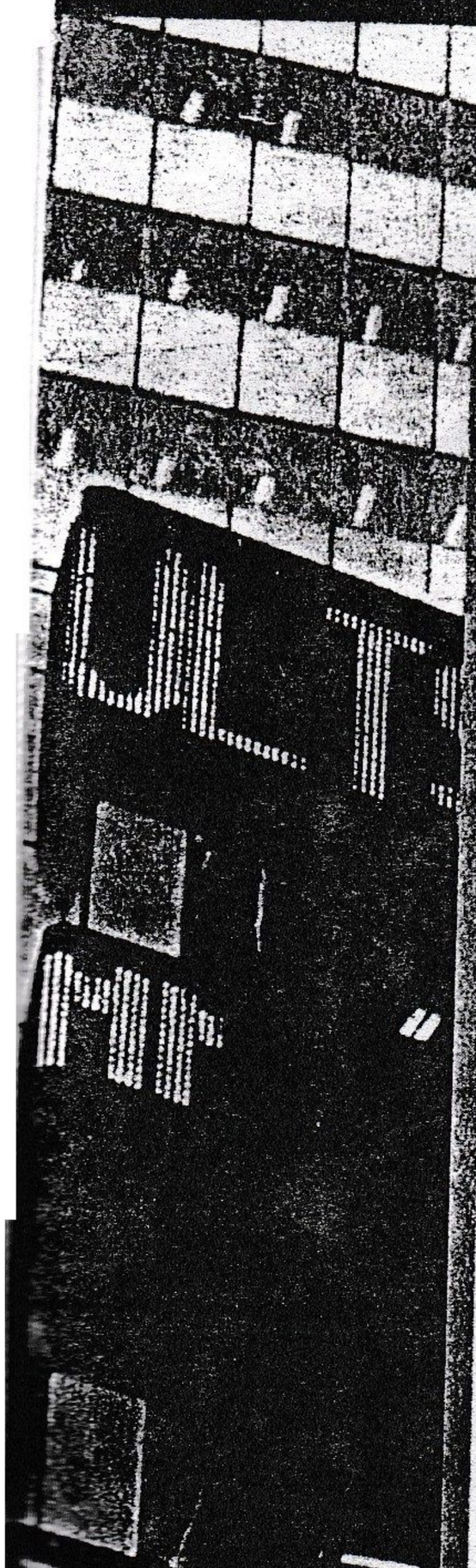
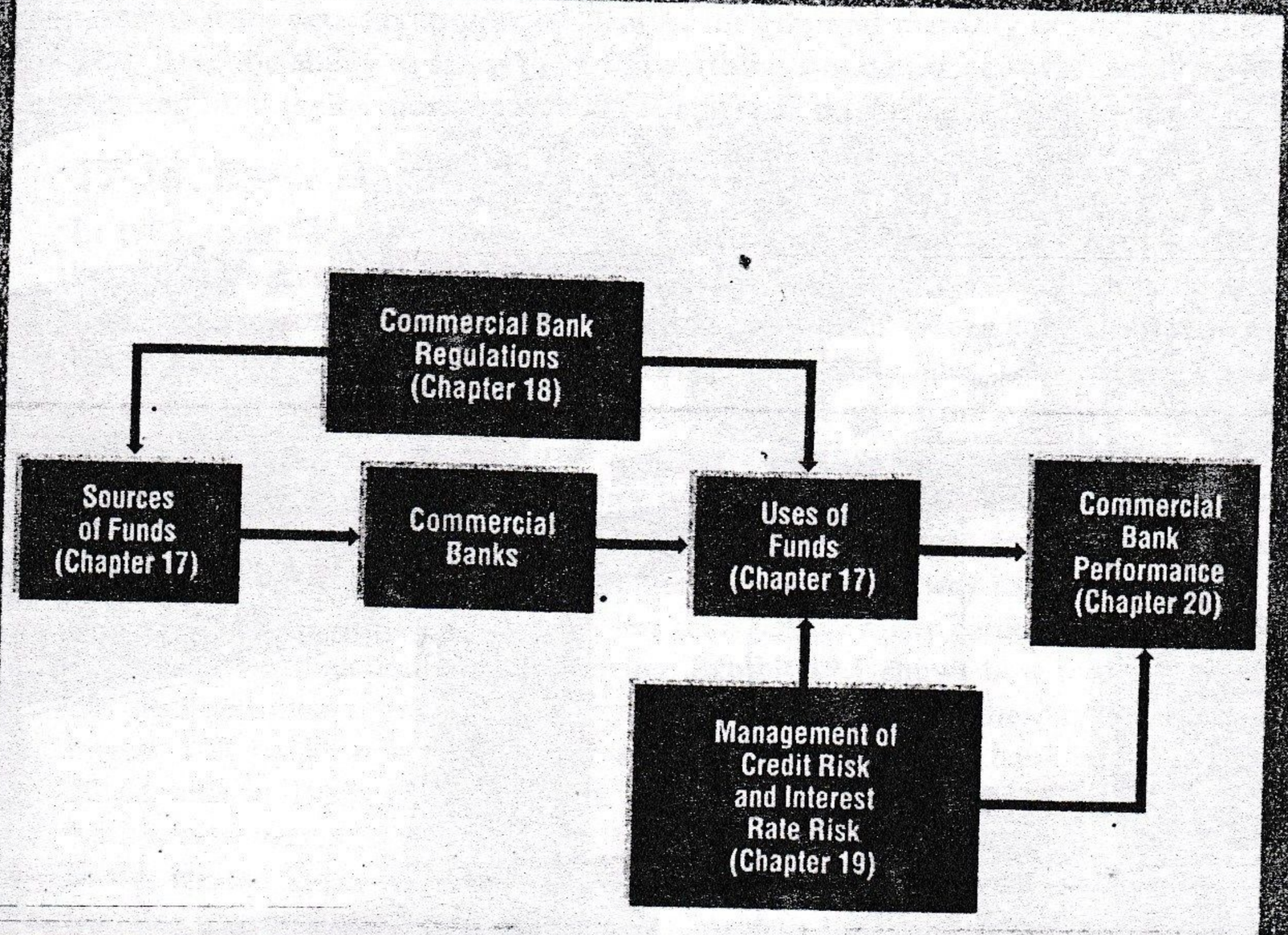
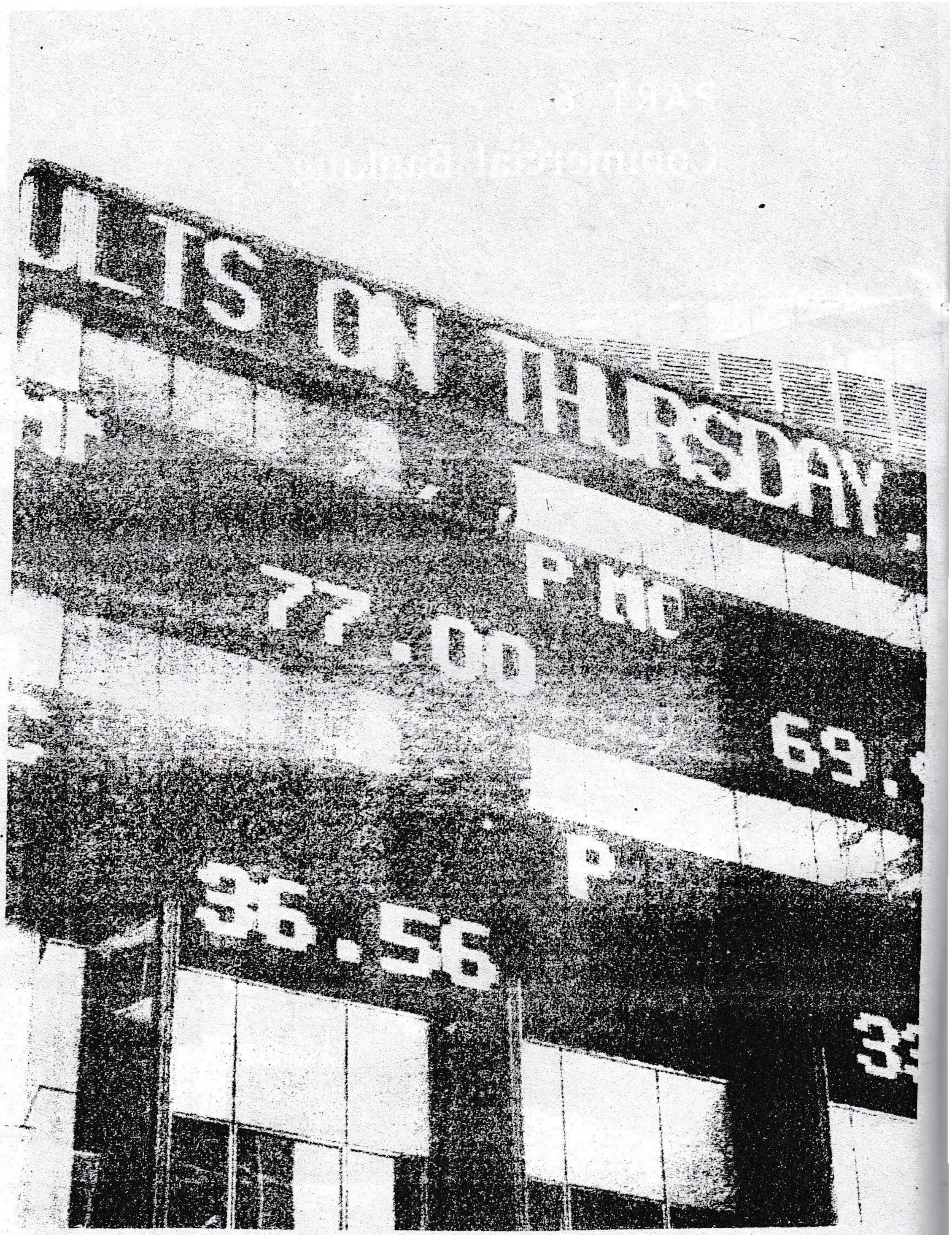
PART 6
Commercial Banking



The chapters in Part 6 focus on commercial banking. Chapter 17 identifies the common sources and uses of funds for commercial banks, and Chapter 18 describes the regulations that are imposed on sources and uses of funds and other banking operations. Chapter 19 explains how banks manage their sources and uses of funds to deal with risk. Chapter 20 explains how commercial bank performance can be measured and monitored to assess previous managerial policies.




ISOMETRIC
PROJECTION
SB.-SB.

17 Commercial Bank Operations

CHAPTER OBJECTIVES

The specific objectives of this chapter are to:

- describe the market structure of commercial banks,
- describe the most common sources of funds for commercial banks,
- explain the most common uses of funds for commercial banks, and
- describe typical off-balance sheet activities for commercial banks.

Measured by total assets, commercial banks are the most important type of financial intermediary. Like other financial intermediaries, they perform the critical function of facilitating the flow of funds from surplus units to deficit units.

17-1 Background on Commercial Banks

Up to this point, the text has focused on the role and functions of financial markets. From this point forward, the emphasis is on the role and functions of financial institutions. Recall from Chapter 1 that financial institutions commonly facilitate the flow of funds between surplus units and deficit units. Commercial banks represent a key financial intermediary because they serve all types of surplus and deficit units. They offer deposit accounts with the size and maturity characteristics desired by surplus units. They repackage the funds received from deposits to provide loans of the size and maturity desired by deficit units. They have the ability to assess the creditworthiness of deficit units that apply for loans, so they can limit their exposure to credit (default) risk on the loans they provide.

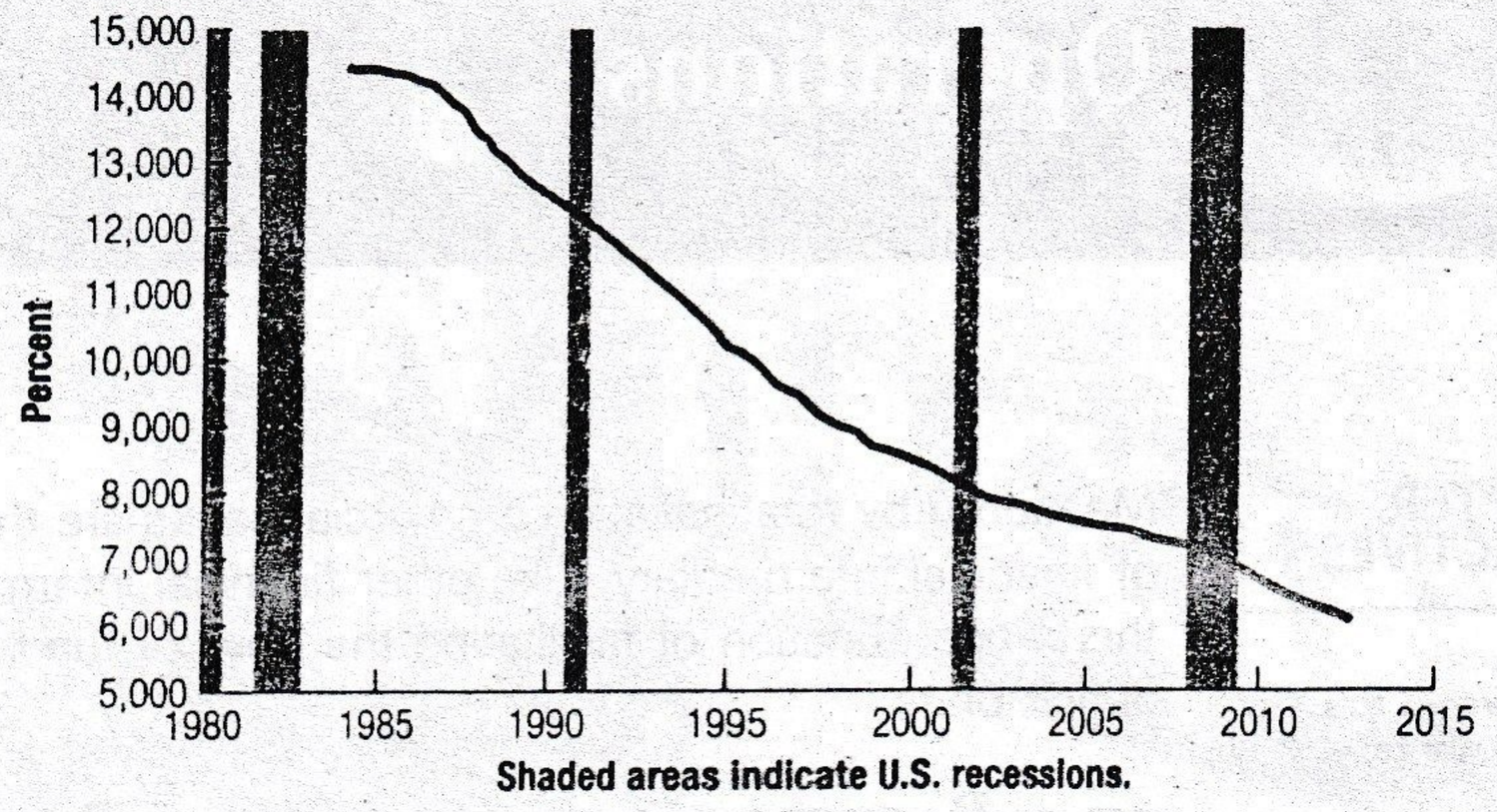
17-1a Bank Market Structure

In 1985, more than 14,000 banks were located in the United States. Since then, the market structure has changed dramatically. Banks have been consolidating for several reasons. One reason is that interstate banking regulations were changed in 1994 to allow banks more freedom to acquire other banks across state lines. Consequently, banks in a particular region are now subject to competition not only from other local banks but also from any bank that may penetrate that market. This has prompted banks to become more efficient in order to survive. They have pursued growth also as a means of capitalizing on economies of scale (lower average costs for larger scales of operations) and enhanced efficiency. Acquisitions have been a convenient way to grow quickly.

As a result of this trend, there are less than half as many banks today as there were in 1985, and consolidation is still occurring. Exhibit 17.1 shows how the number of banks has declined over time, thereby increasing concentration in the banking industry. The largest 100 banks now account for about 75 percent of all bank assets versus about 50 percent in 1985. The largest five banks now account for more than 50 percent of bank assets, versus 30 percent in 2001. JPMorgan Chase & Company is the largest bank in the United States with about $2.3 trillion in assets, while Bank of America Corporation has about $2.2 trillion in assets and Citigroup Inc. has about $1.9 trillion in assets.

Large banks have expanded over time by acquiring other banks. They also acquired many other types of financial service firms in recent years.

Exhibit 17.1 Consolidation among Commercial Banks over Time



Source: *Federal Reserve.*

Many banks are owned by bank holding companies, which are companies that own at least 10 percent of a bank. The holding company structure allows more flexibility to borrow funds, issue stock, repurchase the company's own stock, and acquire other firms. Bank holding companies may also avoid some state banking regulations.

The operations, management, and regulation of a commercial bank vary with the types of services offered. Therefore, the different types of financial services (such as banking, securities, and insurance) are discussed in separate chapters. This chapter on commercial bank operations applies to independent commercial banks as well as to commercial bank units that are part of a financial conglomerate formed by combining a bank and other financial services firms.

The traditional role of a bank was to serve depositors who want to deposit funds and borrowers who want to borrow funds. Banks charge a higher interest rate on funds loaned out than the interest rate they pay on deposits. The difference in interest between loans and deposits must be sufficient to cover other expenses (such as salaries) and generate a reasonable profit for the bank's owners. Although banks have become much more sophisticated over time, the traditional role still applies.

The primary operations of commercial banks can be most easily identified by reviewing their main sources of funds, their main uses of funds, and the off-balance sheet activities that they provide, as explained in this chapter.

17-2 Bank Sources of Funds

WEB

www.fdic.gov
Statistics on bank sources and uses of funds.

To understand how any financial institution (or subsidiary of that institution) obtains funds and uses funds, its balance sheet can be reviewed. The institution's reported liabilities and equity indicate its sources of funds, and its reported assets indicate its uses of funds. The major sources of commercial bank funds are summarized as follows.

Deposit Accounts

1. Transaction deposits
2. Savings deposits
3. Time deposits
4. Money market deposit accounts

Borrowed Funds

1. Federal funds purchased (borrowed)
2. Borrowing from the Federal Reserve banks
3. Repurchase agreements
4. Eurodollar borrowings

Long-Term Sources of Funds

1. Bonds issued by the bank
2. Bank capital

Each source of funds is briefly described in the following subsections.

17-2a Transaction Deposits

A **demand deposit account**, or checking account, is offered to customers who desire to write checks against their account. A conventional demand deposit account requires a small minimum balance and pays no interest. From the bank's perspective, demand deposit accounts are classified as transaction accounts that provide a source of funds that can be used until withdrawn by customers (as checks are written).

Another type of transaction deposit is the **negotiable order of withdrawal (NOW) account**, which pays interest as well as providing checking services. Because NOW accounts at most financial institutions require a larger minimum balance than some consumers are willing to maintain in a transaction account, traditional demand deposit accounts are still popular.

Electronic Transactions Some transactions originating from transaction accounts have become much more efficient as a result of electronic banking. Most employees in the United States have direct deposit accounts, which allow their paychecks to be directly deposited to their transaction account (or other accounts). Social Security recipients have their checks deposited directly to their bank accounts. Computer banking enables bank customers to view their bank accounts online, pay bills, make credit card payments, order more checks, and transfer funds between accounts.

Bank customers use automated teller machines (ATMs) to make withdrawals from their transaction accounts, add deposits, check account balances, and transfer funds. Debit cards allow bank customers to use a card when making purchases and have their bank account debited to reflect the amount spent. Banks also allow preauthorized debits, in which specific periodic payments are automatically transferred from a customer's bank account to a particular recipient. Preauthorized debits are commonly used to cover recurring monthly expenses such as utility bills, car loan payments, and mortgage payments.

17-2b Savings Deposits

The traditional savings account is the passbook savings account, which does not permit check writing. Passbook savings accounts continue to attract savers with a small amount of funds, as such accounts often have no required minimum balance.

17-2c Time Deposits

Time deposits are deposits that cannot be withdrawn until a specified maturity date. The two most common types of time deposits are certificates of deposit (CDs) and negotiable certificates of deposit.

Certificates of Deposit A common type of time deposit is a retail certificate of deposit (or retail CD), which requires a specified minimum amount of funds to be deposited for a specified period of time. Banks offer a wide variety of CDs to satisfy depositors' needs. Annualized interest rates offered on CDs vary among banks and even among maturity types at a single bank. There is no secondary market for retail CDs. Depositors must leave their funds in the bank until the specified maturity or forgo a portion of their interest as a penalty.

The rates offered by CDs are easily accessible on numerous websites. For example, Bank-Rate (www.bankrate.com) and Bank CD-Rate Scanner (www.bankcd.com) identify banks that are currently paying the highest rates on CDs. Because of easy access to CD rate information online, many depositors invest in CDs at banks far away to earn a higher rate than that offered by local banks. Some banks allow depositors to invest in CDs online by providing a credit card number.

In recent years, some financial institutions have begun to offer CDs with a callable feature (referred to as callable CDs). That is, they can be called by the financial institution, forcing an earlier maturity. For example, a bank could issue a callable CD with a five-year maturity, callable after two years. In two years, the financial institution will likely call the CD if it can obtain funds at a lower rate over the following three years than the rate paid on that CD. Depositors who invest in callable CDs earn a slightly higher interest rate, which compensates them for the risk that the CD may be called.

Negotiable Certificates of Deposit Another type of time deposit is the **negotiable CD (NCD)**, which is offered by some large banks to corporations. Negotiable CDs are similar to retail CDs in that they have a specified maturity date and require a minimum deposit. Their maturities are typically short term, and their minimum deposit requirement is $100,000. A secondary market for NCDs does exist.

The level of large time deposits is much more volatile than that of small time deposits, because investors with large sums of money frequently shift their funds to wherever they can earn higher rates. Small investors do not have as many options as large investors and are less likely to shift in and out of small time deposits.

17-2d Money Market Deposit Accounts

Money market deposit accounts (MMDAs) differ from conventional time deposits in that they do not specify a maturity. From the depositor's point of view, MMDAs are more liquid than retail CDs but offer a lower interest rate. They differ from NOW accounts in that they provide limited check-writing ability (a limited number of transactions is allowed per month), require a larger minimum balance, and offer a higher yield.

The remaining sources of funds to be described are of a nondepository nature. Such sources are necessary when a bank temporarily needs more funds than are being deposited. Some banks use nondepository funds as a permanent source of funds.

17-2e Federal Funds Purchased

The federal funds market allows depository institutions to accommodate the short-term liquidity needs of other financial institutions. Federal funds purchased (or borrowed) represent a liability to the borrowing bank and an asset to the lending bank that sells

them. Loans in the federal funds market are typically for one to seven days. Such loans can be rolled over so that a series of one-day loans can be made. The intent of federal funds transactions is to correct short-term fund imbalances experienced by banks. A bank may act as a lender of federal funds on one day and as a borrower shortly thereafter, since its fund balance changes on a daily basis.

The interest rate charged in the federal funds market is called the **federal funds rate**. Like other market interest rates, it moves in reaction to changes in demand or supply or both. If many banks have excess funds and few banks are short of funds, the federal funds rate will be low. Conversely, a high demand by many banks to borrow in the federal funds market combined with a small supply of excess funds available at other banks will result in a higher federal funds rate. The federal funds rate is typically the same for all banks borrowing in the federal funds market, although a financially troubled bank may have to pay a higher rate. The federal funds rate is quoted on an annualized basis (using a 360-day year) even though the loans are usually for terms of less than one week. This rate is typically close to the yield on a Treasury security with a similar term remaining until maturity. The federal funds market is typically most active on Wednesday, because that is the final day of each particular settlement period for which each bank must maintain a specified volume of reserves required by the Fed. Banks that were short of required reserves on average over the period must compensate with additional required reserves before the settlement period ends. Large banks frequently need temporary funds and therefore are common borrowers in the federal funds market.

17-2f Borrowing from the Federal Reserve Banks

WEB

www.newyorkfed.org/markets/markets/omo/dmm/fedfundsdata.cfm
Information about bank borrowing in the federal funds market.

Another temporary source of funds for banks is the Federal Reserve System, which serves as the U.S. central bank. Along with other bank regulators, the Federal Reserve district banks regulate certain activities of banks. They also provide short-term loans to banks (as well as to some other depository institutions). This form of borrowing by banks is often referred to as borrowing at the discount window. The interest rate charged on these loans is known as the **primary credit lending rate**.

As of January 2003, the primary credit lending rate was to be set at a level that always exceeded the federal funds rate. This was intended to ensure that banks rely on the federal funds market for normal short-term financing and borrow from the Fed only as a last resort.

Loans from the Federal Reserve are short term, commonly from one day to a few weeks. To ensure there is a justifiable need for the funds, banks that wish to borrow at the Federal Reserve must first obtain the Fed's approval. Like the federal funds market, loans from the Fed are mainly used to resolve a temporary shortage of funds. If a bank needs more permanent sources of funds, it will develop a strategy to increase its level of deposits.

The Federal Reserve is intended to be a source of funds for banks that experience unanticipated shortages of reserves. Frequent borrowing to offset reserve shortages implies that the bank has a permanent rather than a temporary need for funds and should therefore satisfy this need with a more permanent source of funds. The Fed may veto continuous borrowing by a bank unless there are extenuating circumstances that prevent the bank from obtaining temporary financing from other financial institutions.

17-2g Repurchase Agreements

A **repurchase agreement (repo)** represents the sale of securities by one party to another with an agreement to repurchase the securities at a specified date and price. Banks often use a repo as a source of funds when they expect to need funds for just a few days. The bank simply sells some of its government securities (such as Treasury bills) to a

corporation with a temporary excess of funds and buys those securities back shortly thereafter. The government securities involved in the repo transaction serve as collateral for the corporation providing funds to the bank.

Repurchase agreement transactions occur through a telecommunications network connecting large banks, other corporations, government securities dealers, and federal funds brokers. The federal funds brokers match up firms or dealers that need funds (wish to sell and later repurchase their securities) with those that have excess funds (are willing to purchase securities now and sell them back on a specified date). Transactions are typically in blocks of $1 million. Like the federal funds rate, the yield on repurchase agreements is quoted on an annualized basis (using a 360-day year) even though the loans are for short-term periods. The yield on repurchase agreements is slightly less than the federal funds rate at any given time because the funds loaned out are backed by collateral and are therefore less risky.

17-2h Eurodollar Borrowings

If a U.S. bank is in need of short-term funds, it may borrow dollars from those banks outside the United States (typically in Europe) that accept dollar-denominated deposits, or **Eurodollars**. Some foreign banks (or foreign branches of U.S. banks) accept large short-term deposits and make short-term loans in dollars. Because U.S. dollars are widely used as an international medium of exchange, the Eurodollar market is very active.

17-2i Bonds Issued by the Bank

Like other corporations, banks own some fixed assets such as land, buildings, and equipment. These assets often have an expected life of 20 years or more and are usually financed with such long-term sources as the issuance of bonds. Common purchasers of these bonds are households and various financial institutions, including life insurance companies and pension funds. Banks finance less with bonds than do most other corporations because they have fewer fixed assets than corporations that use industrial equipment and machinery for production. Therefore, banks have less need for long-term funds.

17-2j Bank Capital

Bank capital generally represents funds acquired by the issuance of stock or the retention of earnings. In either case, the bank has no obligation to pay out funds in the future. This distinguishes bank capital from all the other sources of funds, which represent a future obligation by the bank to pay out funds. Bank capital as defined here represents the equity or net worth of the bank. Capital can be classified as primary or secondary. Primary capital results from issuing common or preferred stock or retaining earnings, whereas secondary capital results from issuing subordinated notes and bonds.

A bank's capital must be sufficient to absorb operating losses in the event that expenses or losses exceed revenues, regardless of the reason for the losses. Although long-term bonds are sometimes considered to be secondary capital, they are a liability to the bank and therefore do not appropriately cushion against operating losses.

Although the issuance of new stock increases a bank's capital, it dilutes the bank's ownership because the proportion of the bank owned by existing shareholders decreases. A bank's reported earnings per share are also reduced when additional shares of stock are issued unless earnings increase by a greater proportion than the increase in outstanding shares. For these reasons, banks generally avoid issuing new stock unless absolutely necessary.

Bank regulators are concerned that banks might maintain a lower level of capital than they should and have therefore imposed capital requirements on them. Because capital can absorb losses, a higher level of capital is thought to enhance a bank's safety and may increase the public's confidence in the banking system.

The required level of capital for each bank depends on its risk. Assets with low risk are assigned relatively low weights while assets with high risk are assigned high weights. The capital level is set as a percentage of the risk-weighted assets.

Therefore, riskier banks are subject to higher capital requirements. The same risk-based capital guidelines have been imposed in several other industrialized countries. Additional details are provided in the next chapter.

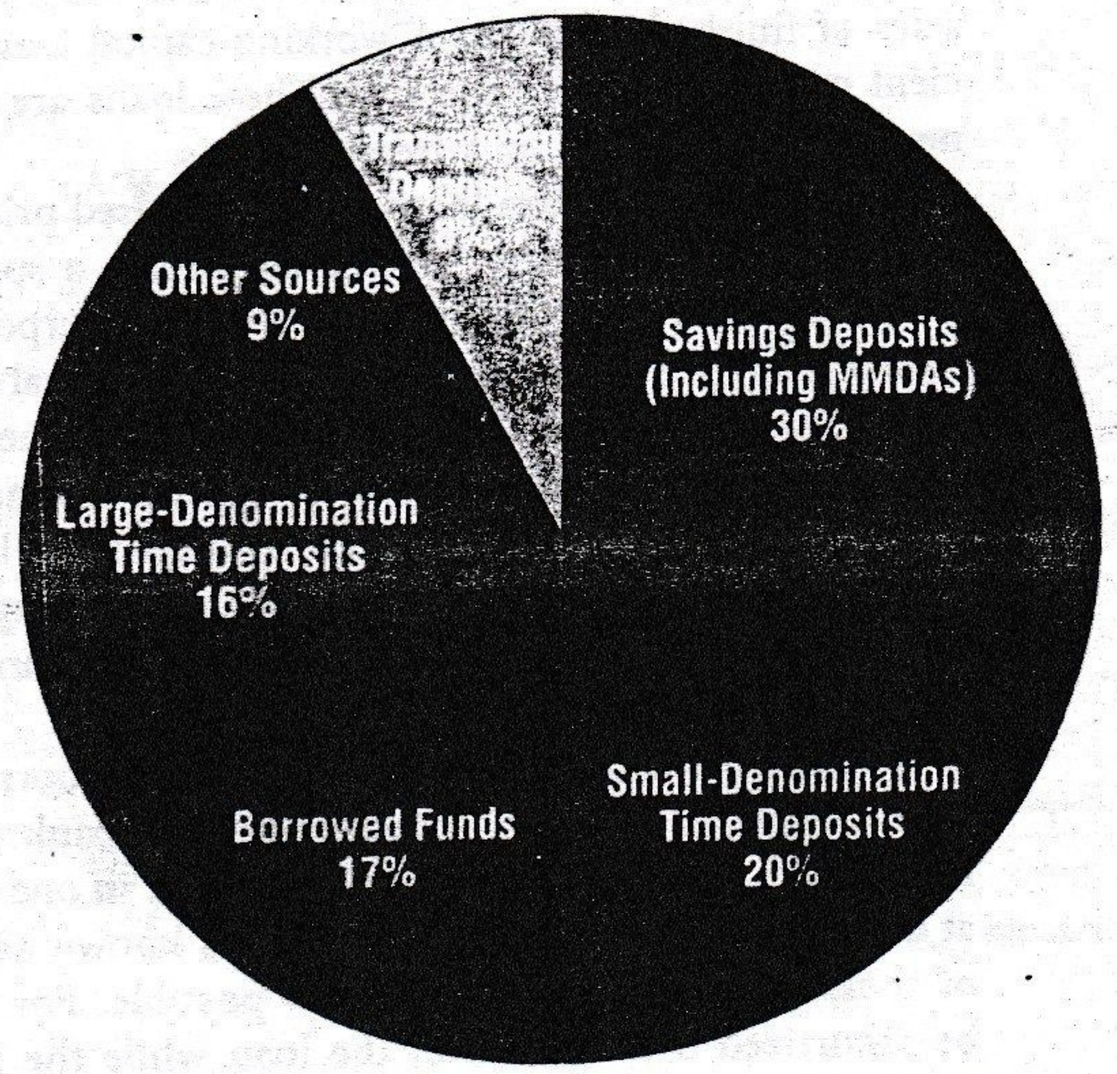
17-2k Distribution of Bank Sources of Funds

Exhibit 17.2 shows the distribution of bank sources of funds. Transaction and savings deposits make up 38 percent of all bank liabilities. The distribution of bank sources of funds is influenced by bank size. Smaller banks rely more heavily on savings deposits than do larger banks because small banks concentrate on household savings and therefore on small deposits. Much of this differential is made up in large time deposits (such as NCDs) for very large banks. In addition, the larger banks rely more on short-term borrowings than do small banks. The impact of the differences in the composition of fund sources on bank performance is discussed in Chapter 20.

The main sources of funds have been identified, so now the bank uses of funds can be discussed. The more common uses of funds by banks include the following:

- Cash
- Bank loans

Exhibit 17.2 Bank Sources of Funds (as a Proportion of Total Liabilities)



Source: *Federal Reserve.*

- Investment in securities
- Federal funds sold (loaned out)
- Repurchase agreements
- Eurodollar loans
- Fixed assets
- Proprietary trading

17-2l Cash

Banks must hold some cash as reserves to meet the reserve requirements enforced by the Federal Reserve. Banks also hold cash to maintain some liquidity and to accommodate any withdrawal requests by depositors. Because banks do not earn income from cash they hold only as much cash as is necessary to maintain a sufficient degree of liquidity. They can tap various sources for temporary funds and therefore are not overly concerned with maintaining excess reserves.

Banks hold cash in their vaults and at their Federal Reserve district bank. Vault cash is useful for accommodating withdrawal requests by customers or for qualifying as required reserves, while cash held at the Federal Reserve district banks represents the major portion of required reserves. The Fed mandates that banks maintain required reserves because they provide a means by which the Fed can control the money supply. The required reserves of each bank depend on the composition of its deposits.

17-2m Bank Loans

The main use of bank funds is for loans. The loan amount and maturity can be tailored to the borrower's needs.

Types of Business Loans A common type of business loan is the **working capital loan** (sometimes called a self-liquidating loan), which is designed to support ongoing business operations. There is a lag between the time when a firm needs cash to purchase raw materials used in production and the time when it receives cash inflows from the sales of finished products. A working capital loan can support the business until sufficient cash inflows are generated. These loans are typically short term, but they may be needed by businesses on a frequent basis.

Banks also offer **term loans**, which are used primarily to finance the purchase of fixed assets such as machinery. With a term loan, a specified amount of funds is loaned out for a specified period of time and a specified purpose. The assets purchased with the borrowed funds may serve as partial or full collateral on the loan. Maturities on term loans commonly range from 2 to 5 years and are sometimes as long as 10 years. Banks that offer term loans typically impose protective covenants, which specify specific conditions for the borrower that may protect the bank from loan default. For example, a bank may specify a maximum level of dividends that the borrower can pay to its shareholders each year. This protective covenant is intended to ensure that the borrower has sufficient cash to repay its loan on time.

Term loans can be amortized so that the borrower makes fixed periodic payments over the life of the loan. Alternatively, the bank can periodically request interest payments, with the loan principal to be paid off in one lump sum (called a **balloon payment**) at a specified date in the future. This is known as a **bullet loan**. Several combinations of these payment methods are also possible. For example, a portion of the loan may be amortized over the life of the loan while the remaining portion is covered with a balloon payment.

