MIDOCEAN UNIVERSITY

Financial Risk Management

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PMG 633

Managing Banks (Part one)

Lecture Three

CHAPTER 2

Managing Banks

Chapter 2 builds on the first chapter and introduces bank management topics that are particularly relevant to risk management and regulation. This chapter examines bank corporate governance, the financial statements banks use to communicate their activities, the function of **asset and liability management** in banking, and how banks manage loan losses.

Chapter Outline

2.1 Balance Sheet and Income Statement
2.2 Loan Losses
2.3 Asset and Liability Management
2.4 Corporate Governance

Key Learning Points

- Banks report their assets, liabilities, and the effects of their various business transactions in financial statements. Financial statements provide a comprehensive view of performance for shareholders, depositors, **stakeholders**, and regulators.
- Banks treat performing and **nonperforming loans** differently; banks build up reserves in their financial statements to reduce the potential negative effects of nonperforming loans.

- Banks manage their assets and liabilities with the overall objective of reducing risks while maximizing returns to shareholders.
- Bank corporate governance refers to the framework banks use to manage their operations and deal with the often conflicting interests of bank stakeholders.

MANAGING BANKS

2.1 Balance Sheet and Income Statement

One responsibility that a bank's board and senior management team must fulfill is to record correctly and account for all the bank's transactions. Transactions include the bank's loans, investments, and other assets as well as deposits. These records form the underlying basis for the bank's financial statements: its balance sheet, **income statement**, statement of cash flows, and the notes to these statements. Through financial statements, a bank is able to communicate its financial position to its stakeholders and regulators. This section focuses on the balance sheet and the income statement.

- The balance sheet shows all the assets, liabilities, and equity the bank has at one particular point in time, such as at the end of a year. It is a snapshot of what the bank owns (assets) and owes (liabilities), and the difference between them, the bank's equity.
- The income statement records all the revenues (income) and costs (expenses) that the bank has encountered over a specific time period, such as one month, one quarter, or one year.

2.1.1 Bank Assets

A bank typically has cash, investments in securities and loans, real estate holdings, and other assets on its balance sheet. The majority of a bank's assets are held in either the bank's banking book or its trading book. A small proportion of the bank's assets are held in cash, either in the vault of the bank to meet immediate needs for payments and withdrawals, as reserves at the central bank, or deposited with other banks to fulfill its regulatory reserve requirements (see Chapter 1).

Figure 2.1 shows a simple balance sheet for a hypothetical bank, Bank A, a typical medium-sized bank that provides credit for commercial and industrial purposes. The bank finances its assets—the bonds it owns and the loans it underwrites—using a combination of deposits and borrowings. We will use this hypothetical balance sheet as our example throughout the remainder of this chapter.

Assets in million USD	**Amount**		**Liabilities in million USD**	**Amount**
Cash		10	Short-term deposits	300
Government bonds		100	Long-term deposits	250
			Subtotal deposits	*550*
Loans to local government, net	190		Short-term financing	200
Loans to SMEs, net	200		Long-term bonds	150
Loans to large corporations, net	500		*Subtotal other liabilities*	*350*
Total loans		*890*	Total liabilities	900
			Equity	100
Total		**1,000**	**Total**	**1,000**

FIGURE 2.1 Bank A's Balance Sheet

From a management perspective, the bank's assets are divided in two "books":

- The **trading book** includes the investments the bank has made in securities such as bonds, equities, and commodities. The trading book is chiefly exposed to market risk. Chapter 6 will discuss in further detail the risks of the various financial assets usually found in the trading book.
- The **banking book** refers to the loans the bank has made. The primary risk in the banking book is credit risk. Interest rate risk is also a major consideration when managing the bank's banking book (see Section 2.3.1). Chapters 4 and 5 will discuss in detail the risks of the various loan types that banks routinely underwrite.

Figure 2.2 below depicts the difference between the trading book and the banking book for our hypothetical bank, Bank A.

Assets in million USD	Amount	Book
Cash	10	
Government bonds	100	Trading
Loans to local government	190	
Loans to SMEs	200	Banking
Loans to large corporations	500	
Total	**1,000**	

FIGURE 2.2 Trading and Banking Books

Bank A's trading book consists of the government bonds the bank owns, and the banking book consists of three distinct portfolios: local government loans, small and medium enterprise (SME) loans, and large corporate loans. The value of the banking book equals the value of the bank's loans.

In addition, banks will usually own real estate (buildings and other premises) and machinery and equipment (computer and other technology networks) used to support operations.

2.1.2 Bank Liabilities

A bank's liabilities consist of its deposits and its borrowings. Most of a commercial bank's liabilities are the deposits made by its customers (depositors). These deposits are generally placed in either **transaction accounts** or savings accounts. Figure 2.3 shows the balance sheet with the various liabilities the bank holds.

- Transaction accounts are accounts where the depositor can withdraw the deposits on demand using checks, debit cards, or similar payment instructions. Transaction accounts usually allow a large number of withdrawals with minimal time restrictions. In exchange for the convenience of immediate access to deposits, banks pay no, or low, interest to the depositors. Checking or debit accounts are examples of transaction accounts.
- Savings accounts may limit the number of withdrawals a depositor can make over a specified period of time, and offer higher interest rates to depositors. Because access to funds in a savings account is limited and withdrawal in certain cases may be restricted by time, savings accounts are important to a bank's asset and liability management function (see Section 2.3 for more details). Examples of savings accounts are time deposits, passbook savings, and certificates of deposit.

