

ANALYZING BANK FINANCIAL PERFORMANCE

INSTRUCTOR

Lauren Nilan | CPA

Senior Manager | Elliott Davis

Direct 843.720.0200 | Lauren.Nilan@elliottdavis.com

100 Calhoun Street, Suite 300 | Charleston, SC 29401

Office 843.577.7040 | www.elliottdavis.com

OVERVIEW

This session introduces the components of bank financial statements and provides tools for analyzing bank financial performance using historical data. It explores the interrelationship between the income statement and balance sheet and describes the risk and return trade-off underlying fundamental management decisions. Data are provided that compare the performance characteristics of small banks versus large banks and differentiate between high and low performers.

LEARNING OBJECTIVES

Following the successful completion of this session, you should be able to:

- Recognize the basic balance sheet accounts and income statement components and understand how they relate to each other
- Use the Return on Equity (ROE) model to analyze bank profitability over time and against peers
- Comprehend the importance of net interest margin, earning assets, and operating efficiency as key sources of bank profitability
- Identify key ratios that signify the degree of credit risk, liquidity risk, interest rate risk, and capital risk assumed by a bank
- Explain the factors that affect a bank's CAMELS rating
- Understand how and why the performance characteristics of small and large banks differ
- Relate key financial concepts and data to planning and managing a bank

THE BALANCE SHEET

A bank's balance sheet presents financial information that compares what a bank owns with what it owes and the ownership interest of stockholders. Assets represent what a bank owns; liabilities represent what a bank owes; and equity refers to stockholders' ownership such that:

$$\text{Assets} = \text{Liabilities} + \text{Equity}$$

The balance sheet represents a snapshot taken at a point in time. Account values indicate what a bank owns or owes on that date. Bank regulators require that banks report financial data quarterly on a "Call Report." Call reports are published for the periods ending March, June, September, and December of each year. **Exhibit 1** presents balance sheet data for SCBS Bank, an \$80 million community bank.

Bank Assets

Bank assets fall into one of four types, each with different yield and risk features.

Cash and Cash Equivalents

Cash and cash equivalents consist of vault cash, deposits held at the Federal Reserve (the Fed), deposits held at other financial institutions, federal funds sold (Fed funds sold), and securities purchased under agreements to resell (Repos). The distinguishing feature of cash and cash equivalents is that they earn little to no interest. Balances at the Fed, Fed funds sold, and Repos pay a nominal amount of interest in line with the Fed Funds target rate. Accounts with other depository institutions are primarily used to obtain correspondent banking services. Together, these accounts provide the necessary liquidity to facilitate transaction clearings (i.e. checks, ACH, wires), new loan funding, investment purchases, currency withdrawals, etc.

Investments

Investment securities are primarily fixed-income securities (i.e. bonds) held to meet liquidity needs and earn interest. Short-term securities have maturities less than one year and can readily be sold if a bank needs cash. Long-term securities have maturities up to 30 years, although most banks prefer not to commit funds out that far. An in-depth analysis of investment strategy is taught in a future course. Securities can also be pledged as collateral against a bank liability. Different types of securities are discussed below:

- Treasury bills, notes, and bonds are direct obligations of the U.S. Treasury. Bills are short term securities (< 1 year) sold at a discount where all interest is paid via payoff; while notes and bonds carry a fixed term (>1 year) and fixed rate, and coupon interest is paid semiannually.

- Federal Agency securities are obligations of federal agencies such as “Fannie Mae” or “Freddie Mac”. They carry yields slightly above the yield on a comparable maturity Treasury security because they are backed by government entities and not the government directly. Government-guaranteed mortgage-backed securities are included under this label. Note that actual yields earned on mortgage-backed securities often differ sharply from expected yields due to prepayments.
- Municipal securities are obligations of state and local governments and their political subdivisions. Interest income is generally exempt from federal income taxes but may be subject to state income taxes. "Bank-qualified" municipals consist of small issue securities for essential public purposes that come with additional tax incentives. Interest rates remaining low for so long have made the purchase of municipals a good option for some community banks.
- Other securities consist primarily of corporate and foreign bonds and various other types of mortgage-backed securities as well as restricted equity securities, like FHLB stock.