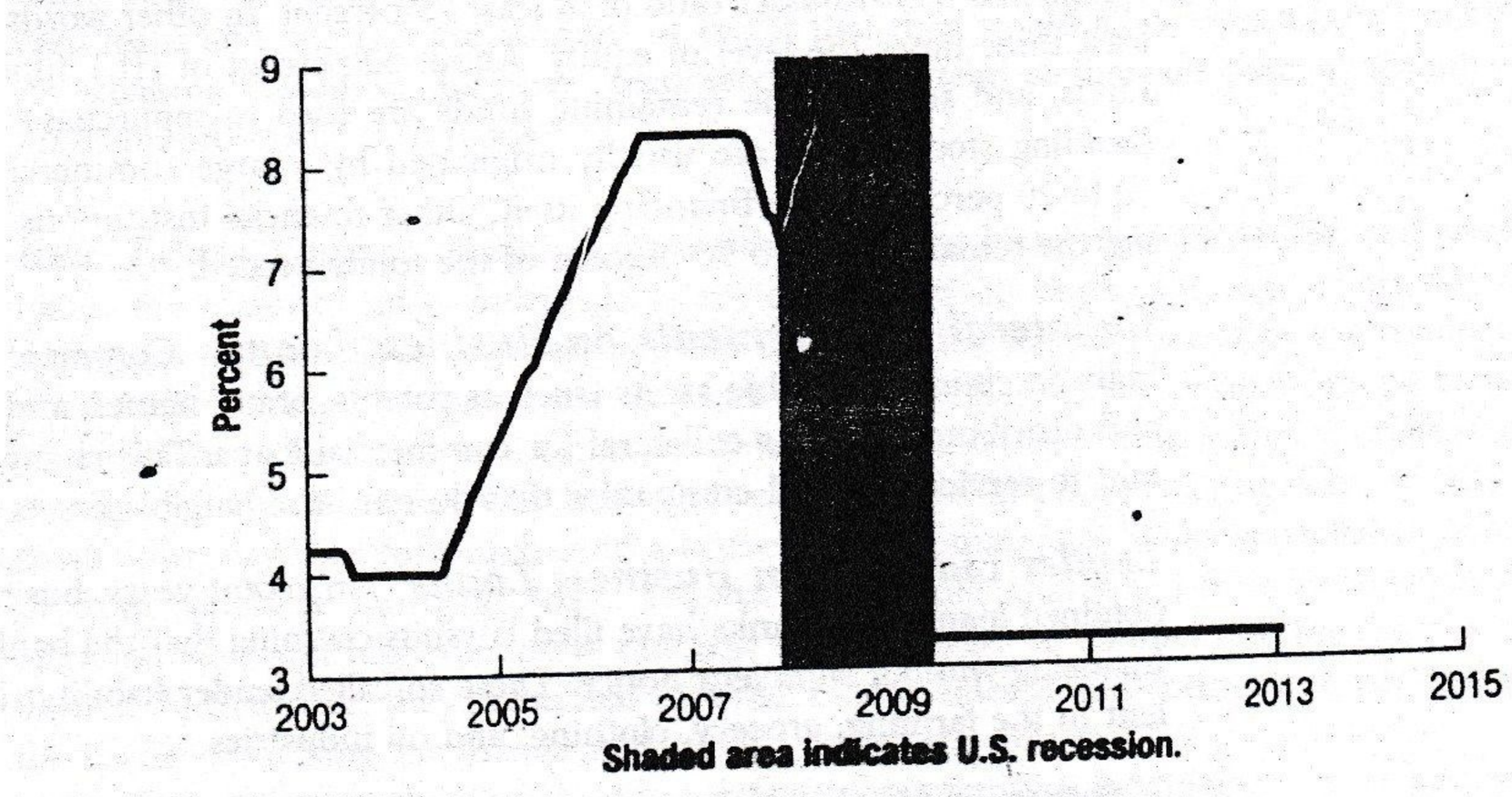
As an alternative to providing a term loan, the bank may purchase the assets and lease them to the firm in need. This method, known as a **direct lease loan**, may be especially appropriate when the firm wishes to avoid adding more debt to its balance sheet. Because the bank is the owner of the assets, it can depreciate them over time for tax purposes.

A more flexible financing arrangement is the informal line of credit, which allows the business to borrow up to a specified amount within a specified period of time. This is useful for firms that may experience a sudden need for funds but do not know precisely when. The interest rate charged on any borrowed funds is typically adjustable in accordance with prevailing market rates. Banks are not legally obligated to provide funds to the business, but they usually honor the arrangement to avoid harming their reputation.

An alternative to the informal line of credit is the **revolving credit loan**, which obligates the bank to offer up to some specified maximum amount of funds over a specified period of time (typically less than five years). Because the bank is committed to provide funds when requested, it normally charges businesses a commitment fee (of about one-half of 1 percent) on any unused funds.

The interest rate charged by banks on loans to their most creditworthy customers is known as the **prime rate**. Banks periodically revise the prime rate in response to changes in market interest rates, which reflect changes in the bank's cost of funds. Thus the prime rate moves in tandem with the Treasury bill rate and other market interest rates. The prime rate in recent years is shown in Exhibit 17.3. It increased during the 2004–2006 period when economic conditions were strong. Conversely, it decreased during recessions, such as during the financial crisis in 2008. The prime rate tends to adjust in response to changes in other interest rates that influence the bank's cost of funds. When economic conditions are weak, however, the spread between the prime rate and the bank's cost of funds tends to widen because banks require a higher premium to compensate for credit risk.

Exhibit 17.3 Prime Rate over Time



Source: *Federal Reserve.*

Loan Participations Some large corporations wish to borrow a larger amount of funds than any individual bank is willing to provide. To accommodate a corporation, several banks may be willing to pool their available funds in what is referred to as a **loan participation**. One of the banks serves as the lead bank by arranging for the documentation, disbursement, and payment structure of the loan. The main role of the other banks is to supply funds that are channeled to the borrower by the lead bank. The borrower may not even realize that other banks have provided much of the funds. As interest payments are received, the lead bank passes the payments on to the other participants in proportion to the original loan amounts they provided. The lead bank receives fees for servicing the loan in addition to its share of interest payments.

The lead bank is expected to ensure that the borrower repays the loan. Normally, however, the lead bank is not required to guarantee the interest payments. Thus all participating banks are exposed to credit (default) risk.

Loans Supporting Leveraged Buyouts Some commercial banks finance leveraged buyouts (LBOs), in which a management group or a business relies mostly on debt to purchase the equity of another business. Firms request LBO financing because they perceive that the market value of certain publicly held shares is too low. Yet because the borrowers are highly leveraged, they may experience cash flow pressure during periods when sales are lower than normal. It is desirable that these firms have access to equity funds because it can serve as a cushion during periods of poor economic conditions. Although such firms prefer not to go public again during such periods, they are at least capable of doing so. Banks financing these firms can, as a condition of any loan, require that the firms reissue stock if they experience cash flow problems.

Some banks originate the loans designed for LBOs and then sell them to other financial institutions, such as insurance companies, pension funds, and foreign banks. In this way, they can generate fee income by servicing the loans while avoiding the credit risk associated with them.

Bank regulators monitor the amount of bank financing provided to corporate borrowers that have a relatively high degree of financial leverage. These loans, known as **highly leveraged transactions (HLTs)**, are defined by the Federal Reserve as credit that results in a debt-to-asset ratio of at least 75 percent. In other words, the level of debt is at least three times the level of equity. About 60 percent of HLT funds are used to finance LBOs, and some of the remaining funds are used to repurchase a portion of the outstanding stock. HLTs are usually originated by a large commercial bank that provides 10 to 20 percent of the financing itself. Other financial institutions participate by providing the remaining 80 to 90 percent of the funds needed.

Collateral Requirements on Business Loans Commercial banks are increasingly accepting intangible assets (such as patents, brand names, and licenses to franchises and distributorships) as collateral for commercial loans. This change is especially important to service-oriented companies that do not have tangible assets.

Lender Liability on Business Loans In recent years, businesses that previously obtained loans from banks have filed lawsuits claiming that the banks terminated further financing without sufficient notice. These so-called lender liability suits have been prevalent in the farming, grocery, clothing, and oil industries.

Volume of Business Loans The volume of business loans provided by commercial banks changes over time in response to economic conditions. When the economy is strong, businesses are more willing to finance expansion. When economic conditions are

weak, businesses defer expansion plans and therefore do not need as much financing. Economic growth increased during the 2004–2006 period, resulting in a major increase in business loans provided by banks. During the credit crisis of 2008–2009, however, the volume of business loans decreased.

WEB

www.fdic.com
Information about bank loan and deposit volume.

Types of Consumer Loans Commercial banks provide individuals with **installment loans** to finance purchases of cars and household products. These loans require the borrowers to make periodic payments over time.

Banks also provide credit cards to consumers who qualify, enabling them to purchase various goods without having to reapply for credit on each purchase. Credit card holders are assigned a maximum limit based on their income and employment record, and a fixed annual fee may be charged. This service often involves an agreement with VISA or MasterCard. If consumers pay off the balance each month, they normally are not charged interest. Bank rates on credit card balances are sometimes about double the rate charged on business loans. State regulators can impose **usury laws** that restrict the maximum rate of interest charged by banks, and these laws may be applied to credit card loans as well. A federal law requires that banks abide by the usury laws of the state where they are located rather than the state where the consumer lives.

Assessing the applicant's creditworthiness is much easier for consumer loans than for corporate loans. An individual's cash flow is typically simpler and more predictable than a firm's cash flow. In addition, the average loan amount to an individual is relatively small, warranting a less detailed credit analysis.

Since the interest rate on credit card loans and personal loans is typically much higher than the cost of funds, many commercial banks have pursued these types of loans as a means of increasing their earnings. The most common method of increasing such loans is to use more lenient guidelines when assessing the creditworthiness of potential customers. However, there is an obvious trade-off between the potential return and exposure to credit risk. When commercial banks experience an increase in defaults on credit card loans and other personal loans, they respond by increasing their standards for extending such loans. This results in a reduced allocation of funds to credit card loans, which also reduces the potential returns of the bank. When the economy weakened during the credit crisis in 2008 and 2009, for example, many banks raised their standards for credit card loans and reduced the amount of credit that they would allow consumers to have. As economic conditions improve, commercial banks tend to increase their allocation of funds toward credit card loans.

Real Estate Loans Banks also provide real estate loans. For residential real estate loans, the maturity on a mortgage is typically 15 to 30 years, although shorter-term mortgages with a balloon payment are also common. The loan is backed by the residence purchased. During the economic expansion in the 2004–2006 period, many banks offered loans to home buyers of questionable credit standards. These *subprime* mortgages were given to home buyers who had relatively lower income, high existing debt, or only a small down payment for purchasing a home. Many commercial banks expected to benefit from subprime mortgage loans because they could charge up-front fees (such as appraisal fees) and higher interest rates on the mortgages to compensate for the risk of default. Furthermore, they presumed that real estate values would continue to rise and so the residence backing the loan would serve as adequate collateral.

In 2008, however, there were many defaults on subprime mortgages. As of January 2009, about 10 percent of all homeowners with mortgages were either late on their payments or subject to foreclosure. Banks and other financial institutions were forced to take

over the ownership of many homes, which led to an excess supply of homes in the housing market. Consequently, the prices of homes declined substantially, which further reduced the collateral value of the homes taken back by the banks. Thus banks that originated mortgages and held them as assets were adversely affected by the credit crisis.

Commercial banks also provide commercial real estate loans, such as loans to build shopping malls. In general, during the early 2000s banks required more stringent standards for borrowers to qualify for commercial real estate loans. For this reason, the default rate on commercial real estate loans provided by commercial banks was low compared to the default rate on residential loans during the credit crisis. In addition, commercial banks commonly retain the commercial real estate loans that they originate as assets. Banks and other financial institutions are likely to use greater diligence in assessing real estate loan applicants when they retain the mortgages that they originate.

17-2n Investment in Securities

Banks purchase various types of securities. One advantage of investing funds in securities rather than loans is that the securities tend to be more liquid. In addition, banks can easily invest in securities whereas more resources are required to assess loan applicants and service loans. However, they normally expect to generate higher rates of return on funds used to provide loans.

Treasury and Agency Securities Banks purchase Treasury securities as well as securities issued by agencies of the federal government. Government agency securities can be sold in the secondary market, but the market is not as active as it is for Treasury securities. Federal agency securities are commonly issued by federal agencies, such as the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac). Funds received by the agencies issuing these securities are used to purchase mortgages from various financial institutions. Such securities have maturities that can range from one month to 25 years.

The values of the mortgages held by Fannie Mae and Freddie Mac declined in 2008 as a result of the large amount of late payments and mortgage defaults during the credit crisis. Consequently, there were concerns that Fannie Mae and Freddie Mac might not be able to cover their debt security payments. In September 2008, the U.S. government took control of Fannie Mae and Freddie Mac, thereby ensuring the safety of the debt securities issued by these agencies.

Corporate and Municipal Bonds Banks also purchase corporate and municipal bonds. Although corporate bonds are subject to credit risk, they offer a higher return than Treasury or government agency securities. Municipal bonds exhibit some degree of risk but can also provide an attractive return to banks, especially when their after-tax return is considered. The interest income earned from municipal securities is exempt from federal taxation. Banks purchase only **investment-grade securities**, which are those rated as "medium quality" or higher by rating agencies.

Mortgage-Backed Securities Banks also commonly purchase mortgage-backed securities (MBS), which represent packages of mortgages. Banks tend to purchase mortgages within a particular "tranche" that is categorized as having relatively low risk. During the credit crisis in 2008 and 2009, however, there were many defaults on mortgages within tranches that had been assigned high ratings by rating agencies. Consequently, banks that had invested in MBS experienced losses during the credit crisis. The market value of MBS at any bank is difficult to measure because the MBS are not standardized

and the secondary market transactions between parties are not conducted through an organized exchange. Thus two banks could have an equal proportion of their assets classified as MBS, but one bank's MBS may be much riskier than the other bank's MBS.

17-2o Federal Funds Sold

Some banks often lend funds to other banks in the federal funds market. The funds sold, or lent out, will be returned (with interest) at the time specified in the loan agreement. The loan period is typically very short, such as a day or a few days. Small banks are common providers of funds in the federal funds market. If the transaction is executed by a broker, the borrower's cost on a federal funds loan is slightly higher than the lender's return because the broker matching up the two parties charges a transaction fee.

17-2p Repurchase Agreements

Recall that, from the borrower's perspective, a repurchase agreement transaction involves repurchasing the securities it had previously sold. From a lender's perspective, the repo represents a sale of securities that it had previously purchased. Banks can act as the lender (on a repo) by purchasing a corporation's holdings of Treasury securities and then selling them back at a later date. This provides short-term funds to the corporation, and the bank's loan is backed by these securities.

17-2q Eurodollar Loans

Branches of U.S. banks located outside the United States, as well as some foreign-owned banks, provide dollar-denominated loans to corporations and governments. These so-called Eurodollar loans are common because the dollar is frequently used for international transactions. Eurodollar loans are short term and denominated in large amounts, such as $1 million or more.

17-2r Fixed Assets

Banks must maintain some amount of fixed assets, such as office buildings and land, so that they can conduct their business operations. However, this is not a concern to the bank managers who decide how day-to-day incoming funds will be used. They direct these funds into the other types of assets already identified.

17-2s Proprietary Trading

Banks also engage in proprietary (or "prop") trading, in which they use their own funds to make investments for their own account. For example, banks may have an equity trading desk that takes positions in equity securities as well as a fixed-income desk that takes speculative positions in bonds and other debt securities; they may also have a derivatives trading desk that takes speculative positions in derivative securities. Proprietary trading was a major contributor to the total income generated by commercial banks prior to the credit crisis, when economic conditions were very favorable. The trading desks tend to engage in much more risk than traditional bank lending operations, and some commercial banks experienced large losses on their proprietary trading during the financial crisis.

Banks also manage investment portfolios in which they pool funds provided by clients and make investments with the funds on behalf of the bank's clients. They charge an annual management fee to clients for managing these funds. The hedge fund may generate periodic fees from clients for managing the funds. Banks may own private equity funds, which pool funds provided by wealthy individual and institutional investors, and then invest the funds in businesses. They may charge their investor clients fees for their

service and take a portion of the profit from managing the funds before distributing profits to their investor clients.

The Wall Street Reform and Consumer Protection Act (also called the Dodd-Frank Act) of 2010 imposes a limit on the amount of proprietary trading by banks. This provision is referred to as the Volcker rule, because it was recommended by Paul Volcker, a previous member of the Board of Governors of the Fed. However, its implementation was delayed due to many arguments about its interpretation. The arguments were intense because some banks wanted to retain their flexibility to engage in a large amount on proprietary trading.

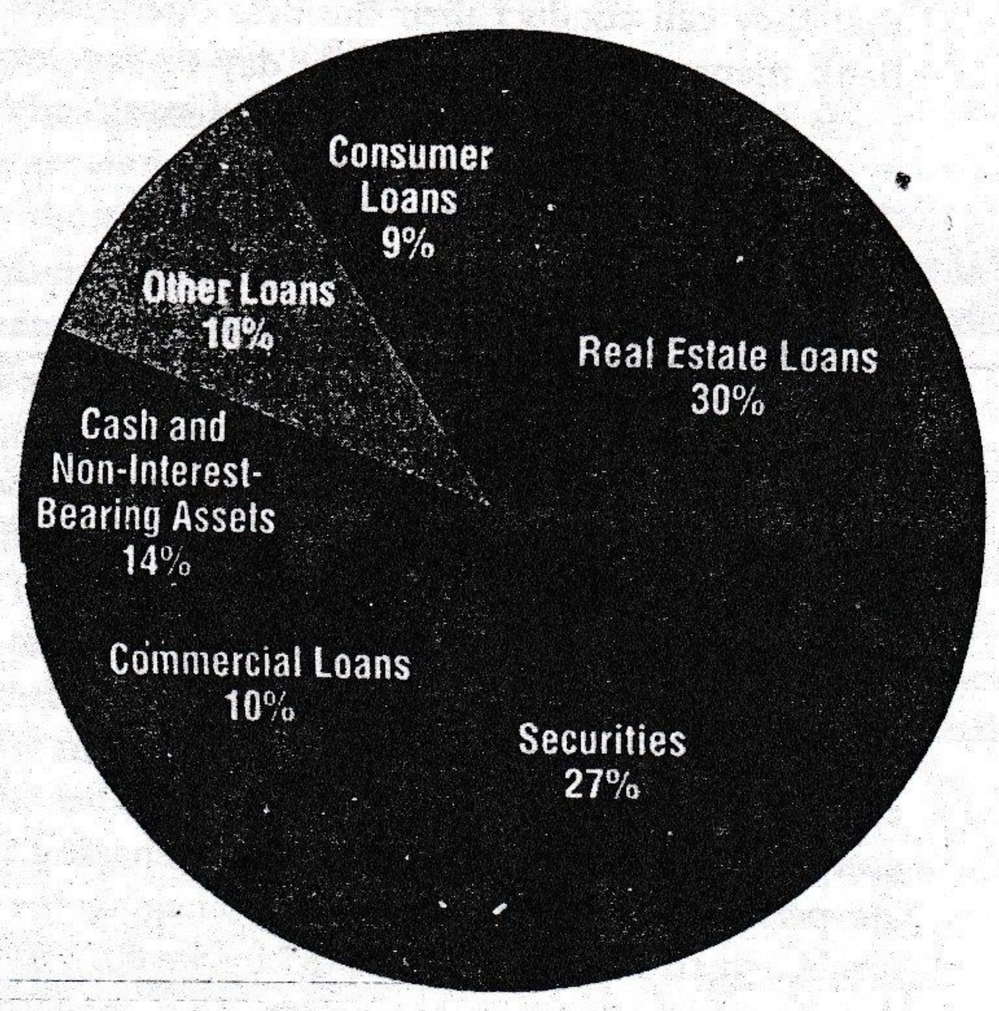
17-2t Summary of Bank Uses of Funds

The distribution of bank uses of funds is illustrated in Exhibit 17.4. Loans of all types make up about 59 percent of bank assets while securities account for about 27 percent. The distribution of assets for an individual bank varies with the type of bank. For example, smaller banks tend to have a relatively large amount of household loans and government securities; larger banks have a higher level of business loans (including loans to foreign firms).

The distribution of bank uses of funds indicates how commercial banks operate. In recent years, however, banks have begun to provide numerous services that are not indicated on their balance sheet. These services differ markedly from banks' traditional operations, which focused mostly on channeling deposited funds into various types of loans and investments.

Commercial Bank Balance Sheet A commercial bank's sources of funds represent its liabilities or equity, and its uses of funds represent its assets. Each commercial bank determines its own composition of liabilities and assets, which determines its specific operations.

Exhibit 17.4 Bank Uses of Funds (as a Proportion of Total Assets)



Source: *Federal Reserve.*

EXAMPLE

Exhibit 17.5 shows the balance sheet of Hornet Bank. The bank's assets are shown on the left side of the balance sheet. The second column indicates the dollar amount of each asset, and the third column shows the size of each asset in proportion to total assets in order to illustrate how Hornet Bank distributes its funds. Hornet's main assets are commercial and consumer loans in addition to securities. The balance sheet shows the bank's holdings at a particular moment in time, but the bank frequently revises the composition of its assets in response to economic conditions. When the economy improves and creditworthy businesses want to expand, Hornet Bank will sell some of its holdings of Treasury securities and use the funds to provide more corporate loans.

Hornet Bank's liabilities and stockholders' equity are shown on the right side of the balance sheet. Hornet obtains funds from various types of deposits, and incurs some expenses from all types of deposits. In particular, it must hire employees to serve depositors. The composition of Hornet's liabilities determines its interest expenses: it does not pay interest on demand deposits, but it does pay a relatively high interest rate on large CDs.

Hornet also incurs expenses from managing its assets. Its main expense is the cost of hiring employees to assess the creditworthiness of businesses and households that request loans. In general, Hornet wants to generate enough income from its assets so that it can cover its expenses and provide a reasonable return to its shareholders. Its primary source of income is the interest received on the business loans that it provides. Its capital is shown on the balance sheet as common stock issued and retained earnings. ●

Exhibit 17.5 Balance Sheet of Hornet Bank as of June 30, 2013

ASSETS	DOLLAR AMOUNT (IN MILLIONS)	PROPORTION OF TOTAL ASSETS	LIABILITIES AND STOCKHOLDERS' EQUITY	DOLLAR AMOUNT (IN MILLIONS)	PROPORTION OF TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY
Cash (includes required reserves)	$ 50	5%	Demand deposits	$ 250	25%
Commercial loans	400	40%	NOW accounts	60	6%
Consumer loans	250	25%	Money market deposit accounts	200	20%
Treasury securities	80	8%	Short-term CDs	250	25%
Corporate securities	120	12%	CDs with maturities beyond one year	120	12%
Federal funds sold (lent out)	10	1%	Federal funds purchased (borrowed)	0	0%
Repurchase agreements	20	2%	Long-term debt	30	3%
Eurodollar loans	0	0%			
Fixed assets	70	7%	Common stock issued	50	5%
			Retained earnings	40	4%
TOTAL ASSETS	$1,000	100%	TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$1,000	100%

Exhibit 17.6 How Commercial Banks Finance Economic Growth

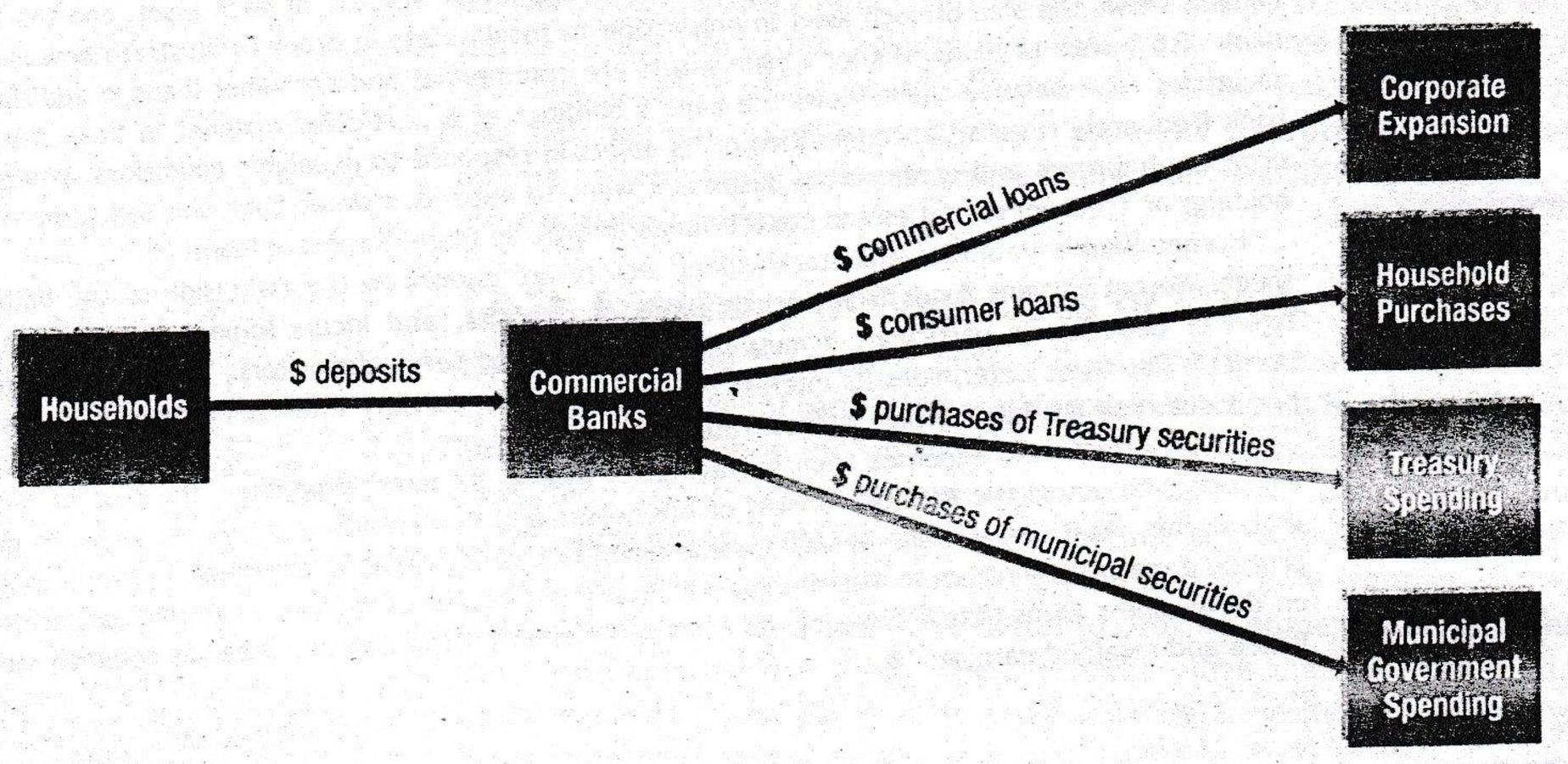


Exhibit 17.6 shows how commercial banks use the key balance sheet items to finance economic growth. They channel funds from their depositors to households and thereby finance household spending. They channel funds from depositors to corporations and thereby finance corporate expansion. They also use some deposits to purchase Treasury and municipal securities and thereby finance spending by the Treasury and municipalities.

17-3 Off–Balance Sheet Activities

Banks commonly engage in off-balance sheet activities, which generate fee income without requiring an investment of funds. However, these activities do create a contingent obligation for banks. The following are some of the more popular off-balance sheet activities:

- Loan commitments
- Standby letters of credit
- Forward contracts on currencies
- Interest rate swap contracts
- Credit default swap contracts

17-3a Loan Commitments

A loan commitment is an obligation by a bank to provide a specified loan amount to a particular firm upon the firm's request. The interest rate and purpose of the loan may also be specified. The bank charges a fee for offering the commitment.

One type of loan commitment is a **note issuance facility** (NIF), in which the bank agrees to purchase the commercial paper of a firm if the firm cannot place its paper in the market at an acceptable interest rate. Although banks earn fees for their

commitments, they could experience illiquidity if numerous firms request their loans at the same time.

17-3b Standby Letters of Credit

A **standby letter of credit** (SLC) backs a customer's obligation to a third party. If the customer does not meet its obligation, the bank will. The third party may require that the customer obtain an SLC to complete a business transaction. For example, consider a municipality that wants to issue bonds. To ensure that the bonds are easily placed, a bank could provide an SLC that guarantees payment of interest and principal. In essence, the bank uses its credit rating to enhance the perceived safety of the bonds. In return for the guarantee, the bank charges a fee to the municipality. The bank should be willing to provide SLCs only if the fee received compensates for the possibility that the municipality will default on its obligation.

17-3c Forward Contracts on Currencies

A forward contract on currency is an agreement between a customer and a bank to exchange one currency for another on a particular future date at a specified exchange rate. Banks engage in forward contracts with customers that desire to hedge their exchange rate risk. For example, a U.S. bank may agree to purchase 5 million euros in one year from a firm for $1.10 per euro. The bank may simultaneously find another firm that wishes to exchange 5 million euros for dollars in one year. The bank can serve as an intermediary and accommodate both requests, earning a transaction fee for its services. However, it is exposed to the possibility that one of the parties will default on its obligation.

17-3d Interest Rate Swap Contracts

Banks also serve as intermediaries for interest rate swaps, whereby two parties agree to periodically exchange interest payments on a specified notional amount of principal. Once again, the bank receives a transaction fee for its services. If it guarantees payments to both parties, it is exposed to the possibility that one of the parties will default on its obligation. In that event, the bank must assume the role of that party and fulfill the obligation to the other party.

Some banks facilitate currency swaps (for a fee) by finding parties with opposite future currency needs and executing a swap agreement. Currency swaps are similar to forward contracts, but they are usually for more distant future dates.

17-3e Credit Default Swap Contracts

Credit default swaps are privately negotiated contracts that protect investors against the risk of default on particular debt securities. Some commercial banks and other financial institutions buy them in order to protect their own investments in debt securities against default risk. Other banks and financial institutions sell them. The banks that sell credit default swaps receive periodic coupon payments for the term of the swap agreement. A typical term of a credit default swap is five years. If there are no defaults on the debt securities, the banks that sold the credit default swaps benefit because they have received periodic payments but are not required to make any payments. However, when there are defaults on the debt securities, the sellers of credit default swaps must make payments to the buyers to cover the damages. In essence, the sellers of credit default swaps are providing insurance against default.

These contracts were heavily used to protect against the default risk from investing in mortgage-backed securities. During the credit crisis in 2008, commercial banks that sold

credit default swap contracts incurred major expenses because of the high frequency of defaults on mortgage-backed securities. Conversely, commercial banks that purchased credit default swap contracts reduced the adverse impact of defaults on mortgage-backed securities (assuming that the counterparty that sold them the swaps did not default on its obligation).

17-4 International Banking



GLOBAL ASPECTS

Until historical barriers against interstate banking were largely removed in 1994, some U.S. commercial banks were better able to achieve growth by penetrating foreign markets than by expanding at home. Many U.S. banks have expanded internationally to improve their prospects for growth and to diversify so that their business will not be dependent on a single economy.

17-4a International Expansion

The most common way for U.S. commercial banks to expand internationally is by establishing branches, full-service banking offices that can compete directly with other banks located in a particular area. Before establishing foreign branches, a U.S. bank must obtain the approval of the Federal Reserve Board. Among the factors considered by the Fed are the bank's financial condition and experience in international business. Commercial banks may also consider establishing agencies, which can provide loans but cannot accept deposits or provide trust services.

U.S. banks have recently established foreign subsidiaries wherever they expect more foreign expansion by U.S. firms, such as in Southeast Asia and Eastern Europe. Recently, expansion has also been focused on Latin America. The banks offer banker's acceptances, foreign exchange services, credit card services, and other household services.

As an example of the diversity in international banking services, Citigroup offers a number of key services to firms around the world including foreign exchange transactions, forecasting, risk management, cross-border trade finance, acquisition finance, cash management services, and local currency funding. Citigroup serves not only large multinational corporations (e.g., Coca-Cola, Dow Chemical, IBM, Sony) but also small firms that need international banking services. By spreading itself across the world, Citigroup can typically handle the banking needs of all the subsidiaries of a multinational corporation.

17-4b Impact of the Euro on Global Competition

The use of a single currency in a number of European countries simplifies transactions because the majority of a bank's transactions between those countries are now denominated in euros. Use of the euro also reduces exposure to exchange rate risk, as banks can accept deposits in euros and use euros to lend funds or invest in securities. The use of a single currency throughout many European countries may also encourage firms to engage in bond or stock offerings to support their European business, as the euro can be used to support most of that business. Commercial banks can serve as intermediaries by underwriting and placing the debt or the equity issued by firms.

The single currency makes it easier to achieve economies of scale and enables banks' internal reporting systems to be more efficient. As banks expand and capitalize on economies of scale, global competition has become more intense. Furthermore, the euro enables businesses in Europe to more easily compare the prices of services offered by banks based in different European countries. This also forces banks to be more competitive.

17-4c International Exposure

As banks attempt to penetrate international markets in order to capitalize on opportunities, they become exposed to conditions in those markets. In particular, European countries such as Greece, Portugal, and Spain have experienced weak economies and large budget deficits. The governments of these countries have borrowed substantially from banks in order to finance their budget deficits. They have struggled to meet their debt payments. Consequently, banks with large loans to these governments are exposed to the possibility of loan defaults. In addition, banks that penetrated these countries by offering loans to corporations in these countries are subject to possible loan defaults because the economies of these countries have been weak.

Summary

- Commercial banks have consolidated over time in an effort to achieve economies of scale and to become more efficient. Consequently, there are less than half as many banks today as there were in 1985, and consolidation is still occurring. Commercial banks have also acquired many other types of financial service firms in recent years.
- The most common sources of commercial bank funds are deposit accounts, borrowed funds, and long-term sources of funds. The common types of deposit accounts are transaction deposits, savings deposits, time deposits, and money market deposit accounts. These accounts vary in terms of liquidity (for the depositor) and the interest rates offered. Commercial banks can solve temporary deficiencies in funds by borrowing from other banks (federal funds market), from the Federal Reserve, or from other sources by issuing short-term securities such as repurchase agreements. When banks need long-term funds to support expansion, they may use retained earnings, issue new stock, or issue new bonds.
- The most common uses of funds by commercial banks are bank loans and investment in securities. Banks can use excess funds by providing loans to other banks or by purchasing short-term securities.
- Banks engage in off-balance sheet activities such as loan commitments, standby letters of credit, forward contracts, and swap contracts. These types of activities generate fees for commercial banks. However, they also reflect commitments by the banks, which can expose them to more risk.

Point Counter-Point

Should Banks Engage in Other Financial Services Besides Banking?

Point No. Banks should focus on what they do best.

Counter-Point Yes. Banks should increase their value by engaging in other services. They can appeal to customers who want to have all their financial services provided by one financial institution.

Who Is Correct? Use the Internet to learn more about this issue and then formulate your own opinion.

Questions and Applications

1. **Bank Balance Sheet** Create a balance sheet for a typical bank, showing its main liabilities (sources of funds) and assets (uses of funds).

2. **Bank Sources of Funds** What are four major sources of funds for banks? What alternatives does a bank have if it needs temporary funds? What is the most common reason that banks issue bonds?

3. **CDs** Compare and contrast a retail CD and a negotiable CD.

4. Money Market Deposit Accounts How does a money market deposit account differ from other bank sources of funds?

5. Federal Funds Define federal funds, federal funds market, and federal funds rate. Who sets the federal funds rate? Why is the federal funds market more active on Wednesday?

6. Federal Funds Market Explain how the federal funds market facilitates bank operations.

7. Borrowing from the Federal Reserve Describe the process of "borrowing at the Federal Reserve." What rate is charged, and who sets it? Why do banks commonly borrow in the federal funds market rather than through the Federal Reserve?

8. Repurchase Agreements How does the yield on a repurchase agreement differ from a loan in the federal funds market? Why?