A bank may also borrow money from other banks overnight or from its central bank for various time periods. Additionally, banks may issue bonds and other debt instruments that are publicly traded. Figure 2.3 shows Bank A's debt financing.

Liabilities in million USD	**Amount**		**Liability type**
Short-term deposits	300		Transaction deposit
Long-term deposits	250		Savings deposit
Total deposits		*550*	
Short-term financing	200		Other bank liability
Long-term bonds	150		Other bank liability
Other debt financing		*350*	
Total liabilities		**900**	

FIGURE 2.3 The Bank's Debt Financing

2.1.3 Equity

The difference between the bank's assets and liabilities equals its equity.

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

EXAMPLE

Bank A has USD 1,000 million in assets with USD 900 million in liabilities; the difference of USD 100 million is the bank's equity.

Equity represents the ownership stake of the bank's shareholders and consists of two parts:

1. **Paid-in capital**, the capital that the owners have provided to the bank
2. **Retained earnings**, all the earnings the bank has generated since its inception, less any income it returned to the owners as dividends

A bank can raise equity in two ways. First, it can sell new stock (equity) to its existing shareholders or the public. When the bank turns to the public to sell new equity in the form of shares, the process is called a **public offering**.

An alternative approach to raising equity is a **private offering**, when the bank turns to a selected group of qualified investors to raise the equity capital. The bank can also generate **net income** that is added to its existing equity capital as retained earnings. Dividends are discretionary payments from the bank to its shareholders. The bank returns part of its income to its owners through dividends. The **board of directors** usually decides whether to pay dividends.

Typically, equity consists of preferred and common stock. One of the fundamental differences between preferred and common stock is that common stock allows its owners to make decisions that affect the bank by voting, including voting for the board of directors. Owners of preferred stock generally do not have this right, which they give up in exchange for set dividend payments and priority over the common shareholders in the event the bank is liquidated. Preferred stock is considered a **hybrid security**, as it has both debt- and equity-like features. The debt-like features are the set return and the fact that preferred shareholders, in case the bank is liquidated, receive payments before the common shareholders. The equity-like features include that preferred shareholders may receive dividends that may be structured to reflect corporate profits, and the fact that if the bank is liquidated, they receive payment after the bondholders but before the common shareholders.

2.1.4 Income Statement

The income statement records the effects of the financial transactions the bank carried out over a specified time period, usually quarterly or annually. The income statement specifically shows the effect of costs on revenues. The difference between the revenues earned and the costs incurred over a set time period is called profit (or loss). In sum, profit (or loss) is the difference between the bank's income and its expenses.

The bank's greatest source of income is the difference between the interest rate the bank earns on the loans it makes and the interest rate it pays to the depositors for their deposits. This difference is called the **interest rate margin**. Banks profit only when their interest income (paid by the borrowers to the bank) is greater than interest expenses (paid by the bank to the depositors). Managing the bank's **net interest income**, the difference between interest income and interest expense, is an important function of bank management.

EXAMPLE

Using the balance sheet presented in Figure 2.1 and the bank's stated rates of return, we can calculate its net interest income. Looking at the assets (left) side of the balance sheet, we see that the USD 10 million in cash Bank A holds on hand currently earns nothing. The interest income the bank derives from the next four items and their total is shown in Figure 2.4.

Assets in million USD	Amount	Annual return	Annual interest income
Cash	10	0%	10 * 0% = 0
Government bonds	100	2%	100 * 2% = 2
Loans to local government, net[1]	190	3%	190 * 3% = 6
Loans to SMEs, net	200	5%	200 * 5% = 10
Loans to large corporations, net	500	7%	500 * 7% = 35
Total			**53**

FIGURE 2.4 The Bank's Interest Income[1]

Looking at the liabilities (right) side of the same balance sheet, the bank's interest expense comes from the first four items, and is shown in Figure 2.5.

Liabilities in million USD	Amount	Annual cost	Annual interest expense
Short-term deposits	300	1%	300 * 1% = 3
Long-term deposits	250	2%	250 * 2% = 5
Short-term financing	200	3%	200 * 3% = 6
Long-term bonds	150	4%	150 * 4% = 6
Total			**20**

Interest income	USD 53 million
– Interest expense	USD 20 million
= Net interest income	USD 33 million

FIGURE 2.5 The Bank's Interest Expense

1. For reasons of presentation simplicity, the number relating to loans to local government, net, is rounded from USD 5.7 million to USD 6.0 million.

A second major source of revenues generated by the bank comes from the various fees banks charge their customers for services provided. For example, fees are charged for opening an account, applying for a loan, arranging a payment, or receiving advice for complex financial services. Fee income is a substantial source of income. Many banks try to maintain some type of balance between the revenues they earn from interest income and fee income.

The most significant cost the bank has apart from its interest expenses is for personnel (employees). Other important costs are the cost for the premises where it operates and the physical infrastructure (computer and other networks) the bank owns.