For financial reporting purposes, banks are required to designate securities either as held-to-maturity, available-for-sale, or held-for-trading. The accounting for each class of securities aligns with the perceived intent. Securities designated as held-to-maturity are valued on the balance sheet at historical, amortized cost. There is no financial statement impact for unrealized gains or losses when interest rates change. Securities designated as available-for-sale are reported at current market values, with unrealized gains and losses included as a component of other comprehensive income, which impacts equity/capital. Thus, when interest rates rise (fall), any decrease (increase) in the value of the securities is balanced by a corresponding unrealized loss (gain) in equity. Trading securities are reported at market values on the balance sheet with unrealized gains and losses recorded in the income statement. The objective for the differences in accounting treatment is to provide better information to regulators, analysts, and investors regarding the market value of securities when banks expect to sell them prior to final maturity.

Loans Held for Sale

Loans held for sale represent loans originated with the intent to be sold. These generally include residential mortgage loans sold in the secondary market and the guaranteed portions of SBA loans sold. Banks recognize interest income during the holding period and a gain (recognized in other income) at the sale of the loan.

Loans Held for Investment

Loans held for investment represent the primary earning asset at most banks. Banks serve the needs of their community by extending loans to businesses and individuals. Loans are typically grouped into categories based on the type of borrower and use of proceeds.

- Commercial and Industrial loans (C&I) consist of loans to businesses for commercial, industrial, and/or other professional purposes. Primarily used to finance working capital needs and new plant and equipment expenditures.
- Real estate loans consist of loans secured by mortgages on real property. This includes commercial or residential real estate loans, including home equity loans, as well as construction and land development loans secured by real property. Commercial real estate is further segmented into owner-occupied and non-owner-occupied real estate for the Call Report.
- Consumer loans are made to individuals for a wide variety of purposes. They may be unsecured (i.e. overdrafts, personal loans, lines of credit) or secured for the purchase of cars, boats, and durable goods. Credit cards would also be included here.
- Agriculture loans represent credit extended to farmers or agribusinesses.
- Other loans would encompass all other loans not included in the above categories.

Loans typically earn the highest yields before expenses. They also exhibit the highest risk and default rates and cost more than securities to administer. A loan loss reserve is maintained by the bank to cover future expected credit losses. This account is presented on the balance sheet as a contra asset account to total loans.

Several key profitability ratios use a bank's earning assets, which equals loans plus investment securities and other interest-earning assets.

Other Assets

Other assets are of relatively small magnitudes, representing such items as bank premises and equipment, accrued interest receivable, other real estate owned, bank-owned life insurance, deferred tax assets, goodwill, and other intangibles. They are considered nonearning assets because they generate no interest income.

Bank Liabilities and Stockholders' Equity

Bank funding sources are classified into deposits, borrowings/debt, other liabilities, and equity components. Deposit accounts are segmented according to transactional abilities, interest bearing status, and maturity features. Amendments to Reg D in 2020 eliminated limits on withdrawals from savings accounts to allow consumers more convenient access to their funds. This rule change also simplified account administration for depository institutions. Reserve requirements on transactional accounts were also removed.

Transaction Accounts

Transaction accounts are accounts on which depositors can freely withdraw or transfer funds by checks, debit cards, mobile banking, ACH drafts, etc.

- Noninterest-bearing or demand deposits pay no interest. The account holder can transact *against the* outstanding balance.
- Interest-bearing or NOW accounts pay interest rates at the discretion of the issuing bank. Banks often require that customers maintain some minimum balance before interest applies and may limit the number of free checks, but *terms vary among* institutions. These accounts are available to both persons and businesses.

These accounts are available to both persons and businesses. Transaction accounts are attractive funding sources because these depositors are generally not very rate sensitive. Thus when interest rates change, customers are less likely to move their balances. For this reason, these accounts are often referred to as relationship accounts in which the customer's primary rationale for keeping the account is convenient and personal service. These stable or "core" deposits improve a bank's liquidity by reducing the potential for large-scale deposit losses with rate swings.

Savings and Time Deposits

These deposits usually comprise most of the interest-bearing liabilities at banks.

- Savings & Money Market Deposit Accounts (MMDAs) have no fixed maturity and the interest rate paid is at the discretion of the issuing bank.
- Time Deposits pay higher interest rates, but the funds have a fixed maturity date and cannot be withdrawn until this date. Banks offer competitive rates in accordance with their market peers or funding needs. Terms vary by duration and balance.
 - **Large (>\$250,000) time deposits** or jumbo CDs are treated as "volatile" or non-core by regulatory agencies as these customers are more likely to move their account to a higher paying bank if rates change.
 - **Brokered deposits** may be obtained through a broker if a bank requires additional funding. Only well capitalized institutions may acquire brokered deposits without restriction. Also seen as "volatile" or non-core funding.
 - **Certificate of Deposit Account Registry Service (CDARS)** provides large deposits full FDIC coverage. Deposits placed in the CDARS network are automatically deposited in increments of less than \$250,000 with other banks in the network in exchange for reciprocal amounts back from those banks. CDARS are generally able to be considered core deposits.