9. Bullet Loan Explain the advantage of a bullet loan.

10. Bank Use of Funds Why do banks invest in securities even though loans typically generate a higher return? Explain how a bank decides the appropriate percentage of funds that should be allocated to each type of asset.

11. Bank Capital Explain the dilemma faced by banks when determining the optimal amount of capital to hold. A bank's capital is less than 10 percent of its assets. How do you think this percentage would compare to that of manufacturing corporations? How would you explain this difference?

12. HLTs Would you expect a bank to charge a higher rate on a term loan or on a highly leveraged transaction (HLT) loan? Why?

13. Credit Crisis Explain how some mortgage operations by some commercial banks (along with other financial institutions) played a major role in instigating the credit crisis.

14. Bank Use of Credit Default Swaps Explain how banks have used credit default swaps.

Interpreting Financial News

Interpret the following comments made by Wall Street analysts and portfolio managers.

a. "Lower interest rates may reduce the size of banks."

b. "Banks are no longer as limited when competing with other financial institutions for funds targeted for the stock market."

c. "If the demand for loans rises substantially, interest rates will adjust to ensure that commercial banks can accommodate the demand."

Managing in Financial Markets

Managing Sources and Uses of Funds As a consultant, you have been asked to assess a bank's sources and uses of funds and to offer recommendations on how it can restructure its sources and uses of funds to improve its performance. This bank has traditionally focused on attracting funds by offering certificates of deposit. It offers checking accounts and money market deposit accounts, but it has not advertised these accounts because it has obtained an adequate amount of funds from the CDs. It pays about 3 percentage points more on its CDs than on its MMDAs, but the bank prefers to know the precise length of time it can use the deposited funds. (The CDs have a specified maturity whereas the MMDAs do not.) Its cost of funds has historically been higher than that of most banks, but it has not been concerned because its earnings have been relatively high. The bank's use of funds has historically focused on local real estate loans to build shopping malls and apartment complexes. The real estate loans have provided a very high return over the last several years. However, the demand for real estate in the local area has slowed.

a. Should the bank continue to focus on attracting funds by offering CDs, or should it push its other types of deposits?

b. Should the bank continue to focus on real estate loans? If the bank reduces its real estate loans, where should the funds be allocated?

c. How will the potential return on the bank's uses of funds be affected by your restructuring of the asset portfolio? How will the cost of funds be affected by your restructuring of the bank's liabilities?

FLOW OF FUNDS EXERCISE

Services Provided by Financial Conglomerates

Carson Company is attempting to compare the services offered by different banks, as it would like to have all services provided by one bank.

a. Explain the different types of services provided by a financial institution that may allow Carson Company to obtain funds or to hedge its risk.

b. Review the services that you listed in the previous question. What services could provide financing to Carson Company? What services could hedge Carson's exposure to risk?

INTERNET/EXCEL EXERCISE

Go to the website www.chase.com and list the various services offered by Chase that were mentioned in this chapter. For each service, state whether it reflects an asset (use of funds) or a liability (source of funds) for the bank. What interest rates does Chase offer on its CDs?

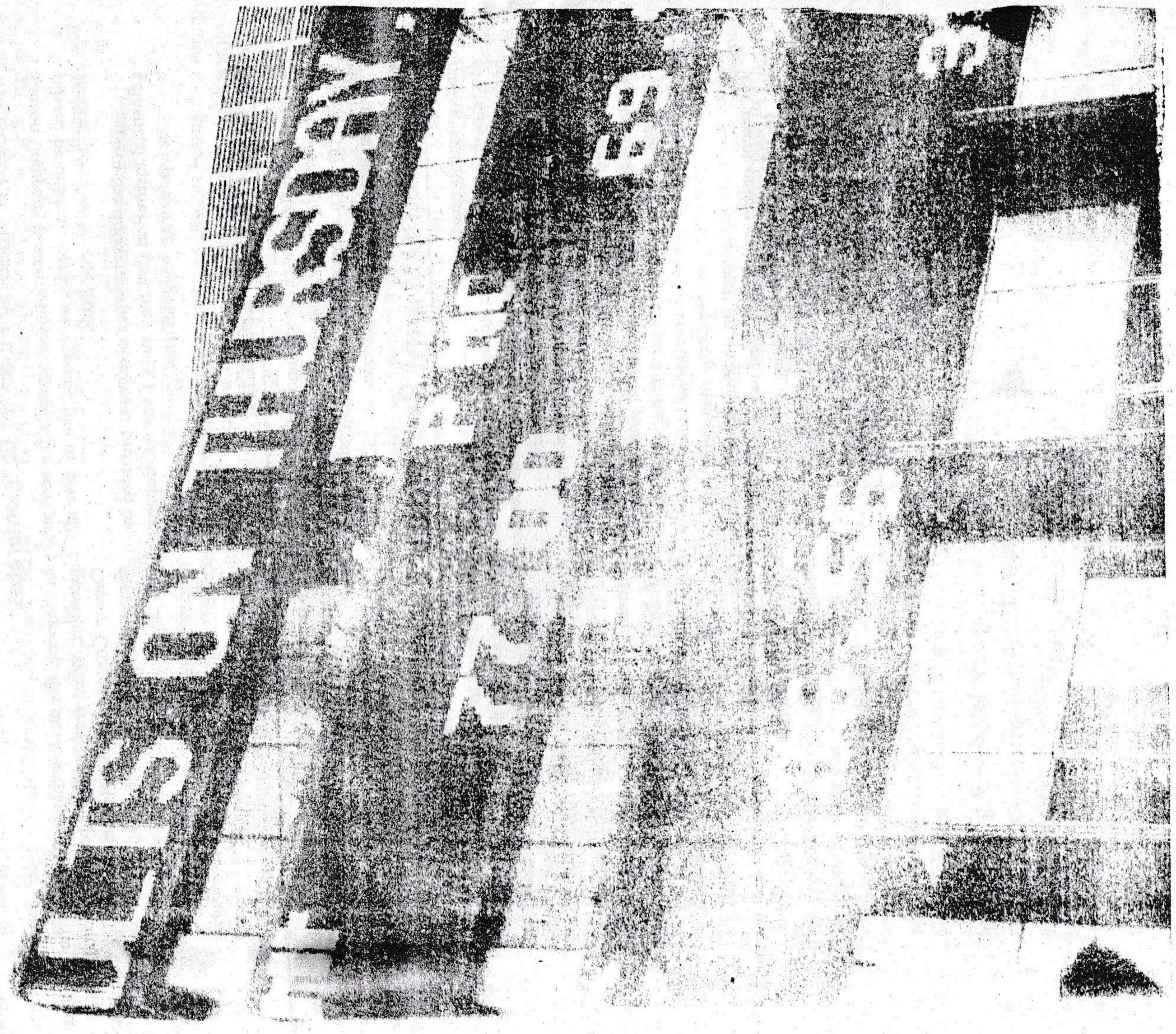
ONLINE ARTICLES WITH REAL-WORLD EXAMPLES

Find a recent practical article available online that describes a real-world example regarding a specific financial institution or financial market that reinforces one or more concepts covered in this chapter.

If your class has an online component, your professor may ask you to post your summary of the article there and provide a link to the article so that other students can access it. If your class is live, your professor may ask you to summarize your application of the article in class. Your professor may assign specific students to complete this assignment or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real-world examples related to this chapter, consider using the following search terms (be sure to include the prevailing year as a search term to ensure that the online articles are recent):

1. bank competition
2. [name of specific bank] AND loans
3. [name of specific bank] AND deposits
4. [name of specific bank] AND capital
5. [name of specific bank] AND balance sheet
6. [name of specific bank] AND assets
7. [name of specific bank] AND liabilities
8. bank AND capital
9. bank AND assets
10. bank AND loans



18
Bank Regulation

CHAPTER OBJECTIVES

Bank regulations are designed to maintain public confidence in the financial system by preventing commercial banks from becoming too risky.

The specific objectives of this chapter are to:

- describe the key regulations imposed on commercial banks,
- explain capital requirements of banks,
- explain how regulators monitor banks,
- explain the issues regarding government rescue of failed banks, and
- describe how the Financial Reform Act of 2010 affects the regulation of commercial bank operations.

18-1 BACKGROUND

Because banks rely on funds from depositors, they have been subject to regulations that are intended to ensure the safety of the financial system. Many of the regulations are intended to prevent banks from taking excessive risk that could cause them to fail. In particular, regulations are imposed on the types of assets in which banks can invest, and the minimum amount of capital that banks must maintain. However, there are trade-offs due to bank regulation. Some critics suggest that the regulation is excessive, and it restricts banks from serving their owners. Banks might be more efficient if they were not subject to regulations. Given these trade-offs, regulations are commonly revised over time in response to bank conditions, as regulators seek the optimal level of regulation that ensures the safety of the banking system, but also allows banks to be efficient.

Many regulations of bank operations were removed or reduced over time, which allowed banks to become more competitive. Because of deregulation, banks have considerable flexibility in the services they offer, the locations where they operate, and the rates they pay depositors for deposits.

Yet some banks and other financial institutions engaged in excessive risk taking in the 2005–2007 period, which is one the reasons for the credit crisis in the 2008–2009 period. Many banks failed as a result of the credit crisis, and government subsidies were extended to many other banks in order to prevent more failures and restore financial stability. This has led to much scrutiny over existing regulations and proposals for new regulations that can still allow for intense competition while preventing bank managers from taking excessive risks. This chapter provides a background on the prevailing regulatory structure, explains how bank regulators attempted to resolve the credit crisis, and describes recent changes in regulations that are intended to prevent another crisis.

18-2 REGULATORY STRUCTURE

The regulatory structure of the banking system in the United States is dramatically different from that of other countries. It is often referred to as a dual banking system because it includes both a federal and a state regulatory system. There are more than 6,000 separately owned commercial banks in the United States, which are supervised by three federal agencies and 50 state agencies. The regulatory structure in other countries is much simpler.

WEB

www.federalreserve.gov/bankinforeg/reglisting.htm
Detailed descriptions of bank regulations from the Federal Reserve Board.

WEB

www.federalreserve.gov
Click on "Banking Information & Regulation" to find key bank regulations at the website of the Board of Governors of the Federal Reserve System.

A charter from either a state or the federal government is required to open a commercial bank in the United States. A bank that obtains a state charter is referred to as a state bank; a bank that obtains a federal charter is known as a national bank. All national banks are required to be members of the Federal Reserve System (the Fed). The federal charter is issued by the Comptroller of the Currency. An application for a bank charter must be submitted to the proper supervisory agency, should provide evidence of the need for a new bank, and should disclose how the bank will be operated. Regulators determine if the bank satisfies general guidelines to qualify for the charter.

State banks may decide whether they wish to be members of the Federal Reserve System. The Fed provides a variety of services for commercial banks and controls the amount of funds within the banking system. About 35 percent of all banks are members of the Federal Reserve. These banks are generally larger than the norm; their combined deposits make up about 70 percent of all bank deposits. Both member and nonmember banks can borrow from the Fed, and both are subject to the Fed's reserve requirements.

18-2a Regulators

National banks are regulated by the Comptroller of the Currency; state banks are regulated by their respective state agency. Banks that are insured by the **Federal Deposit Insurance Corporation (FDIC)** are also regulated by the FDIC. Because all national banks must be members of the Federal Reserve and all Fed member banks must hold FDIC insurance, national banks are regulated by the Comptroller of the Currency, the Fed, and the FDIC. State banks are regulated by their respective state agency, the Fed (if they are Fed members), and the FDIC. The Comptroller of the Currency is responsible for conducting periodic evaluations of national banks, the FDIC holds the same responsibility for state-chartered banks and savings institutions with less than $50 billion in assets, and the Federal Reserve is responsible for state-chartered banks and savings institutions with more than $50 billion in assets.

18-2b Regulation of Bank Ownership

Commercial banks can be either independently owned or owned by a **bank holding company (BHC)**. Although some multibank holding companies (owning more than one bank) exist, one-bank holding companies are more common. More banks are owned by holding companies than are owned independently.

18-3 Regulation of Bank Operations

Banks are regulated according to how they obtain funds, how they use their funds, and the types of financial services they can offer. Some of the most important regulations are discussed here.

18-3a Regulation of Deposit Insurance

Federal deposit insurance has existed since the creation in 1933 of the FDIC in response to the bank runs that occurred in the late 1920s and early 1930s. During the 1930–1932 period of the Great Depression more than 5,000 banks failed, or more than 20 percent of the existing banks. The initial wave of failures caused depositors to withdraw their deposits from other banks, fearing that the failures would spread. These actions actually caused more banks to fail. If deposit insurance had been available, depositors might not have removed their deposits and some bank failures might have been avoided.

The FDIC preserves public confidence in the U.S. financial system by providing deposit insurance to commercial banks and savings institutions. The FDIC is managed by a board of five directors, who are appointed by the President. Its headquarters is in Washington, D.C., but it has eight regional offices and other field offices within each region. Today, the FDIC's insurance funds are responsible for insuring deposits of more than $3 trillion.

Insurance Limits The specified amount of deposits per person insured by the FDIC was increased from $100,000 to $250,000 as part of the Emergency Economic Stabilization Act of 2008, which was intended to resolve the liquidity problems of financial institutions and to restore confidence in the banking system. The $250,000 limit was made permanent by the Financial Reform Act of 2010. Large deposit accounts beyond the $250,000 limit are insured only up to this limit. Note that deposits in foreign branches of U.S. banks are *not* insured by the FDIC.

In general, deposit insurance has allowed depositors to deposit funds under the insured limits in any insured depository institution without the need to assess the institution's financial condition. In addition, the insurance system minimizes bank runs on deposits because insured depositors believe that their deposits are backed by the U.S. government even if the insured depository institution fails. When a bank fails, insured depositors normally have access to their money within a few days.

Risk-Based Deposit Premiums Banks insured by the FDIC must pay annual insurance premiums. Until 1991, all banks obtained insurance for their depositors at the same rate. Because the riskiest banks were more likely to fail, they were being indirectly subsidized by safer banks. This system encouraged some banks to assume more risk because they could still attract deposits from depositors who knew they would be covered regardless of the bank's risk. The act of insured banks taking on more risk because their depositors are protected is one example of what is called a **moral hazard problem**. As a result of many banks taking excessive risks, bank failures increased during the 1980s and early 1990s. The balance in the FDIC's insurance fund declined because the FDIC had to reimburse depositors who had deposits at the banks that failed.

This moral hazard problem prompted bank regulators and Congress to search for a way to discourage banks from taking excessive risk and to replenish the FDIC's insurance fund. As a result of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991, risk-based deposit insurance premiums were phased in. Consequently, bank insurance premiums are now aligned with the risk of banks, thereby reducing the moral hazard problem.

Deposit Insurance Fund Before 2006, the Bank Insurance Fund was used to collect premiums and provide insurance for banks and the Savings Association Insurance Fund was used to collect premiums and provide insurance for savings institutions. In 2006 the two funds were merged into one insurance fund called the **Deposit Insurance Fund**, which is regulated by the FDIC.

The deposit insurance premiums were increased in 2009 because the FDIC had used substantial reserves during the credit crisis to reimburse depositors of failed banks. The range of premiums is now typically between 13 and 53 cents per $100, with most banks paying between 13 and 18 cents. The FDIC's reserves are currently about $45 billion, or about 1 percent of all insured deposits. The FDIC also has a large credit line against which it can borrow from the Treasury.

Bank Deposit Insurance Reserves The Wall Street Reform and Consumer Protection Act (also called the Dodd-Frank Act) of 2010 requires that the Deposit Insurance

Fund should maintain reserves of at least 1.35 percent of total insured bank deposits, to ensure that it always has sufficient reserves to cover losses. If the reserves fall below that level, the FDIC is required to develop a restoration plan to boost reserves to that minimum level. The act also requires that if the reserves exceed 1.50 percent of total insured bank deposits, the FDIC should distribute the excess as dividends to banks.

18-3b Regulation of Deposits

Three regulatory acts created more competition for bank deposits over time, as discussed next.

DIDMCA In 1980, the **Depository Institutions Deregulation and Monetary Control Act (DIDMCA)** was enacted to (1) deregulate the banking (and other depository institutions) industry and (2) improve monetary policy. Because this chapter focuses on regulation and deregulation, only the first goal is discussed here.

The DIDMCA was a major force in deregulating the banking industry and increasing competition among banks. It removed interest rate ceilings on deposits, allowing banks and other depository institutions to make their own decisions on what interest rates to offer for time and savings deposits. In addition, it allowed banks to offer NOW accounts.

The DIDMCA has had a significant impact on the banking industry, most importantly by increasing competition among depository institutions.

Garn-St. Germain Act Banks and other depository institutions were further deregulated in 1982 as a result of the **Garn-St. Germain Act**. The act came at a time when some depository institutions (especially savings institutions) were experiencing severe financial problems. One of its more important provisions permitted depository institutions to offer money market deposit accounts (MMDAs), which have no minimum maturity and no interest ceiling. These accounts allow a maximum of six transactions per month (three by check). They are similar to the traditional accounts offered by **money market mutual funds** (whose main function is to sell shares and pool the funds to purchase short-term securities that offer market-determined rates). Because MMDAs offer savers similar benefits, they allow depository institutions to compete against money market funds in attracting savers' funds.

A second key deregulatory provision of the Garn-St. Germain Act permitted depository institutions (including banks) to acquire failing institutions across geographic boundaries. The intent was to reduce the number of failures that require liquidation, as the chances of finding a potential acquirer for a failing institution improve when geographic barriers are removed. Also, competition was expected to increase because depository institutions previously barred from entering specific geographic areas could now do so by acquiring failing institutions.

Interstate Banking Act In September 1994, Congress passed the Reigle-Neal Interstate Banking and Branching Efficiency Act, which removed interstate branching restrictions and thereby further increased the competition among banks for deposits. Nationwide interstate banking enabled banks to grow and achieve **economies of scale**. It also allowed banks in stagnant markets to penetrate other markets where economic conditions were more favorable. Banks in all markets were pressured to become more efficient as a result of the increased competition.

18-3c Regulation of Bank Loans

Since loans represent the key asset of commercial banks, they are regulated to limit a bank's exposure to default risk.

Regulation of Highly Leveraged Transactions As a result of concern about the popularity of highly leveraged loans (for supporting leveraged buyouts and other activities), bank regulators monitor the amount of highly leveraged transactions (HLTs). HLTs are commonly defined as loan transactions in which the borrower's liabilities are valued at more than 75 percent of total assets.

Regulation of Foreign Loans Regulators also monitor a bank's exposure to loans to foreign countries. Because regulators require banks to report significant exposure to foreign debt, investors and creditors have access to more detailed information about the composition of bank loan portfolios.

Regulation of Loans to a Single Borrower Banks are restricted to a maximum loan amount of 15 percent of their capital to any single borrower (up to 25 percent if the loan is adequately collateralized). This forces them to diversify their loans to some degree.

Regulation of Loans to Community Banks are also regulated to ensure that they attempt to accommodate the credit needs of the communities in which they operate. The Community Reinvestment Act (CRA) of 1977 (revised in 1995) requires banks to meet the credit needs of qualified borrowers in their community, even those with low or moderate incomes. The CRA is not intended to force banks to make high-risk loans but rather to ensure that qualified lower-income borrowers receive the loans that they request. Each bank's performance in this regard is evaluated periodically by its respective regulator.

18-3d Regulation of Bank Investment in Securities

Banks are not allowed to use borrowed or deposited funds to purchase common stock, although they can manage stock portfolios through trust accounts that are owned by individuals. Banks can invest only in bonds that are investment-grade quality. This was measured by a Baa rating or higher by Moody's or a BBB rating or higher by Standard & Poor's. The regulations on bonds are intended to prevent banks from taking excessive risks.

However, during the credit crisis, the ratings agencies were criticized for being too liberal with their ratings. The Wall Street Reform and Consumer Protection Act (also called the Dodd-Frank Act) of 2010 changed the rules to require that banks use not only credit ratings assigned by credit rating agencies, but also other methods to assess the risk of debt securities, including their own assessment of risk. This is intended to ensure that banks do not rely exclusively on credit rating agencies when investing in debt securities. Thus, even if the credit rating agencies apply liberal ratings, the bank should be able to detect when debt securities are too risky when using its own analysis or other methods to assess risk.

18-3e Regulation of Securities Services

The Banking Act of 1933 (better known as the Glass-Steagall Act) separated banking and securities activities. The act was prompted by problems during 1929 when some banks sold some of their poor-quality securities to their trust accounts established for individuals. Some banks also engaged in insider trading: buying or selling corporate securities based on confidential information provided by firms that had requested loans. The **Glass-Steagall** Act prevented any firm that accepted deposits from underwriting stocks and bonds of corporations.

The separation of securities activities from banking activities was intended to prevent potential conflicts of interest. For example, the concern was that if a bank were allowed

to underwrite securities, it might advise its corporate customers to purchase these securities and could threaten to cut off future loans if the customers did not oblige.

WEB

www.federalreserve.gov/bankinforeg/default.htm
Links to regulations of securities services offered by banks.

Financial Services Modernization Act In 1999, Congress passed the **Financial Services Modernization Act** (also called the **Gramm-Leach-Bliley Act**), which essentially repealed the Glass-Steagall Act. The 1999 act allows affiliations between banks, securities firms, and insurance companies. It also allows bank holding companies to engage in any financial activity through their ownership of subsidiaries. Consequently, a single holding company can engage in traditional banking activities, securities trading, underwriting, and insurance. The act also requires that the holding company be well managed and have sufficient capital in order to expand its financial services. The Securities and Exchange Commission regulates any securities products that are created, but the bank subsidiaries that offer the securities products are overseen by bank regulators.

Although many commercial banks had previously pursued securities services, the 1999 act increased the extent to which banks could offer these services. Furthermore, it allowed securities firms and insurance companies to acquire banks. Under the act, commercial banks must have a strong rating in community lending (which indicates that they have actively provided loans in lower-income communities) in order to pursue additional expansion in securities and other nonbank activities.

Since the passage of the Financial Services Modernization Act, there has been much more consolidation of financial institutions. Many of the larger financial institutions are able to offer all types of financial services through their various subsidiaries. Because individuals commonly use financial institutions to deposit funds, obtain mortgage loans and consumer loans (such as an automobile loan), purchase shares of mutual funds, order stock transactions (brokerage), and purchase insurance, they can obtain all their financial services from a single financial conglomerate. And because firms commonly use financial institutions to maintain a business checking account, obtain loans, issue stocks or bonds, have their pension fund managed, and purchase insurance services, they can obtain all of their financial services from a single financial conglomerate.

The Financial Services Modernization Act also offers benefits to financial institutions. By offering more diversified services, financial institutions can reduce their reliance on the demand for any single service that they offer. This diversification may result in less risk for the institution's consolidated business provided the new services are not subject to a much higher degree of risk than its traditional services.

The individual units of a financial conglomerate may generate some new business simply because they are part of the conglomerate and offer convenience to clients who already rely on its other services. Each financial unit's list of existing clients represents a potential source of new clients for the other financial units to pursue.

The consolidation of banks and securities firms continued during the credit crisis in 2008, as some major securities firms (e.g., Bear Stearns and Merrill Lynch) were acquired by commercial banks while others (e.g., Goldman Sachs and Morgan Stanley) applied and were approved to become bank holding companies. This consolidation improved the stability of the financial system because regulations on bank holding companies are generally more stringent than the regulations on independent securities firms.

18-3f Regulation of Insurance Services

As with securities services, banks have been eager to offer insurance services. The arguments for and against bank involvement in insurance are quite similar to those regarding bank involvement in securities. Banks could increase competition in the insurance industry by offering services at a lower cost. In addition, they could offer their customers the

convenience of one-stop shopping (especially if the bank could also offer securities services).

In 1998, regulators allowed the merger between Citicorp and Traveler's Insurance Group, which essentially paved the way for the consolidation of bank and insurance services. Passage of the Financial Services Modernization Act in the following year confirmed that banks and insurance companies could merge and consolidate their operations. These events encouraged banks and insurance companies to pursue mergers as a means of offering a full set of financial services.

18-3g Regulation of Off-Balance Sheet Transactions

Banks offer a variety of off-balance sheet commitments. For example, banks provide letters of credit to back commercial paper issued by corporations. They also act as the intermediary on interest rate swaps and usually guarantee payments over the specified period in the event that one of the parties defaults on its payments.

Various off-balance sheet transactions have become popular because they provide fee income. That is, banks charge a fee for guaranteeing against the default of another party and for facilitating transactions between parties. Off-balance sheet transactions do expose a bank to risk, however. If a severe economic downturn causes many corporations to default on their commercial paper or on payments specified by interest rate swap agreements, the banks that provided guarantees would incur large losses.

Bank exposure to off-balance sheet activities has become a major concern of regulators. Banks could be riskier than their balance sheets indicate because of these transactions. Therefore, the risk-based capital requirements are higher for banks that conduct more off-balance sheet activities. In this way, regulators discourage banks from excessive involvement in such activities.

Regulation of Credit Default Swaps Credit default swaps are a type of off-balance sheet transaction that became popular during the 2004–2008 period as a means of protecting against the risk of default on bonds and mortgage-backed securities. A swap allows a commercial bank to make periodic payments to a counterparty in return for protection in the event that its holdings of mortgage-backed securities default. While some commercial banks purchased these swaps as a means of protecting their assets against default, other commercial banks sold them (to provide protection) as a means of generating fee income. By 2008, credit default swaps represented more than $30 trillion of mortgage-backed securities or other types of securities ($60 trillion when counting each contract for both parties).

When commercial banks purchase credit default swaps to protect their assets against possible default, these assets are not subject to capital requirements. But if the sellers of the credit default swaps are overexposed, they may not be able to provide the protection they promised. Thus the banks that purchased credit default swaps might not be protected if the sellers default. As the credit crisis intensified in 2008 and 2009, regulators became concerned about credit default swaps because of the lack of transparency regarding the exposure of each commercial bank and the credibility of the counterparties on the swaps. They increased their oversight of this market and asked commercial banks to provide more information about their credit default swap positions.

18-3h Regulation of the Accounting Process

Publicly traded banks, like other publicly traded companies, are required to provide financial statements that indicate their recent financial position and performance. The Sarbanes-Oxley (SOX) Act was enacted in 2002 to ensure a more transparent process

for reporting on a firm's productivity and financial condition. It was created following news about how some publicly traded firms (such as Enron) inflated their earnings, which caused many investors to pay a much higher stock price than was appropriate. The act requires all firms (including banks) to implement an internal reporting process that can be easily monitored by executives and makes it impossible for executives to pretend that they were unaware of accounting fraud.

Some of the key provisions of the act require banks to improve their internal control processes and establish a centralized database of information. In addition, executives are now more accountable for a bank's financial statements because they must personally verify the accuracy of the statements. Investors may have more confidence in the financial statements now that there is greater accountability that could discourage accounting fraud.

Nevertheless, questionable accounting practices may still occur at banks. Some types of assets do not have a market in which they are actively traded. Thus banks have some flexibility on valuing these assets. During the credit crisis, many banks assigned values to some types of securities they held that clearly exceeded their proper market values. Consequently, they were able to hide a portion of their losses.

One negative effect of the SOX Act is that publicly traded banks have incurred expenses of more than $1 million per year to comply with its provisions. Such a high expense may encourage smaller publicly traded banks to go private.

18-4 Regulation of Capital

Banks are subject to capital requirements, which force them to maintain a minimum amount of capital (or equity) as a percentage of total assets. They rely on their capital as a cushion against possible losses. If a bank has insufficient capital to cover losses, it will not be able to cover its expenses and will fail. Therefore, regulators closely monitor bank capital levels.

Some bank managers and shareholders would prefer that banks hold a lower level of capital, because a given dollar level of profits would represent a higher return on equity if the bank holds less capital. This might allow for larger bonuses to managers and higher stock prices for shareholders during strong economic conditions. However, regulators are more interested in the safety of the banking system than managerial bonuses, and have increased bank capital requirements in recent years as a means of stabilizing the banking system.

18-4a How Banks Satisfy Regulatory Requirements

When a bank's capital declines below the amount required by regulators, it can increase its capital ratio in the following ways.

Retaining Earnings As a bank generates new earnings, and retains them rather than distributing them as dividends to shareholders, it boosts its capital. However, it cannot retain earnings if it does not generate earnings. If it incurs losses, it needs to use some of its existing capital to cover some of its expenses, because its revenue was not sufficient to cover its expenses. Thus losses (negative earnings) result in a lower level of capital. Poorly performing banks cannot rely on retained earnings to boost capital levels because they may not have any new earnings to retain.

Issuing Stock Banks can boost their capital by issuing stock to the public. However, a bank's capital level becomes deficient when its performance is weak; under these conditions, the bank's stock price is probably depressed. If the bank has to sell stock when its

stock price is very low it might not receive a sufficient amount of funds from its stock offering. Furthermore, investors may not have much interest in purchasing new shares in a bank that is weak and desperate to build capital because they might reasonably expect the bank to fail.

Reducing Dividends Banks can increase their capital by reducing their dividends, which enables them to retain a larger amount of any earnings. However, shareholders might interpret a cut in dividends as a signal that the bank is desperate for capital, which could cause its stock price to decline further. This type of effect could make it more difficult for the bank to issue stock in the future.

Selling Assets When banks sell assets, they can improve on their capital position. Assuming the assets were perceived to be risky, banks would have been required to maintain some capital to back those assets. By selling the assets, they are no longer required to back those assets with capital.

18-4b Basel I Accord

When bank regulators of various countries develop their set of guidelines for capital requirements, they are commonly guided by the recommendations in the Basel guidelines. These guidelines are intended to guide the banks in setting their own capital requirements.

In the first Basel Accord (1988, often called Basel I), the central banks of 12 major countries agreed to establish a framework for determining uniform capital requirements. A key provision in the Basel Accord bases the capital requirements on a bank's risk level. Banks with greater risk are required to maintain a higher level of capital, which discourages banks from excessive exposure to credit risk.

Assets are weighted according to risk. Very safe assets such as cash are assigned a zero weight, while very risky assets are assigned a 100 percent weight. Because the required capital is set as a percentage of risk-weighted assets, riskier banks are subject to more stringent capital requirements.

18-4c Basel II Framework

WEB

www.federalreserve.gov/bankinforeg/basel/USImplementation.htm
Information about the Basel framework.

A committee of central bank and regulatory authorities of numerous countries (called the Basel Committee on Banking Supervision) created a framework in 2004 called Basel II, which was added to the Basel Accord. It has two major parts: revising the measurement of credit risk and explicitly accounting for operational risk.

Revising the Measurement of Credit Risk When banks categorize their assets and assign risk weights to the categories, they account for possible differences in risk levels of loans within a category. Risk levels could differ if some banks required better collateral to back their loans. In addition, some banks may take positions in derivative securities that can reduce their credit risk, while other banks may have positions in derivative securities that increase their credit risk.

A bank's loans that are past due are assigned a higher weight. This adjustment inflates the size of these assets for the purpose of determining minimum capital requirements. Thus, banks with more loans that are past due are forced to maintain a higher level of capital (other things being equal).

An alternative method of calculating credit risk, called the internal ratings-based (IRB) approach, allows banks to use their own processes for estimating the probability of default on their loans.

Explicitly Accounting for Operational Risk The Basel Committee defines operational risk as the risk of losses resulting from inadequate or failed internal processes or systems. Banks are encouraged to improve their techniques for controlling operational risk because doing so could reduce failures in the banking system. By imposing higher capital requirements on banks with higher levels of operational risk, Basel II provided an incentive for banks to reduce their operational risk.

The United States, Canada, and countries in the European Union created regulations for their banks that conform to some parts of Basel II. When applying the Basel II guidelines, many banks underestimated the probability of loan default during the credit crisis. This motivated the creation of the Basel III framework, described next.

18-4d Basel III Framework

In response to the credit crisis, the Basel Committee on Banking Supervision began to develop a Basel III framework in 2011, which attempts to correct deficiencies of Basel II. This framework recommends that banks maintain Tier 1 capital (retained earnings and common stock) of at least 6 percent of total risk-weighted asset. It also recommended a more rigorous process for determining risk-weighted assets. Prior to Basel III, some assets were assigned low risk based on liberal ratings by ratings agencies. Basel III proposed that banks apply scenario analysis to determine how the values of their assets would be affected based on possible adverse economic scenarios.

Basel III also recommended that banks maintain an extra layer of Tier 1 capital (called a capital conservation buffer) of at least 2.5 percent of risk-weighted assets by 2016. Banks that do not maintain this extra layer could be restricted from making dividend payments, repurchasing stock, or granting bonuses to executives.

In addition to the increased capital requirements, Basel III also called for liquidity requirements. Some banks that specialize in low-risk loans and have adequate capital might not have adequate liquidity to survive an economic crisis. Basel III proposes that banks maintain sufficient liquidity so that they can easily cover their cash needs under adverse conditions.

18-4e Use of the VaR Method to Determine Capital Levels

To comply with the Basel Accord, banks commonly apply a value-at-risk (VaR) model to assess the risk of their assets, and determine how much capital they should hold. The VaR model can be applied in various ways to determine capital requirements. In general, a bank defines the VaR as the estimated potential loss from its trading businesses that could result from adverse movements in market prices. Banks typically use a 99 percent confidence level, meaning that there is a 99 percent chance that the loss on a given day will be more favorable than the VaR estimate. When applied to a daily time horizon, the actual loss from a bank's trading businesses should not exceed the estimated loss by VaR on more than 1 out of every 100 days. Banks estimate the VaR by assessing the probability of specific adverse market events (such as an abrupt change in interest rates) and the sensitivity of responses to those events. Banks with a higher maximum loss (based on a 99 percent confidence interval) are subject to higher capital requirements.

This focus on daily price movements forces banks to monitor their trading positions continuously so that they are immediately aware of any losses. Many banks now have access to the market values of their trading businesses at the end of every day. If banks used a longer-term horizon (such as a month), larger losses might build up before being recognized.

Limitations of the VaR Model The VaR model was generally ineffective at detecting the risk of banks during the credit crisis. The VaR model failed to recognize the degree to which the value of bank assets (such as mortgages or mortgage-backed securities) could decline under adverse conditions. The use of historical data from before 2007 did not capture the risk of mortgages because investments in mortgages during that period normally resulted in low defaults. Thus, the VaR model was not adequate for predicting the possible estimated losses.

18-4f Stress Tests Imposed to Determine Capital Levels

Some banks supplement the VaR estimate with their own stress tests.

EXAMPLE

Kenosha Bank wants to estimate the loss that would occur in response to an extreme adverse market event. First, it identifies an extreme scenario that could occur, such as an increase in interest rates on one day that is at least three standard deviations from the mean daily change in interest rates. (The mean and standard deviation of daily interest rate movements may be based on a recent historical period, such as the last 300 days.) Kenosha Bank then uses this scenario, along with the typical sensitivity of its trading businesses to such a scenario, to estimate the resulting loss on its trading businesses. It may then repeat this exercise based on a scenario of a decline in the market value of stocks that is at least three standard deviations from the mean daily change in stock prices. It may even estimate the possible losses in its trading businesses from an adverse scenario in which interest rates increase and stock prices decline substantially on a given day. ●

Regulatory Stress Tests during the Credit Crisis In 2009, regulators applied stress tests to the largest bank holding companies to determine if the banks had enough capital. These banks account for about half of all loans provided by U.S. banks.

One of the stress tests applied to banks in April 2009 involved forecasting the likely effect on the banks' capital levels if the recession existing at that time lasted longer than expected. This adverse scenario would cause banks to incur larger losses farther into the future. As a result, the banks would periodically be forced to use a portion of their capital to cover their losses, resulting in a reduction of their capital over time.

