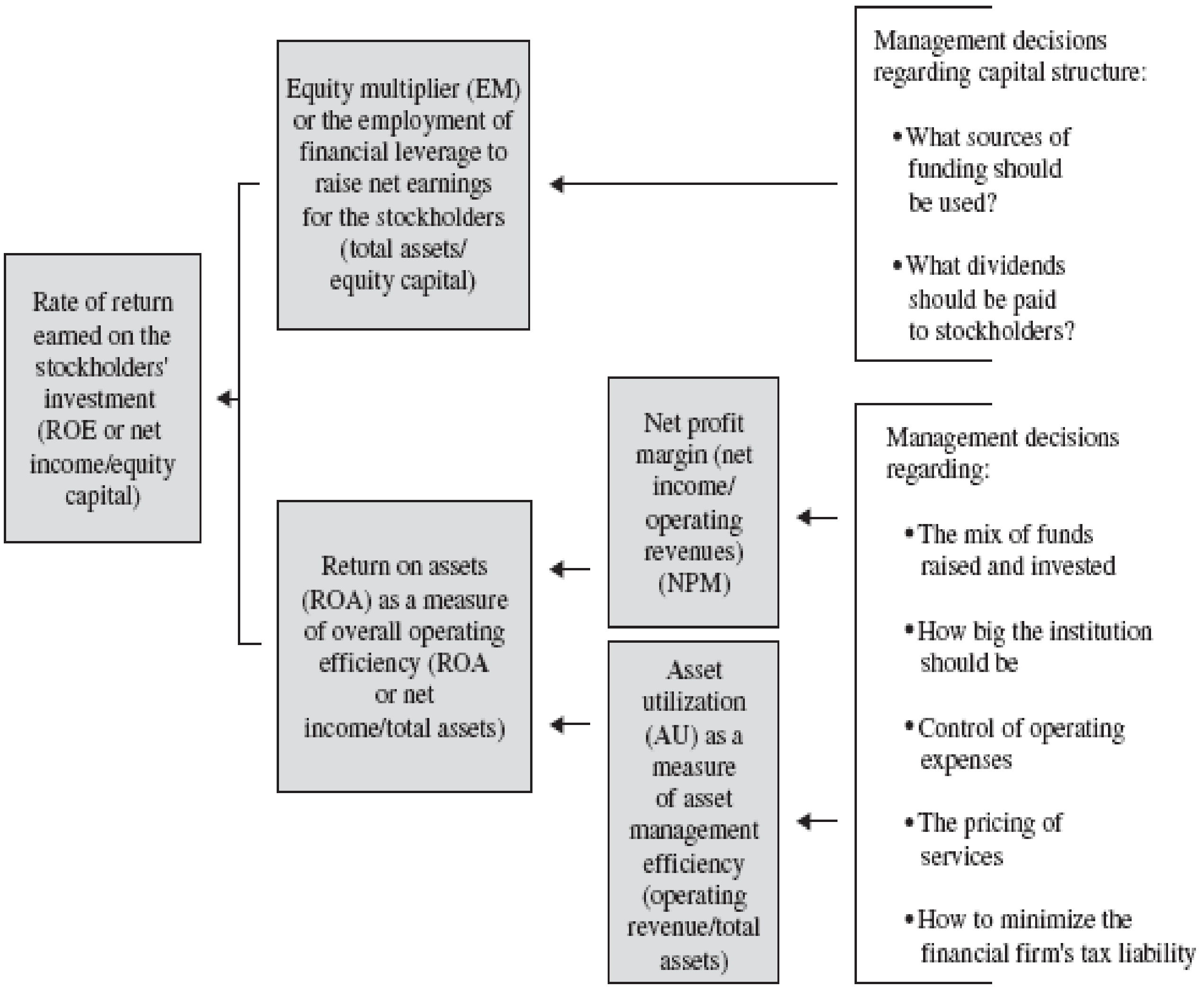
x

Asset Utilization =
Total Operating Revenue/Total Assets

ROE Depends On:

- Equity Multiplier=Total assets/Total equity capital
  - Leverage or Financing Policies: the choice of sources of funds (debt or equity)
- Net Profit Margin=Net income/Total operating revenue
  - Effectiveness of Expense Management (cost control)
- Asset Utilization=Total operating revenue/Total assets
  - Portfolio Management Policies (the mix and yield on assets)

Determinants of ROE in a Financial Firm



Components of ROE for All Insured U.S. Banks (1992–2007)

Year	Return on Equity Capital (ROE)	=	Net Profit Margin (NPM) (Net After-Tax Income/Total Revenues)	×	Asset Utilization (AU) (Total Revenues/Total Assets)	×	Equity Multiplier (EM) (Total Assets/ Total Equity Capital)
2007*	11.36%	=	15.08%	×	7.97%	×	9.45x
2006	11.64%	=	16.45%	×	7.45%	×	9.50x
2005	11.92%	=	17.91%	×	6.85%	×	9.72x
2004	13.27	=	19.81	×	6.51	×	9.72x
2003	15.04	=	19.86	×	6.95	×	10.93x
2002	14.11	=	17.10	×	7.60	×	10.87x
2000	13.53	=	12.02	×	9.48	×	11.78x
1998	13.51	=	12.73	×	9.11	×	11.74x
1996	13.31	=	12.21	×	9.01	×	12.17x
1994	13.33	=	12.59	×	8.34	×	12.80x
1992	12.21	=	9.55	×	9.11	×	13.42x

*Figures for 2007 are for the first quarter, annualized.

A Variation on ROE

$$\text{ROE} = \frac{\text{Net Income}}{\text{Pre-Tax Net Operating Income}} \times \frac{\text{Pre-Tax Net Operating Income}}{\text{Total Operating Revenue}} \times$$

$$\frac{\text{Total Operating Revenue}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Total Equity Capital}}$$

$$\begin{aligned}\text{ROE} = {} & \text{Tax Management Efficiency} \times \\ & \text{Expense Control Efficiency} \times \\ & \text{Asset Management Efficiency} \times \\ & \text{Funds Management Efficiency}\end{aligned}$$

Breakdown of ROA

Gross interest income ÷ Total assets	←	Income from holding assets
− *Interest expense ÷ Total assets*	←	Supply cost of funds for holding assets
= Net interest margin ÷ Total assets	←	Return earned because the lending institution's credit quality is better than its customers' credit quality
+ Noninterest income ÷ Total assets	←	Income from handling customer transactions
− Noninterest expenses ÷ Total assets	←	Cost of operations
− Provision for loan losses ÷ Total assets	←	*Accrual expense*
= Pretax net operating income ÷ Total assets	←	Return on assets before taxes
− *Income taxes ÷ Total assets**	←	The financial firm's share of the cost of government services
= Income before extraordinary items ÷ Total assets	←	Net income from recurring sources of revenue
+ Extraordinary net gains ÷ Total assets	←	Nonrecurring sources of income or loss
= Net income ÷ Total assets (or ROA)	←	Earnings left over for the stockholders after all costs are met

*Both income and taxes applicable to income need to be adjusted for any tax-exempt earnings received. One can restate such income on a fully tax-equivalent basis by multiplying the amount of tax-exempt income by the expression $1 \div (1 - t)$, where t is the firm's tax bracket rate.

Quick Quiz

- What individuals or groups are likely to be interested in the banks' level of profitability and exposure to risk?
- What are the principal components of ROE, and what does each of the these components measure?
- Suppose a bank has an ROA of 0.80% and an equity multiplier of 12x. What is its ROE? Suppose this bank's ROA falls to 0.60%. What size equity multiplier must it have to hold its ROE unchanged?
- What are the most important components of ROA and what aspects of a financial institution's performance do they reflect?