After all costs have been deducted from the bank's revenue, the bank's earnings before taxes are calculated. Banks, like almost all other companies, pay tax on their earnings to local, state, and national governments. After the bank pays any taxes due, the remainder is the bank's net income. If the net income is negative, it is called a loss.

EXAMPLE

In building on the example above, assume Bank A generates USD 15 million in fee income but has USD 23 million in personnel and other expenses. Thus, its earnings before taxes may be calculated as:

Net interest income	USD 33 million
+ Fee income	USD 15 million
– Personnel and other expenses	USD 23 million
= Earnings before taxes	USD 25 million

These examples present a very simplified approach to calculating profits and losses. In reality, there are numerous, and often complex, tax, legal, regulatory, and other considerations that a bank, and any company, must take into account before it can calculate profit(s) or loss(es).

Banks can use their positive net income in any number of ways. As mentioned earlier, the net income can be added to the bank's already existing equity capital as retained earnings, thereby increasing the amount of the bank's equity capital, or the bank can return part of this income to its shareholders as dividends or through the repurchase of existing stock.

2.1.5 The Role of Bank's Equity

Equity plays an important role in the management of the bank. If the bank makes a loan to a borrower who defaults on the obligation, the bank will lose some of its assets, affecting the bank's equity and reducing the shareholders' stake in the bank. The depositors, who have entrusted their money for safekeeping at the bank, expect to be protected from any losses the bank suffers on its loans.

As noted in Chapter 1, the processes of financial intermediation and asset transformation are key to bank operations and are also at the core of bank risks. Underwriting, the process of evaluating a borrower's ability to repay funds to the bank, places the bank in a unique position. The bank must determine how much credit can be extended (if any) and the conditions (or terms) it must impose on the loan to decrease the possibility of loss. In addition, the bank must consider the total amount of credit risk it is willing to take across all its borrowers (see Section 2.4 on corporate governance). In fact, how well a bank succeeds in its underwriting process affects the bank's profits, financial health, and survival.

EXAMPLE

Bank A has extended many loans to SMEs, including a USD 4 million loan to XYZ Construction Inc. The bank's balance sheet, just after it makes the loan to XYZ Construction, is shown in Figure 2.6.

Assets in million USD	**Amount**		**Liabilities in million USD**	**Amount**	
Cash	10		Short-term deposits	300	
Government bonds	100		Long-term deposits	250	
			Subtotal deposits		*550*
Loans to local government, net	190		Short-term financing	200	
Loans to SMEs, net	200		Long-term bonds	150	
Loans to large corporations, net	500		*Subtotal other liabilities*		*350*
Total loans		*890*	Total liabilities	900	
			Equity		100
Total		**1,000**	**Total**		**1,000**

FIGURE 2.6 Bank A's Balance Sheet

Now, suppose that XYZ Construction is unable to repay the loan and defaults. This loan default impacts the bank in several ways:

- The bank will not receive any additional interest income from the loan. Assuming the interest rates on loans to SMEs are 5%, the bank would lose USD 200,000 in annual interest income. In the meantime, Bank A still has to pay interest to its depositors. This will reduce the net interest income of the bank.
- If Bank A cannot recover the loan it has provided to XYZ Construction, the bank loses USD 4 million, which it charges off, or removes, from its balance sheet. (Section 2.2 will discuss in greater detail how banks manage nonperforming loans.) The charge-off affects the bank's balance sheet by reducing two items:

  1. Assets by the loss of USD 4 million
  2. Equity by the loss of USD 4 million

Losses to the bank reduce first its equity. Deposits are usually insulated from these losses, as equity and other sources of capital—such as the bank's own borrowings—bear the primary impact of losses. Banks create various reserves to counterbalance some of the effects of loan losses; how these reserves work will be discussed in Section 2.2. Some countries provide deposit insurance as an additional guarantee for bank depositors, further reducing the potential risk to depositors (see Section 3.4 for more on deposit insurance).

After the USD 4 million loss, the bank's balance sheet looks like Figure 2.7, showing total assets and liabilities (plus equity) of the USD 996 million.

Assets (in USD millions)	Amount	Liabilities	Amount
Cash	10	Short-term deposits	300
Government bonds	100	Long-term deposits	250
Loans to local government, net	190	Short-term financing	200
❶ *Loans to SMEs, net*	*196*	Long-term bonds	150
Loans to large corporations, net	500	❷ *Equity*	*96*
Total	**996**	**Total**	**996**

FIGURE 2.7 Bank A's Balance Sheet after the Loss

The two effects of the loss on the balance sheet of the bank are the following:

1. The value of loans is reduced by the amount of the loss. The USD 4 million loan loss reduces the "Loans to SMEs" from USD 200 million to USD 196 million.
2. The value of equity is reduced by the amount of the loss. The USD 4 million loan loss reduces equity from USD 100 million to USD 96 million.

As in Figure 2.7, the USD 4 million loss is small in relation to all of the bank's assets, just 0.4% of assets of USD 1,000 million. It is, however, a considerable loss in relation to the bank's equity of USD 100 million. It is 4% of the capital. The bank's equity absorbs the losses the bank suffers when loans or other investments go sour. That is why banks carefully evaluate their borrowers. Should losses accumulate, the bank's equity would be in peril. Losses tend to accumulate during bad economic times, when banks are most vulnerable.