Holders of time deposits are typically much more rate sensitive than owners of transaction accounts. Banks must continually change the rates they pay to stay in line with market conditions to retain the bulk of these deposits. With the recent low interest rate environment, time deposits have been steadily declining as depositors are not willing to commit their funds to low rate for a long period. The shift toward transaction accounts has decreased the cost of funds for the industry.

Other Interest-Bearing Liabilities

Banks also rely on other funding sources that can be acquired quickly. Larger banks rely heavily on these funding sources, while community banks typically use them less frequently.

- Federal funds purchased represent overnight obligations where one bank borrows clearing balances, such as reserves held at a Federal Reserve Bank, from other institutions on an overnight basis. Federal funds are primarily traded between banks to meet liquidity needs due to unanticipated loan demand and/or deposit outflows.
- Repurchase agreements (Repos) represent the sale of securities under *an agreement* to repurchase them later at a predetermined price. The maturity ranges from overnight to several weeks. The borrowing is collateralized by the security sold. Thus, the rate is usually lower than the rate on a comparable unsecured fed funds transaction.

These liabilities are commonly referred to as "purchased" liabilities because banks buy the funds by paying a competitive market interest rate. These are also considered "volatile."

- The Discount Window is an instrument of monetary policy that allows eligible institutions to borrow money from the Federal Reserve (or other central bank), on a short-term basis, to meet temporary shortages of liquidity.
 - The interest rate charged is called the **discount rate**. In recent years, the discount rate has been approximately a percentage point above the federal funds rate (the rate at which banks lend money to *each other*). Because of this, it is a relatively unimportant factor in the control of the money supply and is only taken advantage of at large volume during emergencies
- Federal Home Loan Bank (FHLB) Advances provide member banks with liquidity through a variety of short- and long-term credit products. Maturities range from overnight to 30 years and include a variety of fixed and adjustable-rate structures. Advances are secured by eligible mortgages held in portfolio and/or investments. To receive an advance members must purchase FHLB stock in accordance with their level of advances.

Subordinated Debt and Equity

- Subordinated notes and debentures represent long-term securities that may meet regulatory requirements as Tier 2 bank capital. Claims of the bondholders are subordinated to the claims of depositors, which means that in the event a bank fails, depositors are paid before bondholders.
- Stockholders (or Shareholders) equity represents the ownership interest in a bank. Equity components consist of:
 - Common and preferred stock – outstanding at par value
 - Surplus (or additional paid in capital) – includes proceeds received above par value for stock issuance
 - Retained earnings – cumulative net income since the organization started operation minus cash dividends paid to stockholders
 - Accumulated Other Comprehensive Income (Loss) – if a bank designates any securities as available-for sale, it reports unrealized gains and losses, net of tax.

THE INCOME STATEMENT

A bank's income statement generally follows the balance sheet. Revenue consists primarily of interest income and expense consists primarily of interest payments on liabilities. Interest income less interest expense determines net interest income. The next step is to subtract the provision for loan losses, which represents management's recognition that some revenues will be lost due to charge offs on bad loans. The statement continues by adding noninterest income then subtracting noninterest expense and taxes to produce net income. **Exhibit 2** presents the income statement for SCBS Bank.

Income Statement Components

Interest Income

Interest income equals the sum of interest earned on earning assets. An income statement normally itemizes the source of interest by type of asset. **Exhibit 2**, for example, separates interest income into interest earned on loans, investments, federal funds sold and repos, and interest-bearing deposits at other institutions. Interest income is taxable except interest on municipal securities, which may be exempt from federal income taxes. Interest earned on taxable and tax-exempt securities is generally broken out separately to demonstrate this distinction as tax-exempt interest can be converted to a taxable equivalent amount by dividing by one minus the bank's tax rate. Note that interest on loans contributes the most to interest income because loans are the bank's dominant asset and pay the highest gross yields. In general, interest income increases when the level of interest rates increases and/or when a bank can book more earning assets. It decreases when balances decline and/or when rates fall.

Interest Expense

Interest expense equals the sum of interest paid on deposits, other interest-bearing liabilities, and subordinated debt.

Net Interest Income

Net interest income is the primary component of a bank's income statement. Net interest income equals interest income minus interest expense. It plays a crucial role in determining bank profitability. Variations in net interest income are used to measure how successful a bank has been in managing its interest rate risk.

