

PRIMER ON FINANCIAL ANALYSIS OF BANKS

2018

Purpose of Financial Analysis

- Measure past performance
- Determine starting point for planning
- Estimate future performance (What-ifs?)
- Set values
 - Predict cashflows
 - Determine risk

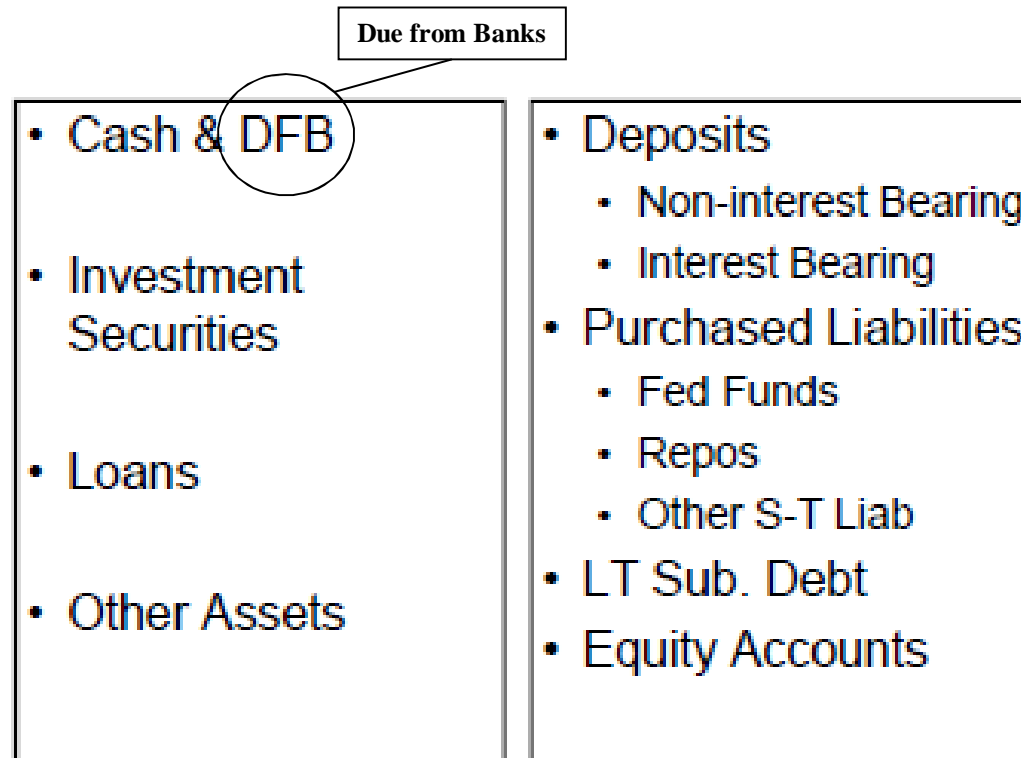
Camels

- Capital Adequacy
- Asset Quality
- Management Quality
- Earnings
- Liquidity
- Sensitivity

Financial Statements

- Balance Sheet
 - $\text{Assets} = \text{Liabilities} + \text{Equity}$
 - Balance sheet figures are calculated at a particular point in time
- Income Statement
 - $\text{Net Income} = \text{Revenues} - \text{Expenses}$
 - Indicates results over a period of time