Bank Risks

- Credit Risk
- Liquidity Risk
- Market Risk
- Interest Rate Risk
- Operational Risk
- Legal and Compliance Risk
- Reputation Risk
- Strategic Risk
- Capital Risk

Credit Risk

The Probability that Some of the Financial Firm's Assets Will Decline in Value and Perhaps Become Worthless

Credit Risk Measures

- Nonperforming Loans/Total Loans
- Net Charge-Offs/Total Loans
- Provision for Loan Losses/Total Loans
- Provision for Loan Losses/Equity Capital
- Allowance for Loan Losses/Total Loans
- Allowance for Loan Losses/Equity Capital
- Nonperforming Loans/Equity Capital

Liquidity Risk

Probability the Financial Firm Will Not Have Sufficient Cash and Borrowing Capacity to Meet Deposit Withdrawals and Other Cash Needs

Liquidity Risk Measures

- Purchased Funds/Total Assets
- Net Loans/Total Assets
- Cash and Due from Banks/Total Assets
- Cash and Government Securities/Total Assets

Market Risk: Comprises Price Risk and Interest Rate Risk

Probability of the Market Value of the Financial Firm's Investment Portfolio Declining in Value Due to a Change in Interest Rates

Market Risk Measures

- Book-Value of Assets/ Market Value of Assets
- Book-Value of Equity/ Market Value of Equity
- Book-Value of Bonds/Market Value of Bonds
- Market Value of Preferred Stock and Common Stock

Interest Rate Risk

The Danger that Shifting Interest Rates May Adversely Affect a Bank's Net Income, the Value of its Assets or Equity

Interest Rate Risk Measures

- Interest Sensitive Assets/Interest Sensitive Liabilities
- Uninsured Deposits/Total Deposits

Off–Balance–Sheet Risk

The Volatility in Income and Market Value of Bank Equity that May Arise from Unanticipated Losses due to OBS Activities (activities that do not have a balance sheet reporting impact until a transaction is affected)

Operational Risk

Uncertainty Regarding a Financial Firm’s Earnings Due to Failures in Computer Systems, Errors, Misconduct by Employees, Floods, Lightening Strikes and Similar Events or Risk of Loss Due to Unexpected Operating Expenses

Legal and Compliance Risk

Risk of Earnings Resulting from Actions Taken by the Legal System. This can Include Unenforceable Contracts, Lawsuits or Adverse Judgments. Compliance Risk Includes Violations of Rules and Regulations

Reputation Risk

This is Risk Due to Negative Publicity that can Dissuade Customers from Using the Services of the Financial Firm. It is the Risk Associated with Public Opinion.

Capital Risk

Probability of the Value of the Bank’s Assets Declining Below the Level of its Total Liabilities. The Probability of the Bank’s Long Run Survival

Capital Risk Measures

- Stock Price/Earnings Per Share
- Equity Capital/Total Assets
- Purchased Funds/Total Liabilities
- Equity Capital/Risk Assets

Other Goals in Banking

$$\text{Operating Efficiency Ratio} = \frac{\text{Total Operating Expenses}}{\text{Total Operating Revenues}}$$

$$\text{Employee Productivity Ratio} = \frac{\text{Net Operating Income}}{\text{Number of Full Time-Equivalent Employees}}$$