Provision for Loan Losses

The provision for loan losses represents a deduction from income for allocations to a bank's loan loss reserve. It is a noncash expense that indicates management's estimate of potential losses from problem loans. Increases in provisions thus lower reported net income. Banks that understate potential losses effectively overstate net income and eventually must increase future provisions in recognition that past income has been overstated. The income statement reports net interest income after provision to account for estimated loan losses.

Noninterest Income

Noninterest income consists primarily of service charges, fees/commissions, gains on sales of loans (mortgage, SBA, etc), and gains (or losses) from securities sales. Community banks have sought to increase noninterest income as an alternative source of earnings. These alternative sources primarily include revenues derived from mortgage banking, investment products, insurance products, credits cards, and electronic banking operations. Any extraordinary or nonrecurring transactions which increase earnings on a one-time basis are normally excluded from profit analyses and comparisons.

Noninterest (Overhead) Expense

Noninterest or overhead expense is composed primarily of personnel, occupancy, equipment, software/data processing, and other expenses, including FDIC premiums. At most banks, noninterest expense exceeds noninterest income. A bank's **burden** is that difference, measured as noninterest expense (OE) minus noninterest income (OI). Improving a bank's burden by raising fees and controlling unit-operating costs improves profits.

A bank's net income (NI) can be viewed as having four general components: net interest income (NII), provision for loan losses (PLL), burden (OE-OI), and taxes (T).

$$NI = NII - PLL - Burden - T$$

Using the income statement data for the SCBS Bank from **Exhibit 2** yields the following breakdown of the bank's net income:

$$\mathbf{\$1,340} = \$3,200 - \$450 - (\$2,700 - \$1,700) - \$410$$

AN OVERVIEW OF BANKING RISK

There are seven fundamental risks in banking: credit risk, liquidity risk, interest-rate risk, capital risk, operational risk, off-balance sheet risk, and foreign exchange risk. Each risk is related to the prospect that expected net returns on bank assets would not be realized. For most community banks, off-balance sheet risk and foreign exchange risk are negligible, so they will not be covered here. As operational risk is non-financial, it will also not be included.

Credit Risk (Asset Quality)

Credit risk is the risk that a borrower will default. A default occurs when a borrower does not make the obligated interest and principal payments in a timely manner. Before making a loan or buying a security, bank officers perform a *credit analysis* that attempts to identify specific sources of cash flow and the likelihood of potential default. Improper management of credit risk is the primary cause of bank failures. When a borrower defaults, the bank's cash inflows decline because interest and principal payments are deferred, reduced, or eliminated. Different assets carry different credit risk with loans exhibiting the highest default rates. Bank security holdings are generally concentrated in federal government and agency securities or high-quality municipal bonds with very low default rates. Generally, banks are required to own investment grade securities: those rated Aaa, Aa, A, or Baa by Moody's; or AAA, AA, A or BBB by Standard & Poor's.

Banks use several metrics to evaluate credit risk. A bank's loan-to-asset and loan-to-deposit ratios indicate the relative size of loan holdings. Net loan charge-offs to total loans indicate how many loans management writes off as uncollectible, net of recoveries. Nonaccrual and past-due loans to total loans similarly indicate the amount of loans that are not currently accruing interest or in which the borrower has not made the contracted interest and principal payments within the last 90 days. Such loans are labeled nonperforming assets. Provision for loan losses and a bank's loan loss reserve signify the amount of funds that management allocates to cover potential losses, but the amounts may lag the true volume of problem loans when a bank gets in trouble.

Liquidity Risk

Banks need liquidity for daily operations; to fund new loan demand, satisfy depositor withdrawals, make debt payments, or acquire new investments. Liquidity refers to the ease with which the owner can convert an asset to cash with a minimum risk of loss. Treasury bills are highly liquid, for example, because a holder can readily sell the bill in the secondary market at a predictable price. Real estate is less liquid because it takes longer to find a buyer at prevailing prices and transaction costs are higher. Of course, a bank can also borrow to obtain cash. The type of borrowing a bank might utilize depends on the time horizon required for liquidity.

Liquidity risk measures focus on the amount of assets that can be readily sold at reasonable prices to meet cash needs, and a bank's capacity to borrow. A bank should hold sufficient short-term government securities, federal funds sold, or deposits at other financial institutions that are not pledged as collateral against existing borrowings. Because banks do not like to sell securities at a loss, securities where the market value exceeds book value are generally viewed as more liquid. The securities also must be designated as available-for-sale for reporting purposes. A bank should also maintain quality assets and a sufficiently large equity capital base to allow it to issue new debt and/or acquire brokered CDs and other purchased liabilities to access cash. Banks with few marketable securities, little or no cash, and with limited ability to issue new liabilities operate with high liquidity risk.