Balance Sheet

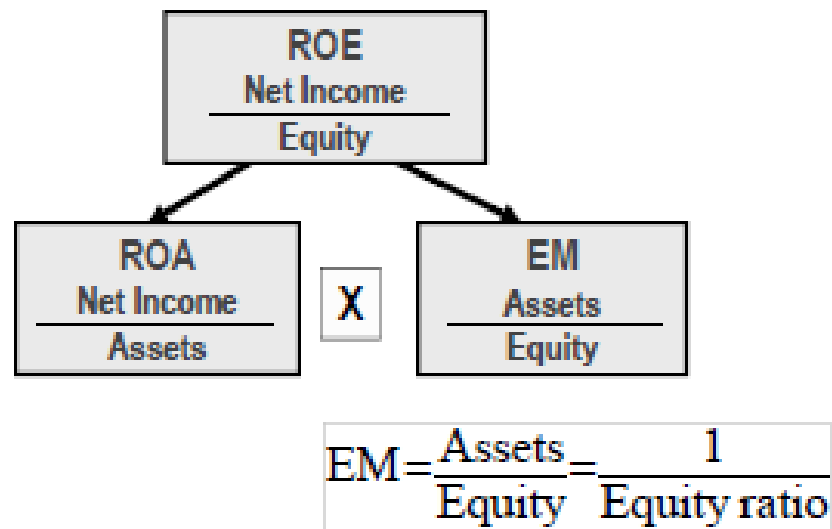


Income Statement

Interest Income
- Interest Expense
Net Interest Income
- Provision for Loan Losses
+ Noninterest Income
- Noninterest Expense
+ Gains/Losses on Secs
Pretax Earnings
- Taxes
Net income

Return on Equity (RoE)

- ROE and ROA are related through degree of financial leverage (EM = Equity multiplier)



Capital Ratios

Elements of regulatory capital under Basel 2 and 3: minima

Elements of regulatory capital	Basel 2 rules	Basel 3 rules
Core Tier 1 capital	At least 2% of RWA	At least 4.5% of RWA
Tier 1 capital	At least 4% of RWA	At least 6% of RWA
Total capital	Tier 1 + Tier 2 + Tier 3 capital: at least 8% of RWA	Tier 1 + Tier 2 capital: at least 8% of RWA

Pile on the cushions

Basel 3 capital requirements, %



Source: Bank for International Settlements

Economist.com

- Equity Ratio = equity/total assets

- Risk-based capital requirements

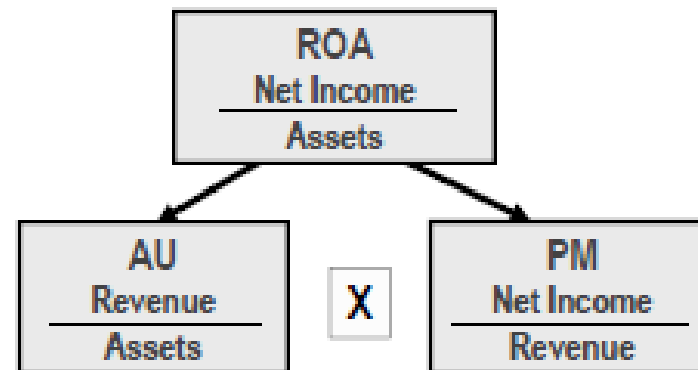
$$\frac{\text{Tier 1 (Core Capital)}}{\text{Risk - Adjusted Assets}} \geq \text{x percent (as per Basel III)}$$

- Texas Ratio

- value of the lender's non-performing assets (Non performing loans + Real Estate Owned) divided by the sum of its tangible common equity capital and loan loss reserves

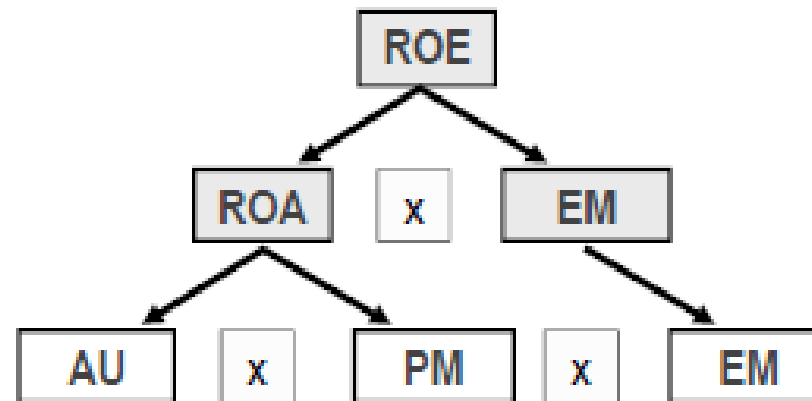
Return on Assets (RoA)