The potential impact of an adverse scenario such as a deeper recession varies among banks. During the credit crisis, banks that had a larger proportion of real estate assets were expected to suffer larger losses if economic conditions worsened because real estate values were extremely sensitive to economic conditions. Thus banks with considerable exposure to real estate values were more likely to experience capital deficiencies if the recession lasted longer than expected. Regulators focused on banks that were graded poorly on the stress tests in order to ensure that these banks would have sufficient capital even if the recession lasted for a longer period of time. Regulators now impose stress tests on an annual basis for banks with asset levels of $50 billion or larger, but will apply the tests in the future to smaller banks with at least $10 billion in assets.

18-4g Government Infusion of Capital during the Credit Crisis

During the 2008–2010 period, the Troubled Asset Relief Program (TARP) was implemented to boost the capital levels of banks and other financial institutions with excessive exposure to mortgages or mortgage-backed securities. The Treasury injected more than $300 billion into banks and financial institutions, primarily by purchasing preferred stock.

The injection of funds allowed banks to cushion their loan losses. It was also intended to encourage additional lending by banks and other financial institutions so that qualified firms or individuals could borrow funds. The Treasury also purchased some "toxic"

assets that had declined in value, and it even guaranteed against losses of other assets at banks and financial institutions. The financial institutions that received these capital injections were required to make dividend payments to the Treasury, but they could repurchase the preferred stock that they had issued to the Treasury (in essence, repaying the funds injected by the Treasury) once their financial position improved.

As a result of this program, the government became a large investor in banks and other financial institutions. For example, by February 2009, the Treasury had a 36 percent ownership stake in Citicorp. By June 2010, more than half of the TARP funds that were extended by the federal government were repaid, and the program generated more than $20 billion in revenue that was due primarily to dividends received on preferred stock that was purchased.

In October 2010, the TARP program stopped extending new funds to banks and other financial institutions. Although the government was subject to some criticism for its intervention in the banking system, it was also complimented for restoring the confidence of depositors and investors in the system.

18-5 How Regulators Monitor Banks

Bank regulators typically conduct an on-site examination of each commercial bank at least once a year. During the examination, regulators assess the bank's compliance with existing regulations and its financial condition. In addition to on-site examinations, regulators periodically monitor commercial banks with computerized monitoring systems that analyze data provided by the banks on a quarterly basis.

www.fdic.gov
Information about specific bank regulations.

18-5a CAMELS Ratings

Regulators monitor banks to detect any serious deficiencies that might develop so that they can correct the deficiencies before the bank fails. The more failures they can prevent, the more confidence the public will have in the banking industry. The evaluation approach described here is used by the FDIC, the Federal Reserve, and the Comptroller of the Currency.

The single most common cause of bank failure is poor management. Unfortunately, no reliable measure of poor management exists. Therefore, the regulators rate banks on the basis of six characteristics that constitute the **CAMELS ratings**, so named for the acronym that identifies the six characteristics:

- Capital adequacy
- Asset quality
- Management
- Earnings
- Liquidity
- Sensitivity

Each of the CAMELS characteristics is rated on a 1-to-5 scale, with 1 indicating outstanding and 5 very poor. A composite rating is determined as the mean rating of the six characteristics. Banks with a composite rating of 4.0 or higher are considered to be problem banks. They are closely monitored because their risk level is perceived to be very high.

Capital Adequacy Because adequate bank capital is thought to reduce a bank's risk, regulators determine the **capital ratio** (typically defined as capital divided by assets). Regulators have become increasingly concerned that some banks do not hold enough capital, so they have increased capital requirements. If banks hold more capital, they

can more easily absorb potential losses and are more likely to survive. Banks with higher capital ratios are therefore assigned a higher capital adequacy rating. Even a bank with a relatively high level of capital could fail, however, if the other components of its balance sheet have not been properly managed. Thus, regulators must evaluate other characteristics of banks in addition to capital adequacy.

Because a bank's capital requirements depend on the value of its assets, they are subject to the accounting method that is used in the valuation process. *Fair value accounting* is used to measure the value of bank assets. That is, a bank is required to periodically mark its assets to market so that it can revise the amount of needed capital based on the reduced market value of the assets. During the credit crisis, the secondary market for mortgage-backed securities and mortgage loans was so illiquid that banks would have had to sell these assets at very low prices (large discounts). Consequently, the fair value accounting method forced the banks to "write down" the value of their assets.

Given a decline in a bank's book value of assets and no associated change in its book value of liabilities, a bank's balance sheet is balanced by reducing its capital. Thus many banks were required to replenish their capital in order to meet the capital requirements, and some banks came under extra scrutiny by regulators. Some banks satisfied the capital requirements by selling some of their assets, but they would have preferred not to sell assets during this period because there were not many buyers and the market price of these assets was low. An alternative method of meeting capital requirements is to issue new stock, but since bank stock values were so low during the credit crisis, this was not a viable option at that time.

Banks complained that their capital was reduced because of the fair value accounting rules. They argued that their assets should have been valued higher if the banks intended to hold them until the credit crisis ended and the secondary market for these assets became more liquid. If the banks' assets had been valued in this manner, their write-downs of assets would have been much smaller, and the banks could have more easily met the capital requirements. As a result of the banks' complaints, the fair value accounting rules were modified somewhat in 2009.

Asset Quality Each bank makes its own decisions as to how deposited funds should be allocated, and these decisions determine its level of credit (default) risk. Regulators therefore evaluate the quality of the bank's assets, including its loans and its securities.

EXAMPLE The Fed considers "the 5 Cs" to assess the quality of the loans extended by Skyler Bank, which it is examining:

- Capacity—the borrower's ability to pay
- Collateral—the quality of the assets that back the loan
- Condition—the circumstances that led to the need for funds
- Capital—the difference between the value of the borrower's assets and its liabilities
- Character—the borrower's willingness to repay loans as measured by its payment history on the loan and credit report

From an assessment of a sample of Skyler Bank's loans, the Fed determines that the borrowers have excessive debt, minimal collateral, and low capital levels. Thus, the Fed concludes that Skyler Bank's asset quality is weak. ●

Rating an asset portfolio can be difficult, as the following example illustrates.

EXAMPLE A bank currently has 1,000 loans outstanding to firms in a variety of industries. Each loan has specific provisions as to how it is secured (if at all) by the borrower's assets; some of the loans have short-term

maturities, while others are for longer terms. Imagine the task of assigning a rating to this bank's asset quality. Even if all the bank's loan recipients are current on their loan repayment schedules, this does not guarantee that the bank's asset quality deserves a high rating. The economic conditions existing during the period of prompt loan repayment may not persist in the future. Thus, an appropriate examination of the bank's asset portfolio should incorporate the portfolio's exposure to potential events (such as a recession). The reason for the regulatory examination is not to grade past performance but rather to detect any problem that could cause the bank to fail in the future. ●

Because of the difficulty in assigning a rating to a bank's asset portfolio, it is possible that some banks will be rated lower or higher than they deserve.

Management Each of the characteristics examined relates to the bank's management. In addition, regulators specifically rate the bank's management according to administrative .skills, ability to comply with existing regulations, and ability to cope with a changing environment. They also assess the bank's internal control systems, which may indicate how easily the bank's management could detect its own financial problems. This evaluation is clearly subjective.

Earnings Although the CAMELS ratings are mostly concerned with risk, earnings are very important. Banks fail when their earnings become consistently negative. A profitability ratio commonly used to evaluate banks is **return on assets (ROA)**, defined as after-tax earnings divided by assets. In addition to assessing a bank's earnings over time, it is also useful to compare the bank's earnings with industry earnings. This allows for an evaluation of the bank relative to its competitors. In addition, regulators are concerned about how a bank's earnings would change if economic conditions change.

Liquidity Some banks commonly obtain funds from outside sources (such as the Federal Reserve or the federal funds market), but regulators would prefer that banks not consistently rely on these sources. Such banks are more likely to experience a liquidity crisis whereby they are forced to borrow excessive amounts of funds from outside sources. If existing depositors sense that the bank is experiencing a liquidity problem, they may withdraw their funds, compounding the problem.

Sensitivity Regulators also assess the degree to which a bank might be exposed to adverse financial market conditions. Two banks could be rated similarly in terms of recent earnings, liquidity, and other characteristics, yet one of them may be much more sensitive than the other to financial market conditions. Regulators began to explicitly consider banks' sensitivity to financial market conditions in 1996 and added this characteristic to what was previously referred to as the CAMEL ratings. In particular, regulators place much emphasis on a bank's sensitivity to interest rate movements. Many banks have liabilities that are repriced more frequently than their assets and are therefore adversely affected by rising interest rates. Banks that are more sensitive to rising interest rates are more likely to experience financial problems.

Limitations of the CAMELS Rating System The CAMELS rating system is essentially a screening device. Because there are so many banks, regulators do not have the resources to closely monitor each bank on a frequent basis. The rating system identifies what are believed to be problem banks. Over time, other banks are added to the "problem list," some problem banks improve and are removed from the list, and others may deteriorate further and ultimately fail.

Although examinations by regulators may help detect problems experienced by some banks in time to save them, many problems still go unnoticed; by the time they are

detected, it may be too late to find a remedy. Because financial ratios measure current or past performance rather than future performance, they do not always detect problems in time to correct them. Thus, although an analysis of financial ratios can be useful, the task of assessing a bank is as much an art as it is a science. Subjective opinion must complement objective measurements to provide the best possible evaluation of a bank.

Any system used to detect financial problems may err in one of two ways. It may classify a bank as safe when in fact it is failing or it may classify a bank as risky when in fact it is safe. The first type of mistake is more costly, because some failing banks are not identified in time to help them. To avoid this mistake, bank regulators could lower their benchmark composite rating. If they did, however, many more banks would be on the problem list and require close supervision, so regulators' limited resources would be spread too thin.

WEB

www.occ.treas.gov/interp/monthly.htm Information on the latest bank regulations and their interpretation from the Office of the Comptroller.

18-5b Corrective Action by Regulators

When a bank is classified as a problem bank, regulators thoroughly investigate the cause of its deterioration. Corrective action is often necessary. Regulators may examine such banks frequently and thoroughly and will discuss with bank management possible remedies to cure the key problems. For example, regulators may request that a bank boost its capital level or delay its plans to expand. They can require that additional financial information be periodically updated to allow continued monitoring. They have the authority to remove particular officers and directors of a problem bank if doing so would enhance the bank's performance. They even have the authority to take legal action against a problem bank if the bank does not comply with their suggested remedies. Such a drastic measure is rare, however, and would not solve the existing problems of the bank.

18-5c Funding the Closure of Failing Banks

If a failing bank cannot be saved, it will be closed. The FDIC is responsible for the closure of failing banks. It must decide whether to liquidate the failed bank's assets or to facilitate the acquisition of that bank by another bank. When liquidating a failed bank, the FDIC draws from its Deposit Insurance Fund to reimburse insured depositors. After reimbursing depositors, the FDIC attempts to sell any marketable assets (such as securities and some loans) of the failed bank. The cost to the FDIC of closing a failed bank is the difference between the reimbursement to depositors and the proceeds received from selling the failed bank's assets.

18-6 Government Rescue of Failing Banks

The U.S. government periodically rescues failed banks in various ways. The FDIC provides some financial support to facilitate another bank's acquisition of the failed bank. The financial support is necessary because the acquiring bank recognizes that the market value of the failed bank's assets is less than its liabilities. The FDIC may be willing to provide funding if doing so would be less costly than liquidating the failed bank. Whether a failing bank is liquidated or acquired by another bank, it loses its identity.

In some cases, the government has given preferential treatment to certain large troubled banks. For example, the government has occasionally provided short-term loans to a distressed bank or insured all its deposits, even those above the insurance limit, in an effort to encourage depositors to leave their funds in the troubled bank. Or the government might orchestrate a takeover of the troubled bank in a manner that enables the shareholders to receive at least some payment for their shares (when a failed bank is acquired, shareholders ordinarily lose their investment). However, such intervention by the government is controversial.

18-6a Argument for Government Rescue

If all financial institutions that were weak during the credit crisis had been allowed to fail without any intervention, the FDIC might have had to use all of its reserves to reimburse depositors. To the extent that FDIC intervention can reduce the extent of losses at depository institutions, it may reduce the cost to the government (and therefore the taxpayers).

How a Rescue Might Reduce Systemic Risk The financial problems of a large bank failure can be contagious to other banks. This so-called systemic risk occurs because of the interconnected transactions between banks. The rescue of large banks might be necessary to reduce systemic risk in the financial system, as illustrated next.

EXAMPLE

Consider a financial system with only four large banks, all of which make many mortgage loans and invest in mortgage-backed securities. Assume that Bank A sold credit default swaps to Banks B, C, and D and so receives periodic payments from those banks. It will have to make a large payment to these banks if a particular set of mortgages default.

Now assume that the economy weakens and many mortgages default, including the mortgages referenced by the credit default swap agreements. This means that Bank A now owes a large payment to Banks B, C, and D. But since Bank A incurred losses from its own mortgage portfolio, it cannot follow through on its payment obligation to the other banks. Meanwhile, Banks B, C, and D may have used the credit default swap position to hedge their existing mortgage holdings; however, if they do not receive the large payment from Bank A, they incur losses without any offsetting gains.

If bank regulators do not rescue Bank A, then all four banks may fail because of Bank A's connections with the other three banks. However, if bank regulators rescue Bank A then Bank A can make its payments to Banks B, C, and D, and all banks should survive. Thus, a rescue may be necessary to stabilize the financial system. ●

In reality, the financial system is supported not only by a few large banks, but by many different types of financial institutions. The previous example is not restricted to banks, but extends to all types of financial institutions that can engage in those types of transactions. Furthermore, a government rescue of a bank benefits not only bank executives, but bank employees at all levels. To the extent that a government rescue can stabilize the banking system, it can indirectly stimulate all the sectors that rely on funding from the banking system. This potential benefit was especially relevant during the credit crisis.

18-6b Argument against Government Rescue

Those who oppose government rescues say that, when the federal government rescues a large bank, it sends a message to the banking industry that large banks will not be allowed to fail. Consequently, large banks may take excessive risks without concern about failure. If a large bank's risky ventures (such as loans to risky borrowers) pay off, the return will be high. If they do not pay off, the federal government will bail the bank out. If large banks can be sure that they will be rescued, their shareholders will benefit because they face limited downside risk.

Some critics recommend a policy of letting the market work, meaning that no financial institution would ever be bailed out. In this case, managers of a troubled bank would be held accountable for their bad management because their jobs would be terminated in response to the bank's failure. In addition, shareholders would more closely monitor the bank managers to make sure that they do not take excessive risk.

18-6c Government Rescue of Bear Stearns

The credit crisis led to new arguments about government rescues of failing financial institutions. In March 2008, Bear Stearns (a large securities firm) was about to go

bankrupt. Bear Stearns had facilitated many transactions in financial markets, and its failure would have delayed them and so caused liquidity problems for many individuals and firms that were to receive cash as a result of these transactions. The Federal Reserve provided short-term loans to Bear Stearns to ensure that it had adequate liquidity. The Fed then backed the acquisition of Bear Stearns by JPMorgan Chase by providing a loan so that JPMorgan Chase could afford the acquisition.

At this point, the question was whether the Federal Reserve (a regulator of commercial banks) should be assisting a securities firm such as Bear Stearns that it did not regulate. Some critics (including Paul Volcker, a previous chair of the Fed) suggested that the rescue of a firm other than a commercial bank should be the responsibility of Congress and not the Fed. The Fed's counter was that it recognized that many financial transactions would potentially be frozen if it did not intervene. Thus, it was acting in an attempt to stabilize the financial system rather than in its role as a regulator of commercial banks.

18-6d Failure of Lehman and Rescue of AIG

In September 2008, Lehman Brothers (another large securities firm) was allowed to go bankrupt without any assistance from the Fed even though American International Group (AIG, a large insurance company) was rescued by the Fed. Some critics asked why some large financial institutions were bailed out but others were not. At what point does a financial institution become sufficiently large or important that it deserves to be rescued? This question will continue to trigger heated arguments.

Lehman Brothers was a large financial institution with more than $600 billion in assets. However, it might have been difficult to find another financial institution willing to acquire Lehman Brothers without an enormous subsidy from the federal government. Many of the assets held by Lehman Brothers (such as the mortgage-backed securities) were worth substantially less in the market than the book value assigned to them by Lehman.

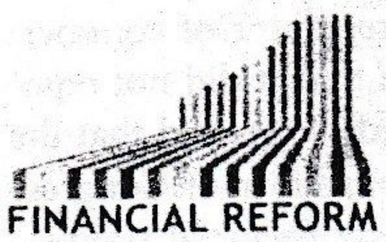
American International Group had more than $1 trillion in assets when it was rescued and, like Lehman, had many obligations to other financial institutions because of its credit default swap arrangements. However, one important difference between AIG and Lehman Brothers was that AIG had various subsidiaries that were financially sound at the time, and the assets in these subsidiaries served as collateral for the loans extended by the federal government to rescue AIG. From the federal government's perspective, the risk of taxpayer loss due to the AIG rescue was low. In contrast, Lehman Brothers did not have adequate collateral available and so a large loan from the government could have been costly to U.S. taxpayers.

18-6e Protests of Bank Bailouts

The bailouts during the credit crisis led to the organization of various groups. In 2009, the Tea Party organized and staged protests throughout the United States. Its main theme was that the government was spending excessively, which led to larger budget deficits that arguably could weaken economic conditions. Their proposed solution is to eliminate the bailouts as one form of reducing the excessive government spending.

In 2011, Occupy Wall Street organized and also staged protests. While this movement also protested government funding decisions, its underlying theme is not as clear. Some protestors within this movement believe that bank bailouts are appropriate, whereas others do not. In addition, many protestors wanted the government to direct more funding to their own specials interests, such as health care, education, or programs to reduce

unemployment. This led to the common sign or phrase associated with Occupy Wall Street protests: "Where's my bailout?" Although the Occupy Wall Street movement gained much support for protesting against the government, there does not appear to be a clear consensus solution among protestors regarding bailouts or the proper use of government funding.



18-7 Financial Reform Act of 2010

In July, 2010, the Financial Reform Act (also referred to as the Dodd-Frank Act, or the Wall Street Reform and Consumer Protection Act) was implemented. This act contained numerous provisions regarding financial services. The provisions that concern bank regulation are summarized here.

18-7a Mortgage Origination

The Financial Reform Act requires that banks and other financial institutions granting mortgages verify the income, job status, and credit history of mortgage applicants before approving mortgage applications. This provision is intended to prevent applicants from receiving mortgages unless they are creditworthy, which should minimize the possibility of a future credit crisis. It may seem that this provision would naturally be followed even if there was no law. Yet there were many blatant violations shortly before and during the credit crisis in which mortgages were approved for applicants who were clearly not creditworthy.

18-7b Sales of Mortgage-Backed Securities

The act requires that banks and other financial institutions that sell mortgage-backed securities retain 5 percent of the portfolio unless it meets specific standards that reflect low risk. This provision forces financial institutions to maintain a stake in the mortgage portfolios that they sell. The act also requires more disclosure regarding the quality of the underlying assets when mortgage-backed securities are sold.

18-7c Financial Stability Oversight Council

The Financial Reform Act created the Financial Stability Oversight Council, which is responsible for identifying risks to financial stability in the United States and makes recommendations that regulators can follow to reduce risks to the financial system. The council can recommend methods to ensure that banks do not rely on regulatory bailouts, which may prevent situations where a large financial institution is viewed as too big to fail. Furthermore, it can recommend rules such as higher capital requirements for banks that are perceived to be too big and complex, which may prevent these banks from becoming too risky.

The council consists of 10 members, including the Treasury Secretary (who chairs the council) and the heads of three regulatory agencies that monitor banks: the Federal Reserve, the Comptroller of the Currency, and the Federal Deposit Insurance Corporation. Because systemic risk in the financial system may be caused by financial security transactions that connect banks with other types of financial institutions, the council also includes the head of the Securities and Exchange Commission and of the U.S. Commodities Futures Trading Commission. The remaining members are the heads of the National Credit Union Association, the Federal Housing Finance Agency, and the

Consumer Financial Protection Bureau (described shortly) as well as an independent member with insurance experience who is appointed by the President.

18-7d Orderly Liquidation

The act assigned specific regulators with the authority to determine whether any particular financial institution should be liquidated. This expedites the liquidation process and can limit the losses incurred by a failing financial institution. The act calls for the creation of an orderly liquidation fund that can be used to finance the liquidation of any financial institution that is not covered by the Federal Deposit Insurance Corporation. Shareholders and unsecured creditors are expected to bear most of the losses of failing financial institutions, so they are not covered by this fund. If losses are beyond what can be absorbed by shareholders and unsecured creditors, other financial institutions in the corresponding industry are expected to bear the cost of the liquidation. The liquidations are not to be financed by taxpayers.

18-7e Consumer Financial Protection Bureau

The act established the Consumer Financial Protection Bureau, which is responsible for regulating consumer finance products and services offered by commercial banks and other financial institutions, such as online banking, checking accounts, and credit cards. The bureau can set rules to ensure that bank disclosure about financial products is accurate and to prevent deceptive financial practices.

18-7f Limits on Bank Proprietary Trading

The act mandates that commercial banks must limit their proprietary trading, in which they pool money received from customers and use it to make investments for the bank's clients. A commercial bank can use no more than 3 percent of its capital to invest in hedge fund institutions, private equity funds, or real estate funds (combined). This requirement has also been referred to as the Volcker rule, and it has led to much controversy.

The implementation of the limits on proprietary trading has been deferred to July 2014. This gives banks time to sell divisions if they exceed the limit. This provision had a larger impact on securities firms (such as Goldman Sachs and Morgan Stanley) that had converted to bank holding companies shortly before the act, because those firms had previously engaged in heavy proprietary trading.

The general argument for this rule is that commercial banks should not be making investments in extremely risky projects. If they want to pursue very high returns (and therefore be exposed to very high risk), they should not be part of the banking system, and should not have access to depositor funds, or be able to obtain deposit insurance. That is, if they want to invest like hedge funds, they should apply to be hedge funds and not commercial banks.

However, some critics believe that the Volcker rule could prevent U.S. banks from competing against other banks on a global basis. In addition, there is much disagreement regarding the degree to which banks should be allowed to take risks. Some critics argue that the Volcker rule would not have prevented some banks from making the risky investments that caused them to go bankrupt during the credit crisis. Furthermore, although JPMorgan Chase posted a trading loss of $2 billion in May 2012 while the Volcker rules were still being developed, it has been argued that the trades that caused that loss would not have been prohibited by the Volcker rule. There are also concerns

that the provisions of the Volcker rule are not sufficiently clear, which will allow some banks to circumvent the rule when making investments by using their own interpretations of the rule.

18-7g Trading of Derivative Securities

The act requires that derivative securities be traded through a clearinghouse or exchange, rather than over the counter. This provision should enable a more standardized structure regarding margins and collateral as well as more transparency of prices in the market. Consequently, banks that trade these derivatives should be less susceptible to risk that the counterparty posted insufficient collateral.

18-8 Global Bank Regulations



GLOBAL ASPECTS

Although the division of regulatory power between the central bank and other regulators varies among countries, each country has a system for monitoring and regulating commercial banks. Most countries also maintain different guidelines for deposit insurance. Differences in regulatory restrictions give some banks a competitive advantage in a global banking environment.

Historically, Canadian banks were not as restricted in offering securities services as U.S. banks and therefore control much of the Canadian securities industry. Recently, Canadian banks have begun to enter the insurance industry. European banks have had much more freedom than U.S. banks in offering securities services such as underwriting corporate securities. Many European banks are allowed to invest in stocks.

Japanese commercial banks have some flexibility to provide investment banking services, but not as much as European banks. Perhaps the most obvious difference between Japanese and U.S. bank regulations is that Japanese banks are allowed to use depositor funds to invest in stocks of corporations. Thus, Japanese banks are not only the creditors of firms but also their shareholders.

Summary

- Banks must observe regulations on the deposit insurance they must maintain, their loan composition, the bonds they are allowed to purchase, and the financial services they can offer. In general, regulations on deposits and financial services have been loosened in recent decades in order to allow for more competition among banks.
- Capital requirements are intended to ensure that banks have a cushion against any losses. The requirements have become more stringent and are risk adjusted so that banks with more risk are required to maintain a higher level of capital.
- Bank regulators monitor banks by focusing on six criteria: capital, asset quality, management, earnings, liquidity, and sensitivity to financial market conditions. Regulators assign ratings to these criteria in order to determine whether corrective action is necessary. When a bank is failing, the FDIC or other government agencies consider whether it can be saved. During the credit crisis, many banks failed and also Lehman Brothers failed, but the government rescued American International Group (AIG). Unlike Lehman brothers, AIG had various subsidiaries that were financially sound at the time, and the assets in these subsidiaries served as collateral for the loans extended by the government to rescue AIG.
- In July 2010, the Financial Reform Act was implemented. It set more stringent standards for mortgage applicants, required banks to maintain a stake in the mortgage portfolios that they sell, and established a Consumer Financial Protection Bureau to regulate consumer finance products and services offered by commercial banks and other financial institutions.

Point Counter-Point

Should Regulators Intervene to Take Over Weak Banks?

Point Yes. Intervention could turn a bank around before weak management results in failure. Bank failures require funding from the FDIC to reimburse depositors up to the deposit insurance limit. This cost could be avoided if the bank's problems are corrected before it fails.

Counter-Point No. Regulators will not necessarily manage banks any better. Also, this would lead to excessive government intervention each time a bank experienced problems. Banks would use a very conservative management approach to avoid intervention, but this approach would not necessarily appeal to their shareholders who want high returns on their investment.

Who Is Correct? Use the Internet to learn more about this issue and then formulate your own opinion.

Questions and Applications

1. **Regulation of Bank Sources and Uses of Funds** How are a bank's balance sheet decisions regulated?

2. **Off-Balance Sheet Activities** Provide examples of off–balance sheet activities. Why are regulators concerned about them?

3. **Moral Hazard and the Credit Crisis** Explain why the moral hazard problem received so much attention during the credit crisis.

4. **FDIC Insurance** What led to the establishment of FDIC insurance?

5. **Glass-Steagall Act** Briefly describe the Glass-Steagall Act. Then explain how the related regulations have changed.

6. **DIDMCA** Describe the main provisions of the DIDMCA that relate to deregulation.

7. **CAMELS Ratings** Explain how the CAMELS ratings are used.

8. **Uniform Capital Requirements** Explain how the uniform capital requirements established by the Basel Accord can discourage banks from taking excessive risk.

9. **Value at Risk** Explain how the value at risk (VaR) method can be used to determine whether a bank has adequate capital.

10. **HLTs** Describe highly leveraged transactions (HLTs), and explain why a bank's exposure to HLTs is closely monitored by regulators.

11. **Bank Underwriting** Given the higher capital requirements now imposed on them, why might banks be even more interested in underwriting corporate debt issues?

12. **Moral Hazard** Explain the moral hazard problem as it relates to deposit insurance.

13. **Economies of Scale** How do economies of scale in banking relate to the issue of interstate banking?

14. **Contagion Effects** How can the financial problems of one large bank affect the market's risk evaluation of other large banks?

15. **Regulating Bank Failures** Why are bank regulators more concerned about a large bank failure than a small bank failure?

16. **Financial Services Modernization Act** Describe the Financial Services Modernization Act of 1999. Explain how it affected commercial bank operations and changed the competitive landscape among financial institutions.

17. **Impact of SOX on Banks** Explain how the Sarbanes-Oxley Act improved the transparency of banks. Why might the act have a negative impact on some banks?

18. **Conversion of Securities Firms to BHCs** Explain how the conversion of a securities firm to a bank holding company (BHC) structure might reduce its risk.

19. Capital Requirements during the Credit Crisis Explain how the accounting method applied to mortgage-backed securities made it more difficult for banks to satisfy capital requirements during the credit crisis.

20. Fed Assistance to Bear Stearns Explain why regulators might argue that the assistance they provided to Bear Stearns was necessary.

21. Fed Aid to Nonbanks Should the Fed have the power to provide assistance to firms, such as Bear Stearns, that are not commercial banks?

22. Regulation of Credit Default Swaps Why were bank regulators concerned about credit default swaps during the credit crisis?

23. Impact of Bank Consolidation on Regulation Explain how bank regulation can be more effective when there is consolidation of banks and securities firms.

24. Concerns about Systemic Risk during the Credit Crisis Explain why the credit crisis caused concerns about systemic risk.

25. Troubled Asset Relief Program (TARP) Explain how the Troubled Asset Relief Program was expected to help resolve problems during the credit crisis.

26. Financial Reform Act Explain how the Financial Reform Act resolved some problems during the credit crisis.

27. Bank Deposit Insurance Reserves What changes to reserve requirements were added by The Wall Street Reform and Consumer Protection Act (also called the Dodd-Frank Act) of 2010?

28. Basel III Changes to Capital and Liquidity Requirements How did Basel III change capital and liquidity requirements for banks?

Interpreting Financial News

Interpret the following comments made by Wall Street analysts and portfolio managers.

a. "The FDIC recently subsidized a buyer for a failing bank, which had different effects on FDIC costs than if the FDIC had closed the bank."

b. "Bank of America has pursued the acquisition of many failed banks because it sees potential benefits."

c. "By allowing a failing bank time to resolve its financial problems, the FDIC imposes an additional tax on taxpayers."

Managing in Financial Markets

Effect of Bank Strategies on Bank Ratings A bank has asked you to assess various strategies it is considering and explain how they could affect its regulatory review. Regulatory reviews include an assessment of capital, asset quality, management, earnings, liquidity, and sensitivity to financial market conditions. Many types of strategies can result in more favorable regulatory reviews based on some criteria but less favorable reviews based on other criteria. The bank is planning to issue more stock, retain more of its earnings, increase its holdings of Treasury securities, and reduce its business loans. The bank has historically been rated favorably by regulators yet believes that these strategies will result in an even more favorable regulatory assessment.

a. Which regulatory criteria will be affected by the bank's strategies? How?

b. Do you believe that the strategies planned by the bank will satisfy its shareholders? Is it possible for the bank to use strategies that would satisfy both regulators and shareholders? Explain.

c. Do you believe that the strategies planned by the bank will satisfy the bank's managers? Explain.

FLOW OF FUNDS EXERCISE

Impact of Regulation and Deregulation on Financial Services

Carson Company relies heavily on commercial banks for funding and for some other services.

a. Explain how the services provided by a commercial bank (just the banking, not the nonbank, services) to Carson may be limited because of bank regulation.

b. Explain the types of nonbank services that Carson Company can receive from the subsidiaries of a commercial bank as a result of deregulation. How might Carson Company be affected by the deregulation that allows subsidiaries of a commercial bank to offer nonbank services?

INTERNET/EXCEL EXERCISE

Browse the most recent Quarterly Banking Profile at www.fdic.gov/bank/analytical/index.html. Review the information provided about failed banks, and describe how regulators responded to one recent bank failure listed here.

WSJ EXERCISE

Impact of Bank Regulations

Using a recent issue of the *Wall Street Journal*, summarize an article that discusses a particular commercial bank regulation that has recently been passed or is currently being considered by regulators. (You may wish to use the *Wall Street Journal Index* to identify a specific article on a commercial banking regulation or bill.) Would this regulation have a favorable or unfavorable impact on commercial banks? Explain.

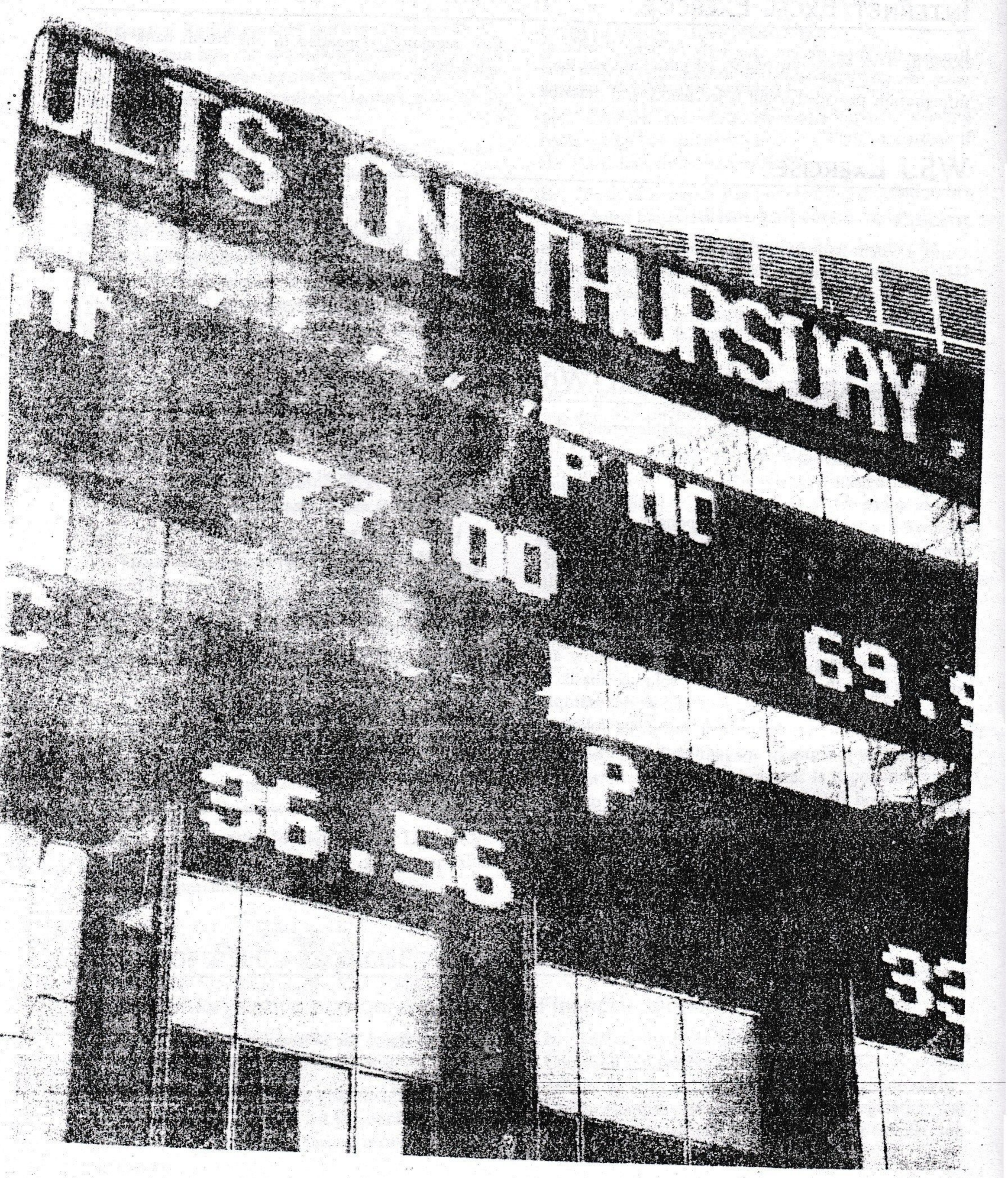
ONLINE ARTICLES WITH REAL-WORLD EXAMPLES

Find a recent practical article available online that describes a real-world example regarding a specific financial institution or financial market that reinforces one or more concepts covered in this chapter.

If your class has an online component, your professor may ask you to post your summary of the article there and provide a link to the article so that other students can access it. If your class is live, your professor may ask you to summarize your application of the article in class. Your professor may assign specific students to complete this assignment or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real-world examples related to this chapter, consider using the following search terms (be sure to include the prevailing year as a search term to ensure that the online articles are recent):

1. bank AND deposit insurance
2. bank AND moral hazard
3. bank loans AND regulation
4. bank investments AND regulation
5. bank capital AND regulation
6. bank regulator AND rating banks
7. bank regulator AND stress test
8. too big to fail AND conflict
9. bank regulation AND conflict
10. government rescue AND bank


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19 Bank Management

CHAPTER OBJECTIVES

The specific objectives of this chapter are to:

- describe the underlying goal, strategy, and governance of banks,
- explain how banks manage liquidity,
- explain how banks manage interest rate risk,
- explain how banks manage credit risk, and
- explain integrated bank management.