If the losses are large enough, the entire capital of the bank disappears. In practice, in this particular case, the bank can only withstand an additional USD 96 million in losses before its equity becomes zero. With USD 996 million in loans outstanding, if a little less than 1/10 of the total amount the bank lent to the customers is lost, the equity of the bank becomes zero. In practice, in most countries, a bank would be closed by the regulators before it lost all of its equity. A bank with a larger equity base is better able to absorb potential losses from nonperforming and defaulted loans and is considered more stable. In the example, 90% of the assets are financed through debt. Leverage (or gearing) is the ratio of debt to equity.

During the global financial crisis of 2007–2009, some banks suffered large losses on their loan portfolios and had to reduce the value of their capital by significant amounts. In several cases, the losses were so large that governments had to step in to support the banks.

EXAMPLE

Initially, Bank A's USD 1,000 million in assets were financed through USD 900 million in debt and USD 100 million equity. The **leverage** was 9-to-1 (9:1); each dollar of equity supported USD 10 in assets. In relation to many other businesses, banks are highly leveraged.

When compared to other businesses, banks are inherently highly leveraged. Let's revisit Bank A's balance sheet with the previous loan loss example to see how quickly bank equity can disappear when a bank has higher leverage and suffers losses. (See Figure 2.8.)

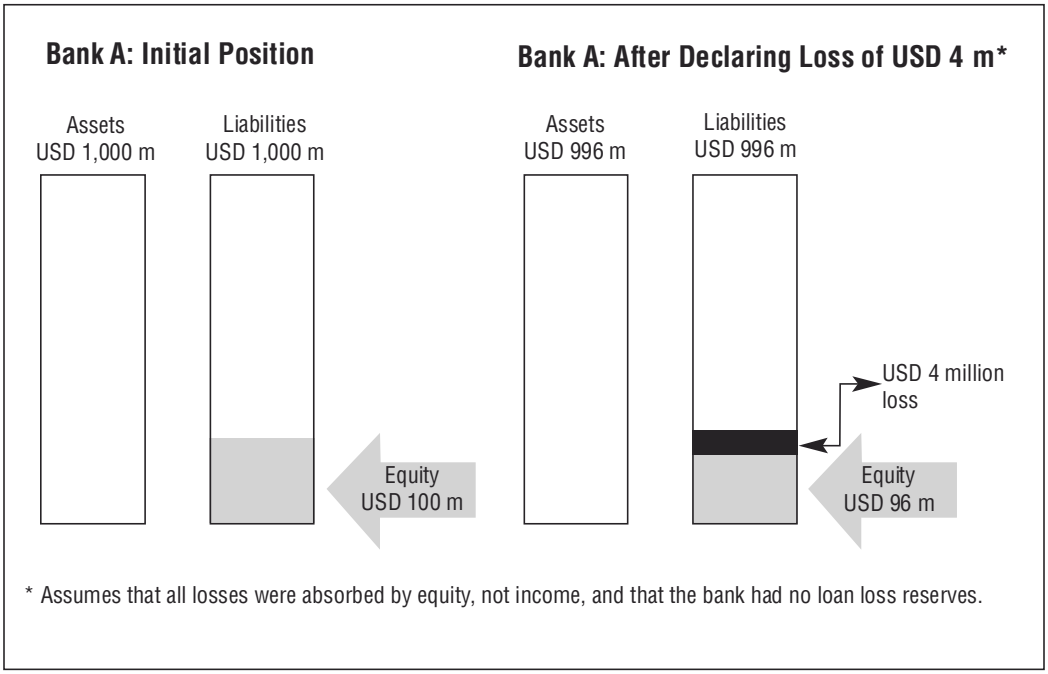

FIGURE 2.8 Effect of Losses on a Bank's Equity

EXAMPLE

Looking at the same loss of USD 4 million discussed earlier, the impact on Bank A will be far greater when leverage increases. Let us assume that instead of 9-to-1 leverage (9:1), Bank A's initial leverage was 19-to-1 (19:1). In this scenario, the bank's assets of USD 1,000 million would be financed with USD 950 million in debt and only USD 50 million in equity. Here, each dollar of equity supports USD 19 in debt (USD 950/USD 50 = USD 19). Figure 2.9 shows the combined effects of losses and smaller equity base.

Assets (in USD millions)	Amount	Liabilities	Amount
Cash	10	Short-term deposits	300
Government bonds, net	100	Long-term deposits	250
Loans to local government, net	190	Short-term financing	250
❶ *Loans to SMEs, net*	*196*	Long-term bonds	150
Loans to large corporations, net	500	❷ *Equity*	*46*
Total	**996**	**Total**	**996**

FIGURE 2.9 Simplified Balance Sheet—Smaller Equity Base or Higher Leverage

1. The value of loans is reduced by the amount of the loss. The USD 4 million loan loss reduces the "Loans to SME" from USD 200 million to USD 196 million.
2. The value of equity is reduced by the amount of the loss. The USD 4 million loan loss reduces equity from USD 50 million to USD 46 million.