Interest Rate Risk

Interest rate risk refers primarily to the variation in a bank's net interest income caused by changes in market interest rates. The fundamental issue is to determine how much a bank's interest income will rise or fall when rates change compared to how much interest expense rises or falls. The focus is on the volume of rate sensitive assets and liabilities that reprice when interest rates change. If the rate sensitivity of assets and liabilities are well matched and a bank has no off-balance sheet exposure, it exhibits little interest rate risk. If the rate sensitivity difference is large as a fraction of assets, a bank's risk can be substantial. Banks typically examine their funding GAP as a measure of interest rate risk. GAP is a balance sheet measure that equals the dollar difference between rate sensitive assets and rate sensitive liabilities within a set repricing interval, such as the next 90 days, 3 months, 6-12 months, 1-3 years, 3-5 years, and greater than 5 years. The greater the difference, regardless of whether rate sensitive assets exceed rate sensitive liabilities, the greater is the risk because interest rates rise and fall. Banks also are required to use asset liability models to simulate changes in interest rates (rate shocks) and the effects on earnings and capital.

Interest rate risk is also associated with changes in the market value of bank assets versus changes in the market value of bank liabilities when rates rise or fall. Interest rate changes cause prices of certain balance sheet items to change in the opposite direction. When rates rise, bond prices fall; and when rates fall, bond prices rise. Interest rate risk can be measured by comparing the change in asset values relative to liability values due to interest rate changes, to determine how much the market or economic value of equity rises or falls.

Capital Risk

The overall solvency risk of a bank is measured by its capital risk. A bank that assumes too much risk can become insolvent and fail. Insolvency occurs when the market value of a bank's assets is less than the market value of its liabilities. Such a bank has negative net worth or stockholders' equity. In banking, the term **capital** indicates the buffer or safety margin provided to insured depositors by equity or related long-term sources of funds. Capital risk is thus solvency risk, or the risk that a bank might fail because it has insufficient long-term debt and equity to absorb losses.

High credit risk produces high loan charge-offs and reduced interest and principal payments received from loans and securities. High interest rate risk manifests itself through reduced net interest income. High liquidity risk creates problems as banks must replace lost funds by asset sales and/or paying a premium on borrowed funds. Capital risk is more closely associated with asset quality and rate sensitivity mismatches. A bank with few risky assets needs less of an equity buffer to protect against losses, while a bank with many risky assets should operate with more equity. The same holds for banks with high or low interest rate risk. Measures of capital or solvency risk thus compare long-term debt and equity to total assets or to risk assets.

CAMELS Ratings

Federal and state bank regulators regularly assess the financial condition and specific risks faced by each bank through on-site safety and soundness examinations. The exams may address any facet of bank management, but typically focus on assessing asset quality and determining whether policies conform to regulatory requirements.

Federal regulators rate banks according to a CAMELS system that ranks performance in six general categories. The letters refer to each rating category as:

C	capital adequacy
A	asset quality
M	management quality
E	earnings quality
L	liquidity
S	sensitivity to market risk

Each bank is evaluated in each of the six categories ranging from the best rating, 1, to the worst rating, 5. The regulators also assign a composite or overall rating using the same range. However, the six categories do not receive equal weighting in determining the composite rating. A composite rating of 1 or 2 is excellent, a 3 indicates that the bank has some problems that need to be corrected but the risk profile is generally acceptable, while a rating of 4 or 5 signifies that there is a reasonable chance that the bank might fail in the near term because of its problems.

ANALYZING PROFITABILITY

Financial ratios combine balance sheet and income statement figures to calculate ratios that compare performance over time and relative to peers. As a rule, ratios should be constructed using average balance sheet data calculated over the same time period as income statement data. This eliminates distortions caused by large changes in balance sheets just before a quarter or year ending reporting period. The following discussion introduces key ratios, and then uses the data for SCBS Bank from *Exhibits 1* and *2* as an application.

A peer group consists of other banks of similar size and structure that compete in similar markets. Community banks are generally compared with other community banks competing in the same geographic market. Since call report data is publicly posted, peer data can be pulled from multiple public sources. One such source is the FFIEC (Federal Financial Institutions Examination Council), who publishes the Uniform Bank Performance Report (UBPR) quarterly. The UBPR is an analytical tool created for bank supervisory, examination, and management purposes. Each bank's UBPR identifies a peer group for comparison. In a concise format, it shows the impact of management decisions and economic conditions on a bank's performance and balance-sheet composition. The performance and composition data contained in the report can be used as an aid in evaluating the adequacy of earnings, liquidity, capital, asset and liability management, and growth management. Bankers and examiners alike can use this report to further their understanding of a bank's financial condition, and through such understanding, perform their duties more effectively.