- ROA is determined by the Profit Margin (PM) and Asset Utilization (AU)



- AU – mix and yield on asset portfolio; generation of revenue given assets
- PM – effectiveness of expense management

RoE Breakdown



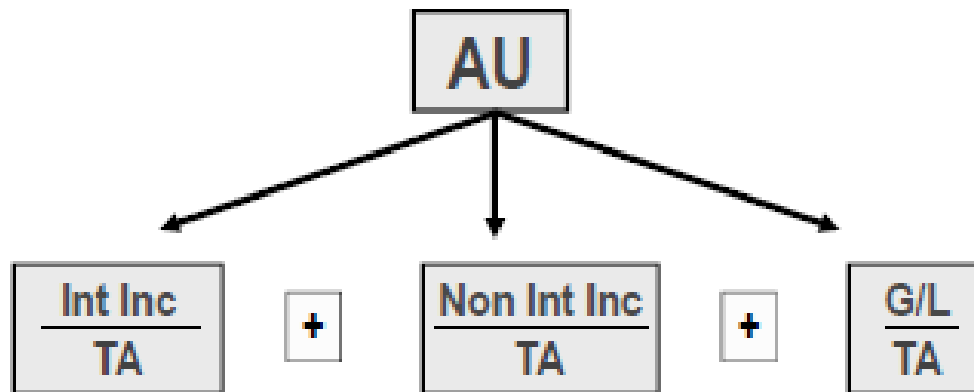
- Return on equity depends on
 - Asset Utilization (AU)
 - Profit Margin (PM)
 - Equity Multiplier (EM)

Income Statement

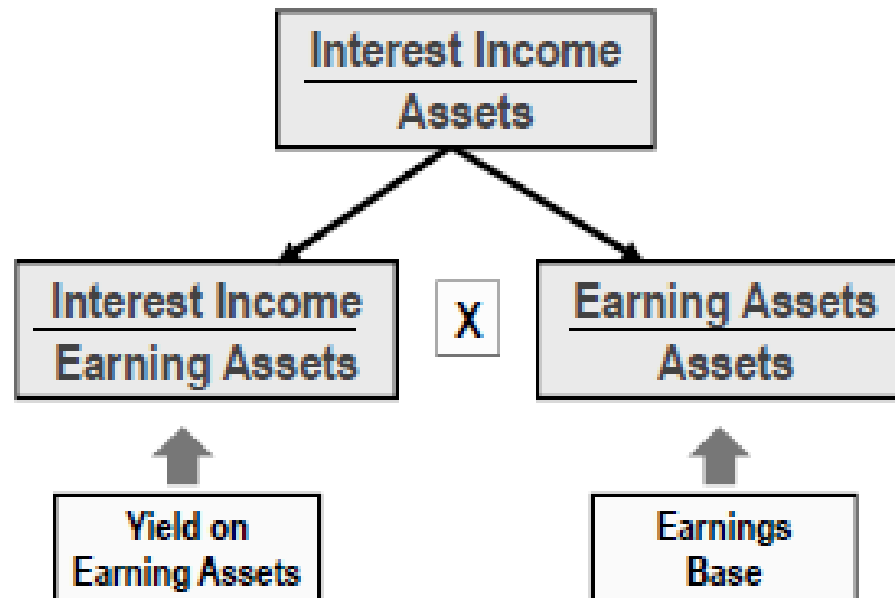
$$\text{Net Income} = \text{Revenue} - \text{Expense}$$

Interest Income
<u>- Interest Expense</u>
Net Interest Income
- Provision for Loan Losses
+ Noninterest Income
- Noninterest Expense
<u>+ Gains/Losses on Secs</u>
Pretax Earnings
<u>- Taxes</u>
Net income