The performance of any commercial bank depends on the management of the bank's assets, liabilities, and capital. Increased competition has made efficient management essential for survival.

19-1 Bank Goals, Strategy, and Governance

The underlying goal behind the managerial policies of a bank is to maximize the wealth of the bank's shareholders. Thus, bank managers should make decisions that maximize the price of the bank's stock. However, bank managers may make decisions that serve their own goals rather than the preferences of shareholders. For example, if they receive a fixed salary without a bonus, they may prefer to make very conservative decisions that avoid the risk of failure. In this way, they may secure their existing job position for a long-term period. Bank shareholders might prefer that bank managers take some risk in order to strive for higher returns, and this may justify why bank manager compensation is typically tied to a measure of performance such as earnings.

19-1a Aligning Managerial Compensation with Bank Goals

In order to ensure that managers serve shareholder interests, banks commonly implement compensation programs that provide bonuses to high-level managers that satisfy bank goals. For example, managerial compensation may include stock options, which encourage managers to serve shareholders because they become shareholders. However, this might encourage bank managers to forgo the development of some long-term projects in order to focus more exclusively on increasing the current stock price in order to achieve a high bonus. Compensation programs that provide stock options are thus more effective (in terms of realizing the bank's goals) when managers are required to hold their stock for several years before selling it.

Banks have been criticized for implementing compensation programs that are overly generous and that do not necessarily align compensation with long-term performance. Many compensation programs of banks are based on existing compensation programs used by other banks. It is difficult to correct for deficiencies in compensation programs when they are fairly standard across the industry.

Some compensation programs could cause bank managers to take excessive risk, especially if the bonus would be very high when the bank's earnings are very high. They may be more willing to take excessive risk if they believe that the government will rescue them under conditions in which their risky strategies result in large losses. In this case,

they earn large bonuses if their risky strategies are successful and expect to be rescued if their strategies are not successful, so they have little to lose by taking risks.

19-1b Bank Strategy

A bank's strategy involves the management of its sources of funds (liabilities) and its uses of funds (assets). Its managerial decisions will affect its performance, as measured by its income statement, in the following ways. First, a bank's decisions on sources of funds will heavily influence its interest expenses on the income statement. Second, its asset structure will strongly influence its interest revenue on the income statement. The bank's asset structure also affects its expenses; for example, an emphasis on commercial loans will result in a high labor cost for assessing loan applicants.

A bank must also manage the operating risk that results from its general business operations. Specifically, banks face risk related to information (sorting, processing, transmitting through technology), execution of transactions, damaged relationships with clients, legal issues (lawsuits by employees and customers), and regulatory issues (increased costs due to new compliance requirements or penalties due to lack of compliance).

How Financial Markets Facilitate the Bank's Strategy To implement their strategy, commercial banks rely heavily on financial markets, as explained in Exhibit 19.1. They rely on the money markets to obtain funds, on the mortgage and bond markets to use some of their funds, and on the futures, options, and swaps markets to hedge their risk (as explained in this chapter).

19-1c Bank Governance by the Board of Directors

A bank's board of directors oversees the operations of the bank and attempts to ensure that managerial decisions are in the best interests of the shareholders. Bank boards tend to have more directors and a higher percentage of outside directors than do boards of other types of firms. Some of the more important functions of bank directors are to:

- Determine a compensation system for the bank's executives
- Ensure proper disclosure of the bank's financial condition and performance to investors
- Oversee growth strategies such as acquisitions

Exhibit 19.1 Participation of Commercial Banks in Financial Markets

FINANCIAL MARKET	PARTICIPATION BY COMMERCIAL BANKS
Money markets	As banks offer deposits, they must compete with other financial institutions in the money market along with the Treasury to obtain short-term funds. They serve households that wish to invest funds for short-term periods.
Mortgage markets	Some banks offer mortgage loans on homes and commercial property and therefore provide financing in the mortgage market.
Bond markets	Commercial banks purchase bonds issued by corporations, the Treasury, and municipalities.
Futures markets	Commercial banks take positions in futures to hedge interest rate risk.
Options markets	Commercial banks take positions in options on futures to hedge interest rate risk.
Swaps markets	Commercial banks engage in interest rate swaps to hedge interest rate risk.

- Oversee policies for changing the capital structure, including decisions to raise capital or to engage in stock repurchases
- Assess the bank's performance and ensure that corrective action is taken if the performance is weak because of poor management

Bank directors are liable if they do not fulfill their duties. The Sarbanes-Oxley (SOX) Act, described in the previous chapter, has had a major effect on the monitoring conducted by board members of commercial banks. Recall that this act requires publicly traded firms to implement a more thorough internal control process to ensure more accurate financial reporting to shareholders. As a result of SOX, directors are now held more accountable for their oversight because the internal process requires them to document their assessment and opinion of key decisions made by the bank's executives. Furthermore, directors more frequently hire outside legal and financial advisers to aid in assessing key decisions (such as acquisitions) by bank executives to determine whether the decisions are justified.

Inside versus Outside Directors Board members who are also managers of the bank (called inside directors) may sometimes face a conflict of interests because their decisions as board members may affect their jobs as managers. Outside directors (directors who are not managers) are generally expected to be more effective at overseeing a bank: they do not face a conflict of interests in serving shareholders.

19-1d Other Forms of Bank Governance

In addition to the board of directors, publicly traded banks are subject to potential shareholder activism. In particular, institutional investors holding a relatively large amount of shares can attempt to influence the approach taken by the bank's managers. Shareholders may also pursue proxy contests if they want to change the composition of the board, and they can pursue lawsuits if they believe that the board is not serving shareholder interests.

The market for corporate control serves as an additional form of governance over publicly traded banks, since a bank that performs poorly may be subject to a takeover. To the extent that a bank's management serves its own rather than shareholder interests, the bank's prevailing stock valuation may be low, which could encourage another bank to acquire it. The market for corporate control serves as a form of governance because bank managers recognize that they could lose their jobs if their bank is acquired.

19-2 Managing Liquidity

Healthy banks tend to have easy access to liquidity. However, banks can experience illiquidity when cash outflows (due to deposit withdrawals, loans, etc.) exceed cash inflows (new deposits, loan repayments, etc.). Bank liquidity problems are typically preceded by other financial problems such as major defaults on their loans. A bank that is performing poorly has less ability to obtain short-term funds because it may not be able to repay the credit that it desires.Banks can resolve liquidity problems with proper management of their liabilities or their assets.

19-2a Management of Liabilities

Banks have access to various forms of borrowing, such as the federal funds market. The decision regarding how to obtain funds depends on the situation. If the need for funds is temporary, an increase in short-term liabilities (from the federal funds market) may be

appropriate. If the need is permanent, however, then a policy for increasing deposits or selling liquid assets may be appropriate.

Some banks may borrow frequently by issuing short-term securities such as commercial paper, especially when short-term interest rates are low. They may use this strategy as a form of long-term financing, as the proceeds received from each new issuance of commercial paper is used to repay the principal owed as a result of the previous issuance. However, this strategy is dangerous because if economic conditions deteriorate, causing bank loan defaults to increase, banks may no longer be able to obtain funds by issuing commercial paper. Some banks have experienced liquidity problems because they were cut off from their short-term funding sources once weak economic conditions caused their assets to appear risky.

19-2b Management of Money Market Securities

Because some assets are more marketable than others, the bank's asset composition can affect its degree of liquidity. At an extreme, banks can ensure sufficient liquidity by using most of their funds to purchase short-term Treasury securities or other money market securities. Banks could easily sell their holdings of these securities at any time in order to obtain cash. However, banks must also be concerned with achieving a reasonable return on their assets, which often conflicts with the liquidity objective. Although short-term Treasury securities are liquid, their yield is low relative to bank loans or investments in other securities. In fact, the return that banks earn on short-term Treasury securities might be lower than the interest rate they pay on deposits. Banks should maintain the level of liquid assets (such as money market securities) that will satisfy their liquidity needs but use their remaining assets to earn a higher return.

19-2c Management of Loans

Since the secondary market for loans has become active, banks can attempt to satisfy their liquidity needs with a higher proportion of loans while striving for higher profitability. However, loans are not as liquid as money market securities. Banks may be unable to sell their loans when economic conditions weaken, because many other banks may be attempting to sell loans as well, and very few financial institutions will be willing to purchase loans under those conditions.

19-2d Use of Securitization to Boost Liquidity

The ability to securitize assets such as automobile and mortgage loans can enhance a bank's liquidity position. The process of securitization commonly involves the sale of assets by the bank to a trustee, who issues securities that are collateralized by the assets. The bank may still service the loans, but the interest and principal payments it receives are passed on to the investors who purchased the securities. Banks are more liquid as a result of securitization because they effectively convert future cash flows into immediate cash. In most cases, the process includes a guarantor who, for a fee, guarantees future payments to the investors who purchased the securities. The loans that collateralize the securities normally either exceed the amount of the securities issued or are backed by an additional guarantee from the bank that sells the loans.

Collateralized Loan Obligations As one form of securitization, commercial banks can obtain funds by packaging their commercial loans with those of other financial institutions as collateralized loan obligations (CLOs) and then selling securities that represent ownership of these loans. The banks earn a fee for selling these loans. The pool

of loans might be perceived to be less risky than a typical individual loan within the pool because the loans were provided to a diversified set of borrowers. The securities that are issued to investors who invest in the loan pool represent various classes.

For example, one class of notes issued to investors may be BB-rated notes, which offer an interest rate of LIBOR (London Interbank Offer Rate) plus 3.5 percent. If there are loan defaults by the corporate borrowers whose loans are in the pool, this group of investors will be the first to suffer losses. Another class may consist of BBB-rated notes that offer a slightly lower interest rate. Investors in these notes are slightly less exposed to defaults on the loans. The AAA-rated notes offer investors the most protection against loan defaults but provide the lowest interest rate, such as LIBOR plus 0.25 percent. Insurance companies and pension funds are common investors in CLOs.

Banks learned during the credit crisis that not all AAA-rated CLOs are risk free. Their CLOs experienced substantial defaults in 2008. The AAA rating was apparently based on the assumption of much better economic conditions than the crisis conditions that occurred in the second half of 2008.

19-3 Managing Interest Rate Risk

The performance of a bank is highly influenced by the interest payments earned on its assets relative to the interest paid on its liabilities (deposits). The difference between interest payments received and interest paid is measured by the net interest margin (also known as the *spread*):

$$\text{Net interest margin} = \frac{\text{Interest revenues} - \text{Interest expenses}}{\text{Assets}}$$

In some cases, net interest margin is defined to include only the earning assets so as to exclude any assets (such as required reserves) that do not generate a return to the bank. Because the rate sensitivity of a bank's liabilities normally does not perfectly match that of the assets, the net interest margin changes over time. The change depends on whether bank assets are more or less rate sensitive than bank liabilities, the degree of difference in rate sensitivity, and the direction of interest rate movements.

During a period of rising interest rates, a bank's net interest margin will likely decrease if its liabilities are more rate sensitive than its assets, as illustrated in Exhibit 19.2. Under the opposite scenario, when market interest rates are declining over time, rates offered on new bank deposits (as well as those earned on new bank loans) will be affected by the decline in interest rates. The deposit rates will typically be more sensitive if their turnover is quicker, as illustrated in Exhibit 19.3.

To manage interest rate risk, a bank measures the risk and then uses its assessment of future interest rates to decide whether and how to hedge the risk. Methods of assessing the risk are described next, followed by a discussion of the hedging decision and methods of reducing interest rate risk.

19-3a Methods Used to Assess Interest Rate Risk

No method of measuring interest rate risk is perfect, so commercial banks use a variety of methods to assess their exposure to interest rate movements. The following are the most common methods of measuring interest rate risk:

- Gap analysis
- Duration analysis
- Regression analysis

Exhibit 19.2 Impact of Increasing Interest Rates on a Bank's Net Interest Margin (If the Bank's Liabilities Are More Rate Sensitive Than Its Assets)

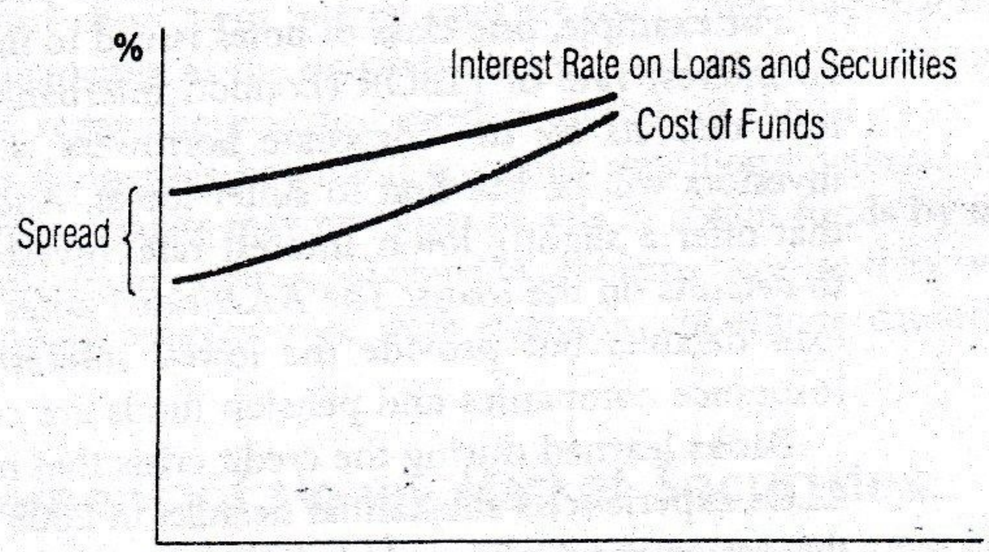
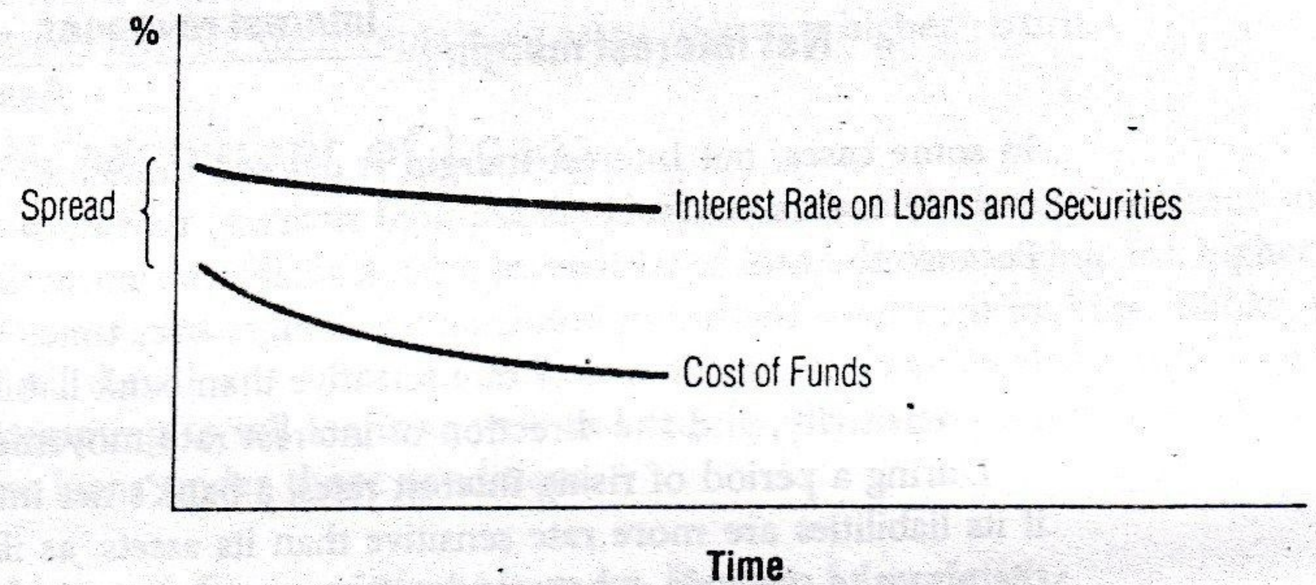


Exhibit 19.3 Impact of Decreasing Interest Rates on a Bank's Net Interest Margin (If the Bank's Liabilities Are More Rate Sensitive Than Its Assets)



Gap Analysis Banks can attempt to determine their interest rate risk by monitoring their gap over time, where

Gap = Rate-sensitive assets − Rate-sensitive liabilities

An alternative formula is the gap ratio, which is measured as the volume of rate-sensitive assets divided by rate-sensitive liabilities. A gap of zero (or gap ratio of 1.00) indicates that rate-sensitive assets equal rate-sensitive liabilities, so the net interest margin should not be significantly influenced by interest rate fluctuations. A negative gap (or gap ratio of less than 1.00) indicates that rate-sensitive liabilities exceed rate-sensitive assets. Banks with a negative gap are typically concerned about a potential increase in interest rates, which could reduce their net interest margin.

EXAMPLE Kansas City (K.C.) Bank had interest revenues of $80 million last year and interest expenses of $35 million. About $400 million of its $1 billion in assets are rate sensitive, and $700 million of its liabilities are rate sensitive. K.C. Bank's net interest margin is

$$\begin{aligned}\text{Net interest margin} &= (\$80{,}000{,}000 - \$35{,}000{,}000) \div \$1{,}000{,}000{,}000 \\ &= 0.045, \text{ or } 4.5\%\end{aligned}$$

K.C. Bank's gap is

$$\begin{aligned}\text{Gap} &= \$400{,}000{,}000 - \$700{,}000{,}000 \\ &= -\$300{,}000{,}000\end{aligned}$$

and its gap ratio is

$$\begin{aligned}\text{Gap} &= \$400{,}000{,}000 \div \$700{,}000{,}000 \\ &= 0.5714, \text{ or } 57.14\%\end{aligned}$$

Based on the gap analysis of K.C. Bank, an increase in market interest rates would cause its net interest margin to decline from its recent level of 4.5 percent. Conversely, a decrease in interest rates would cause its net interest margin to increase above 4.5 percent. ●

Many banks classify interest-sensitive assets and liabilities into various categories based on the timing in which interest rates are reset. Then the bank can determine the gap in each category so that its exposure to interest rate risk can be more accurately assessed.

EXAMPLE Deacon Bank compares the interest rate sensitivity of its assets versus its liabilities as shown in Exhibit 19.4. It has a negative gap in the less-than-1-month maturity range, in the 3-6-month range, and in the 6-12-month range. Hence, the bank may hedge this gap if it believes that interest rates are rising. ●

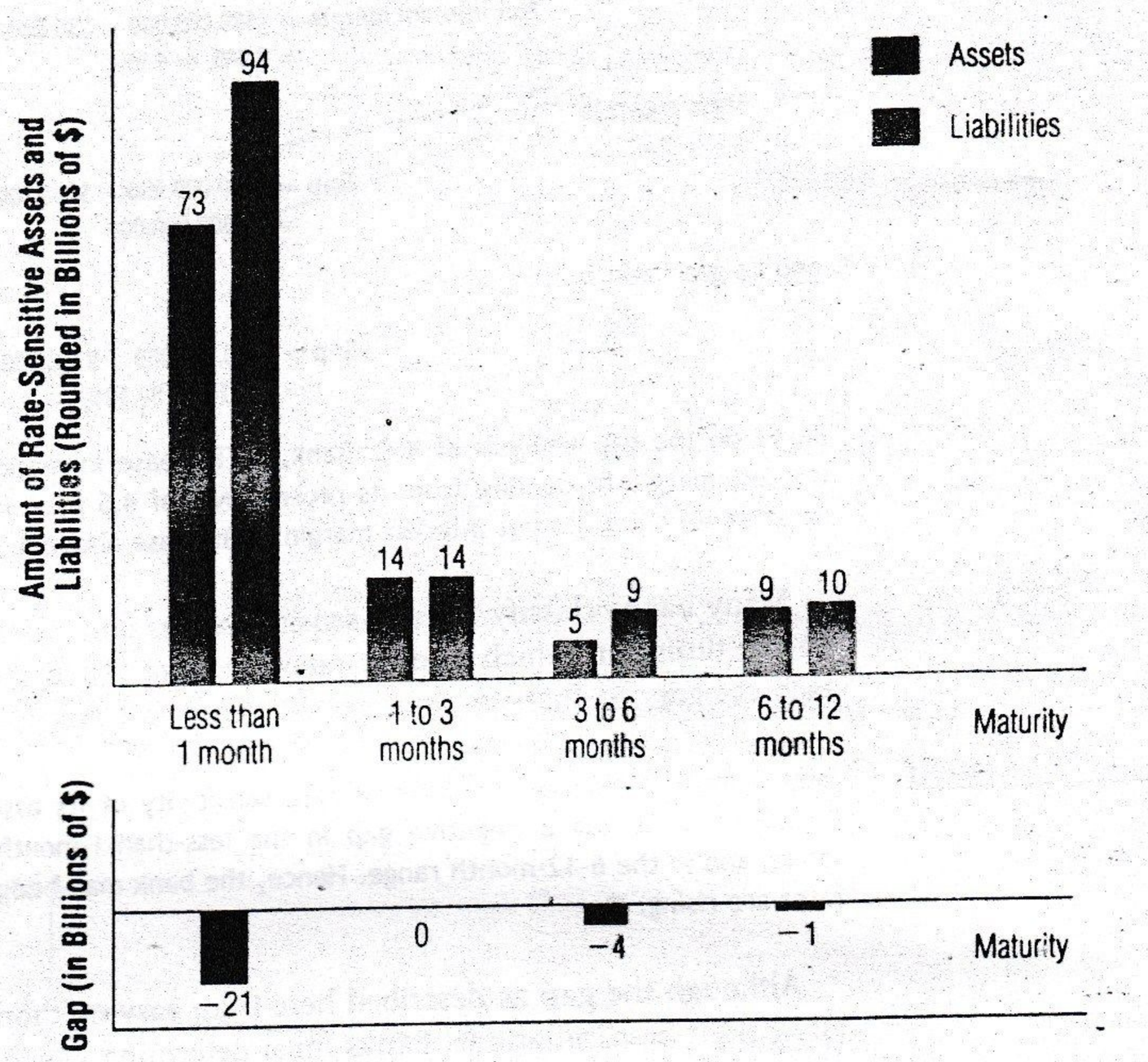
Although the gap as described here is an easy method for measuring a bank's interest rate risk, it has limitations. Banks must determine which of their liabilities and assets are rate sensitive. For example, should a Treasury security with a year to maturity be classified as rate sensitive or rate insensitive? How short must a maturity be to qualify for the rate-sensitive classification?

Each bank may have its own classification system. Whatever system is used, there is a possibility that the measurement will be misinterpreted.

EXAMPLE Spencer Bank obtains much of its funds by issuing CDs with seven-day and one-month maturities as well as money market deposit accounts (MMDAs). Assume that it typically uses these funds to provide loans with a floating rate that is adjusted once per year. These sources and uses of funds will likely be classified as rate sensitive. Thus the gap will be close to zero, implying that the bank is not exposed to interest rate risk. However, there is a difference in rate sensitivity between the bank's sources and uses of funds: the rates paid by the bank on its sources of funds will change more frequently than the rates earned on its uses of funds. Thus, Spencer Bank's net interest margin will likely decline during periods of rising interest rates. This exposure would not be detected by the gap measurement. ●

Duration Measurement An alternative approach to assessing interest rate risk is to measure duration. Some assets or liabilities are more rate sensitive than others, even if the frequency of adjustment and the maturity are the same. A 10-year, zero-coupon bond is more sensitive to interest rate fluctuations than is a 10-year bond that generates coupon payments. Thus the market value of assets in a bank that has invested heavily in zero-coupon bonds will be susceptible to interest rate movements. The duration measurement can capture these different degrees of sensitivity. In recent years, banks and

Exhibit 19.4 Interest-Sensitive Assets and Liabilities: Illustration of the Gap Measured for Various Maturity Ranges for Deacon Bank



other financial institutions have used the concept of duration to measure the sensitivity of their assets to interest rate movements. There are various measurements for an asset's duration; one of the more common is

$$\text{DUR} = \frac{\sum_{t=1}^{n} \frac{C_t(t)}{(1+k)^t}}{\sum_{t=1}^{n} \frac{C_t}{(1+k)^t}}$$

Here C_t represents the interest or principal payments of the asset; t is the time at which the payments are provided; and k is the required rate of return on the asset, which reflects the asset's yield to maturity. The duration of each type of bank asset can be determined, and the duration of the asset portfolio is the weighted average (based on the relative proportion invested in each asset) of the durations of the individual assets.

The duration of each type of bank liability can also be estimated, and the duration of the liability portfolio is likewise estimated as the weighted average of the durations of the liabilities. The bank can then estimate its **duration gap**, which is commonly measured as

the difference between the weighted duration of the bank's assets and the weighted duration of its liabilities, adjusted for the firm's asset size:

$$\text{DURGAP} = \frac{(\text{DURAS} \times \text{AS})}{\text{AS}} - \frac{(\text{DURLIAB} \times \text{LIAB})}{\text{AS}}$$

$$= \text{DURAS} - \left[\text{DURLIAB}\left(\frac{\text{LIAB}}{\text{AS}}\right)\right]$$

Here DURAS is the weighted average duration of the bank's assets, DURLIAB is the weighted average duration of the bank's liabilities, and AS and LIAB represent the market value of the bank's assets and liabilities, respectively. A duration gap of zero suggests that the bank's value should be insensitive to interest rate movements, meaning that the bank is not exposed to interest rate risk. For most banks, the average duration of assets exceeds the average duration of liabilities, so the duration gap is positive. This implies that the market value of the bank's assets is more sensitive to interest rate movements than the value of its liabilities. So if interest rates rise, banks with positive duration gaps will be adversely affected. Conversely, if interest rates decline, then banks with positive duration gaps will benefit. The larger the duration gap, the more sensitive the bank should be to interest rate movements.

Other things being equal, assets with shorter maturities have shorter durations; also, assets that generate more frequent coupon payments have shorter durations than those that generate less frequent payments. Banks and other financial institutions concerned with interest rate risk use duration to compare the rate sensitivity of their entire asset and liability portfolios. Because duration is especially critical for a savings institution's operations, Chapter 21 gives a numerical example showing the measurement of the duration of a savings institution's entire asset and liability portfolio.

Although duration is a valuable technique for comparing the rate sensitivity of various securities, its capabilities are limited when applied to assets that can be terminated on a moment's notice. For example, consider a bank that offers a fixed-rate, five-year loan that can be paid off early without penalty. If the loan is not paid off early, it is perceived as rate insensitive. Yet the loan could be terminated at any time over the five-year period. If it is paid off, the bank would reinvest the funds at the prevailing market rate. Thus the funds used to provide the loan *can* be sensitive to interest rate movements, but the degree of sensitivity depends on when the loan is paid off. In general, loan prepayments are more common when market rates decline because borrowers refinance by obtaining lower-rate loans to pay off existing loans. The point here is that the possibility of prepayment makes it impossible to perfectly match the rate sensitivity of assets and liabilities.

Regression Analysis Gap analysis and duration analysis are based on the bank's balance sheet composition. Alternatively, a bank can assess interest rate risk simply by determining how performance has historically been influenced by interest rate movements. This approach requires that proxies be identified for bank performance and for prevailing interest rates and that a model be chosen that can estimate the relationship between the proxies. Common proxies for performance include return on assets, return on equity, and the percentage change in stock price. To determine how performance is affected by interest rates, regression analysis can be applied to historical data. For example, using an interest rate proxy called i, the S&P 500 stock index as the market, and the bank's stock return (R) as the performance proxy, the following regression model could be used:

$$R = B_0 + B_1 R_m + B_2 i + \mu$$

where R_m is the return on the market; B_0, B_1, and B_2 are regression coefficients; and μ is an error term. The regression coefficient B_2 in this model can also be called the interest rate coefficient because it measures the sensitivity of the bank's performance to interest rate movements. A positive (negative) coefficient suggests that performance is favorably (adversely) affected by rising interest rates. If the interest rate coefficient is not significantly different from zero, this suggests that the bank's stock returns are insulated from interest rate movements.

Models similar to the one just described have been tested on the portfolio of all publicly traded banks to determine whether bank stock levels are affected by interest rate movements. The vast majority of this research has found that bank stock levels are inversely related to interest rate movements (i.e., the B_2 coefficient is negative and significant). These results can be attributed to the common imbalance between a bank's rate-sensitive liabilities and its assets. Because banks tend to have a negative gap (their liabilities are more rate sensitive than their assets), rising interest rates reduce bank performance. These results are generalized for the banking industry and do not apply to every bank.

Because a bank's assets and liabilities are replaced over time, exposure to interest rate risk must be continually reassessed. As exposure changes, the reaction of bank performance to a particular interest rate pattern will change.

When a bank uses regression analysis to determine its sensitivity to interest rate movements, it may combine this analysis with the value-at-risk (VaR) method to determine how its market value would change in response to specific interest rate movements. The VaR method can be applied by combining a probability distribution of interest rate movements with the interest rate coefficient (measured from the regression analysis) to determine a maximum expected loss due to adverse interest rate movements.

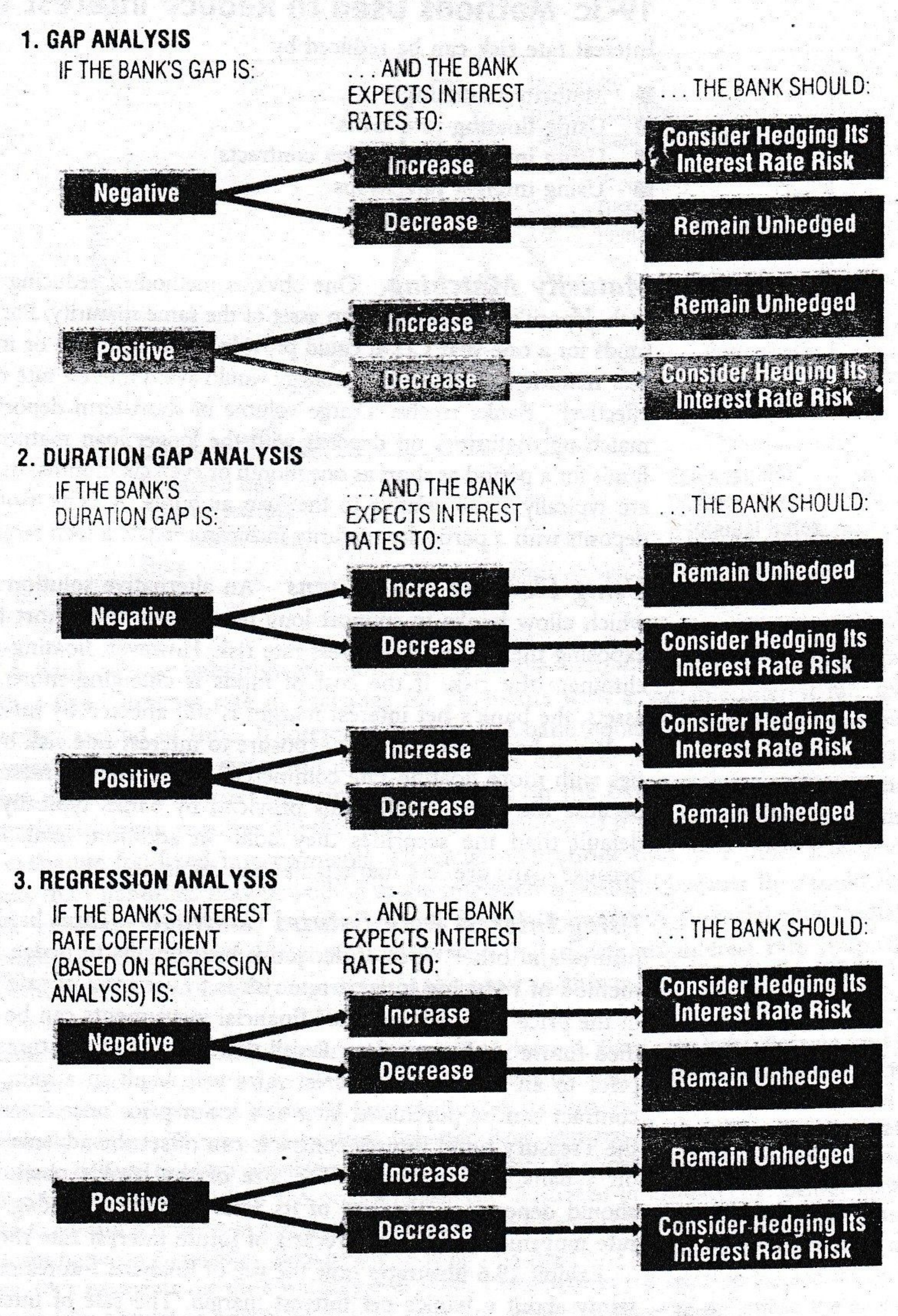
EXAMPLE After applying the regression model to monthly data, Dixon Bank determines that its interest rate regression coefficient is −2.4. This implies that, for a 1 percentage point increase in interest rates, the value of the bank would decline by 2.4 percent. The model also indicates (at the 99 percent confidence level) that the change in the interest rate should not exceed +2.0 percent. For a 2 percentage point increase, the value of Dixon Bank is expected to decline by 4.8 percent (computed as 2.0 percent multiplied by the regression coefficient of −2.4). Thus the maximum expected loss due to interest rate movements (based on a 99 percent confidence level) is a 4.8 percent loss in market value. ●

19-3b Whether to Hedge Interest Rate Risk

A bank can consider the measurement of its interest rate risk along with its forecast of interest rate movements to determine whether it should consider hedging that risk. The general conclusions resulting from a bank's analysis of its interest rate risk are presented in Exhibit 19.5. This exhibit shows the three methods commonly used by banks to measure their interest rate risk. Since none of these measures is perfect for all situations, some banks measure interest rate risk using all three methods. Other banks prefer just one of the methods. Using any method along with an interest rate forecast can help a bank determine whether it should consider hedging its interest rate risk. However, since interest rate movements cannot always be accurately forecasted, banks should not be overly aggressive in attempting to capitalize on interest rate forecasts. They should assess the sensitivity of their future performance to each possible interest rate scenario that could occur to ensure that they can survive any possible scenario.

In general, the three methods of measuring interest rate risk should lead to a similar conclusion. If a bank has a negative gap, its average asset duration is probably larger than its liability duration (positive duration gap) and its past performance level is probably inversely related to interest rate movements. If a bank recently revised the composition of

Exhibit 19.5 Framework for Managing Interest Rate Risk



its assets or liabilities, it may wish to focus on the gap or the duration gap because regression analysis is based on a historical relationship that may no longer exist. Banks can use their analysis of gap along with their forecast of interest rates to make their hedging decision. If a bank decides to reduce its interest rate risk then it must consider the methods of hedging, which are described next.

19-3c Methods Used to Reduce Interest Rate Risk

Interest rate risk can be reduced by

- Maturity matching
- Using floating-rate loans
- Using interest rate futures contracts
- Using interest rate swaps
- Using interest rate caps

Maturity Matching One obvious method of reducing interest rate risk is to match each deposit's maturity with an asset of the same maturity. For example, if the bank receives funds for a one-year CD, it could provide a one-year loan or invest in a security with a one-year maturity. Although this strategy would avoid interest rate risk, it cannot be implemented effectively. Banks receive a large volume of short-term deposits and would not be able to match up maturities on deposits with the longer loan maturities. Borrowers rarely request funds for a period as short as one month or even six months. In addition, the deposit amounts are typically small relative to the loan amounts. A bank would have difficulty combining deposits with a particular maturity to accommodate a loan request with the same maturity.

Using Floating-Rate Loans An alternative solution is to use floating-rate loans, which allow banks to support long-term assets with short term deposits without overly exposing themselves to interest rate risk. However, floating-rate loans cannot completely eliminate the risk. If the cost of funds is changing more frequently than the rate on assets, the bank's net interest margin is still affected by interest rate fluctuations.

