CHAPTER 1

Functions and Forms of Banking

Chapter 1 introduces **banks** and the banking system: their roles in facilitating economic activity, and their relevant risks banks face. The three core banking functions—collecting deposits, arranging payments, and making loans—and their attendant risks are described. As this chapter intends to provide a foundation for the more detailed discussions in subsequent chapters, most of the key topics are presented within a risk management framework. A glossary is provided at the end of the book.

Chapter Outline

Key Learning Points

- Banks provide three **core banking services**: deposit collection, payment arrangement, and loan **underwriting**. Banks may also offer financial services such as cash, **asset**, and risk management.
- Banks play a central role in facilitating economic activity through three interrelated processes: **financial intermediation**, **asset transformation**, and **money creation**.

- **Retail banks** primarily serve retail customers, and **wholesale banks** primarily serve corporate customers. A country's central bank sets monetary policy on behalf of the country's government, liaises with other central banks, and may act as the bank regulator. Sometimes a body other than the central bank is responsible for the regulation of individual banks.
- The main risks that banks face are credit, market, operational, and **liquidity risks**. Other types of risk include business, and **reputational risk**. As economies, banks, and societies as a whole develop and change, the risks faced by banks may also change, and new risks may emerge.
- Multiple forces shape the banking industry, including regulation, competition, product innovation, changing technology, and the uncertainty surrounding future interest and **inflation rates**.

FUNCTIONS AND FORMS OF BANKING

1.1 Banks and Banking

To understand banking risk and regulation, it is important to understand the range of services banks provide and the key role that banks play in a modern economy.

1.1.1 Core Bank Services

Banks offer many products and services. While there is variation among banks and across regions, the core services that banks traditionally provide are:

- **Deposit collection—**the process of accepting cash or money (deposits) from individuals and businesses (depositors) for safekeeping in a bank account, available for future use.
- **Payment services—**the process of accepting and making payments on behalf of the customers using their bank accounts.
- **Loan underwriting—**the process of evaluating and deciding whether a customer (**borrower**) is eligible to receive credit and then extending a loan or credit to the customer.

As banking has evolved, the complexity of the three core banking functions has increased. For instance, in early banking, depositors received a certificate stating the amount of money they had deposited with the bank.

Later, deposit certificates could be used to make payments. Initially a cumbersome process, the concept of using deposit certificates for payments further evolved into passbooks, checks, and other methods to conveniently withdraw deposits from the bank. Today, deposits, withdrawals, and payments are instantaneous: withdrawals and payments can now be made through debit cards, and payments are easily made via electronic fund transfers (EFTs). See Figure 1.1 for examples of bank products and the services each provides.

Underwriting has many different meanings in finance and banking. This book focuses on lending or credit. Banks underwrite loans in two steps. First, the bank analyzes the borrower's financial capacity, or the borrower's ability and willingness to repay. This process will be discussed in detail in Chapter 4. Then, the bank pays out, or funds, the loan (cash or other forms of payment) to the borrower.

Services	**Examples of Bank Products**
Collecting Deposits, or Deposit Collection	■ Checking/current accounts ■ Certificates of deposit ■ Savings accounts
Arranging Payments, or Payment Services	■ Debit cards ■ Electronic banking ■ Foreign exchange ■ Checking accounts
Underwriting Loans	■ Commercial and industrial loans ■ Consumer loans ■ Real estate/mortgage loans ■ Credit cards

FIGURE 1.1 Examples of Bank Products and Core Bank Services

Providing all these core services is not enough for an institution to be called a bank in a modern economy, however. In order to provide these services, a modern bank must also hold a **banking license** and be subject to regulation and supervision by a banking regulator.

1.1.2 Banks in the Economy

Through the core bank services mentioned, banks are critical facilitators of economic activity.

- Banks channel savings from depositors to borrowers, an activity known as financial intermediation.
- Banks create loans from deposits through asset transformation.
- Banks, through financial intermediation and asset transformation, engage in money creation.

When a bank accepts deposits, the depositor in effect lends money to the bank. In exchange, the depositor receives interest payments on the deposits. The bank then uses the deposits to finance loans to borrowers and generates income by charging interest on the loans. The difference between the interest that the bank receives from the borrowers and the interest it pays to the depositors is the main source of revenue and profit to the bank.