Aggregate Profitability Ratios

Bank managers and bank analysts generally evaluate overall bank profitability in terms of return on equity (ROE) and return on assets (ROA). When a bank consistently reports an above average ROE and ROA, it is designated a high-performance bank. To earn higher returns, a bank must either control expenses, take on above-average risk, or have a competitive advantage in offering certain products or services.

$ROE = \text{Net income} / \text{Stockholders' equity}$

Return on equity equals net income divided by (average) stockholders' equity and thus measures the percentage return on stockholders' investment. A higher ROE indicates superior profitability.

$ROA = \text{Net income} / \text{Total assets}$

Return on assets equals net income divided by (average) total assets and thus measures the percentage return per dollar of average assets held during the period. Again, a higher ROA indicates superior profitability. ROAs vary between banks largely due to differences in net interest income, provisions for loan losses, and burden.

In the “ROE model”, ROE is linked to ROA through a bank's equity multiplier (EM), which equals total assets divided by stockholders' equity. EM measures a bank's financial leverage, or its amount of liabilities compared with equity. A larger EM indicates greater leverage.

$$EM = \text{Total assets} / \text{Stockholders' equity}$$

Consider two banks with the assets, liabilities, and equity summarized below. Both banks have \$100 million in assets, but City Bank has \$90 million in liabilities and \$10 million in equity, while County Bank has \$95 million in liabilities and \$5 million in equity. Because County Bank has more debt, and thus greater financial leverage, its equity multiplier is higher, at 20 rather than 10.

City Bank	County Bank
Assets = \$100	Debt = \$90 Equity = \$10
$EM = \$100 / \$10 = 10 \times$	$EM = \$100 / \$5 = 20 \times$

The EM has a multiplier effect on a bank's ROE because ROE equals ROA times EM.

$$ROE = ROA \times EM$$

Thus, if a bank earns positive profits, greater debt financing produces a greater ROE. Of course, if the bank reports a loss, greater debt financing produces a larger negative ROE. For example, if both City Bank and County Bank earned a 1 percent ROA, their ROEs would equal 10 percent and 20 percent, respectively. If the ROAs equaled -1 percent, the corresponding ROEs would be -10 percent and -20 percent.

Decomposition of ROA

A bank's ROA can be deconstructed into ratios that indicate what factors contribute to higher or lower returns. For example, ROA equals a bank's profit margin (PM) times its asset utilization (AU):

$$ROE = PM \times AU$$

$$PM = \text{Net income} / \text{Total operating income}$$

$$AU = \text{Total operating income} / \text{Total assets}$$

Remember, net income equals total operating income minus expenses and taxes. PM thus measures a bank's ability to control expenses and taxes. The greater PM, the greater ROA will be, because the bank is more efficient in keeping expenses low. To determine where the efficiencies are, you can analyze four additional ratios that compare interest expense, noninterest expense, provision for loan losses, and taxes as a fraction of total operating income. The lower each ratio; the better the bank has controlled that expense. If you use UBPR data, comparable ratios are reported relative to total assets.

AU measures a bank's gross yield on total assets before expenses and taxes. This yield varies over time when interest income and noninterest income change relative to assets, as indicated by the following decomposition.

$$AU = (\text{interest income}/\text{total assets}) + (\text{noninterest income}/\text{total assets})$$

AU increases when interest rates rise and decreases when interest rates fall, simply because interest income tracks with the level of interest rates. This ratio will differ among banks due to differences in average yields on various assets, asset composition (i.e. mix of loans vs investments), and the ratio of total earning assets. Noninterest income encompasses bank fees, service charges, and other income. The greatest variation in this category arises when a bank generates some nonrecurring income, such as from the sale of loans, securities or other bank assets, or when a bank dramatically changes its fee structure and product mix.