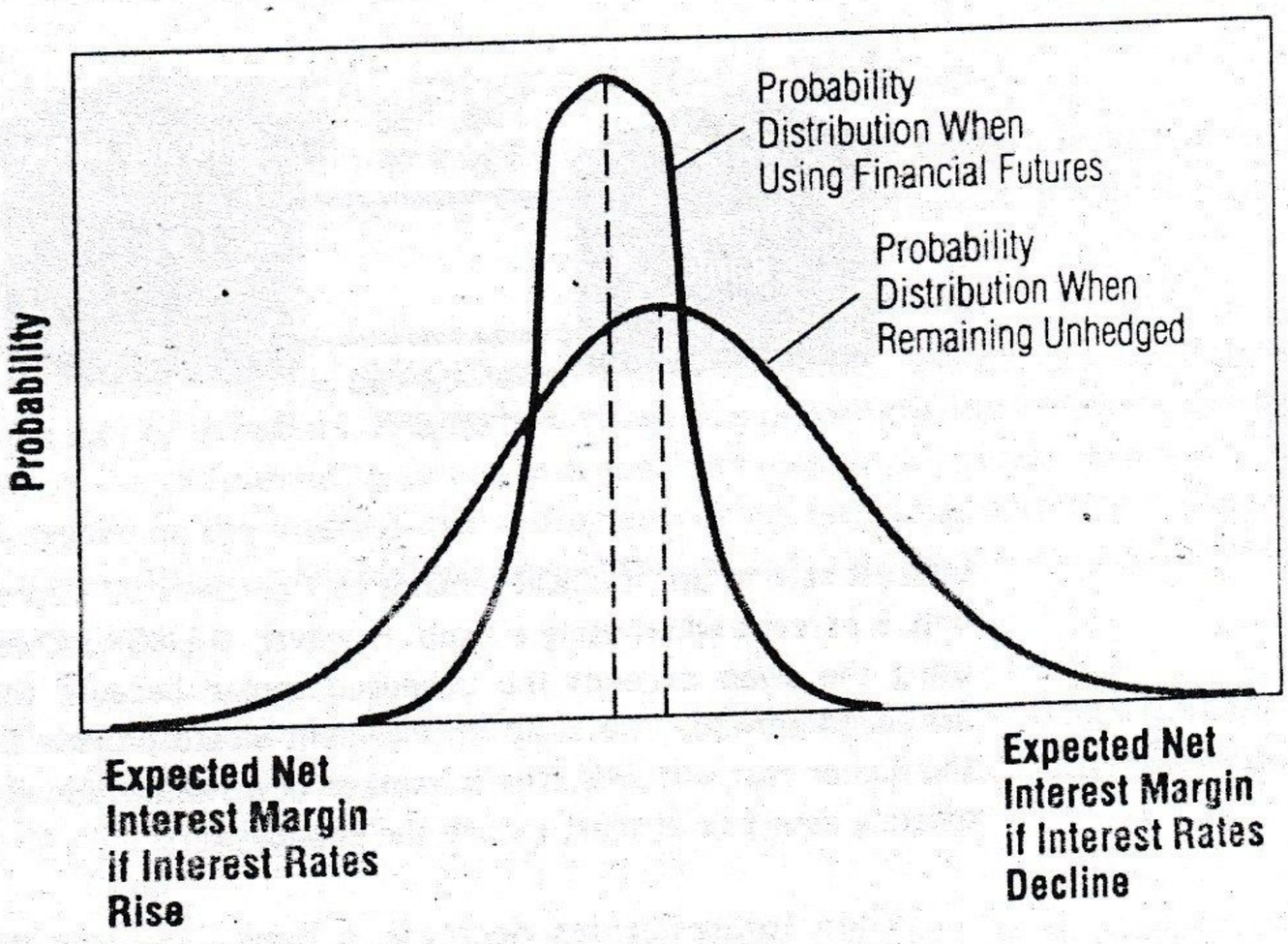
When banks reduce their exposure to interest rate risk by replacing long-term securities with more floating-rate commercial loans, they increase their exposure to credit risk because the commercial loans provided by banks typically have a higher frequency of default than the securities they hold. In addition, bank liquidity risk would increase because loans are less marketable than securities.

Using Interest Rate Futures Contracts Large banks frequently use interest rate futures and other types of derivative instruments to hedge interest rate risk. A common method of reducing interest rate risk is to use interest rate futures contracts, which lock in the price at which specified financial instruments can be purchased or sold on a specified future settlement date. Recall that the sale of a futures contract on Treasury bonds prior to an increase in interest rates will result in a gain, because an identical futures contract can be purchased later at a lower price once interest rates rise. Thus a gain on the Treasury bond futures contracts can offset the adverse effects of higher interest rates on a bank's performance. The size of the bank's position in Treasury bond futures should depend on the size of its asset portfolio, the degree of its exposure to interest rate movements, and its forecasts of future interest rate movements.

Exhibit 19.6 illustrates how the use of financial futures contracts can reduce the uncertainty about a bank's net interest margin. The sale of interest rate futures, for example, reduces the potential adverse effect of rising interest rates on the bank's interest expenses, yet it also reduces the potential favorable effect of declining interest rates on the bank's interest expenses. Assuming that the bank initially had more rate-sensitive liabilities, its use of futures would reduce the impact of interest rates on its net interest margin.

Using Interest Rate Swaps Commercial banks can hedge interest rate risk by engaging in an interest rate swap, which is an arrangement to exchange periodic cash flows based on specified interest rates. A fixed-for-floating swap allows one party to periodically

Exhibit 19.6 Effect of Financial Futures on the Net Interest Margin of Banks That Have More Rate-Sensitive Liabilities Than Assets



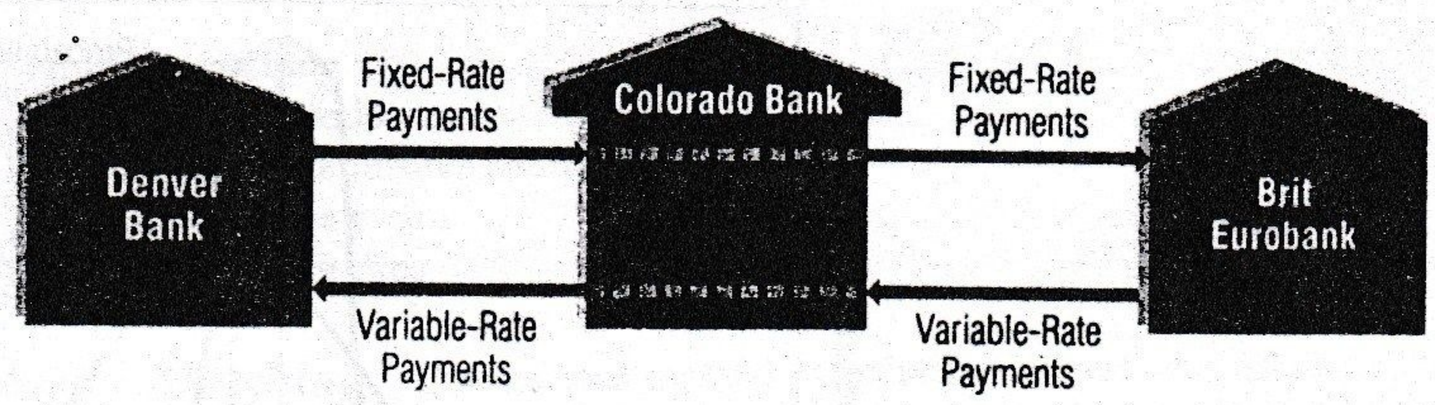
A bank whose liabilities are more rate sensitive than its assets can swap payments with a fixed interest rate in exchange for payments with a variable interest rate over a specified period of time. If interest rates rise, the bank benefits because the payments to be received from the swap will increase while its outflow payments are fixed. This can offset the adverse impact of rising interest rates on the bank's net interest margin. An interest rate swap requires another party that is willing to provide variable-rate payments in exchange for fixed-rate payments. Financial institutions that have more rate-sensitive assets than liabilities may be willing to assume such a position because they could reduce their exposure to interest rate movements in this manner. A financial intermediary is typically needed to match up the two parties that desire an interest rate swap. Some securities firms and large commercial banks serve in this role.

EXAMPLE

Assume that Denver Bank (DB) has large holdings of 11 percent, fixed-rate loans. Because most of its sources of funds are sensitive to interest rates, DB desires to swap fixed-rate payments in exchange for variable-rate payments. It informs Colorado Bank of its situation because it knows that this bank commonly engages in swap transactions. Colorado Bank searches for a client and finds that Brit Eurobank desires to swap variable-rate dollar payments in exchange for fixed dollar payments. Colorado Bank then develops the swap arrangement illustrated in Exhibit 19.7. Denver Bank will swap fixed-rate payments in exchange for variable-rate payments *based on* LIBOR (the rate charged on loans between Eurobanks). Because the variable-rate payments will fluctuate with market conditions, DB's payments received will vary over time. The length of the swap period and the notional amount (the amount to which the interest rates are applied in order to determine the payments) can be structured to meet the participants' needs. Colorado Bank, the financial intermediary conducting the swap, charges a fee amounting to 0.1 percent of the notional amount per year. Some financial intermediaries for swaps may serve as the counterparty and exchange the payments desired rather than matching up two parties.

Now assume that the fixed payments are based on a fixed rate of 9 percent. Also assume that LIBOR is initially 7 percent and that DB's cost of funds is 6 percent. Exhibit 19.8 shows how DB's spread is affected by various possible interest rates when unhedged versus when hedged with an

Exhibit 19 7 Illustration of an Interest Rate Swap



interest rate swap. If LIBOR remains at 7 percent, DB's spread would be 5 percent if unhedged and only 3 percent when using a swap. However, if LIBOR increases beyond 9 percent, the spread when using the swap exceeds the unhedged spread because the higher cost of funds causes a lower unhedged spread. The swap arrangement would provide DB with increased payments that offset the higher cost of funds. The advantage of a swap is that it can lock in the spread to be earned on existing assets or at least reduce the possible variability of the spread. ●

When interest rates decrease, a bank's outflow payments would exceed inflow payments on a swap. However, the spread between the interest rates received on existing fixed-rate loans and those paid on deposits should increase, offsetting the net outflow from the swap. During periods of declining interest rates, fixed-rate loans are often prepaid, which could result in a net outflow from the swap without any offsetting effect.

Using Interest Rate Caps An alternative method of hedging interest rate risk is an interest rate cap, an agreement (for a fee) to receive payments when the interest rate

Exhibit 19.8 Comparison of Denver Bank's Spread: Unhedged versus Hedged

UNHEDGED STRATEGY	POSSIBLE FUTURE LIBOR RATES					
	7%	8%	9%	10%	11%	12%
Average rate on existing mortgages	11%	11%	11%	11%	11%	11%
Average cost of deposits	6	7	8	9	10	11
Spread	5	4	3	2	1	0
HEDGING WITH AN INTEREST RATE SWAP						
Fixed interest rate earned on fixed-rate mortgages	11	11	11	11	11	11
Fixed interest rate owed on swap arrangement	9	9	9	9	9	9
Spread on fixed-rate payments	2	2	2	2	2	2
Variable interest rate earned on swap arrangement	7	8	9	10	11	12
Variable interest rate owed on deposits	6	7	8	9	10	11
Spread on variable-rate payments	1	1	1	1	1	1
Combined total spread when using the swap	3	3	3	3	3	3

of a particular security or index rises above a specified level during a specified time period. Various financial intermediaries (such as commercial banks and brokerage firms) offer interest rate caps. During periods of rising interest rates, the cap provides compensation that can offset the reduction in spread during such periods.

19-3d International Interest Rate Risk

When a bank has foreign currency balances, the strategy of matching the overall interest rate sensitivity of assets to that of liabilities will not automatically achieve a low degree of interest rate risk.

EXAMPLE California Bank has deposits denominated mostly in euros, whereas its floating-rate loans are denominated mostly in dollars. It matches its average deposit maturity with its average loan maturity. However, the difference in currency denominations creates interest rate risk. The deposit and loan rates depend on the interest rate movements of the respective currencies. The performance of California Bank will be adversely affected if the interest rate on the euro increases and the U.S. interest rate decreases. ●

Even though a bank matches the mix of currencies in its assets and its liabilities, it can still be exposed to interest rate risk if the rate sensitivities differ between assets and liabilities for each currency.

EXAMPLE Oklahoma Bank uses its dollar deposits to make dollar loans and its euro deposits to make euro loans. It has short-term dollar deposits and uses the funds to make long-term dollar loans. It also has medium-and long-term fixed-rate deposits in euros and uses those funds to make euro loans with adjustable rates. An increase in U.S. rates will reduce the spread on Oklahoma Bank's dollar loans versus deposits, because the dollar liabilities are more rate sensitive than the dollar assets. In addition, a decline in interest rates on the euro will decrease the spread on the euro loans versus deposits, because the euro assets are more rate sensitive than the euro liabilities. Thus exposure to interest rate risk can be minimized only if the rate sensitivities of assets and liabilities are matched for each currency. ●

WEB

www.fdic.gov
Information about bank loan and deposit volume.

19-4 Managing Credit Risk

Most of a bank's funds are used either to make loans or to purchase debt securities. For either use of funds, the bank is acting as a creditor and is subject to credit (default) risk, or the possibility that credit provided by the bank will not be repaid. The types of loans provided and the securities purchased will determine the overall credit risk of the asset portfolio. A bank also can be exposed to credit risk if it serves as a guarantor on interest rate swaps and other derivative contracts in which it is the intermediary.

19-4a Measuring Credit Risk

An important part of managing credit risk is to assess the creditworthiness of prospective borrowers before extending credit. Banks employ credit analysts who review the financial information of corporations applying for loans and evaluate their creditworthiness. The evaluation should indicate the probability of the firm meeting its loan payments so that the bank can decide whether to grant the loan.

Determining the Collateral When a bank assesses a request for credit, it must decide whether to require collateral that can back the loan in case the borrower is unable to make the payments. For example, if a firm applies for a loan to purchase machinery, the loan agreement may specify that the machinery will serve as collateral. When a bank

serves as an intermediary and a guarantor on derivative contracts, it commonly attempts to require collateral such as securities owned by the client.

Determining the Loan Rate If the bank decides to grant the loan, it can use its evaluation of the firm to determine the appropriate interest rate. Loan applicants deserving of a loan may be rated on a scale of 1 to 5 (with 1 as the highest quality) in terms of their degree of credit risk. The rating dictates the premium to be added to the base rate. For example, a rating of 5 may dictate a 2 percentage point premium above the prime rate (the rate a bank offers to its most creditworthy customers), while a rating of 3 may dictate a 1 percentage point premium. Given the current prime rate along with the rating of the potential borrower, the loan rate can be determined.

Some loans to high-quality (low-risk) customers are commonly offered at rates below the prime rate. This does not necessarily mean that the bank has reduced its spread. It may instead imply that the bank has redefined the prime rate to represent the appropriate loan rate for borrowers with a moderate risk rating. Thus a discount would be attached to the prime rate when determining the loan rate for borrowers with a superior rating.

Measuring Credit Risk of a Bank Portfolio The exposure of a bank's loan portfolio to credit risk is dependent on the types of loans that it provides. When it uses a larger proportion of loans for financing credit cards, it increases its exposure to credit risk. A bank's exposure also changes over time in response to economic conditions. As economic conditions weaken, the expected cash flows to be earned by businesses are reduced because their sales will likely decline. Consequently, they are more likely to default on loans. In addition, individuals are more likely to lose their jobs when the economy weakens, which could increase their likelihood of defaulting on loans.

19-4b Trade-off between Credit Risk and Return

If a bank wants to minimize credit risk, it can use most of its funds to purchase Treasury securities, which are virtually free of credit risk. However, these securities may not generate a much higher yield than the average overall cost of obtaining funds. In fact, some bank sources of funds can be more costly to banks than the yield earned on Treasury securities.

At the other extreme, a bank concerned with maximizing its return could use most of its funds to provide credit card and consumer loans. While this strategy may allow a bank to achieve a high return, these types of loans experience more defaults than other types of loans. Thus the bank may experience high loan losses, which could offset the high interest payments it received from those loans that were repaid. A bank that pursues the high potential returns associated with credit card loans or other loans that generate relatively high interest payments must accept a high degree of credit risk. Because riskier assets offer higher potential returns, a bank's strategy to increase its return on assets will typically entail an increase in the overall credit risk of its asset portfolio. Thus a bank's decision to create a very safe versus a moderate or high-risk asset portfolio is a function of its risk–return preferences.

Expected Return and Risk of Subprime Mortgage Loans Many commercial banks aggressively funded subprime mortgage loans in the 2004–2006 period by originating the mortgages or purchasing mortgage-backed securities that represented subprime mortgages. The banks pursuing this strategy expected that they would earn a relatively high interest rate compared to prime mortgages and that the subprime mortgages would have low default risk because the home serves as collateral. They provided many mortgages without requiring much collateral, as they presumed that market values of homes would

continue to increase over time. Even after home prices increased substantially, many banks continued to aggressively offer subprime mortgages, as they were blinded by the expected return to be earned on this strategy without concern about risk. Perhaps many banks justified their strategy by trying to keep up with all other banks that were using an aggressive strategy for achieving high returns. Furthermore, since bank managerial compensation is commonly tied to the bank's earnings, they could benefit directly from pursuing aggressive strategies.

Bank managers did not anticipate the credit crisis in the 2008–2009 period, in which the value of many homes declined far below the amount owed on the mortgages. As the economy weakened, many homeowners were not able to continue their payments. The banks were forced to initiate mortgage foreclosures and sell some homes at a large discount in the weak housing market. Alternatively, some banks worked out arrangements with homeowners who were behind in their mortgage payments, but the banks had to provide more favorable terms so that the homeowners could afford the mortgage. Banks incurred major expenses from these arrangements.

19-4c Reducing Credit Risk

Although all consumer and commercial loans exhibit some credit risk, banks can use several methods to reduce this risk.

Industry Diversification of Loans Banks should diversity their loans to ensure that their customers are not dependent on a common source of income. For example, a bank in a small farming town that provides consumer loans to farmers and commercial loans to farm equipment manufacturers is highly susceptible to credit risk. If the farmers experience a bad growing season because of poor weather conditions, they may be unable to repay their consumer loans. Furthermore, the farm equipment manufacturers would simultaneously experience a drop in sales and may be unable to repay their commercial loans.

When a bank's loans are too heavily concentrated in a specific industry, it should attempt to expand its loans into other industries. In this way, if one particular industry experiences weakness (which will lead to loan defaults by firms in that industry), loans provided to other industries will be insulated from that industry's conditions. However, a bank's loan portfolio may still be subject to high credit risk even though its loans are diversified across industries.

International Diversification of Loans Many banks reduce their exposure to U.S. economic conditions by diversifying their loan portfolio internationally. They use a country risk assessment system to assess country characteristics that may influence the ability of a government or corporation to repay its debt. In particular, the country risk assessment focuses on a country's financial and political conditions. Banks are more likely to invest in countries to which they have assigned a high rating.

Diversifying loans across countries can often reduce the loan portfolio's exposure to any single economy or event. But if diversification across geographic regions means that the bank must accept loan applicants with very high risk, the bank is defeating its purpose. Furthermore, international diversification does not necessarily avoid adverse economic conditions. The credit crisis adversely affected most countries and therefore affected the ability of borrowers around the world to repay their loans.

Selling Loans Banks can eliminate loans that are causing excessive risk to their loan portfolios by selling them in the secondary market. Most loan sales enable the bank

originating the loan to continue servicing it by collecting payments and monitoring the borrower's collateral. However, the bank that originated the loan is no longer funding it, so the loan is removed from the bank's assets. Bank loans are commonly purchased by other banks and financial institutions, such as pension funds, insurance companies, and mutual funds.

Revising the Loan Portfolio in Response to Economic Conditions Banks continuously assess both the overall composition of their loan portfolios and the economic environment. As economic conditions change, so does the risk of a bank's loan portfolio. A bank is typically more willing to extend loans during strong economic conditions because businesses are more likely to meet their loan payments under those conditions. During weak economic conditions, the bank is more cautious and increases its standards, which results in a smaller amount of new loans extended to businesses. Under these conditions, the bank typically increases the credit it extends to the Treasury by purchasing more Treasury securities. Nevertheless, its loan portfolio may still be heavily exposed to economic conditions because some of the businesses that have already borrowed may be unable to repay their loans.

WEB

www.fdic.gov
Analytical assessment of the banking industry, including the recent performance of banks.

19-5 Managing Market Risk

From a bank management perspective, market risk results from changes in the value of securities due to changes in financial market conditions such as interest rate movements, exchange rate movements, and equity prices. As banks pursue new services related to the trading of securities, they have become much more susceptible to market risk. For example, some banks now provide loans to various types of investment funds, which use the borrowed funds to invest in stocks or derivative securities. Thus these loans may not be repaid if the prices of the stocks or derivative securities held by the investment funds decline substantially.

The increase in banks' exposure to market risk is also attributed to their increased participation in the trading of derivative contracts. Many banks now serve as intermediaries between firms that take positions in derivative securities and will be exchanging payments in the future. For some of these transactions, a bank serves as a guarantor to one of the parties if the counterparty in the transaction does not fulfill its payment obligation. If derivative security prices change abruptly and cause several parties involved in these transactions to default, a bank that served as a guarantor could suffer major losses. Furthermore, banks that purchase debt securities issued in developing countries are subject to abrupt losses resulting from sudden swings in the economic or currency conditions in those countries.

19-5a Measuring Market Risk

Banks commonly measure their exposure to market risk by applying the value-at-risk (VaR) method, which involves determining the largest possible loss that would occur as a result of changes in market prices based on a specified percent confidence level. To estimate this loss, the bank first determines an adverse scenario (e.g., a 20 percent decline in derivative security prices) that has a 1 percent chance of occurring. Then it estimates the impact of that scenario on its investment or loan positions given the sensitivity of investments' values to the scenario. All of the losses that would occur from the bank's existing positions are summed to determine the estimated total loss to the bank under this scenario. This estimate reflects the largest possible loss at the 99 percent confidence level, since there is only a 1-in-100 chance that such an unfavorable scenario would

occur. By determining its exposure to market risk, the bank can ensure that it has sufficient capital to cushion against the adverse effects of such an event.

Bank Revisions of Market Risk Measurements Banks continually revise their estimate of market risk in response to changes in their investment and credit positions and to changes in market conditions. When market prices become more volatile, banks recognize that market prices could change to a greater degree and typically increase their estimate of their potential losses due to market conditions.

Relationship between a Bank's Market Risk and Interest Rate Risk A bank's market risk is partially dependent on its exposure to interest rate risk. Banks give special attention to interest rate risk, because it is commonly the most important component of market risk. Moreover, many banks assess interest rate risk by itself when evaluating their positions over a longer time horizon. For example, a bank might assess interest rate risk over the next year using the methods described earlier in the chapter. In this case, the bank might use the assessment to alter the maturities on the deposits it attempts to obtain or on its uses of funds. In contrast, banks' assessment of *market* risk tends to be focused on a shorter-term horizon, such as the next month. Nevertheless, banks may still use their assessment of market risk to alter their operations, as explained next.

19-5b Methods Used to Reduce Market Risk

If a bank determines that its exposure to market risk is excessive, it can reduce its involvement in the activities that cause the high exposure. For example, the bank could reduce the amount of transactions in which it serves as guarantor for its clients or reduce its investment in foreign debt securities that are subject to adverse events in a specific region. Alternatively, it could attempt to take some trading positions to offset some of its exposure to market risk. It could also sell some of its securities that are heavily exposed to market risk.

WEB

www.fdic.gov
Statistical overview of how banks have performed in recent years.

19-6 Integrated Bank Management

Bank management of assets, liabilities, and capital is integrated. A bank's asset growth can be achieved only if it obtains the necessary funds. Furthermore, growth may require an investment in fixed assets (such as additional offices) that will require an accumulation of bank capital. Integration of asset, liability, and capital management ensures that all policies will be consistent with a cohesive set of economic forecasts. An integrated management approach is necessary to manage liquidity risk, interest rate risk, and credit risk.

19-6a Application

Assume that you are hired as a consultant by Atlanta Bank to evaluate its favorable and unfavorable aspects. Atlanta Bank's balance sheet is shown in Exhibit 19.9. A bank's balance sheet can best be evaluated by converting the actual dollar amounts of balance sheet components to a percentage of assets. This conversion enables the bank to be compared with its competitors. Exhibit 19.10 shows each balance sheet component as a percentage of total assets for Atlanta Bank (derived from Exhibit 19.9). To the right of each bank percentage is the assumed industry average percentage for a sample of banks with a similar amount of assets. For example, the bank's required reserves are 4 percent of assets (the same as the industry average), its floating-rate commercial loans are 30 percent of assets (versus an industry average of 20 percent), and so on. The same type of comparison is

Exhibit 19.9 Balance Sheet of Atlanta Bank (in Millions of Dollars)

ASSETS			LIABILITIES AND CAPITAL		
Required reserves		$400	Demand deposits		$500
Commercial loans			NOW accounts		1,200
Floating-rate	3,000		MMDAs		2,000
Fixed-rate	1,100		CDs		
Total		4,100	Short-term	1,500	
Consumer loans		2,500	From 1 to 5 years.	3,800	
Mortgages			Total		5,300
Floating-rate	500		Long-term bonds		200
Fixed-rate	None		CAPITAL		800
Total		500			
Treasury securities					
Short-term	1,000				
Long-term	None				
Total		1,000			
Corporate securities					
High-rated	None				
Medium-rated	1,000				
Total		1,000			
Municipal securities					
High-rated	None				
Medium-rated	None				
Total		None			
Fixed assets		500			
TOTAL ASSETS		$10,000	TOTAL LIABILITIES AND CAPITAL		$10,000

provided for liabilities and capital on the right side of the exhibit. A comparative analysis relative to the industry can indicate the management style of Atlanta Bank.

It is possible to evaluate the potential level of interest revenues, interest expenses, noninterest revenues, and noninterest expenses for Atlanta Bank relative to the industry. Furthermore, it is possible to assess the bank's exposure to credit risk and interest rate risk as compared to the industry.

A summary of Atlanta Bank based on the information in Exhibit 19.10 is provided in Exhibit 19.11. Although its interest expenses are expected to be above the industry average, so are its interest revenues. Thus it is difficult to determine whether Atlanta Bank's

Exhibit 19.10 Comparative Balance Sheet of Atlanta Bank

ASSETS			LIABILITIES AND CAPITAL		
	PERCENTAGE OF ASSETS FOR ATLANTA BANK	AVERAGE PERCENTAGE FOR INDUSTRY		PERCENTAGE OF TOTAL FOR ATLANTA BANK	AVERAGE PERCENTAGE FOR INDUSTRY
Required reserves	4%	4%	Demand deposits	5%	17%
Commercial loans			NOW accounts	12	8
Floating-rate	30	20	MMDAs	20	20
Fixed-rate	11	11	CDs		
Total	41	31	Short-term	15	35
Consumer loans	25	20	From 1 to 5 years	38	10
Mortgages			Long-term bonds	2	2
Floating-rate	5	7	CAPITAL	8	8
Fixed-rate	0	3			
Total	5	10			
Treasury securities					
Short-term	10	7			
Long-term	0	8			
Total	10	15			
Corporate securities					
High-rated	0	5			
Medium-rated	10	5			
Total	10	10			
Municipal securities					
High-rated	0	3			
Medium-rated	0	2			
Total	0	5			
Fixed assets	5	5			
TOTAL ASSETS	100%	100%	TOTAL LIABILITIES AND CAPITAL	100%	100%

net interest margin will be above or below the industry average. Because it is more heavily concentrated in risky loans and securities, its credit risk is higher than that of the average bank; however, its interest rate risk is less because of its relatively high concentration of medium-term CDs and floating-rate loans. A gap measurement of Atlanta

Exhibit 19.11 Evaluation of Atlanta Bank Based on Its Balance Sheet

	MAIN INFLUENTIAL COMPONENTS	EVALUATION OF ATLANTA BANK RELATIVE TO INDUSTRY
Interest expenses	All liabilities except demand deposits	Higher than industry average because it concentrates more on high-rate deposits than the norm
Noninterest expenses	Loan volume and checkable deposit volume	Possibly higher than the norm; its checkable deposit volume is less than the norm, but its loan volume is greater than the norm
Interest revenues	Volume and composition of loans and securities	Potentially higher than industry average because its assets are generally riskier than the norm
Exposure to credit risk	Volume and composition of loans and securities	Higher concentration of loans than industry average; it has a greater percentage of risky assets than the norm
Exposure to interest rate risk	Maturities on liabilities and assets; use of floating-rate loans	Lower than the industry average; it has more medium-term liabilities, fewer assets with very long maturities, and more floating-rate loans

Bank can be conducted by first identifying the rate-sensitive liabilities and assets, as follows:

RATE-SENSITIVE ASSETS	AMOUNT (IN MILLIONS)	RATE-SENSITIVE LIABILITIES	AMOUNT (IN MILLIONS)
Floating-rate loans	$3,000	NOW accounts	$1,200
Floating-rate mortgages	500	MMDAs	2,000
Short-term Treasury securities	1,000	Short-term CDs	1,500
Total	$4,500	Total	$4,700

$$\text{Gap} = \$4{,}500 \text{ million} - \$4{,}700 \text{ million}$$
$$= -\$200 \text{ million}$$

$$\text{Gap ratio} = \frac{\$4{,}500 \text{ million}}{\$4{,}700 \text{ million}}$$
$$= 0.957$$

The gap measurements suggest a similar rate sensitivity on both sides of the balance sheet.

The future performance of Atlanta Bank relative to the industry depends on future economic conditions. If interest rates rise then it will be more insulated than other banks; if interest rates fall, other banks will likely benefit to a greater degree. Under conditions of a strong economy, Atlanta Bank would likely benefit more than other banks because of its aggressive lending approach. Conversely, an economic slowdown could cause more loan defaults, and Atlanta Bank would be more susceptible to possible defaults than other banks. This could be confirmed only if more details were provided (such as a more comprehensive breakdown of the balance sheet).

Management of Bank Capital An evaluation of Atlanta Bank should also include an assessment of its capital. As with all banks, the future performance of Atlanta

Bank is influenced by the amount of capital that it holds. It needs to maintain at least the minimum capital ratio required by regulators. However, if Atlanta Bank maintains too much capital, each shareholder will receive a smaller proportion of any distributed earnings. A common measure of the return to the shareholders is the return on equity (ROE), measured as

$$\text{ROE} = \frac{\text{Net profit after taxes}}{\text{Equity}}$$

The term *equity* represents the bank's capital. The return on equity can be broken down as follows:

$$\text{ROE} = \text{Return on assets (ROA)} \times \text{Leverage measure}$$

$$\frac{\text{Net profit after taxes}}{\text{Equity}} = \frac{\text{Net profit after taxes}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

The ratio (assets/equity) is sometimes called the leverage measure because leverage reflects the volume of assets a firm supports with equity. The greater the leverage measure, the greater the amount of assets per dollar's worth of equity. The preceding breakdown of ROE is useful because it demonstrates how Atlanta Bank's capital can affect its ROE. For a given level of return on assets (ROA), a higher capital level reduces the bank's leverage measure and therefore reduces its ROE.

If Atlanta Bank is holding an excessive amount of capital, it may not need to rely on retained earnings to build its capital and so can distribute a high percentage of its earnings to shareholders (as dividends). Thus its capital management is related to its dividend policy. If Atlanta Bank is expanding, it may need more capital to support construction of new buildings, office equipment, and other expenses. In this case, it would need to retain a larger proportion of its earnings to support its expansion plans.

WEB

www.risknews.net
Links to risk-related information in international banking.

19-7 Managing Risk of International Operations

Banks that are engaged in international banking face additional types of risk, including exchange rate risk and settlement risk.

19-7a Exchange Rate Risk

When a bank providing a loan requires that the borrower repay in the currency denominating the loan, it may be able to avoid exchange rate risk. However, some international loans contain a clause that allows repayment in a foreign currency, thus allowing the borrower to avoid exchange rate risk.

In many cases, banks convert available funds (from recent deposits) to whatever currency corporations want to borrow. Thus, they create an asset denominated in that currency while the liability (deposits) is denominated in a different currency. If the liability currency appreciates against the asset currency, the bank's profit margin is reduced.

All large banks are exposed to exchange rate risk to some degree. They can attempt to hedge this risk in various ways.

EXAMPLE Cameron Bank, a U.S. bank, converts dollar deposits into a British pound (£) loan for a British corporation, which will pay £50,000 in interest per year. Cameron Bank may attempt to engage in forward contracts to sell £50,000 forward for each date when it will receive those interest payments. That is, it will search for corporations that wish to purchase £50,000 on the dates of concern. ●

In practice, a large bank will not hedge every individual transaction and instead will net out the exposure and be concerned only with net exposure. Large banks enter into several international transactions on any given day. Some reflect future cash inflows in a particular currency while others reflect cash outflows in that currency. The bank's exposure to exchange rate risk is determined by the net cash flow in each currency.

19-7b Settlement Risk

International banks that engage in large currency transactions are exposed not only to exchange rate risk as a result of their different currency positions but also to settlement risk, or the risk of a loss due to settling their transactions. For example, a bank may send its currency to another bank as part of a transaction agreement, yet it may not receive any currency from the other bank if that bank defaults before sending its payment.

The failure of a single large bank could create more losses if other banks were relying on receivables from the failed bank to make future payables of their own. Consequently, there is concern about systemic risk, or the risk that many participants will be unable to meet their obligations because they did not receive payments on obligations due to them.

Summary

- The underlying goal of bank management is to maximize the wealth of the bank's shareholders, which implies maximizing the price of the bank's stock (if the bank is publicly traded). A bank's board of directors needs to monitor bank managers to ensure that managerial decisions are intended to serve shareholders.
- Banks manage liquidity by maintaining some liquid assets such as short-term securities and ensuring easy access to funds (through the federal funds market).
- Banks measure their sensitivity to interest rate movements so that they can assess their exposure to interest rate risk. Common methods of measuring interest rate risk include gap analysis, duration analysis, and measuring the sensitivity of earnings (or stock returns) to interest rate movements.
- Banks can reduce their interest rate risk by matching the maturities of their assets and liabilities or by using floating-rate loans to create more rate sensitivity in their assets. Alternatively, they could sell financial futures contracts or engage in a swap of fixed-rate payments for floating-rate payments.
- Banks manage credit risk by carefully assessing the borrowers who apply for loans and by limiting the amount of funds they allocate toward risky loans (such as credit card loans). They also diversify their loans across borrowers of different regions and industries so that the loan portfolio is not overly susceptible to financial problems in any single region or industry.
- An evaluation of a bank includes assessment of its exposure to interest rate movements and to credit risk. This assessment can be used along with a forecast of interest rates and economic conditions to forecast the bank's future performance.

Point Counter-Point

Can Bank Failures Be Avoided?

Point No. Banks are in the business of providing credit. When economic conditions deteriorate, there will be loan defaults and some banks will not be able to survive.

Counter-Point Yes. If banks focus on providing loans to creditworthy borrowers, most loans will not default even during recessionary periods.

Who Is Correct? Use the Internet to learn more about this issue and then formulate your own opinion.

QUESTIONS AND APPLICATIONS

1. Integrating Asset and Liability Management What is accomplished when a bank integrates its liability management with its asset management?

2. Liquidity Given the liquidity advantage of holding Treasury bills, why do banks hold only a relatively small portion of their assets as T-bills?

3. Illiquidity How do banks resolve illiquidity problems?

4. Managing Interest Rate Risk If a bank expects interest rates to decrease over time, how might it alter the rate sensitivity of its assets and liabilities?

5. Rate Sensitivity List some rate-sensitive assets and some rate-insensitive assets of banks.

6. Managing Interest Rate Risk If a bank is very uncertain about future interest rates, how might it insulate its future performance from future interest rate movements?