When underwriting a loan, a bank evaluates the credit quality of the borrower—the likelihood that the borrower will repay the loan. However, depositors, who lend money to the bank in the form of deposits, typically do not evaluate the credit quality of the bank or the bank's ability to repay the deposits on demand. Depositors assume that their deposits with the bank are safe and will be returned in full by the bank "on demand." This puts depositors at risk because, as we will see in later sections, banks occasionally do fail and are not able to repay deposits in full (Section 3.1). To protect depositors against bank failures, governments have created safety nets such as **deposit insurance** (Section 3.4). These safety nets vary from country to country and generally do not provide unlimited protection, thus leaving a certain percentage of deposits exposed to the risk that a bank will **default** and the depositors will not be able to receive their deposits in full.

By collecting funds in the form of deposits and then loaning these funds out, banks engage in financial intermediation. Throughout the world, bank loans are the predominant source of financing for individuals and companies. Other financial intermediaries such as finance companies and the financial markets (such as stock or bond markets) also channel savings and investments. Unlike other financial intermediaries, though, banks alone channel deposits from depositors to borrowers. Hence, banks are also called depository financial intermediaries.

Financial intermediation emphasizes the qualitative differences between bank deposits and bank loans. Bank deposits (e.g., **savings accounts**, checking accounts) are typically relatively small, consisting of money entrusted to

the bank by individuals, companies, and other organizations for safekeeping. Deposits are also comparatively safe and can typically be withdrawn at any time or have relatively short maturities. By contrast, bank loans (e.g., home mortgage loans, car loans, corporate loans) are generally larger and riskier than deposits and have repayment schedules typically extending over several years. The process of creating a new asset (loan) from **liabilities** (deposits) with different characteristics is called asset transformation (see Figure 1.2).

FIGURE 1.2 Asset Transformation

1.1.3 Money Creation

Banks earn revenues from the financial intermediation/asset transformation process by converting customer deposits into loans. To be profitable, however, the **interest rates** that the bank earns on its loans must be greater than the rate it pays on the deposits that finance them. Since the majority of deposits can be withdrawn at any time, banks must balance the goal of higher revenues (investing more of the deposits to finance loans) with the need to have cash on hand to meet the withdrawal requests of depositors. To do this, banks "reserve" a relatively small fraction of their deposit funds to meet depositor demand. Banking regulators determine the **reserve requirements**, the proportion of deposits a bank must keep as reserves in the vault

of the bank. Keeping only a small fraction of the depositors' funds available for withdrawal is called **fractional reserve banking.** This system allows banks to create money.

Money creation is the process of generating additional money by repeatedly lending, through the fractional reserve banking system, an original deposit to a bank.

EXAMPLE

Suppose Bank A has collected deposits totaling USD 100 and retains 10% of those deposits as reserves to meet withdrawals. Bank A uses the remaining 90%, or USD 90, for lending purposes. Suppose the USD 90 is lent to one person, who then spends all the funds at one store. This USD 90 is effectively "new" money. The store then deposits the USD 90 in Bank B. At that point there are deposits in the two banks of USD 190 (the initial deposit of USD 100 plus the new deposit of USD 90). Bank B now sets aside 10% of the USD 90, or USD 9, in reserves, and loans the remaining USD 81, which is then deposited by the borrower in Bank C. There is now USD 100 + USD 90 + USD 81, or USD 271 of deposits in the three banks. As this process continues, more deposits are loaned out and spent and more money is deposited; at each turn, more and more money is made available through the lending process.

Figure 1.3 below shows the amount of money that an initial USD 100 deposit generates, assuming a 10% reserve requirement, transaction by transaction. (The dark shading is the reserve requirement held back from each loan (10%), and the lighter gray shading is each successive loan amount). Over the course of 21 separate transactions, USD 801 of deposits is generated, from an initial deposit of only USD 100. Allowed to continue indefinitely, this process would generate a total of USD 1,000 in deposits—the original USD 100 deposit plus USD 900 created through subsequent loans.