Performance Indicators Related to the Size of a Firm, 2007

	Average for All FDIC-Insured Institutions	Depository Institutions Arrayed by Total Assets in the Size Range			
		Under $100 Million	$100 Million to $1 Billion	$1 Billion to $10 Billion	Greater than $10 Billion
Return on assets (ROA)	1.21%	0.86%	1.09%	1.15%	1.24%
Return on equity (ROE)	11.44	6.47	10.43	10.31	11.91
Net operating income to assets	1.18	0.85	1.08	1.14	1.21
Net interest margin	3.32	4.07	3.89	3.67	3.17
Net noninterest margin	−0.85	−2.48	−1.97	−1.39	−1.57
Efficiency ratio	57.56	74.40	65.58	58.35	56.03
Credit loss provision to net charge-offs	113.08	186.87	170.95	149.69	107.27
Net charge-offs to loans	0.45	0.14	0.13	0.25	0.55
Loss allowance to loans	1.08	1.31	1.18	1.17	1.04
Noncurrent assets plus other real estate owned to assets**	0.48	0.69	0.52	0.44	0.48
Net loans and leases to deposits	91.17	75.05	84.90	93.62	92.34
Equity capital to assets	10.58	13.24	10.50	9.46	7.66
Yield on earning assets	6.77	6.96	7.10	7.02	6.68
Cost of funding earning assets	3.45	2.89	3.21	3.35	3.51
Noninterest income to earning assets	2.09	1.21	1.16	1.47	2.34

Notes: Data for all U.S. commercial banking and savings institutions whose deposits are FDIC insured.
*Figures shown are for the first quarters of 2007 and are annualized.
**Figures in this row are for 2006.

Appendix: UBPR

The Uniform Bank Performance Report Provided by U.S. Federal Regulators so that Analysts Can Compare the Performance of One Bank Against Another

Web link for UBPR and BHCPR: www.ffiec.gov

中国商业银行效益类指标

净利润	扣除资产减值损失和所得税后的当年累计利润总额
资产利润率	净利润/ 资产平均余额 × 100% × 折年系数
资本利润率	净利润 / （所有者权益 + 少数股东权益）平均余额 × 100% × 折年系数
净息差	（利息净收入+债券投资利息收入）/ 生息资产平均余额 × 100% × 折年系数
非利息收入占比	（手续费及佣金净收入 + 其他业务收入 + 投资的非利息收益） / 营业收入 × 100%
成本收入比	（营业支出 – 营业税金及附加） / 营业收入 × 100%

2017年中国商业银行效益类指标

净利润(本年累计)	4933	9703	14274	17477
资产利润率	1.07%	1.04%	1.02%	0.92%
资本利润率	14.77%	14.48%	13.94%	12.56%
净息差	2.03%	2.05%	2.07%	2.10%
非利息收入占比	26.84%	24.84%	23.63%	22.65%
成本收入比	26.76%	27.60%	28.63%	31.58%

2016年工商银行主要盈利能力指标

盈利能力（1-12月）	
平均总资产收益率	1.20%
加权平均净资产收益率	15.24%
净利差	2.02%
净利息收益率	2.16%
成本收入比	25.91%

2016，2017年工商银行主要盈利能力指标

盈利能力指标（%）		
平均总资产回报率[1]	1.14	1.20
加权平均净资产收益率[2]	14.35	15.24
扣除非经常性损益后加权平均净资产收益率[2]	14.24	15.11
净利息差[3]	2.10	2.02
净利息收益率[4]	2.22	2.16
风险加权资产收益率[5]	1.89	2.01
手续费及佣金净收入比营业收入	19.22	21.45
成本收入比[6]	24.46	25.91

（1）净利润除以期初和期末总资产余额的平均数。
（2）根据中国证监会《公开发行证券的公司信息披露编报规则第 9 号－净资产收益率和每股收益的计算及披露》(2010 年修订)的规定计算。
（3）平均生息资产收益率减平均计息负债付息率。
（4）利息净收入除以平均生息资产。
（5）净利润除以期初及期末风险加权资产的平均数。
（6）业务及管理费除以营业收入。

2016年招商银行主要盈利能力指标

盈利能力（1-12月）	
平均总资产收益率	1.09%
加权平均净资产收益率	16.27%
净利差	2.37%
净利息收益率	2.50%
成本收入比	28.01%

招商银行

财务比率（%）	2017 年	2016 年
盈利能力指标		
净利差[1]	**2.29**	2.37
净利息收益率[2]	**2.43**	2.50
占营业收入百分比		
—净利息收入	**65.57**	64.18
—非利息净收入	**34.43**	35.82
成本收入比[3]	**30.23**	27.67