Net Interest Margin and the Earnings Base

Other commonly referenced ratios indicate specific factors that contribute to bank profitability. Net interest margin (NIM) is the single largest variable which affects profitability for banks. NIM equals net interest income divided by earning assets and thus represents the net interest return on income producing assets.

$$NIM = NII (\text{Net interest income}) / \text{earning assets}$$

A bank's earnings base (EB) measures the fraction of assets that produce income.

$$EB = \text{earning assets} / \text{total assets}$$

Efficiency Ratios

Banks typically monitor their ability to generate noninterest income versus their noninterest expense. The most popular ratio currently used by analysts is the efficiency ratio or overhead ratio (OH), which is calculated by dividing noninterest expense by the sum of net interest income and noninterest income.

$$OH = \text{Noninterest expense} / (\text{NII} + \text{noninterest income})$$

Typically, large banks have lower overhead ratios, but community banks can still achieve improved efficiency ratios over time through overhead cost control measures. It is also common to compare other productivity ratios, such as total assets or total income per employee or per compensation dollar. There is more parity between large and small banks when compensation cost is used as the denominator.

Another mechanism to improve the efficiency ratio is to increase income. Net interest income is driven by fluctuations in interest rates and balance sheet volume/ mix, but noninterest income can be affected by management decisions. Growth strategies for noninterest income include increasing fee and service charge income streams and offering ancillary product offerings like investment advisory, insurance, title advisory as well as operating a secondary market mortgage business.

APPLICATION TO SCBS BANK'S FINANCIAL INFORMATION

The following analysis uses data from *Exhibits 1* and *2* to calculate and interpret the various profitability ratios. Summary figures are presented in *Exhibit 3* for SCBS Bank and its peer banks. You should review the ratio definitions and verify each calculation.

Profitability Analysis

In terms of ROE, SCBS Bank is a high-performance bank as its 18.82 percent return exceeds the peer average of 15.74 percent. SCBS generated a higher ROE because its ROA is well above peers', even though EM (equity multiplier) is lower. SCBS appears to be in excellent shape as its aggregate profitability is above average, yet it operates with more equity (and thus less financial leverage).

$$18.82\% = 1.68\% \times 11.2 \text{ for SCBS}$$
$$15.74\% = 1.29\% \times 12.2 \text{ for peers}$$

The bank's ROA of 1.68% reflects a PM (profit margin) of 14.56% and an AU (asset utilization) of 11.50%.

$$1.68\% = 14.56\% \times 11.50\% \text{ for SCBS}$$
$$1.29\% = 12.60\% \times 10.22\% \text{ for peers}$$

Both PM and AU exceed comparable figures for peer banks, which suggests that SCBS controls expenses and/or taxes better and earns a higher gross yield on assets. The bottom part of *Exhibit 3* demonstrates that PM is higher because SCBS pays less in both interest expense and taxes, which offsets the fact that its provision for loan losses and noninterest expense exceed peers. SCBS's AU is higher which indicates it is able to generate more interest income and noninterest income per dollar of assets.

The other profit measures confirm SCBS's strong performance. The bank's NIM is 4.30%, which is 29 basis points above peers. On a tax-equivalent basis, the difference is 43 basis points, indicating that SCBS has made good use of municipal bonds. SCBS also has more earning assets and covers more of its noninterest expense with noninterest income such that its burden is lower. **Exhibit 5** demonstrates the changes in profitability for SCBS that results from changes in the asset/liability mix.

Risk Analysis

To adequately assess SCBS's risk position, an analyst should have more detailed information about the composition and quality of assets. In general, you must examine footnotes in the financial statements to find this information. **Exhibit 4** summarizes various risk measures for SCBS, some of which are obtained from footnotes and do not appear in **Exhibits 1** or **2**. In terms of credit risk, SCBS has proportionately more loans than peers and reports a higher provision for loan losses. The bank also charges off more loans and a higher percentage is past due. Thus, its credit risk appears to be greater than peer banks'. It is difficult to determine a bank's true credit risk by looking at just one year of data. Rather, it is important to examine a longer time trend of ratios to assess patterns in reporting and performance.

Liquidity risk measures also indicate that SCBS exhibits more risk than its peers. SCBS has almost two percent fewer short-term securities, and the market value of its securities is a smaller fraction of book value. This ratio indicates that a higher fraction of the bank's securities is in an unrealized loss position (likely due to below market interest rates). We can assume SCBS has greater access to borrowed funds. Both stockholders' equity and core deposits are a greater fraction of assets, and the bank is less reliant on hot money in the form of jumbo CDs. If the bank needs to borrow, it should have better access to new funds.

It is difficult to evaluate the bank's capital risk without knowing more about the quality of assets. The fact that SCBS has more stockholders' equity seems appropriate given that the bank has more risky loans and has reported greater charge-offs and past due loans. It would also be hard to analyze interest rate risk measures from the information presented. Interest rate risk measures are examined in detail in the session on asset and liability management.