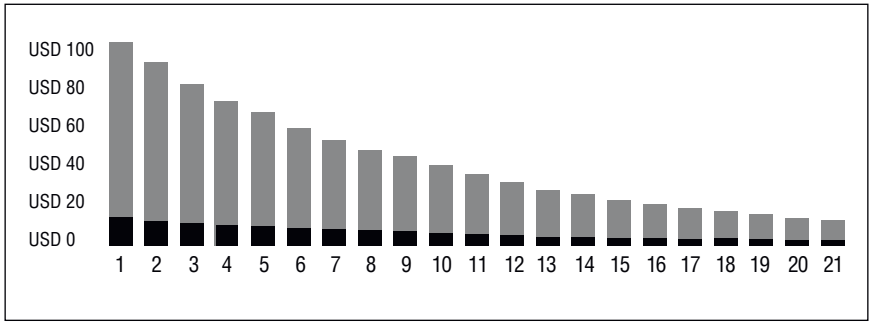

FIGURE 1.3 Money Creation (USD 801 in New Lending from Initial USD 100 Deposit)

In the example, the cycle started with an initial deposit of USD 100; no additional money was put into the system. Portions of the original USD 100 repeatedly flowed through the system, increasing both bank deposits and bank loans. The amount of money created at each deposit is 90% of the previous step (100% less the 10% held in reserve).

Reserve requirements limit how much money an initial deposit can create in the fractional reserve banking system. The **money multiplier**, the inverse of the reserve requirement, is a formula used to determine how much new money each unit of currency can create. As the following example shows, the higher the reserve requirement, the more the bank must keep as regulatory reserves in the vault of the bank and the less money the bank can create.

EXAMPLE

With a reserve requirement of 10%, the money multiplier is 10 (1/10% = 10). Thus, the amount of money that can be created on a USD 100 deposit is USD 1,000. Out of USD 1,000, USD 900 (or 90%) is new money and USD 100 (or 10%) is the original deposit.

With a reserve requirement of 20%, the money multiplier falls to 5 (1/20% = 5). Thus, the amount of money that can be created on a USD 100 deposit would be USD 500. Out of this USD 500, USD 400 (or 80%) is new money and USD 100 (or 20%) is the original deposit.

Globally, banks represent the largest source of financing for businesses and are therefore critical to economic development. Banks provide financing directly, by extending loans and buying **bonds**, and they also help companies secure financing by arranging for others to lend them money or invest in their bonds. Banks can also help companies secure financing by arranging share issues for them or even taking direct ownership stakes in them. Debt and equity are the two types of financing and two sources of capital.

Banks also provide financing for consumers, who use bank loans to purchase and finance assets they might not otherwise be able to afford, such as a car or a house. Credit cards, another type of bank loan, provide consumers with convenient access to credit that enables them to make purchases and can also stimulate economic growth. Chapter 4 will discuss in greater detail the various loan products and how they are used. Through their core functions—financial intermediation, asset transformation, and money creation—banks play a central role in advanced economies.

EXAMPLE

The global financial crisis of 2007–2009 vividly showed the interrelationship between bank functions and economic activity. Because banks were unable to collect on loans that were made to low credit quality borrowers called subprime borrowers, banks became unable to recirculate deposits and lend to other parties. This in turn meant there was less credit available for the use of companies and individuals who depend on bank loans to finance their purchases. Consequently, the companies and individuals made fewer deposits, creating less money. The effects were widely felt around the world and led to a substantial reduction in credit, which first led to a reduction in the demand for goods and services and further reduced the amount of money being deposited at banks. This caused an even further tightening of credit availability, which was one of a number of different causes and consequences related to the financial crisis.

1.1.4 Payment Services

Depositors can use their deposit accounts at banks to make and receive payments between depositors and between banks. Payments refer to the settlement of financial transactions between parties and usually involve the transfer of funds between the parties. There are various **payment systems** that facilitate transfer of funds for transactions, including checks, payment orders, bill payment, and electronic payments in the form of wire services and other electronic settlement systems. Payment systems can also help large corporations and government organizations handle their payments for goods and services.