Asset Utilisation



Interest Income / Total Assets



Non-Interest Income

$$\frac{\text{Non II}}{\text{TA}} = \frac{\text{Fid Fees}}{\text{TA}} + \frac{\text{Dep Svc}}{\text{TA}} + \frac{\text{Other}}{\text{TA}}$$

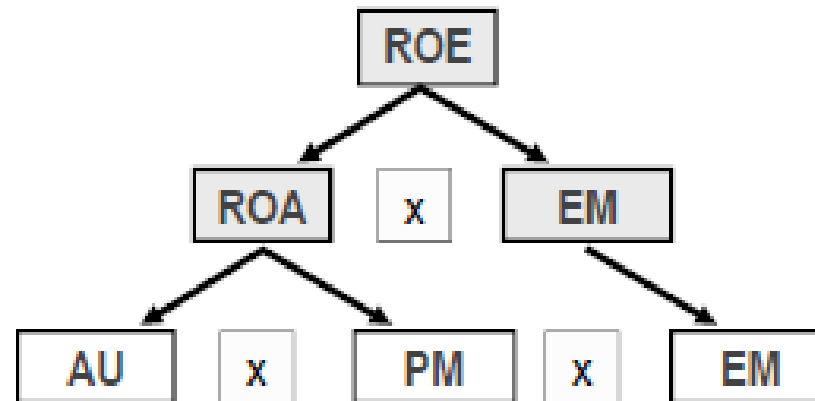
- Fee income measured relative to asset categories or number of employees
 - Deposit service charges to Deposits
- Breakdown of categories to reveal results of “focus areas”

Gains / Losses on Securities

$$\frac{\text{GL}}{\text{TA}} = \frac{\text{GL}}{\text{SEC}} \times \frac{\text{SEC}}{\text{TA}}$$

- Gains/Losses relative to level of securities and securities as percentage of assets
- Further breakdowns by category
 - Importance of potential gains/losses?

RoE Breakdown



- Return on equity depends on
 - Asset Utilization (AU)
 - Profit Margin (PM)
 - Equity Multiplier (EM)

Alternative Approach to Profit Margin

$$\frac{\text{Net Income}}{\text{Revenue}}$$
$$\text{NI} = \text{Revenue} - \text{Expense}$$

So

$$\frac{\text{Net Income}}{\text{Revenue}} = \frac{\text{Revenue}}{\text{Revenue}} - \frac{\text{Expense}}{\text{Revenue}}$$
$$= 1 - \frac{\text{Expense}}{\text{Revenue}}$$

Income Statement

$$\text{Net Income} = \text{Revenue} - \text{Expense}$$

Interest Income
- Interest Expense
Net Interest Income
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Net income

Total Expense Ratio Components

$$\frac{\text{Expense}}{\text{Assets}} = \frac{\text{IE}}{\text{TA}} - \frac{\text{Non IE}}{\text{TA}} - \frac{\text{PLL}}{\text{TA}} - \frac{\text{TAX}}{\text{TA}}$$