A more complete performance review would examine additional ratios and compare the bank's performance over time to detect trends in profitability and asset quality. With SCBS it is particularly important to review trends because of the higher level of credit risk. While greater loan interest improves profits near term, the impact of problem loan can persist for years. A bank that understates provision for loan losses is essentially overstating current income and will eventually have increased charge-offs and provisions to catch up.

A Top Performing Bank (Benchmarks)

Many analysts compare a bank's profit and risk measures to basic target values that indicate a strong bank, or one that is well-fortified to handle problems. See below for a listing of key target metrics.

Profit Targets

ROE	>	15.00%
ROA	>	1.25%
NIM	>	4.00%
Efficiency Ratio	<	55.00%

Risk Measures

Non-performing loans / Total Assets	<	1.00%
Net Charge offs / Total Loans	<	0.50%
Provision for Loan Losses / Total Loans	<	0.50%
Short-Term Assets – Purchased Liabilities / TA	>	-10.00%
Total Capital / Risk Weighted Assets	>	10.00%
Rate Sensitive Assets – Rate Sensitive Liabilities/ Total Assets	<	10.00%

Performance of Different-Sized Banks

Banks of different sizes can exhibit substantially different performance depending on the markets they serve and the impact of government regulations. Banks are generally classified as either commercial or retail banks. **Commercial banks** concentrate on the commercial customer. They make more commercial and real estate loans and rely more on commercial deposits and purchased liabilities for funding. **Retail banks** focus on the consumer, relying heavily on consumer deposits and putting more of their assets in consumer-related loans.

Aggregate profitability among large and small banks measured by ROE and ROA has varied substantially from year to year. Generally, smaller banks report greater net interest margin, which reflects small banks' lower cost of funds and higher gross yields on assets. The higher NIM offsets the generally smaller contribution from noninterest income. Noninterest expense varies among large and small banks depending on differing factors and strategy. Finally, loan loss provisions can vary sharply across different sized banks. Small banks are generally less able to diversify and when local economic conditions deteriorate, the asset quality problems and charge-offs can be quite severe.

Analyzing Performance with a Bank's Uniform Bank Performance Report (UBPR)

Each bank is required to file a report of condition and income via a "Call Report" with the appropriate regulatory agency quarterly. Filed call reports are publicly available on the FFIEC's website within 30 days of quarter end. The Uniform Bank Performance Report (UBPR) aggregates this data to allow for comparison and analysis among peers. The UBPR presents a bank's most recent financial data plus key profitability and risk measures, as well as similar figures for recent reporting periods.

All federally insured banks can obtain their UBPR quarterly. **Exhibit 6** presents the December 2021 UBPR data for a South Carolina bank. The format and range of data provided differ slightly for different types of banks. We will use this to assess the bank's profitability and risk profile over time and versus peers for your bank, as indicated in your bank's UBPR.

For this exercise, we will review the bank's performance over a 5-year period and look at the trends and try to determine the changes in operations that caused changes in results.

Some tips in performing your analysis:

1. Review Assets and make determinations on what changed during the 5-year period.
2. Were there any changes in strategies?
3. Did the types of assets change?
4. What happened to the NIM?
5. What about overhead costs or Burden?
6. What happened with asset quality?
7. What happens when you have asset quality problems?
8. Liquidity: Where did the bank get its liquidity?
9. What about Capital?
10. What would you have done differently?

SUMMARY

1. Bank assets can generally be classified in one of four categories: cash and equivalents, investment securities, loans, and other assets. Liabilities include transaction accounts, time and savings deposits, borrowings, long-term debt, and other liabilities. Stockholders' equity represents ownership interest in the bank.
2. A bank's net income can be divided into four components that potentially reveal differences in performance: net interest income, provision for loan losses, burden (noninterest expense minus noninterest income), and taxes.
3. Ratio analysis provides a means of analyzing the source and magnitude of banking profits over time and against peer banks. The ROE model describes the relationship between return on equity and a bank's return on assets and disaggregates ratios into contributing factors.
4. There are seven fundamental risks in banking: credit risk, liquidity risk, interest-rate risk, capital (solvency) risk, operational/fraud risk, off-balance sheet risk, and foreign exchange risk.
5. There is a fundamental trade-off between bank profitability and risk. A bank that reports above average profits either takes on above average risk or realizes a competitive advantage in offering some product or service.
6. Different-sized banks exhibit different profitability and risk profiles because they serve different types of customers and operate in different geographic markets. Commercial banks work primarily with commercial loan and deposit customers. Retail banks focus primarily on consumer customers.
7. The Uniform Bank Performance Report (UBPR) is publicly available quarterly to evaluate a bank's risk and return performance.