Losing USD 4 million, or 0.4% of its assets in this case, reduces equity from USD 50 million to USD 46 million, but this erosion will reduce equity by 8% (USD 4/USD 50 = 8%). The bank now can only withstand an additional USD 46 million in losses before its equity becomes zero. With USD 996 million in loans outstanding, if a little less than 5% of the total amount the bank lent to the customers is lost, the equity of the bank becomes zero.

The higher the leverage, the faster the equity disappears when the bank has to take losses on loans that default. The impact that losses have on equity is why bank regulations and regulators have historically focused on the bank's equity. Regulators consider the bank's equity the core tool to motivate bank managers and owners to reduce risks and to provide a sufficient cushion against losses.

More equity and lower leverage represents the following:

- Bigger commitment by the owners, on the aggregate, to the future of the bank, as they have more of their wealth tied to the fortunes of the bank and potentially more to lose.
- Greater cushion for the bank to absorb and withstand potential losses.

In fact, over the years, both regulators and economists have found that prudently managed banks have higher capital-to-total-assets ratios and suffer losses less frequently. They have found that the amount of capital a bank must have to support its operations reduces the risks it will take and increases the likelihood that the equity of the bank is sufficient to withstand loan losses as well as liquidity pressures. In fact, contemporary banking regulation, such as the Basel Accords (described in Section 3.3), is risk based and links the riskiness of the bank's assets to its equity.

2.2 Loan Losses

Banks recognize that some of the loans they underwrite may default, and they anticipate the impact this could have on both the bank's earnings and its profits. As will be seen in later chapters, banks have developed sophisti-

cated and highly structured approaches to predict, manage, and reduce potential loan losses. Since loan losses diminish the equity capital and consequently may affect the long-term survival of the bank, banks must incorporate into their planning and budgeting processes a reasonable level of loan losses as a "cost of doing business," similar to expenses they budget for employees, office space, and equipment. For good corporate governance, a bank's board of directors should set and approve the bank's loan loss policies. That is why each year banks set aside part of their income to offset the potential impact of loan losses in a way similar to budgeting for salaries and other common expenses.

Complex rules govern the way banks are required to publicly report the assets they have in their trading and banking books. Regulators, shareholders, and other stakeholders have an interest in having high-quality, reliable, and up-to-date information on the financial position of the bank. One core concern is how well the recorded value of loans and other assets reflects their true value. This issue of asset valuation is one of the underlying reasons for the credit crisis that began in 2007.

This section discusses how banks record and value assets in their trading and banking books, and, in general, what rules they are required to follow to properly treat and value loans that do not perform. The section also describes methods to manage loan losses and the reserves that are held by the bank to deal with them.

2.2.1 Valuing Assets in the Trading Book

Assets in the trading book are usually held for sale, and their value on the balance sheet of the bank should reflect what these assets would fetch in the financial markets (Chapter 6). Thus, the value of these assets has to be **marked-to-market**; that is, their value on the balance sheet must reflect the fair market value. The **fair market value** is the price the asset would bring if sold immediately on the market to a willing buyer.

EXAMPLE

Bank A, our hypothetical bank, has purchased a **bond** for USD 1 million. As a result of severe financial turmoil, the bond dropped in value by 10%, and it can only be sold for USD 900,000. The bank's financial records must record the fair market value of the bond at USD 900,000 and not the purchase price of USD 1 million. The difference of USD 100,000 is an unrealized loss (a book loss that has not been actually incurred, as the bond has not yet been sold in the

market). The unrealized loss will reduce the bank's assets and equity at the time it is recorded. The effects of this loss are similar to the loss the bank suffers if one of its loans defaults and the ensuing loss reduces the bank's earnings.

Several months later, the financial turmoil subsided, and the price of the bond increased to USD 1,010,000. As a result of the price of the bond increasing in the market, the previous loss of USD 100,000 is erased, and both the bank's assets and equity increase in value. Although the bond can be sold for USD 1,010,000 in the market, at a gain of USD 10,000, this gain is considered an unrealized gain until the bond is sold. Most accounting rules are generally more restrictive in treating unrealized gains than unrealized losses. The bank must initially record the bond on its books at the purchase price of USD 1,000,000. The unrealized gain of USD 10,000 will have to wait for a period of time or until the bond is actually sold for that gain to be recognized in the financial statements.

2.2.2 Value of Assets in the Banking Book, Performing Loans

Assets held in the banking book, mostly loans, are usually not made available for sale. As such, they are different from assets held in the trading book that, as already noted, are usually held for sale.

Loans whose borrowers make payments as agreed are considered **performing loans**. Loans whose borrowers fail to make payments, or make delayed payments, may be considered nonperforming loans (NPLs).

In the banking book, if the loans held by the bank are not sold off to third parties, then for accounting purposes they are considered to be held until they are repaid or held to maturity. Since these assets are held long-term, changes in their value do not necessarily have to reflect their fair market value. Their value, however, does have to reflect what the bank reasonably can expect to receive from the borrower. If the bank expects the loan to be repaid in full, no adjustments are necessary.