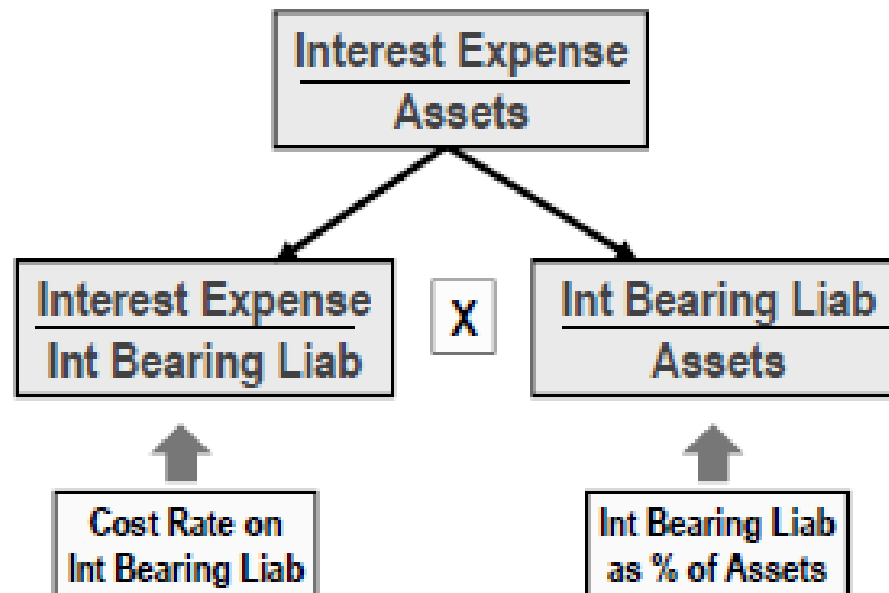
IE = Interest Expense

Non IE = Non-Interest Expense

PLL = Provision for Loan Losses

TAX = Taxes

Interest Expense / Total Assets



Non-Interest Expense

$$\frac{\text{Personnel}}{\text{TA}} = \frac{\text{Personnel}}{\# \text{ Employees}} \times \frac{\# \text{ Employees}}{\text{TA}}$$

- If Personnel / TA is high, then:
 - Personnel / # employees is high, and/or
 - # Employees / TA is high

$$\frac{\text{Occupancy}}{\text{TA}} = \frac{\text{Occupancy}}{\# \text{ Branches}} \times \frac{\# \text{ Branches}}{\text{TA}}$$

- If Occupancy / TA is high, then:
 - Occupancy / # Branches is high, and/or
 - # Branches / TA is high
- Composition effects may exist
 - More deposits – then more overhead

Provision for Loan Losses

$$\frac{\text{PLL}}{\text{TA}} = \frac{\text{PLL}}{\text{Loans}} \times \frac{\text{Loans}}{\text{TA}}$$

- Provision for Loan Losses
 - Funds put aside to prepare for bad loans
- Large PLL / Loans may indicate
 - New risky loans
 - Overall risk of loan portfolio (catch-up)
 - Safety conscious management

Taxes

$$\frac{\text{TAX}}{\text{TA}} = \frac{\text{TAX}}{\text{Taxable Inc}} \times \frac{\text{Taxable Inc}}{\text{REV}} \times \frac{\text{REV}}{\text{TA}}$$

- If Taxes/ TA is high, then:
 - The tax rate may be high
 - Increase over time could indicate tax rate changes or different tax rate environments
 - Revenue may be high
 - Good by itself
 - Taxable income may be high
 - Less use of “tax advantaged” assets

Components of RoA

$$\begin{aligned} \text{ROA} &= \text{Asset Utilization} - \text{Total Exp Ratio} \\ &= \frac{\text{Revenue}}{\text{Assets}} - \frac{\text{Expense}}{\text{Assets}} \\ \text{AU} &= \frac{\text{Int Inc}}{\text{TA}} + \frac{\text{Non Int Inc}}{\text{TA}} + \frac{\text{G/L}}{\text{TA}} \\ \text{EXP} &= \frac{\text{Int Exp}}{\text{TA}} + \frac{\text{Non Int Exp}}{\text{TA}} + \frac{\text{PLL}}{\text{TA}} + \frac{\text{TAX}}{\text{TA}} \end{aligned}$$

Diagram illustrating the components of Return on Assets (RoA). The top equation shows RoA as the difference between Asset Utilization (Revenue/Assets) and Total Expense Ratio (Expense/Assets). The middle equation breaks down Asset Utilization (AU) into three components: Interest Income (Int Inc) divided by Total Assets (TA), Non-Interest Income (Non Int Inc) divided by TA, and Goodwill/Losses (G/L) divided by TA. The bottom equation breaks down the Expense Ratio (EXP) into four components: Interest Expense (Int Exp) divided by TA, Non-Interest Expense (Non Int Exp) divided by TA, Provision for Loan Losses (PLL) divided by TA, and Taxes (TAX) divided by TA. Double-headed arrows indicate that the 'Int Inc' and 'Non Int Inc' terms in the AU equation correspond to the 'Int Exp' and 'Non Int Exp' terms in the EXP equation, respectively.