7. Net Interest Margin What is the formula for the net interest margin? Explain why it is closely monitored by banks.

8. Managing Interest Rate Risk Assume that a bank expects to attract most of its funds through short-term CDs and would prefer to use most of its funds to provide long-term loans. How could it follow this strategy and still reduce interest rate risk?

9. Bank Exposure to Interest Rate Movements According to this chapter, have banks been able to insulate themselves against interest rate movements? Explain.

10. Gap Management What is a bank's gap, and what does it attempt to determine? Interpret a negative gap. What are some limitations of measuring a bank's gap?

11. Duration How do banks use duration analysis?

12. Measuring Interest Rate Risk Why do loans that can be prepaid on a moment's notice complicate the bank's assessment of interest rate risk?

13. Bank Management Dilemma Can a bank simultaneously maximize return and minimize default risk? If not, what can it do instead?

14. Bank Exposure to Economic Conditions As economic conditions change, how do banks adjust their asset portfolios?

15. Bank Loan Diversification In what two ways should a bank diversify its loans? Why? Is international diversification of loans a viable strategy for dealing with credit risk? Defend your answer.

16. Commercial Borrowing Do all commercial borrowers receive the same interest rate on loans?

17. Bank Dividend Policy Why might a bank retain some excess earnings rather than distribute them as dividends?

18. Managing Interest Rate Risk If a bank has more rate-sensitive liabilities than rate-sensitive assets, what will happen to its net interest margin during a period of rising interest rates? During a period of declining interest rates?

19. Floating-Rate Loans Does the use of floating-rate loans eliminate interest rate risk? Explain.

20. Managing Exchange Rate Risk Explain how banks become exposed to exchange rate risk.

Advanced Questions

21. Bank Exposure to Interest Rate Risk Oregon Bank has branches overseas that concentrate on short-term deposits in dollars and floating-rate loans in British pounds. Because it maintains rate-sensitive assets and liabilities of equal amounts, it believes it has essentially eliminated its interest rate risk. Do you agree? Explain.

22. Managing Interest Rate Risk Dakota Bank has a branch overseas with the following balance sheet characteristics: 50 percent of the liabilities are rate sensitive and denominated in Swiss francs; the remaining 50 percent of liabilities are rate insensitive and are denominated in dollars. With regard to assets, 50 percent are rate sensitive and are denominated in dollars; the remaining 50 percent of assets are rate insensitive and are denominated in Swiss francs.

a. Is the performance of this branch susceptible to interest rate movements? Explain.

b. Assume that Dakota Bank plans to replace its short-term deposits denominated in U.S. dollars with short-term deposits denominated in Swiss francs

because Swiss interest rates are currently lower than U.S. interest rates. The asset composition would not change. This strategy is intended to widen the spread between the rate earned on assets and the rate paid on liabilities. Offer your insight on how this strategy could backfire.

c. One consultant has suggested to Dakota Bank that it could avoid exchange rate risk by making loans in whatever currencies it receives as deposits. In this way, it will not have to exchange one currency for another. Offer your insight on whether there are any disadvantages to this strategy.

Interpreting Financial News

Interpret the following comments made by Wall Street analysts and portfolio managers.

a. "The bank's biggest mistake was that it did not recognize that its forecasts of a strong local real estate market and declining interest rates could be wrong."

b. "Banks still need some degree of interest rate risk to be profitable."

c. "The bank used interest rate swaps so that its spread is no longer exposed to interest rate movements. However, its loan volume and therefore its profits are still exposed to interest rate movements."

Managing in Financial Markets

Hedging with Interest Rate Swaps As a manager of Stetson Bank, you are responsible for hedging Stetson's interest rate risk. Stetson has forecasted its cost of funds as follows:

YEAR	COST OF FUNDS
1	6%
2	5%
3	7%
4	9%
5	7%

It expects to earn an average rate of 11 percent on some assets that charge a fixed interest rate over the next five years. It considers engaging in an interest rate swap in which it would swap fixed payments of 10 percent in exchange for variable-rate payments of LIBOR plus 1 percent. Assume LIBOR is expected to be consistently 1 percent above Stetson's cost of funds.

a. Determine the spread that would be earned each year if Stetson uses an interest rate swap to hedge all of its interest rate risk. Would you recommend that Stetson use an interest rate swap?

b. Although Stetson has forecasted its cost of funds, it recognizes that its forecasts may be inaccurate. Offer a method that Stetson can use to assess the potential results from using an interest rate swap while accounting for the uncertainty surrounding future interest rates.

c. The reason for Stetson's interest rate risk is that it uses some of its funds to make fixed-rate loans, as some borrowers prefer fixed rates. An alternative method of hedging interest rate risk is to use adjustable-rate loans. Would you recommend that Stetson use only adjustable-rate loans to hedge its interest rate risk? Explain.

PROBLEMS

1. Net Interest Margin Suppose a bank earns $201 million in interest revenue but pays $156 million in interest expense. It also has $800 million in earning assets. What is its net interest margin?

2. Calculating Return on Assets If a bank earns $169 million net profit after tax and has $17 billion invested in assets, what is its return on assets?

3. Calculating Return on Equity If a bank earns $75 million net profits after tax and has $7.5 billion invested in assets and $600 million equity investment, what is its return on equity?

4. Managing Risk Use the balance sheet for San Diego Bank in Exhibit A and the industry norms in Exhibit B to answer the following questions.

a. Estimate the gap and the gap ratio and determine how San Diego Bank would be affected by an increase in interest rates over time.

b. Assess San Diego's credit risk. Does it appear high or low relative to the industry? Would San Diego Bank perform better or worse than other banks during a recession?

Exhibit A Balance Sheet for San Diego Bank (in Millions of Dollars)

ASSETS			LIABILITIES AND CAPITAL		
Required reserves		$800	Demand deposits		$800
Commercial loans			NOW accounts		2,500
Floating-rate	None		MMDAs		6,000
Fixed-rate	7,000		CDs		
Total		7,000	Short-term	9,000	
Consumer loans		5,000	From 1 to 5 yrs.	None	
Mortgages			Total		9,000
Floating-rate	None		Federal funds		500
Fixed-rate	2,000		Long-term bonds		400
Total		2,000	CAPITAL		800
Treasury securities					
Short-term	None				
Long-term	1,000				
Total		1,000			
Long-term corporate securities					
High-rated	None				
Moderate-rated	2,000				
Total		2,000			
Long-term municipal securities					
High-rated	None				
Moderate-rated	1,700				
Total		1,700			
Fixed assets		500			
TOTAL ASSETS		$20,000	TOTAL LIABILITIES and CAPITAL		$20,000

Exhibit B Industry Norms in Percentage Terms

ASSETS		LIABILITIES AND CAPITAL	
Required reserves	4%	Demand deposits	17%
Commercial loans		NOW accounts	10
Floating-rate	20	MMDAs	20
Fixed-rate	11	CDs	
Total	31	Short-term	35
Consumer loans	20	From 1 to 5 yrs.	10
Mortgages		Total	45
Floating-rate	7	Long-term bonds	2
Fixed-rate	3	CAPITAL	6
Total	10		
Treasury securities			
Short-term	7		
Long-term	8		
Total	15		
Long-term corporate securities			
High-rated	5		
Moderate-rated	5		
Total	10		
Long-term municipal securities			
High-rated	3		
Moderate-rated	2		
Total	5		
Fixed assets	5		
TOTAL ASSETS	100%	TOTAL LIABILITIES and CAPITAL	100%

c. For any type of bank risk that appears to be higher than the industry, explain how the balance sheet could be restructured to reduce the risk.

5. Measuring Risk Montana Bank wants to determine the sensitivity of its stock returns to interest rate movements, based on the following information:

QUARTER	RETURN ON MONTANA'S STOCK	RETURN ON MARKET	INTEREST RATE
1	2%	3%	6.0%
2	2	2	7.5
3	−1	−2	9.0
4	0	−1	8.2
5	2	1	7.3
6	−3	−4	8.1
7	1	5	7.4
8	0	1	9.1
9	−2	0	8.2
10	1	−1	7.1
11	3	3	6.4
12	6	4	5.5

Use a regression model in which Montana's stock return is a function of the stock market return and the interest rate. Determine the relationship between the interest rate and Montana's stock return by assessing the regression coefficient applied to the interest rate. Is the sign of the coefficient positive or negative? What does it suggest about the bank's exposure to interest rate risk? Should Montana Bank be concerned about rising or declining interest rate movements in the future?

Flow of Funds Exercise

Managing Credit Risk

Recall that Carson Company relies heavily on commercial banks for loans. When the company was first established with equity funding from its owners, Carson Company could easily obtain debt financing because the financing was backed by some of the firm's assets. However, as Carson expanded, it continually relied on extra debt financing, which increased its ratio of debt to equity. Some banks were unwilling to provide more debt financing because of the risk that Carson would not be able to repay additional loans. A few banks were still willing to provide funding, but they required an extra premium to compensate for the risk.

a. Explain the difference in the willingness of banks to provide loans to Carson Company. Why is there a difference between banks when they are assessing the same information about a firm that wants to borrow funds?

b. Consider the flow of funds for a publicly traded bank that is a key lender to Carson Company. This bank received equity funding from shareholders, which it used to establish its business. It channels bank deposit funds, which are insured by the Federal Deposit Insurance Corporation (FDIC), to provide loans to Carson Company and other firms. The depositors have no idea how the bank uses their funds. Yet, the FDIC does not prevent the bank from making risky loans. So who is monitoring the bank? Do you think the bank is taking more risk than its shareholders desire? How does the FDIC discourage the bank from taking too much risk? Why might the bank ignore the FDIC's efforts to discourage excessive risk taking?

INTERNET/EXCEL EXERCISES

1. Assess the services offered by an Internet bank. Describe the types of online services offered by the bank. Do you think an Internet bank such as this offers higher or lower interest rates than a "regular" commercial bank? Why or why not?

2. Go to finance.yahoo.com/, enter the symbol BK (Bank of New York Mellon Corporation), and click on "Get Quotes." Click on "5y" just below the stock price trend to review the stock price movements over the last five years. Click on "Compare" and then on "S&P 500" in order to compare the trend of Bank of New York Mellon with the movements in the S&P stock index. Has Bank of New York Mellon Corporation performed better or worse than the index? Offer an explanation for its performance.

3. Go to finance.yahoo.com/, enter the symbol WFC (Wells Fargo Bank), and click on "Get Quotes." Retrieve stock price data at the beginning of the last 20 quarters. Then go to http://research.stlouisfed.org/fred2/ and retrieve interest rate data at the beginning of the last 20 quarters for the three-month Treasury bill. Record the data on an Excel spreadsheet. Derive the quarterly return of Wells Fargo Bank. Derive the quarterly change in the interest rate. Apply regression analysis in which the quarterly return of Wells Fargo Bank is the dependent variable and the quarterly change in the interest rate is the independent variable (see Appendix B for more information about using regression analysis). Is there a positive or negative relationship between the interest rate movement and the return of Wells Fargo Bank stock? Is the relationship significant? Offer an explanation for this relationship.

WSJ EXERCISE

Bank Management Strategies

Summarize an article in the *Wall Street Journal* that discussed a recent change in managerial strategy by a particular commercial bank. (You may wish to do an Internet search in the online version of the *Wall Street Journal* to identify an article on a commercial bank's change in strategy.) Describe the change in managerial strategy. How will the bank's balance sheet be affected by this change? How will the bank's potential return and risk be affected? What reason does the article give for the bank's decision to change its strategy?

ONLINE ARTICLES WITH REAL-WORLD EXAMPLES

Find a recent practical article available online that describes a real-world example regarding a specific financial institution or financial market that reinforces one or more concepts covered in this chapter.

If your class has an online component, your professor may ask you to post your summary of the article there and provide a link to the article so that other students can access it. If your class is live, your professor may ask you to summarize your application of the article in class. Your professor may assign specific students to complete this assignment or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real-world examples related to this chapter, consider using the following search terms (be sure to include the prevailing year as a search term to ensure that the online articles are recent):

1. [name of a specific bank] AND liquidity
2. [name of a specific bank] AND management
3. [name of a specific bank] AND interest rate risk
4. [name of a specific bank] AND credit risk
5. [name of a specific bank] AND strategy
6. bank AND management
7. bank AND strategy
8. bank AND loans
9. bank AND asset management
10. bank AND operations

20 Bank Performance

CHAPTER OBJECTIVES

The specific objectives of this chapter are to:

- identify the factors that affect the valuation of a commercial bank,
- compare the performance of banks in different size classifications over recent years, and
- explain how to evaluate the performance of a particular bank based on financial statement data.

A commercial bank's performance is examined for various reasons. Bank regulators identify banks that are experiencing severe problems so that they can be remedied. Shareholders need to determine whether they should buy or sell the stock of various banks. Investment analysts must be able to advise prospective investors on which banks to select for investment. Commercial banks also evaluate their own performance over time to determine the outcomes of previous management decisions so that changes can be made where appropriate. Without persistent monitoring of performance, existing problems can remain unnoticed and lead to financial failure in the future.

20-1 Valuation of a Commercial Bank

Commercial banks (or commercial bank units that are part of a financial conglomerate) are commonly valued by their managers as part of their efforts to monitor performance over time and to determine the proper mix of services that will maximize the bank's value. Banks may also be valued by other financial institutions that are considering an acquisition. An understanding of commercial bank valuation is useful because it identifies the factors that determine a commercial bank's value, which can be modeled as the present value of its future cash flows:

$$V = \sum_{t=1}^{n} \frac{E(CF_t)}{(1+k)^t}$$

where $E(CF_t)$ represents the expected cash flow to be generated in period t and k represents the required rate of return by investors who invest in the commercial bank. Thus, the value of a commercial bank should change in response to changes in its expected cash flows in the future and to changes in the required rate of return by investors:

$$\Delta V = f[\underbrace{\Delta E(CF)}_{+}, \underbrace{\Delta k}_{-}]$$

20-1a Factors That Affect Cash Flows

The change in a commercial bank's expected cash flows may be modeled as

$$\Delta E(CF) = f(\underbrace{\Delta ECON}_{+}, \underbrace{\Delta R_f}_{-}, \underbrace{\Delta INDUS}_{?}, \underbrace{\Delta MANAB}_{+})$$

where ECON denotes economic growth, R_f the risk-free interest rate, INDUS the prevailing bank industry conditions (including regulations and competition), and MANAB the abilities of the commercial bank's management.

Change in Economic Growth Economic growth can enhance a commercial bank's cash flows by increasing the household or business demand for loans. During periods of strong economic growth, loan demand tends to be higher, which allows commercial banks to provide more loans. Because loans tend to generate better returns to commercial banks than investment in Treasury securities or other securities, expected cash flows should be higher. Another reason cash flows may be higher is that, normally, fewer loan defaults occur during periods of strong economic growth.

Furthermore, the demand for other financial services provided by commercial banks tends to be higher during periods of strong economic growth. For example, brokerage, insurance, and financial planning services typically receive more business when economic growth is strong because households then have relatively high levels of disposable income.

Change in the Risk-Free Interest Rate Interest rate movements may be inversely related to a commercial bank's cash flows. If the risk-free interest rate decreases other market rates may also decline, which may result in a stronger demand for the commercial bank's loans. Second, commercial banks rely heavily on short-term deposits as a source of funds, and the rates paid on these deposits are typically revised in accordance with other interest rate movements. Banks' uses of funds (such as loans) also are normally sensitive to interest rate movements, but to a smaller degree. Therefore, when interest rates fall, the depository institution's cost of obtaining funds declines more than the decline in the interest earned on its loans and investments. Conversely, an increase in interest rates could reduce a commercial bank's expected cash flows because the interest paid on deposits may increase to a greater degree than the interest earned on loans and investments.

Change in Industry Conditions One of the most important industry characteristics that can affect a commercial bank's cash flows is regulation. If regulators reduce the constraints imposed on commercial banks, banks' expected cash flows should increase. For example, when regulators eliminated certain geographic constraints, commercial banks were able to expand across new regions in the United States. As regulators reduced constraints on the types of businesses that commercial banks could pursue, the banks were able to expand by offering other financial services (such as brokerage and insurance services).

Another important industry characteristic that can affect a bank's cash flows is technological innovation, which can improve efficiencies and thereby enhance cash flows. The level of competition is an additional industry characteristic that can affect cash flows, because a high level of competition may reduce the bank's volume of business or reduce the prices it can charge for its services. As regulation has been reduced, competition has intensified. Some commercial banks benefit from this competition, but others may lose some of their market share.

Management Abilities Of the four characteristics that commonly affect cash flows, the only one over which the bank has control is management abilities. It cannot dictate economic growth, interest rate movements, or regulations, but it can determine its organizational structure, and its sources and uses of funds. The managers can attempt to make internal decisions that will capitalize on the external forces (economic growth, interest rates, regulatory constraints) that the bank cannot control.

As the management skills of a commercial bank improve, so should its expected cash flows. For example, skillful managers will recognize how to revise the composition of the bank's assets and liabilities to capitalize on existing economic or regulatory conditions.

They can capitalize on economies of scale by expanding specific types of businesses and by offering a diversified set of services that accommodate specific customers. They may restructure operations and use technology in a manner that reduces expenses.

20-1b Factors That Affect the Required Rate of Return by Investors

The required rate of return by investors who invest in a commercial bank can be modeled as

$$\Delta k = f(\underbrace{\Delta R_f}_{+}, \underbrace{\Delta RP}_{+})$$

where ΔR_f represents a change in the risk-free interest rate and ΔRP a change in the bank's risk premium.

Change in the Risk-Free Rate When the risk-free rate increases, so does the return required by investors. Recall that the risk-free rate of interest is driven by inflationary expectations (INF), economic growth (ECON), the money supply (MS), and the budget deficit (DEF):

$$\Delta R_f = f(\underbrace{\Delta INF}_{+}, \underbrace{\Delta ECON}_{+}, \underbrace{\Delta MS}_{-}, \underbrace{\Delta DEF}_{+})$$

High inflation, economic growth, and a high budget deficit place upward pressure on interest rates, whereas money supply growth places downward pressure on interest rates (assuming it does not cause inflation).

Change in the Risk Premium If the risk premium on a commercial bank rises, so will the required rate of return by investors who invest in the bank. The risk premium can change in response to changes in economic growth, industry conditions, or management abilities:

$$\Delta RP = f(\underbrace{\Delta ECON}_{-}, \underbrace{\Delta INDUS}_{?}, \underbrace{\Delta MANAB}_{-})$$

High economic growth results in less risk for a commercial bank because its loans and investments in debt securities are less likely to default.

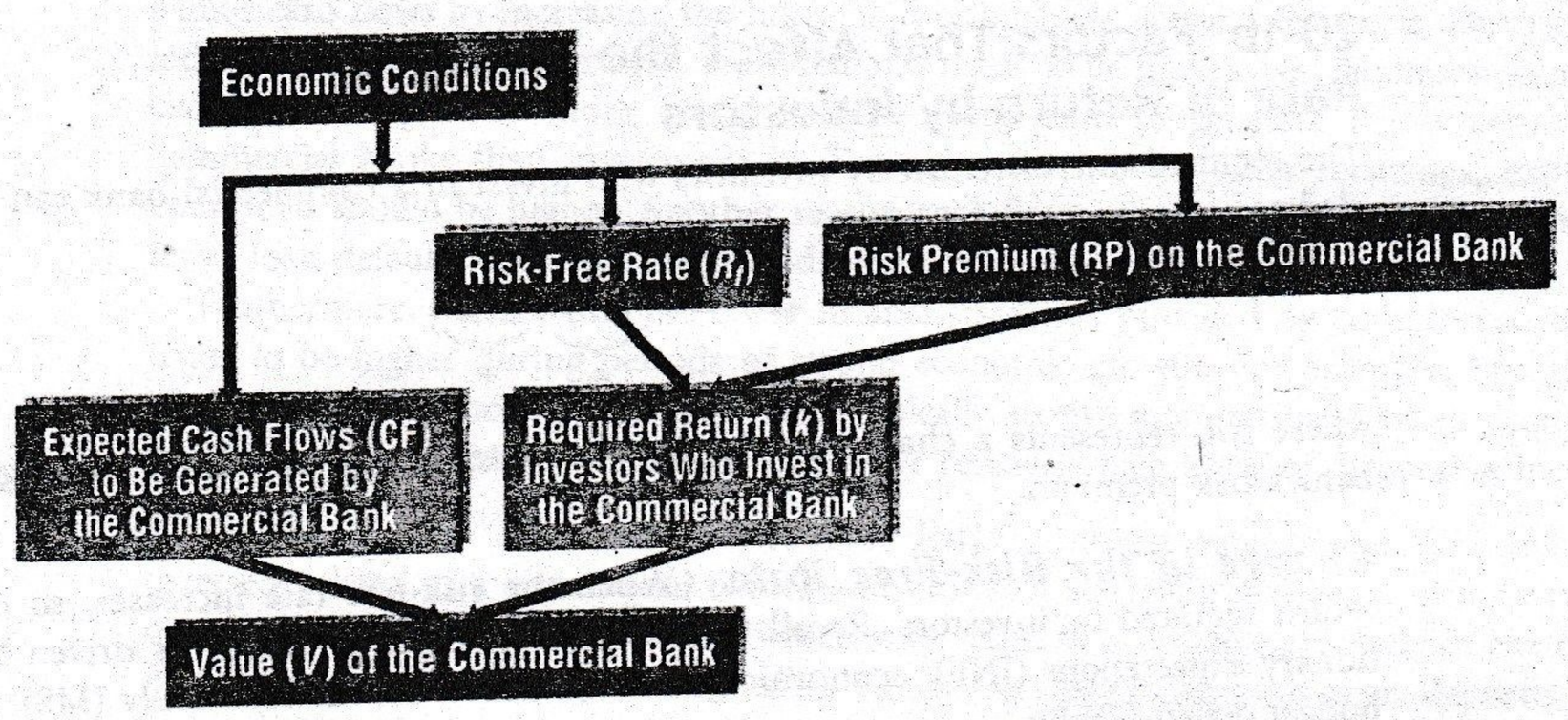
Bank industry characteristics such as regulatory constraints, technological innovations, and the level of competition can affect the risk premium on banks. Regulatory constraints may include a minimum level of capital required of banks. Capital requirements have increased recently; this change alone reduces the risk premium of banks.

Regulators have allowed commercial banks to diversify their offerings, which could reduce risk. At the same time, it may allow commercial banks to engage in some services that are riskier than their traditional services and to pursue some services that they cannot provide efficiently. Thus, the reduction in regulatory constraints could actually increase the risk premium required by investors.

An improvement in management skills may reduce the perceived risk of a commercial bank. To the extent that more skillful managers allocate funds to assets that exhibit less risk, they may reduce the risk premium required by investors who invest in the bank.

Exhibit 20.1 provides a framework for valuing commercial banks that is based on the preceding discussion. In general, the valuation is favorably affected by economic growth, lower interest rates, a reduction in regulatory constraints (assuming the bank focuses on

Exhibit 20.1 Framework for Valuing a Commercial Bank



- A stronger economy leads to an increased demand for loans (interest income) and other services provided by the commercial bank (noninterest income), fewer loan defaults, and better cash flows.
- A lower risk-free rate can enhance the valuation of bank assets that do not have an adjustable interest rate, such as some consumer and mortgage loans. It can also increase the valuations of bonds. Commercial banks that have a higher proportion of these types of assets will benefit more from a decline in the risk-free rate and will be adversely affected to a greater degree by an increase in the risk-free rate.
- The valuation is also influenced by industry conditions and the commercial bank's management (not shown in the diagram). These factors affect the risk premium (and therefore the required return by investors) and the expected cash flows to be generated by the commercial bank.

services that it can provide efficiently), and an improvement in the bank's management abilities.

20-1c Impact of the Credit Crisis on Bank Valuations

Exhibit 20.2 shows the movement in a bank equity index over time, which suggests how bank valuations overall were affected during the credit crisis. Notice the steep decline in bank valuations that occurred during the 2008–2009 recession, which is when the credit crisis was most severe. Many publicly traded banks experienced a decline in their valuation of more than 70 percent during the crisis before rebounding. The main reason for this decline was the weak economic conditions that affected bank cash flows. In addition, investors recognized that they were more susceptible to failure during that period and required higher risk premiums. The banks with weaker management abilities that were overly exposed to mortgage problems suffered more severe losses. In the 2003–2007 period just before the crisis, only 11 banks failed. However, 140 banks failed in 2009 and another 157 banks failed in 2010.

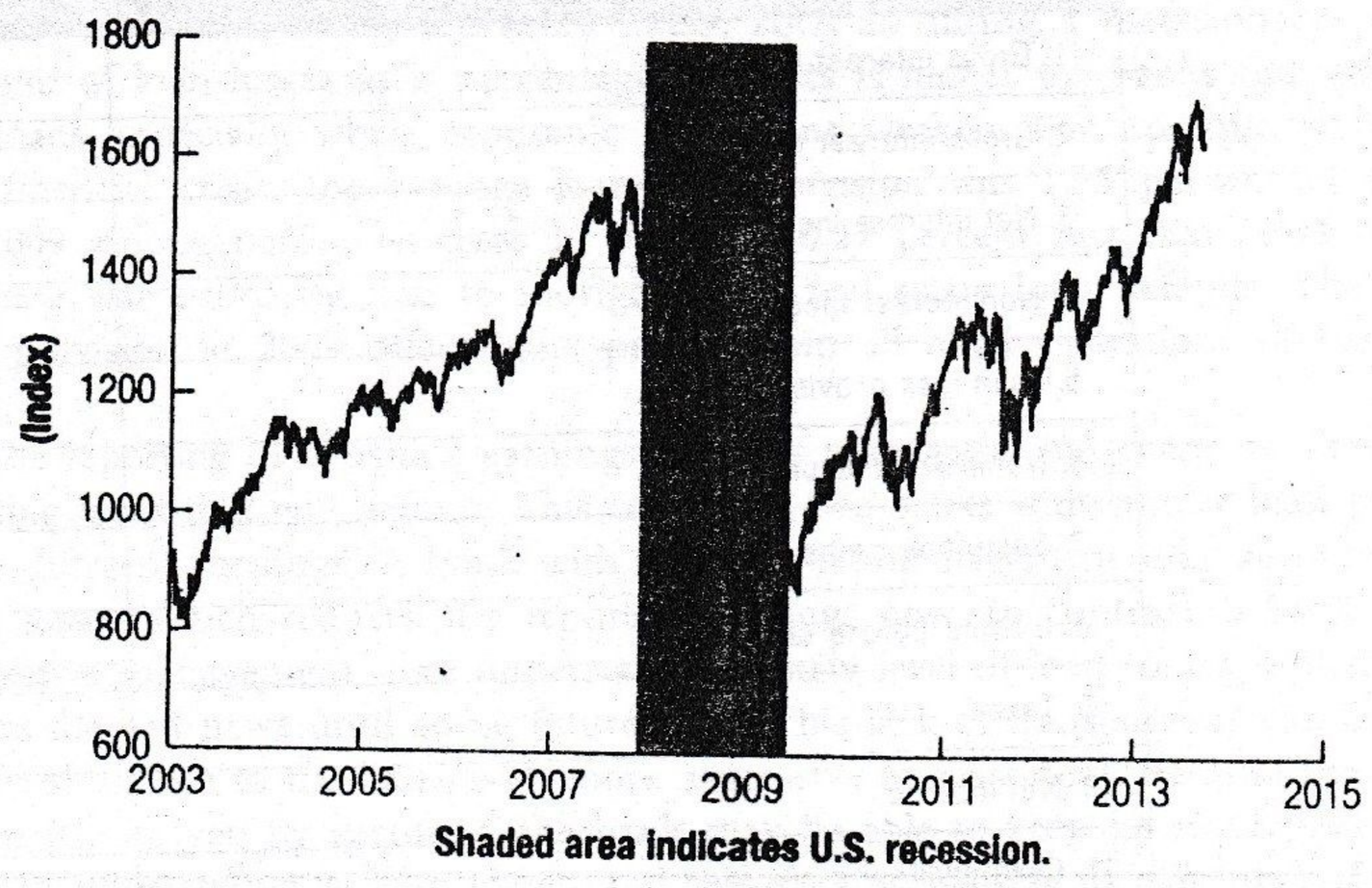
WEB

www.fdic.gov
Information about the performance of commercial banks.

20-2 Assessing Bank Performance

Exhibit 20.3 illustrates how the general performance of a bank is commonly summarized based mostly on income statement items. This summary is very basic but still offers much insight about a bank's income, expenses, and its efficiency. Each item in

Exhibit 20.2 Movements in Bank Equity Values Before and After the Financial Crisis



Source: *Federal Reserve, Standard & Poor's.*

Exhibit 20.3 is measured as a percentage of assets, which allows for easy comparison to other banks or to a set of banks within the same region. Analysts commonly compare a bank's performance with that of other banks of the same size. The Federal Reserve provides bank performance summaries for banks in four size classifications: money center banks (the 10 largest banks that serve money centers such as New York), large banks (ranked 11 to 100 in size), medium banks (ranked 101 to 1,000 in size), and small banks (ranked lower than 1,000 in size).

Measuring each item in Exhibit 20.3 as a percentage of assets also allows for an assessment of the bank's performance over time. The measurement of the dollar amount of income and expenses over time could be misleading without controlling for the change in the size (as measured by total assets) of the bank over time. A complete analysis of a bank would require the use of a bank's income statement and balance sheet. Yet Exhibit 20.3 is sufficient for identifying the key indicators of a bank's performance that deserve much attention.

The following discussion examines the items in Exhibit 20.3 in the order listed.

20-2a Interest Income and Expenses

Gross interest income (Row 1 of Exhibit 20.3) is interest income generated from all assets. It is affected by market rates and the composition of assets held by the bank. Gross interest income tends to increase when interest rates rise and to decrease when interest rates decline.

The gross interest income varies among banks of different sizes because of the rates they may charge on particular types of loans. Small banks tend to make more loans to small local businesses, which may allow them to charge higher interest rates than the money center and large banks charge on loans they provide to larger businesses. The

Exhibit 20.3 Example of Performance Summary of Canyon Bank 2012

ITEM	2013
1. Gross interest income	6.2%
2. Gross interest expenses	3.2
3. Net interest income	3.0
4. Noninterest income	2.0
5. Loan loss provision	.6
6. Noninterest expenses	3.
7. Securities gains (losses)	0.0
8. Income before tax	1.4
9. Taxes	.4
10. Net income	1.0
11. Cash dividends provided	.3
12. Retained earnings	.7

Note: All items in the exhibit are estimated as a proportion of total assets.

rates charged to larger businesses tend to be lower because those businesses generally have more options for obtaining funds than do small local businesses.

Gross interest expenses (Row 2) represent interest paid on deposits and on other borrowed funds (from the federal funds market). These expenses are affected by market rates and the composition of the bank's liabilities. Gross interest expenses will normally be higher when market interest rates are higher. The gross interest expenses will vary among banks depending on how they obtain their deposits. Banks that rely more heavily on NOW accounts, money market deposit accounts, and CDs instead of checking accounts for deposits will incur higher gross interest expenses.

Net interest income (Row 3 of Exhibit 20.3) is the difference between gross interest income and interest expenses and is measured as a percentage of assets. This measure is commonly referred to as net interest margin. It has a major effect on the bank's performance. Banks need to earn more interest income than their interest expenses in order to cover their other expenses. Yet competition prevents them from charging excessive rates (and earning excessive income). In general, the net interest margin of all banks is fairly stable over time.

20-2b Noninterest Income and Expenses

Noninterest income (Row 4 of Exhibit 20.3) results from fees charged on services provided, such as lockbox services, banker's acceptances, cashier's checks, and foreign exchange transactions. During the 1990s, banks increased their noninterest income as they offered more fee-based services. Since 2000, however, noninterest income has stabilized because of more intense competition among financial institutions offering fee-based services. Noninterest income is usually higher for money center, large, and medium banks than for small banks. This difference occurs because the larger banks tend to provide more services for which they can charge fees.

The **loan loss provision** (Row 5 of Exhibit 20.3) is a reserve account established by the bank in anticipation of loan losses in the future. It should increase during periods when loan losses are more likely, such as during a recessionary period. The amount of loan losses as a percentage of assets is higher for banks that provide riskier loans, especially when economic conditions weaken. For example, as a result of the financial crisis, the average loan loss provision was 1.95 percent of total assets in 2009 among banks, whereas it was only 0.27 percent just two years earlier. The increase was primarily due to mortgage and real estate loan defaults. The large loan loss provision in 2009 offset bank profits from all other operations of banks in that year.

The reporting of a bank's earnings requires managerial judgment on the amount of existing loans that will default. This can cause two banks with similar loan portfolios to have different earnings. A bank with conservative management may account for larger loan losses, which reduces the reported earnings now. In contrast, a bank with more aggressive management may understate the likely level of loan losses, which essentially defers the bad news until some future time. This lack of transparency can be beneficial in the short run to the bank with more aggressive management. Because the stock price is partially driven by earnings, the bank may be able to keep its stock price artificially high by understating its loan losses (and therefore overstating its earnings). If managerial compensation is tied to the bank's short-term stock price movements or earnings, managers may be tempted to understate loan losses.

Noninterest expenses (Row 6 of Exhibit 20.3) include salaries, office equipment, and other expenses not related to the payment of interest on deposits. Noninterest expenses depend partially on personnel costs associated with the credit assessment of loan applications, which in turn are affected by the bank's asset composition (proportion of funds allocated to loans). Noninterest expenses also depend on the liability composition because small deposits are more time-consuming to handle than large deposits. Banks offering more nontraditional services will incur higher noninterest expenses, although they expect to offset the higher costs with higher noninterest income.

Securities gains and losses (Row 7 of Exhibit 20.3) result from the bank's sale of securities. They are usually negligible for banks in aggregate, although an individual bank's gains or losses can be significant. During the financial crisis, securities losses were pronounced as banks in general suffered losses on their investments in mortgage-backed securities during the credit crisis.

Income before tax (Row 8 of Exhibit 20.3) is obtained by summing net interest income, noninterest income, and securities gains and then subtracting from this sum the provision for loan losses and noninterest expenses.

The key income statement item, according to many analysts, is net income (Row 10 of Exhibit 20.3), which accounts for any taxes paid. Therefore, the net income is the focus in the following section.

WEB

www.fdic.gov
Financial data provided for individual commercial banks allows their performance to be evaluated. The site also provides a quarterly outlook for the banking industry.

20-3 Evaluation of a Bank's ROA

The net income figure shown in Exhibit 20.3 is measured as a percentage of assets and therefore represents the **return on assets (ROA)**. The ROA is influenced by all previously mentioned income statement items and therefore by all policies and other factors that affect those items.

Exhibit 20.4 identifies some of the key policy decisions that influence a bank's income statement. This exhibit also identifies factors not controlled by the bank that affect the bank's income statement.

Exhibit 20.4 Influence of Bank Policies and Other Factors on a Bank's Income Statement

INCOME STATEMENT ITEM AS A PERCENTAGE OF ASSETS	BANK POLICY DECISIONS AFFECTING THE INCOME STATEMENT ITEM	UNCONTROLLABLE FACTORS AFFECTING THE INCOME STATEMENT ITEM
(1) Gross interest income	• Composition of assets • Quality of assets • Maturity and rate sensitivity of assets • Loan pricing policy	• Economic conditions • Market interest rate movements
(2) Gross interest expenses	• Composition of liabilities • Maturities and rate sensitivity of liabilities	• Market interest rate movements
(3) Net interest income = (1) − (2)		
(4) Noninterest income	• Service charges • Nontraditional activities	• Regulatory provisions
(5) Noninterest expenses	• Composition of assets • Composition of liabilities • Nontraditional activities • Efficiency of personnel • Costs of office space and equipment • Marketing costs • Other costs	• Inflation
(6) Loan losses	• Composition of assets • Quality of assets • Collection department capabilities	• Economic conditions • Market interest rate movements
(7) Pretax return on assets = (3) + (4) − (5) − (6)		
(8) Taxes	• Tax planning	• Tax laws
(9) After-tax return on assets = (7) − (8)		
(10) Financial leverage, measured here as (assets/equity)	• Capital structure policies	• Capital structure regulations
(11) Return on equity = (9) × (10)		

20-3a Reasons for a Low ROA

The ROA will usually reveal when a bank's performance is not up to par, but it does not indicate the reason for the poor performance. Therefore, its components must be evaluated separately. Exhibit 20.5 identifies the factors that affect bank performance as measured by ROA and ROE. If a bank's ROA is less than desired, the bank is possibly incurring excessive interest expenses. Banks typically know what deposit rate is necessary to attract deposits and therefore are not likely to pay excessive interest. Yet if all a bank's sources of funds require a market-determined rate, the bank will face relatively high interest expenses. A relatively low ROA could also be due to low interest received on loans and securities because the bank has been overly conservative with its funds or was locked into fixed rates prior to an increase in market interest rates. High interest expenses and/or low interest revenues (on a relative basis) will reduce the net interest margin and thereby reduce ROA.