EXAMPLE

Bank A has extended a USD 5 million, five-year loan to XYZ Construction Inc. and records the loan on its balance sheet as USD 5 million since it expects to hold the loan until the loan is fully repaid. Regardless of how well XYZ Construction performs over the next five years (absent bankruptcy or other materially adverse problems), Bank A can carry the loan on its books at that face value.

2.2.3 Value of Assets in the Banking Book, Non-performing Loans

If a bank does not expect full or partial repayment of a loan on time, it must then be classified as a nonperforming loan, and adjustments must be made to the recorded value of the loan in the bank's financial statements. The bank has to adjust the recorded value of nonperforming loans on its balance sheet so that shareholders, management, regulators, and other stakeholders can correctly assess the strength of the bank. The loan's newly recorded value must be changed to reflect the expected amount the bank can reasonably recover from the borrower. As a consequence of a borrower not repaying the loan in full, the bank must categorize the nonperforming loan as past due, written down, or charged off.

- A loan is past-due when the repayment of principal and interest is in doubt because the borrower has missed several payments to the bank or the bank has a clear indication that the borrower may not repay the loan; that is, there is doubt about the borrower's ability or willingness to pay. A **past-due loan** may eventually be fully repaid by the borrower.
- A loan is **written-down** if it is past due, and the bank has made a determination that it will not be able to recover fully the amount it has lent to the borrower. Therefore, the bank has to adjust the value of the loan in its financial statements to the value that the bank expects to recover from the borrower. The amount by which the bank reduces the value of the loan is also called the write-down.
- A loan is **charged-off** if it has been removed from the bank's financial statements because the bank believes that it will collect nothing of the loan from the borrower. A charged-off loan will reduce the bank's equity. Even though a loan may be completely charged off, the bank may continue to try to collect on it.

EXAMPLE

Due to unforeseen circumstances, XYZ Construction Inc., the borrower from the previous example, became unable to make principal and interest payments in a timely manner. XYZ Construction, a home builder, has been materially impacted by the softening real estate market and is largely incapable of selling its already-built property inventory. As a result, it has not been able to raise sufficient funds to make loan payments as scheduled.

When Bank A first received an indication that XYZ Construction would not be able to continue making its loan principal and/or interest payments on time, it flagged the loan as nonperforming or doubtful. As is true with any bank, nonperforming loans receive additional

attention from Bank A's management, as well as its regulators. Initially, the bank exercises forbearance by working with XYZ Construction and providing additional time to make the payments or, alternatively, to reduce (at least temporarily) the interest rate on the loan. Under this situation, Bank A may not have to make any adjustments to the value of the loan. If XYZ Construction Inc. is able to catch up with its payments, the loan will no longer be classified as nonperforming. However, if the forbearance does not help XYZ Construction and it is not able to catch up with the payments, Bank A will then typically decide that it is unlikely that the borrower will make all the payments it owes the bank. In that case, the bank must adjust the value of the loan recorded on its balance sheet. This can be achieved by either a write-down or through a specific provision (more about provisions in the next section).

When a loan is written down, the value of the loan is reduced to a value the bank expects to recover. For example, if Bank A believes that it can recover only 80% of the outstanding loan, it would reduce the value of the loan by 20%, or USD 1 million. The loan will then be recorded at its net value or USD 4 million, with the USD 1 million that was written down reducing the bank's assets and consequently its equity.

If the situation worsens further and it becomes more likely that XYZ Construction Inc. will be unable to repay even 80% of the USD 5 million loan, the bank will have to write down the loan even further to a value that it deems to be reasonable. If Bank A does not expect the loan to be repaid at all—due to significantly worsening economic conditions or other factors—the bank faces no other option but to charge off and remove the entire remaining loan of USD 4 million as it is recorded on the bank's balance sheet.

In this scenario, the bank charged off the loan in two steps. First, it wrote down the loan. Next, because XYZ Construction was unable to make any payments, the bank had to remove the entire loan from its balance sheet.

How a bank deals with nonperforming loans depends on the regulatory rules it operates under, how conservative the bank's risk management policies are, and the degree of prudence the bank's management exercises in its overall bank management.

Prudent management is a function of the bank's corporate governance and reflects the risk management culture promoted by the bank's board of directors and the operational structure of the bank. Very conservatively, or prudently, managed banks may aggressively charge off the entire loan as soon as the loan becomes nonperforming. Other banks may exercise a less conservative approach and delay writing down or even charging off loans for as long as they can. Although regulators provide guidance on how to treat nonperforming loans on the bank's books, some banks, particularly those that have limited financial strength, may tend to be less conservative when it comes to writing down or charging off assets and may keep them on their books at face value much longer.

Because there is discretion afforded to a bank in dealing with nonperforming assets, regulators pay a great deal of attention to how banks deal with nonperforming loans, often demanding that banks make additional write-downs. Delaying write-downs or charge-offs can easily lead to an incorrect valuation of the bank's financial condition, because the value of its loans will be overstated. Overstating the value of loans negatively affects the bank's earnings capacity and the size of its equity capital. This could hinder its ability to support operations and absorb future losses, and would be misleading to the shareholders.