Alternative Breakdown of RoA

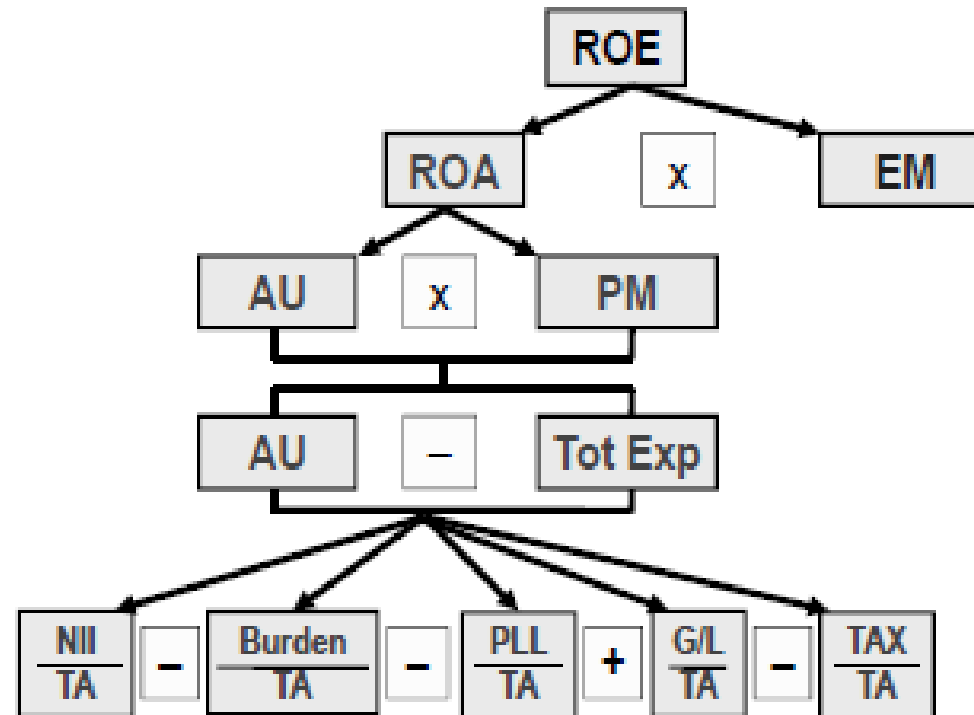
Net Interest Income = NII = Int Inc – Int Exp

Burden = Non IE – Non II

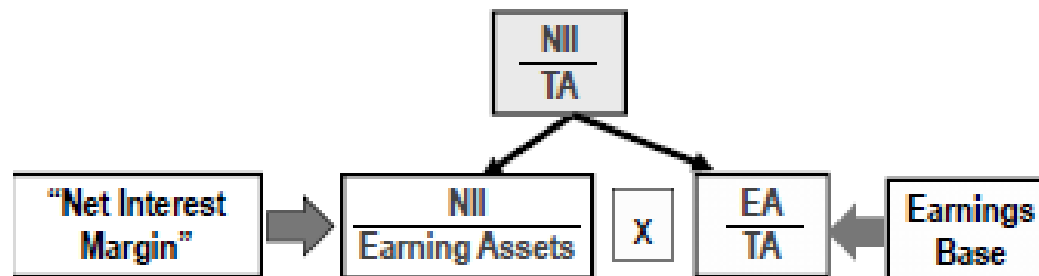
(some analysts include G/L in Non-interest income)

$$\text{ROA} = \frac{\text{NII}}{\text{TA}} - \frac{\text{Burden}}{\text{TA}} - \frac{\text{PLL}}{\text{TA}} + \frac{\text{G/L}}{\text{TA}} - \frac{\text{TAX}}{\text{TA}}$$