Apart from settlement for payments, banks can also offer payment services by providing their customers with foreign currencies to make international payments. In arranging international payments, banks facilitate international transactions by, on one hand, offering facilities that enable the creation of payment documents that foreign banks accept and, on the other hand, by accepting payment documents that foreign banks have issued. By using international payment networks between banks, banks can also send payments according to their customers' requests.

1.1.5 Other Banking Services

Apart from its core services, a bank usually offers other financial services, sometimes in competition with nonbank financial service providers that typically include finance companies, brokerage firms, risk management consultants, and insurance companies. Banks and the companies offering these services typically receive fees, or "fee income," for providing these services.

Fee income is the second main source of revenue to banks after the interest the bank receives from its borrowers. Other banking services may include:

- ***Cash management.*** As a part of their core deposit collection and arranging payments function, banks provide cash or treasury management services to large corporations. In general, this service means the bank agrees to handle cash collection and payments for a company and invest any temporary cash surplus.
- ***Investment- and securities-related activities.*** Many bank customers demand investment products—such as mutual funds, unit trusts, and annuities—that offer higher returns, with higher associated risks, than bank deposits. Historically, customers have turned to nonbanks for these investment products. Today, however, most banks offer them in an effort to maintain customer relationships.

  Banks also offer other securities-related activities, including brokerage and investment banking services. **Brokerage services** involve the buying and selling of securities (e.g., stocks and bonds) on behalf of customers. **Investment banking** services include advising commercial customers on mergers and acquisitions, as well as offering a broad range of financing options, including direct investment in the companies themselves.
- ***Derivatives trading.*** **Derivatives** such as **swaps**, options, forwards, and futures are financial instruments whose value is "derived" from the intrinsic value and/or change in value of another financial or physical asset, such as bonds, stocks, or commodities such as gold or oil. Derivative transactions help institutions manage various types of risks, such as foreign exchange, interest rate, commodity price, equity price, and credit **default risks**. Derivatives and their use are discussed in Chapter 6.
- ***Loan commitments.*** Banks receive a flat fee for extending a loan commitment of a certain amount of funds for a period of time, regardless of whether the full amount is drawn down by the borrower. When the borrower uses the loan commitment, either in full or in part, the used portion of the commitment is recorded on the bank's balance sheet. The unused portion remains off its balance sheet.
- ***Letters of credit.*** When a bank provides a **letter of credit**, it guarantees a payment (up to the amount specified in the letter of credit) on behalf of its customer and receives a fee for providing this guarantee.
- ***Insurance services.*** Many banks, particularly those outside the United States, offer insurance products to broaden their customer base. Insurance services are a logical progression for banks since insurance products have financial intermediation and asset transformation features similar to traditional bank products. Life insurance policies, for instance, are

often similar to many of the long-term deposit products that banks offer: all are savings tools, but they deliver their savings benefits differently.

- ***Trust services.*** Some bank customers, particularly wealthy individuals, corporate pension plans, and estates, prefer to have professionals manage their assets. Therefore, many banks offer trust services that professionally manage a customer's assets for a fee. These assets under management do not show up on the balance sheet of the bank.
- ***Risk management services.*** As banks have expanded into more complex businesses, they have had to confront more complicated and composite risks such as interest rate, **exchange rate**, and price risks. Banks have developed sophisticated skills and complicated tools to manage these complex risks. For a fee, banks now offer the same risk management skills and tools to their customers.

1.2 Different Bank Types

This section illustrates different types of banks by focusing on the types of customers served and the range of services offered. Variations of the types of banks described here exist in different parts of the world.

1.2.1 Retail Banks

Retail banks' primary customers are individuals, or "consumers." Many retail banks also offer services to **small and medium enterprises (SMEs)**. Retail banks may have different specializations:

- ***Retail and consumer banks, savings and loans companies (thrifts, building societies), cooperatives, and credit unions.*** These offer loans primarily to individuals to finance house, car, or other purchases (e.g., Woodlands Bank in the United States, TSB Bank in the United Kingdom, or OTP Bank in Hungary). The particular features of cooperatives and credit unions are addressed below.
- ***Private banking firms.*** These provide wealth management services, including tax and investment advice, typically to rich individuals (e.g., Coutts & Co. in the United Kingdom and Bank Julius Baer in Switzerland).
- ***Postal banks.*** These offer banking services to customers in post offices. This structure, where the postal service owns or collaborates with a bank, is widely used throughout the world (e.g., Postbank A.G. in Germany, Japan Post Bank in Japan).