2.2.4 Provision for Loan Losses and Loan Loss Reserves

As will be seen in later chapters, particularly in Chapter 5, the bank's entire underwriting process focuses on making a prediction about the borrower's likelihood of defaulting. Even though the bank thoroughly analyzes all the loans it underwrites, circumstances can change so that what was initially considered to be a good, high-quality loan becomes a nonperforming loan. Banks know this and expect a reasonable level of losses on the loans they make. To compensate for the expected loan losses, banks price their loans accordingly: the interest rate and other fees the borrower pays for the loan are calculated to compensate for the risk the lender undertakes, including the potential loan losses the bank would suffer if the borrower defaults. That is why higher-risk borrowers pay a higher interest rate to the bank.

Another approach a bank can use to manage the effect of loan losses is to create a **loan loss reserve** in its balance sheet. Through provisions in their income statements, banks set aside part of their earnings to cover the losses they expect to suffer from bad loans. The **provision for loan losses** reduces the bank's income as recorded in the income statement and creates a loan loss reserve on the balance sheet that reduces the value of the loans recorded on the bank's balance sheet. The loan loss reserve is also referred to as an "allowance for loan losses" or a "credit loss reserve."

EXAMPLE

Using the income statement example in Section 2.1.4, earnings before taxes were USD 25 million. When the bank makes a provision for loan losses, its earnings are directly reduced. If the bank decides to make a USD 2 million provision for loan losses, it reduces its earnings by the amount of the provision.

Earnings before provision for loan losses	USD 25 million
– Provision for loan losses	USD 2 million
= Earnings after provision for loan losses and before taxes	USD 23 million

Banks pay taxes on earnings after the provision for loan losses is calculated.

There is an important difference between the provision for loan losses and the loan loss reserve. *The provision for loan losses is recorded in the income statement of the bank and affects the earnings of the bank. The loan loss reserve is recorded on the balance sheet of the bank and affects the value of the bank's assets.*

During good times, banks generally perform well, experience infrequent defaults, and generate high earnings. Stability coupled with high earnings allows banks to make loan loss provisions as a part of their normal business operations to ultimately bolster the bank's loan loss reserve in anticipation of an economic downturn. Banks budget for losses on loans each year based on historical experience and business judgment. When actual loan losses start accumulating, usually during weaker economic times or recessionary environments, the loan loss reserves can be used to absorb some, if not all, of the losses the bank will suffer. Since the bank made provisions for potential losses in previous years, the loan losses will reduce the loan loss reserves first, not the earnings of the bank. Because of this, losses are not recognized in that year's income statement unless the accumulated loan loss reserves are depleted that year and additional provisions have to be made. In effect, by maintaining an appropriate loan loss reserve, the bank is able to smooth its earnings.

Regulators pay close attention to the size of the loan loss reserve, as inadequate provisions for loan losses can hurt the bank's equity capital during economic contraction, when banks need the most protection to withstand potentially sizable losses.

2.2.5 Loan Loss Reserves and Loan Losses

The loan loss reserves that a bank builds up over the years should be sufficient to offset future charge-offs the bank expects to make, but if loan loss reserves are not sufficient, then the bank needs to use its earnings to add to its reserves. If neither existing reserves nor the bank's earnings are sufficient to cover loan losses, then the bank will have to reduce the value of its equity.

EXAMPLE

1. Bank's A's balance sheet totaled USD 1,000. Its assets comprised a mixture of loans, some government bonds, and some cash. Its liabilities comprised deposits and equity.

Assets in million USD	Amount	Liabilities in million USD	Amount
Cash	10	Short-term deposits	300
Government bonds	100	Long-term deposits	250
		Subtotal deposits	*550*
Loans to local government	190	Short-term financing	200
Loans to SMEs	200	Long-term bonds	150
Loans to large corporations	500	*Subtotal other liabilities*	*350*
Total loans	*890*	Equity	100
Total	**1,000**	**Total**	**1,000**

FIGURE 2.10 Typical Bank Balance Sheet

2. One of the bank's loans to large corporations is a loan of USD 5 million to XYZ Corporation. At the end of the year, the bank judges that XYZ Corporation is unlikely to be able to repay the full USD 5 million that it owes. It thinks that USD 4 million is a more realistic estimate of what it will receive. Bank A therefore decides to create a loan loss reserve of USD 1 million against the XYZ Corporation loan.

   During the year, Bank A made a profit before provisions of USD 1 million. All of this is used to create the loan loss provision against the XYZ Corporation loan. As a result, the bank declares net profits of zero.

   After Bank A has created the USD 1 million loan loss reserve, net loans to large corporations are USD 499 million—that is, the amount that the bank expects to collect. Gross loans are still USD 500 million. The amount of total assets on the bank's balance sheet remains the same, but assets other than loans increase by USD 1 million. In our example, this USD 1 million is added to cash, increasing cash on the balance sheet to USD 11 million from USD 10 million.