Decomposition of RoE



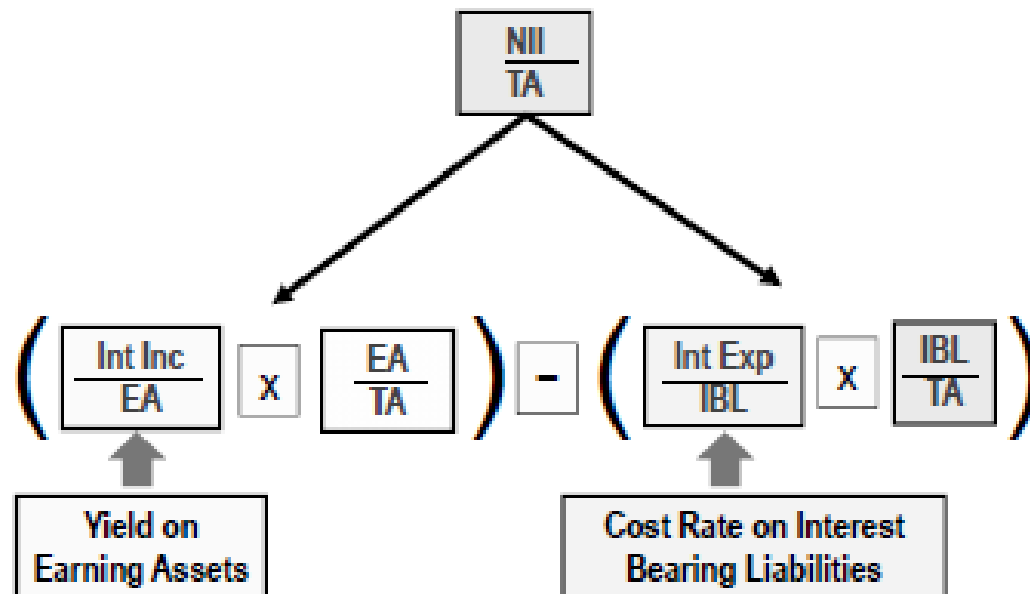
Net Interest Income / Total Assets



Net Int Income = Interest Income – Interest Expense

$$\text{"Net Interest Margin"} = \frac{\text{Int Inc}}{\text{EA}} - \frac{\text{Int Exp}}{\text{EA}}$$

Net Interest Income / Total Assets



Net Interest Margin and Spread

$$\begin{aligned} \text{"Net Interest Margin"} &= \frac{\text{Int Inc}}{\text{EA}} - \frac{\text{Int Exp}}{\text{EA}} \\ \text{Spread} &= \frac{\text{Int Inc}}{\text{EA}} - \frac{\text{Int Exp}}{\text{IBL}} \end{aligned}$$

- Spread and NIM are important in evaluating a bank's ability to manage interest rate risk
 - As rates change, interest income and expense change
 - Variation in NIM and Spread indicate whether a bank positioned itself to handle rate changes
 - Expected changes in NIM and Spread are examined to assess a bank's exposure to interest rate risk
 - GAP and Earnings Sensitivity Analysis

Efficiency Ratio

$$\text{Efficiency Ratio} = \frac{\text{Non Int Exp}}{\text{NII} + \text{Non Int Inc}}$$

- Measures ability to control Non-Int Exp
- Indicates how much non-interest expense a bank has per dollar of operating income
- The smaller the efficiency ratio, the more profitable the bank, all other factors equal
- Many analysts consider below 55% as “good” on average

Examples for Financial Statement Shortcomings

- Off-balance sheet activities
 - Derivative contracts may have massive notional values that are not reflected in traditional measures
- Window dressing
 - Timing of asset/liability adjustments may impact reported numbers
- Accounting Differences
 - Leeway in accounting reporting rules often make comparisons difficult

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