Exhibit 20.5 Breakdown of Performance Measures

MEASURES OF BANK PERFORMANCE	FINANCIAL CHARACTERISTICS INFLUENCING PERFORMANCE	BANK DECISIONS AFFECTING FINANCIAL CHARACTERISTICS
(1) Return on assets (ROA)	Net interest margin	Deposit rate decisions Loan rate decisions Loan losses
	Noninterest revenues	Bank services offered
	Noninterest expenses	Overhead requirements Efficiency Advertising
	Loan losses	Risk level of loans provided
(2) Return on equity (ROE)	ROA Leverage measure	Same as for ROA Capital structure decision

A relatively low ROA may also result from insufficient noninterest income. Some banks have made a much greater effort than others to offer services that generate fee (noninterest) income. Because a bank's net interest margin is dictated in part by interest rate trends and balance sheet composition, many banks attempt to focus on noninterest income to boost their ROA.

A bank's ROA can also be damaged by heavy loan losses. However, if the bank is too conservative in attempting to avoid loan losses then its net interest margin will be low (because of the low interest rates received from very safe loans and investments). Because of the obvious trade-off here, banks generally attempt to shift their risk–return preferences according to economic conditions. They may increase their concentration of relatively risky loans during periods of prosperity, when they can improve their net interest margin without incurring excessive loan losses. Conversely, they may increase their concentration of relatively low-risk (and low-return) investments when economic conditions are less favorable.

A low ROA may also be attributed to excessive noninterest expenses, such as overhead and advertising expenses. Any waste of resources due to inefficiencies can lead to relatively high noninterest expenses.

20-3b Converting ROA to ROE

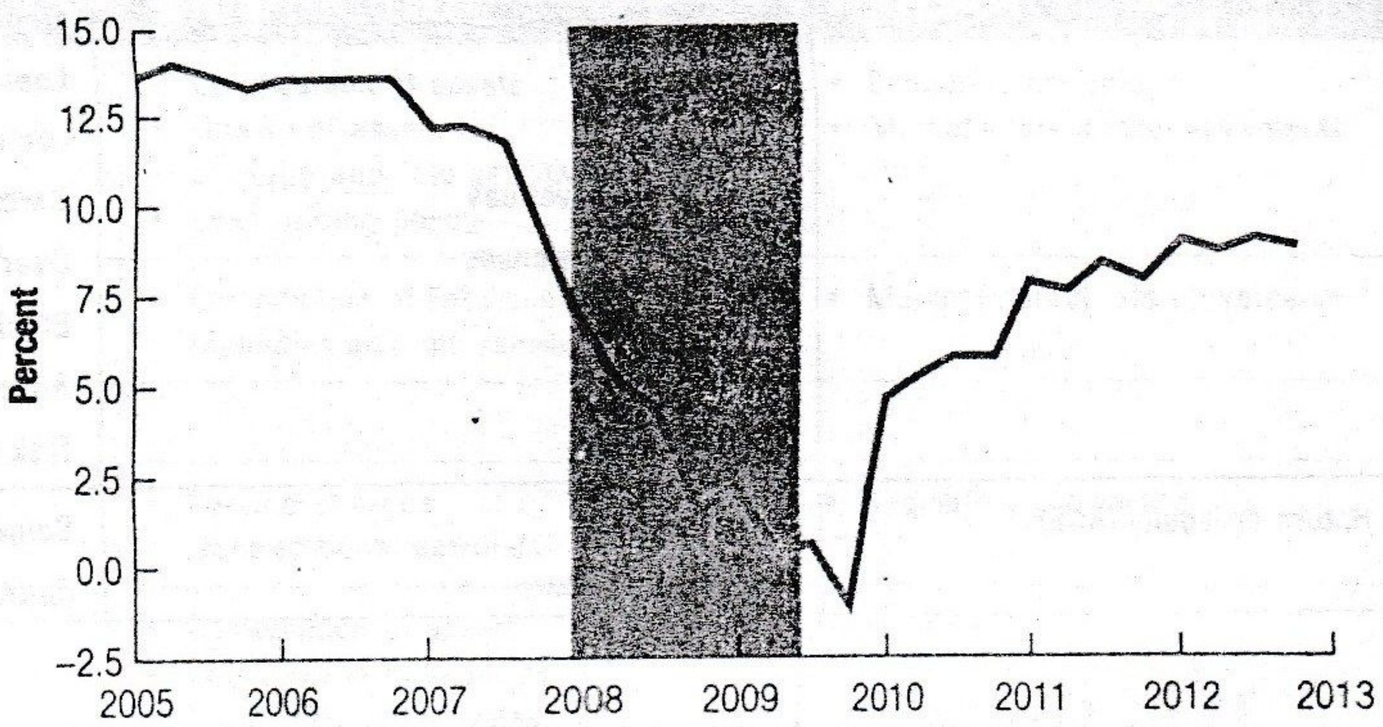
An alternative measure of overall bank performance is return on equity (ROE). A bank's ROE is affected by the same income statement items that affect ROA but also by the bank's degree of financial leverage:

$$\text{ROE} = \text{ROA} \times \text{Leverage measure}$$

$$\frac{\text{Net income}}{\text{Equity capital}} = \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Equity capital}}$$

The leverage measure is simply the inverse of the capital ratio (when only equity counts as capital). The higher the capital ratio, the lower the leverage measure and the lower the degree of financial leverage. For a given positive level of ROA, a bank's ROE will be higher if it uses more financial leverage.

Exhibit 20.6 Average ROE among Banks Over Time



Source: *Federal Reserve and Federal Financial Institutions Examination Council.*

Exhibit 20.6 shows the average annualized return on equity among banks over tim The ROE was relatively high during the 2005–2007 period when the U.S. economy w expanding. However, it declined substantially during the financial crisis, even reaching negative levels in 2009, and gradually increased over time as the effects of the crisis subsided.

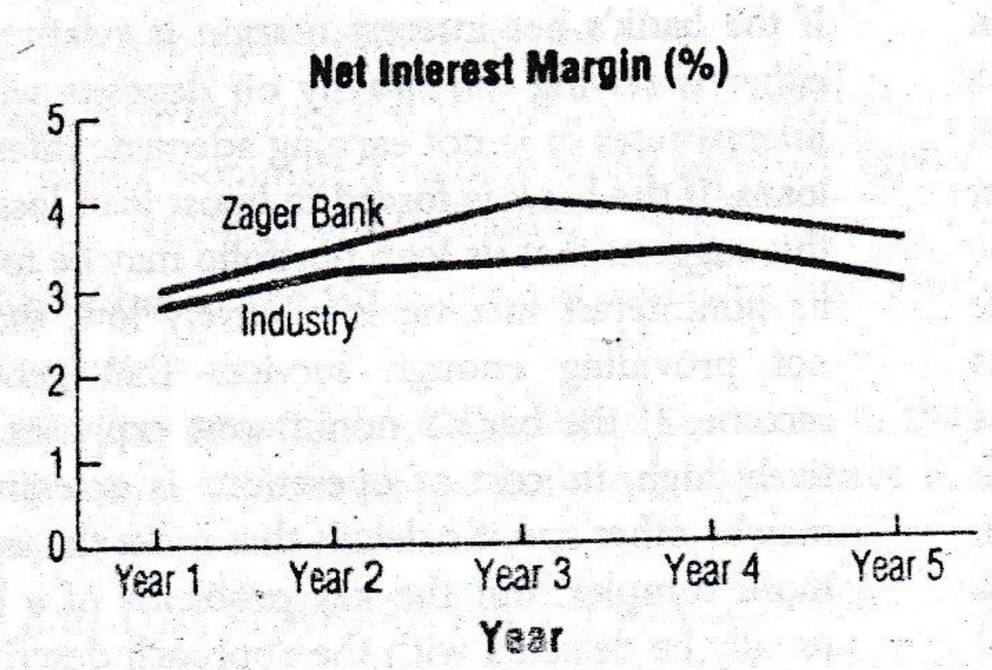
20-3c Application

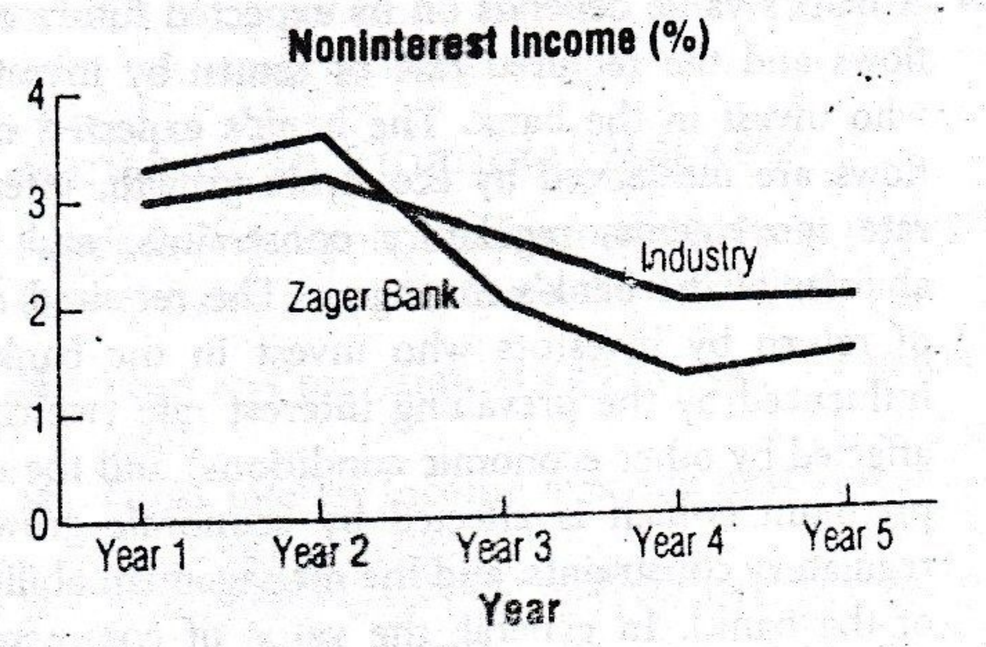
Consider the performance characteristics for Zager Bank and the industry in Exhibit 20.7 over the last five years. The years in the exhibit are labeled Year 1 through Year 5, whereby Year 5 just ended. Because of differences in accounting procedures, the information may not be perfectly comparable. Since Zager Bank is a medium-sized bank, it is compared here to other medium-sized banks.

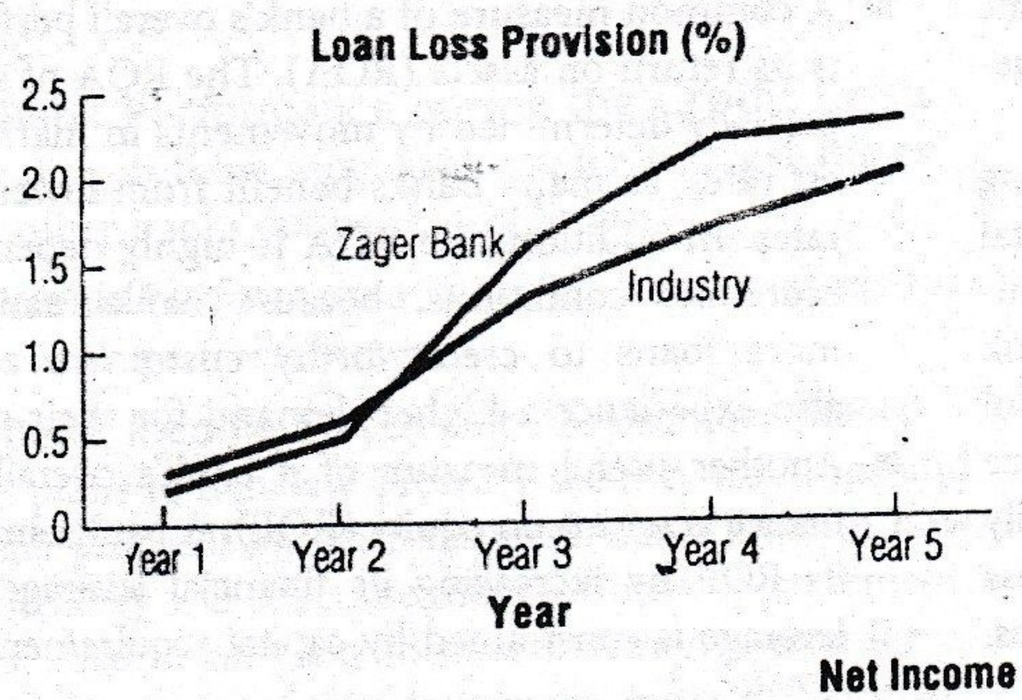
Zager Bank has used an aggressive management style of providing loans to borrowers that might be viewed as risky given their limited collateral and their cash flow situation. The bank charges high interest rates on these loans because the borrowers do not have alternative lenders. It also charges these borrowers high annual fees after providing its loans. During the strong economic conditions in Years 1 and 2, Zager's strategy was very successful. It achieved a high net interest margin and high noninterest income. The borrowers typically made their loan payments in a timely manner. However, when the economy weakened in Year 3, many of the borrowers who received loans from Zager Bank could not repay them. Furthermore, Zager was not able to extend many new loans because the demand for loans declined.

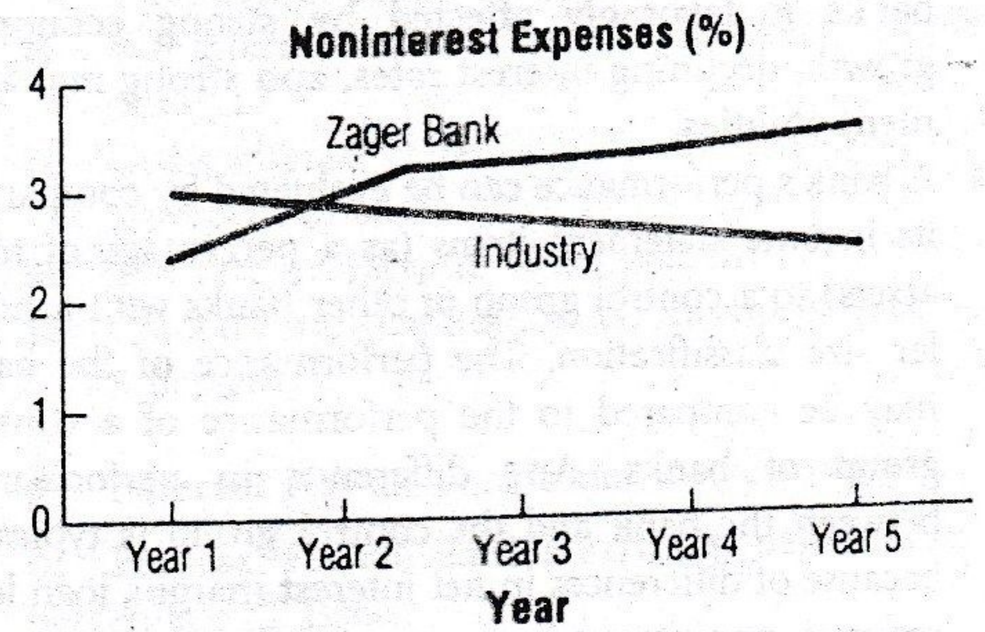
Although other banks also experienced weak performance when the economy weakened, Zager Bank experienced a more pronounced decline in performance because it had more loans that were susceptible to default. Exhibit 20.7 shows that net income declined for medium-sized banks in general during Year 3, but it actually turned negative for

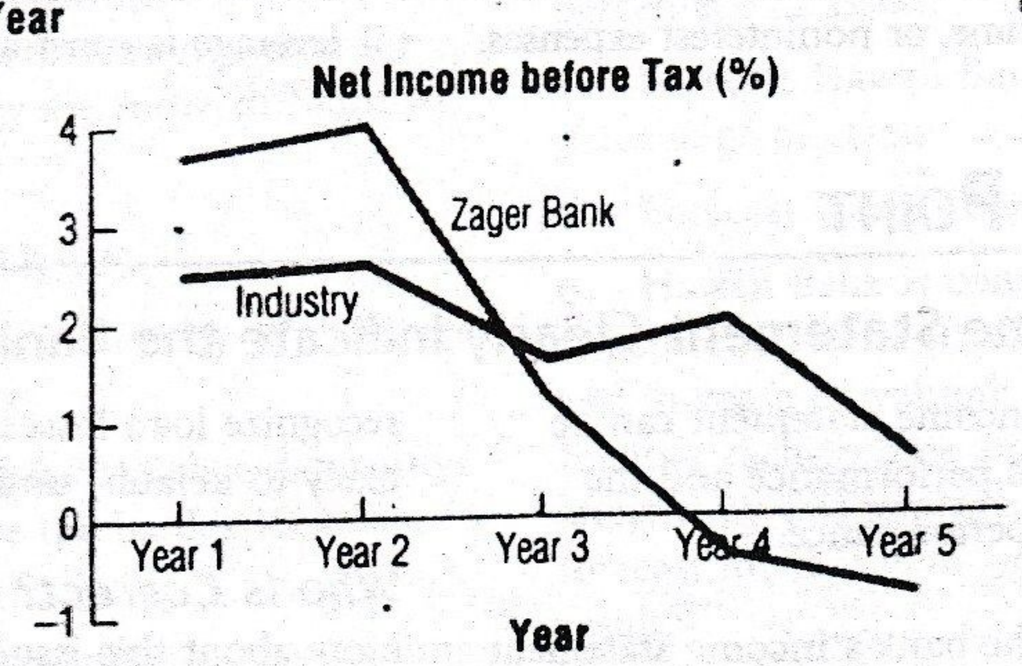
Exhibit 20.7 Comparison of Zager Bank's Expenses and Income to the Industry











Zager Bank because of its large loan losses. This example illustrates the risk–return trade-off for Zager Bank. It was rewarded for its risky strategy when the economy was strong, but it was severely penalized for that strategy when the economy was weak.

Any particular bank will perform a more thorough evaluation of itself than that shown here, including a comprehensive explanation for its performance in recent years. Investors can evaluate any particular bank's performance by conducting an analysis similar to the one described here.

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SUMMARY

- A bank's value depends on its expected future cash flows and the required rate of return by investors who invest in the bank. The bank's expected cash flows are influenced by economic growth, interest rate movements, regulatory constraints, and the abilities of the bank's managers. The required rate of return by investors who invest in the bank is influenced by the prevailing interest rate (which is affected by other economic conditions) and the risk premium (which is affected by economic growth, regulatory constraints, and the management abilities of the bank). In general, the value of commercial banks is favorably affected by strong economic growth, declining interest rates, and strong management abilities.
- A bank's performance can be evaluated by comparing its income statement items (as a percentage of total assets) to a control group of other banks with a similar size classification. The performance of the bank may be compared to the performance of a control group of banks. Any difference in performance between the bank and the control group is typically because of differences in net interest margin, loan loss reserves, noninterest income, or noninterest expenses. If the bank's net interest margin is relatively low, it either is relying too heavily on deposits with higher interest rates or is not earning adequate interest on its loans. If the bank is forced to boost loan loss reserves, this suggests that its loan portfolio may be too risky. If its noninterest income is relatively low, the bank is not providing enough services that generate fee income. If the bank's noninterest expenses are relatively high, its cost of operations is excessive. There may be other specific details that make the assessment more complex, but the key problems of a bank can usually be detected with the approach described here.
- A common measure of a bank's overall performance is its return on assets (ROA). The ROA of a bank is partially determined by movements in market interest rates, as many banks benefit from lower interest rates. In addition, the ROA is highly dependent on economic conditions, because banks can extend more loans to creditworthy customers and may also experience a higher demand for their services.
- Another useful measure of a bank's overall performance is return on equity (ROE). A bank can increase its ROE by increasing its financial leverage, but its leverage is constrained by capital requirements.

POINT COUNTER-POINT

Does a Bank's Income Statement Clearly Indicate the Bank's Performance?

Point Yes. The bank's income statement can be partitioned to determine its performance and the underlying reasons for its performance.

Counter-Point No. The bank's income statement can be manipulated because the bank may not fully recognize loan losses (will not write off loans that are likely to default) until a future period.

Who Is Correct? Use the Internet to learn more about this issue and then formulate your own opinion.

QUESTIONS AND APPLICATIONS

1. **Interest Income** How can gross interest income rise while the net interest margin remains somewhat stable for a particular bank?
2. **Impact on Income** If a bank shifts its loan policy to pursue more credit card loans, how will its net interest margin be affected?
3. **Noninterest Income** What has been the trend in noninterest income in recent years? Explain.
4. **Net Interest Margin** How could a bank generate higher income before tax (as a percentage of assets) when its net interest margin has decreased?

5. Net Interest Income Suppose the net interest income generated by a bank is equal to 1.5 percent of its assets. Based on past experience, would the bank experience a loss or a gain? Explain.

6. Noninterest Income Why have large money center banks' noninterest income levels typically been higher than those of smaller banks?

7. Bank Leverage What does the assets/equity ratio of a bank indicate?

8. Analysis of a Bank's ROA What are some of the more common reasons why a bank may experience a low ROA?

9. Loan Loss Provisions Explain why loan loss provisions of most banks could increase in a particular period.

10. Bank Performance during the Credit Crisis Why do you think some banks suffered larger losses than other banks during the credit crisis?

11. Weak Performance What are likely reasons for weak bank performance?

12. Bank Income Statement Assume that SUNY Bank plans to liquidate Treasury security holdings and use the proceeds for small business loans. Explain how this strategy will affect the different income statement items. Also identify any income statement items for which the effects of this strategy are more difficult to estimate.

Interpreting Financial News

Interpret the following comments made by Wall Street analysts and portfolio managers.

a. "The three most important factors that determine a local bank's bad debt level are the bank's location, location, and location."

b. "The bank's profitability was enhanced by its limited use of capital."

c. "Low risk is not always desirable. Our bank's risk has been too low, given the market conditions. We will restructure operations in a manner to increase risk."

Managing in Financial Markets

Forecasting Bank Performance As a manager of Hawaii Bank, you anticipate the following:

- Loan loss provision at end of year = 1 percent of assets
- Gross interest income over the next year = 9 percent of assets
- Noninterest expenses over the next year = 3 percent of assets
- Noninterest income over the next year = 1 percent of assets
- Gross interest expenses over the next year = 5 percent of assets
- Tax rate on income = 30 percent
- Capital ratio (capital/assets) at end of year = 5 percent

a. Forecast Hawaii Bank's net interest margin.

b. Forecast Hawaii Bank's earnings before taxes as a percentage of assets.

c. Forecast Hawaii Bank's earnings after taxes as a percentage of assets.

d. Forecast Hawaii Bank's return on equity.

e. Hawaii Bank is considering a shift in its asset structure to reduce its concentration of Treasury bonds and increase its volume of loans to small businesses. Identify each income statement item that would be affected by this strategy, and explain whether the forecast for that item would increase or decrease as a result.

PROBLEM

Assessing Bank Performance Select a bank whose income statement data are available. Using recent income statement information about the commercial bank, assess its performance. How does the performance of this bank compare to the performance of other banks? Compared with the other banks assessed in this chapter, is its return on equity higher or lower? What is the main reason why its ROE is different from the norm? (Is it due to its interest expenses? Its noninterest income?)

FLOW OF FUNDS EXERCISE

How the Flow of Funds Affects Bank Performance

In recent years, Carson Company has requested the services listed below from Blazo Financial, a financial conglomerate. These transactions have created a flow of funds between Carson Company and Blazo.

a. Classify each service according to how Blazo benefits from the service.

- Advising on possible targets that Carson may acquire
- Futures contract transactions
- Options contract transactions
- Interest rate derivative transactions
- Loans
- Line of credit
- Purchase of short-term CDs
- Checking account

b. Explain why Blazo's performance from providing these services to Carson Company and other firms will decline if economic growth is reduced.

c. Given the potential impact of slow economic growth on a bank's performance, do you think that commercial banks would prefer that the Fed use a restrictive monetary policy or an expansionary monetary policy?

INTERNET/EXCEL EXERCISES

1. Go to www.suntrust.com and retrieve a recent annual report of the SunTrust Bank. Use the income statement to determine SunTrust's performance. Describe SunTrust's performance in recent years.

2. Has SunTrust's ROA increased since the year before? Explain what caused its ROA to change over the last year. Has its net interest margin changed since last year? How has its noninterest income (as a percentage of assets) changed over the last year? How have its noninterest expenses changed over the last year? How have its loan loss reserves changed in the last year? Discuss how SunTrust's recent strategy and economic conditions might explain the changes in these components of its income statement.

WSJ EXERCISE

Assessing Bank Performance

Using a recent issue of the *Wall Street Journal*, summarize an article that discussed the recent performance of a particular commercial bank. Does the article suggest that the bank's performance was better or worse than the norm? What is the reason given for the performance?

ONLINE ARTICLES WITH REAL-WORLD EXAMPLES

Find a recent practical article available online that describes a real-world example regarding a specific financial institution or financial market that reinforces one or more concepts covered in this chapter.

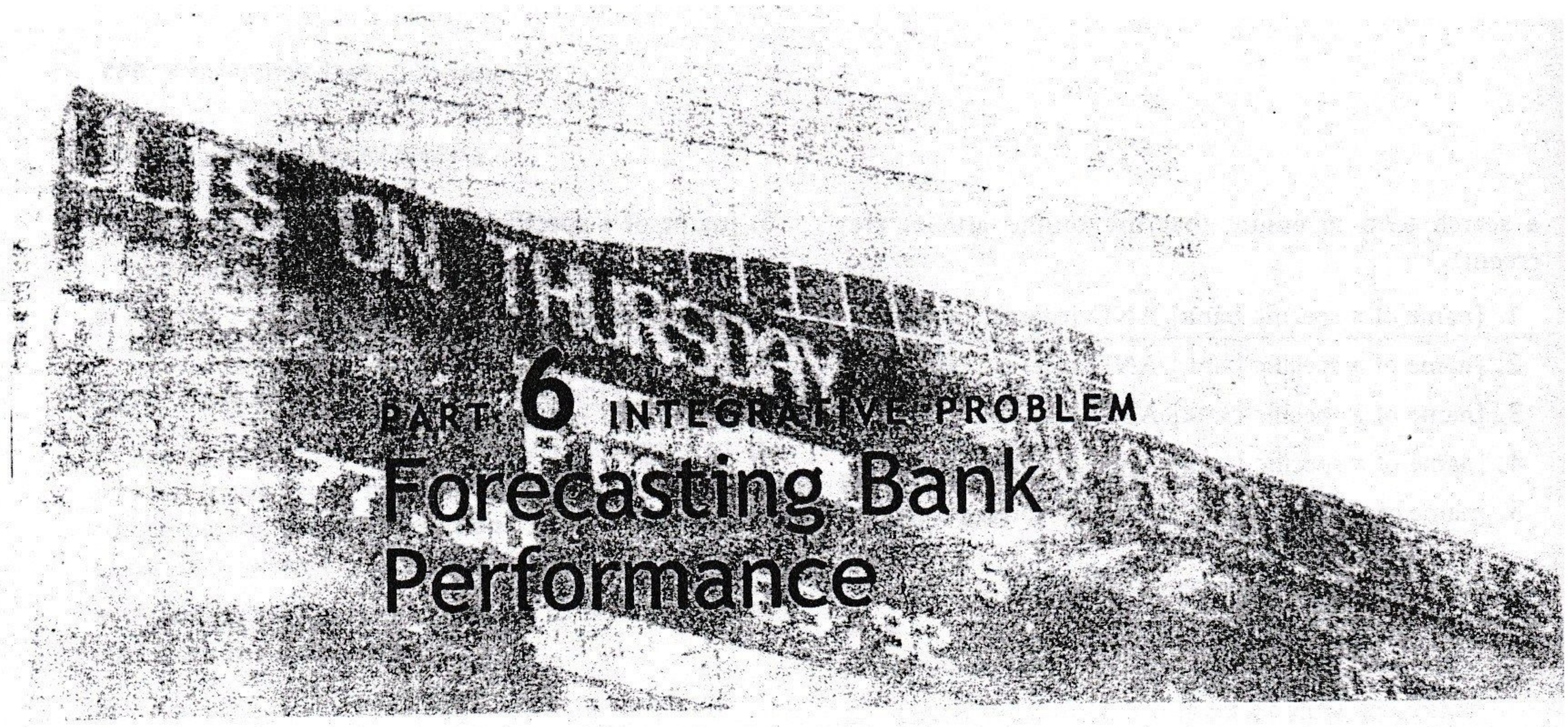
If your class has an online component, your professor may ask you to post your summary of the article there and provide a link to the article so that other students can access it.

If your class is live, your professor may ask you to summarize your application of the article in class. Your professor may assign specific students to complete this assignment or may allow any students to do the assignment on a volunteer basis.

For recent online articles and real-world examples related to this chapter, consider using the following search terms (be sure to include the prevailing year as

a search term to ensure that the online articles are recent):

1. [name of a specific bank] AND interest income
2. [name of a specific bank] AND interest expense
3. [name of a specific bank] AND loan loss
4. [name of a specific bank] AND net income
5. [name of a specific bank] AND net interest margin
6. [name of a specific bank] AND earnings
7. [name of a specific bank] AND return on equity
8. bank AND income
9. bank AND return on assets
10. bank AND net interest margin



PART 6 INTEGRATIVE PROBLEM

Forecasting Bank Performance

This problem requires an understanding of banks' sources and uses of funds (Chapter 17), bank management (Chapter 19), and bank performance (Chapter 20). It also requires the use of spreadsheet software such as Microsoft Excel. The data provided can be input onto a spreadsheet so that the necessary computations can be completed more easily. A conceptual understanding of commercial banking is needed to interpret the computations.

As an analyst of a medium-sized commercial bank, you have been asked to forecast next year's performance. In June you were provided with information about the sources and uses of funds for the upcoming year. The bank's sources of funds for the upcoming year are as follows (where NCDs are negotiable certificates of deposit):

SOURCES OF FUNDS	DOLLAR AMOUNT (IN MILLIONS)	INTEREST RATE TO BE OFFERED
Demand deposits	$5,000	0%
Time deposits	2,000	6%
1-year NCDs	3,000	T-bill rate + 1%
5-year NCDs	2,500	1-year NCD rate + 1%

The bank also has $1 billion in capital.

The bank's uses of funds for the upcoming year are as follows:

USES OF FUNDS	DOLLAR AMOUNT (IN MILLIONS)	INTEREST RATE	LOAN LOSS PERCENTAGE
Loans to small businesses	$4,000	T-bill rate + 6%	2%
Loans to large businesses	2,000	T-bill rate + 4%	1
Consumer loans	3,000	T-bill rate + 7%	4
Treasury bills	1,000	T-bill rate	0
Treasury bonds	1,500	T-bill rate + 2%	0
Corporate bonds	1,100	Treasury bond rate + 2%	0

The bank also has $900 million in fixed assets. The interest rates on loans to small and large businesses are tied to the T-bill rate and will change at the beginning of each new year. The forecasted Treasury bond rate is tied to the future T-bill rate because an upward-sloping yield curve is expected at the beginning of next year. The corporate bond rate is tied to the Treasury bond rate, allowing for a risk premium of 2 percent. Consumer loans will be provided at the beginning of next year, and interest rates will be fixed over the lifetime of the loan. The remaining time to maturity on all assets except T-bills exceeds three years. As the one-year T-bills mature, the funds are to be reinvested in new one-year T-bills (all T-bills are to be purchased at the beginning of the year). The bank's loan loss percentage reflects the percentage of bad loans. Assume that no interest will be received on these loans. In addition, assume that this percentage of loans will be accounted for as loan loss reserves (i.e., assume that they should be subtracted when determining before-tax income).

The bank has forecast its noninterest revenues to be $200 million and its noninterest expenses to be $740 million. A tax rate of 34 percent can be applied to the before-tax income in order to estimate after-tax income. The bank has developed the following probability distribution for the one-year T-bill rate at the beginning of next year:

POSSIBLE T-BILL RATE	PROBABILITY
8%	30%
9	50
10	20

Questions

1. Using the information provided, determine the probability distribution of return on assets (ROA) for next year by completing the following table:

INTEREST RATE SCENARIO (POSSIBLE T-BILL RATE)	FORECASTED ROA	PROBABILITY
8%		
9		
10		

2. Will the bank's ROA next year be higher or lower if market interest rates are higher? (Use the T-bill rate as a proxy for market interest rates.) Why? The information provided did not assume any required reserves. Explain how including required reserves would affect forecasted interest revenue, ROA, and ROE.

3. The bank is considering a strategy of attempting to attract an extra $1 billion as one-year negotiable certificates of deposit to replace $1 billion of five-year NCDs. Develop the probability distribution of ROA based on this strategy:

INTEREST RATE SCENARIO	FORECASTED ROA BASED ON THE STRATEGY OF INCREASING ONE-YEAR NCDs	PROBABILITY
8%		
9		
10		

4. Is the bank's ROA likely to be higher next year if it uses this strategy of attracting more one-year NCDs?
5. What would be an obvious concern about a strategy of using more one-year NCDs and fewer five-year NCDs beyond the next year?
6. The bank is considering a strategy of using $1 billion to offer additional loans to small businesses instead of purchasing T-bills. Using all the original assumptions provided, determine the probability distribution of ROA (assume that noninterest expenses would not be affected by this change in strategy).

INTEREST RATE SCENARIO (POSSIBLE T-BILL RATE)	FORECASTED ROA IF AN EXTRA $1 BILLION IS USED FOR LOANS TO SMALL BUSINESSES	PROBABILITY
8%		
9		
10		

7. Would the bank's ROA likely be higher or lower over the next year if it allocates the extra funds to small business loans?
8. What is the obvious risk of such a strategy beyond the next year?
9. The previous strategy of attracting more one-year NCDs could affect noninterest expenses and revenues. How would noninterest expenses be affected by this strategy of offering additional loans to small businesses? How would noninterest revenues be affected by this strategy?
10. Now assume that the bank is considering a strategy of increasing its consumer loans by $1 billion instead of using the funds for loans to small businesses. Using this information along with all the original assumptions provided, determine the probability distribution of ROA.

INTEREST RATE SCENARIO (POSSIBLE T-BILL RATE)	POSSIBLE ROA IF AN EXTRA $1 BILLION IS USED FOR CONSUMER LOANS	PROBABILITY
8%		
9		
10		

11. Other than possible changes in the economy that may affect credit risk, what key factor will determine whether this strategy is beneficial beyond one year?
12. Now assume that the bank wants to determine how its forecasted return on equity (ROE) next year would be affected by boosting its capital from $1 billion to $1.2 billion. (The extra capital would not be used to increase interest or noninterest

revenues.) Using all the original assumptions provided, complete the following table:

INTEREST RATE SCENARIO (POSSIBLE T-BILL RATE)	FORECASTED ROE IF CAPITAL = $1 BILLION	FORECASTED ROE IF CAPITAL = $1.2 BILLION	PROBABILITY
8%			
9			
10			

Briefly state how the ROE will be affected if the capital level is increased.


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