   Assuming no other changes, its balance sheet now appears as follows:

Assets in million USD	**Amount**	**Liabilities in million USD**	**Amount**
Cash	11	Short-term deposits	300
Government bonds	100	Long-term deposits	250
		Subtotal deposits	*550*
Loans to local government	190		
Loans to SMEs	200	Short-term financing	200
Loans to large corporations	*500*	Long-term bonds	150
Loan loss reserve	*(1)*		
Net loans to large corporations	499		
Total loans (net)	*889*	*Subtotal other liabilities*	*350*
		Equity	100
Total	**1,000**	**Total**	**1,000**

FIGURE 2.11 Creating a Loan Loss Reserve

If the bank had not been able to use the USD 1 million in pre-provision profits to create the loan loss reserve, it would have had to reduce the value of its equity to USD 999 million: Cash would have remained at USD 10 million and net loans would have been USD 889 million, with the result that total assets would have become USD 999 million.

3. At the end of the following year, Bank A judges that XYZ Corporation's financial position has deteriorated further and that it is now realistic to expect only USD 3 million of the original USD 5 million loan to be repaid. The bank therefore decides to add another USD 1 million to its existing loan loss reserve against the XYZ Corporation loan. During this year, Bank A made pre-provision profits of USD 2 million. After deducting the USD 1 million loan loss provision, it declares a net profit of USD 1 million.

After adding the additional USD 1 million to the loan loss reserve, net loans to large corporations are USD 498 million, which is the amount that the bank now expects to collect, and gross loans are still USD 500 million.

Net assets other than loans are increased by the amount of the net profit before loan loss provisions. This increase is reflected in an increase in cash of USD 2 million. Looked at another way, retained earnings (which are part of equity) have increased by USD 1 million, reflecting the bank's net profit of USD 1 million, so liabilities and equity now equal USD 1,001 million. Assets must equal liabilities, so with net loans now at USD 498 million, cash increases to USD 13 million.[2]

2. The bank does not have to allocate its profits to cash. It could use that money to extend more loans or to buy more bonds, but in order to keep this example simple, we assume that the bank always allocates this money to cash and keeps it in cash.

Assets in million USD	Amount	Liabilities in million USD	Amount
Cash	13	Short-term deposits	300
Government bonds	100	Long-term deposits	250
		Subtotal deposits	*550*
Loans to local government	190		
Loans to SMEs	200	Short-term financing	200
Loans to large corporations	*500*	Long-term bonds	150
Loan loss reserve	*(2)*		
Net loans to large corporations	498		
Total loans (net)	*888*	*Subtotal other liabilities*	*350*
		Equity	101
Total	**1,001**	**Total**	**1,001**

FIGURE 2.12 Profits Reduced by Additional Provision

4. At the end of the next year, XYZ Corporation's financial position has deteriorated even further, and Bank A decides that it is unlikely to repay any of the USD 5 million loan. Bank A therefore decides to write off the entire loan. It already has USD 2 million in loan loss reserves, leaving USD 3 million to write off. During this year, the bank made profits before provisions of USD 2 million.

Since the bank has only USD 2 million in pre-provision profits but is making a loan loss provision of USD 3 million, it declares a net loss of USD 1 million.

Net loans to corporations are now USD 495 million, reflecting the full write-down of the USD 5 million loan. The bank has no loan loss reserves; they have all been used to write down the value of the XYZ Corporation loan. As a result, net loans are now the same as gross loans.

Cash on the balance sheet increases by USD 2 million; the bank has allocated USD 3 million from its income statement as loan loss provisions, but this has resulted in a net loss of USD 1 million. The net loss must be accounted for on the balance sheet. As a result, while net loans are reduced by USD 3 million, the net increase in assets other than loans is USD 2 million.

Assets in million USD	Amount		Liabilities in million USD	Amount
Cash		15	Short-term deposits	300
Government bonds		100	Long-term deposits	250
			Subtotal deposits	*550*
Loans to local government	190			
Loans to SMEs	200		Short-term financing	200
Loans to large corporations	*495*		Long-term bonds	150
Total loans (net)		*885*	*Subtotal other liabilities*	*350*
			Equity	100
Total		**1,000**	**Total**	**1,000**

FIGURE 2.13 Additional Loan Loss Provision Creates Net Loss

5. The following year, it turns out that XYZ's financial condition improves and it is able to repay USD 2 million to Bank A. During the year, the bank made pre-provision profits of USD 1 million (before taking account of the debt recovery from XYZ Corporation). As a result of the recovery of USD 2 million from XYZ Corporation, it declares net profits of USD 3 million. This is shown as an increase in the bank's cash of USD 3 million. Total assets therefore increase by a total of USD 3 million to USD 1,003 million. Loans to corporations remain the same at USD 495 million; the money received from XYZ Corporation does not affect the amount of loans.

Because assets now total USD 1,003 million, liabilities and equity must also total USD 1,003 million, so the bank's equity increases by USD 3 million to USD 102 million. Assets must equal liabilities, and this is reflected in an increase in cash to USD 18 million.

Assets in million USD	Amount		Liabilities in million USD	Amount
Cash		18	Short-term deposits	300
Government bonds		100	Long-term deposits	250
			Subtotal deposits	*550*
Loans to local government	190			
Loans to SMEs	200		Short-term financing	200
Loans to large corporations	*495*		Long-term bonds	150
Total loans (net)		*885*	*Subtotal other liabilities*	*350*
			Equity	103
Total		**1,003**	**Total**	**1,003**

FIGURE 2.14 Writing Back Loan Losses Increases Cash