Although retail banks can come in many forms, most have a network of local branches that enable them to focus on retail consumers in one specific geographic area such as a city or a region of a country. However, there are a number of very large retail banks that have extensive branch networks that cover entire countries or portions of countries (e.g., HSBC and Industrial and Commercial Bank of China) and link to retail branches in networks owned through their affiliated entities in other parts of the world (e.g., Citigroup and Santander).

1.2.2 Wholesale Banks

Wholesale banks' customers are primarily corporate and noncorporate businesses. Although the range of business customers varies, it usually includes larger domestic and international companies. Wholesale banks also offer advisory services tailored to the specific needs of large businesses. Types of wholesale banks include:

- ***Commercial banks.*** These offer a wide range of highly specialized loans to large businesses, act as intermediaries in raising funds, and provide specialized financial services, such as payment and risk management services.
- ***Correspondent banks.*** These offer banking services to other banks, often in another country, including loans and various investment alternatives.
- ***Investment (sometimes called "merchant banks").*** These offer professional advice to corporations and governments about raising funds in the capital markets such as the stock, bond, or credit markets. In the case of companies, they also provide advice on buying or selling companies as a whole or in part. In the case of governments, they will advise on privatizing public assets. They may also serve as underwriters and investors in these activities.

BANKING IN FOCUS

The number of investment or merchant banks has diminished since 2008 due to the effects of the global financial crisis that started in 2007.

In 2008, in the wake of the collapse of the subprime mortgage market, investment banks Bear Stearns and Lehman Brothers went out of business. Bear Stearns was sold to JPMorgan Chase, and

Lehman Brothers declared bankruptcy. Merrill Lynch, the third largest investment bank in the United States, merged with Bank of America. Two of the remaining major U.S. investment banks, Goldman Sachs and Morgan Stanley, legally converted their operations to those of bank holding companies. This move allowed them to accept deposits and thereby raise funds through customer deposits to support their ongoing operations. It also gave them access to emergency funding from their central bank, which was perhaps more important than their new ability to collect deposits.

This was a monumental change to banking because the investment banking model—which relies on accessing the credit markets daily for financing while being exposed to financial market risks—has been called into question.

In Europe, some large banks, such as Barclays, reduced their investment banking activity, although because they had significant businesses in other areas (such as retail banking) they were better able to survive than those banks that were wholly reliant on investment banking business.

Although the large investment banks in the United States have either converted to banks or collapsed, there are still investment banks remaining in the United States. Many of them are smaller, highly specialized investment banks. They are not as reliant on wholesale funding, and typically focus on providing advice to corporate customers about raising money in the financial markets (e.g., Keefe, Bruyette & Woods).

Many wholesale banks finance international trade and often operate in several countries through representative offices or smaller branches. These banks are known as international, multinational, or global banks. Banks that offer financial services, including insurance, along with the core banking functions are called **universal banks**. Citibank, Deutsche Bank, HSBC, and BNP Paribas are examples of large universal banks.

1.2.3 Bank Holding Companies

Bank holding companies are companies that own one or more banks but do not conduct banking business themselves. Bank holding companies are primarily a feature of the U.S. banking system where regulators were concerned to limit the ability of banks to engage in nonbanking activity. Bank holding

companies could own subsidiaries that, between them, covered the full range of financial service activities, but each individual operating institution engaged in only a limited sector of the financial markets.

When analyzing U.S. banks, it is important to differentiate between the holding company or the operating company. For example, Wells Fargo & Company is a holding company that owns Wells Fargo Bank. It is Wells Fargo Bank that conducts banking business.

There are some large non-U.S. banking groups that operate through a holding company structure, such as HSBC Holdings and Royal Bank of Scotland.

Bank holding companies often raise funding on behalf of their group and then "downstream" it to their operating companies. They are able to service interest on the debt from **dividends** that are "upstreamed" from the operating companies.

1.2.4 Cooperative Banks

Cooperative banks are owned by their customers and usually have a large branch network that covers small towns and villages as well as larger cities. Their core strength is often lending to and taking deposits from individuals and small businesses.

For most banks, there is a distinction between **shareholders**, who invest in the bank and who therefore own it, and customers, who do business with the bank but have no ownership rights. In contrast, someone who deposits money with a cooperative bank automatically becomes a shareholder in that cooperative bank. In some cooperative banks, customers who receive loans also become shareholders. Such customers are, in principle, entitled to vote and to control how the local cooperative bank is run. Cooperative banks are structured like a pyramid, with individual customers controlling local cooperatives, these local cooperatives in turn controlling regional organizations, and these regional organizations controlling a national organization that oversees the network as a whole.

Examples of such cooperative banks include Rabobank in the Netherlands, the Nationwide Building Society in the United Kingdom, and the Shinkin cooperative bank network in Japan.

Although cooperative banks usually have strong ties to local communities, many have become very large and in some ways behave just like other banks. Rabobank, in the Netherlands, is one of the biggest banks in the world. The BPCE Group in France works with large companies and offers sophisticated financial products.

Many of the larger cooperative banks have a central entity—still ultimately owned by the members—that manages liquidity and risk for the group as a whole.

1.2.5 Credit Unions

Credit unions are similar to cooperative banks in that they are owned by their customers. However, in practice, credit unions tend to be small, closely connected to their local community, and focused on meeting the needs of low-income groups. Frequently, customers may borrow from a credit union only if they also have a savings account there. Although credit unions are seen all over the world and are an important feature of the financial landscape, there are no credit unions that have the size of, say, Rabobank or that compete in international markets.

An example of a credit union is the Croydon, Merton, and South Sutton Credit Union that operates in an area of southwest London in the United Kingdom.

1.2.6 Micro-finance Institutions

Micro-finance institutions (MFIs) exist to extend small amounts of money to low-income customers, usually in developing countries. The amounts lent can be as little as USD 20, though they can sometimes reach a few thousand dollars. The purpose of these loans is to enable customers to rise out of poverty and become more economically self-reliant, for example by buying materials with which to manufacture simple goods that can then be sold in a local marketplace. MFIs often try to replace unscrupulous lenders that exploit customers and charge exorbitant rates of interest. Much MFI activity is directed to women.

The most famous example of an MFI is Grameen Bank, which was set up in Bangladesh in the 1970s to lend money to poor people in small villages. Grameen has since become a large institution, though it retains its strategy of making small loans to underprivileged, largely rural borrowers.

Micro-finance lending now occupies a central position in economic development programs worldwide, with significant networks in South America, Asia, and sub-Saharan Africa. Some large commercial banks provide funding to MFIs as part of their corporate responsibility programs or even as part of their regular lending programs.

1.2.7 Central Banks

Central banks are the principal monetary authority of a country (or, occasionally, a group of countries) and are crucial to the functioning of all banks, financial markets, and the economy. Central banks manage the amount of money and credit in an economy—usually in an effort to contain inflation rates and/or to foster economic growth. They typically accomplish this through their daily activities of buying and selling government debt, determining and maintaining core interest rates, setting reserve requirement levels, and issuing currency. Some central banks are also charged with maintaining certain foreign exchange rate levels for the home currency. Central banks also arrange payments between banks.

Historically, central banks have usually combined this role as the principal monetary authority with two other roles: oversight of the banking system as a whole (**macroprudential supervision**) and the regulation and supervision of individual banks (**microprudential supervision**). Even before the global financial crisis, there were moves to separate these functions (for example, the British government took banking supervision away from the Bank of England in 1997 and gave it to the newly created Financial Services Authority), and in the aftermath of the crisis there has been intense discussion among politicians and bank regulators about how these roles should be assigned. Views differ on how to divide the responsibilities, and no clear consensus has formed on the right way to do it.

The body that is given responsibility for microprudential supervision usually has responsibility not only for **bank regulation** but also for **bank supervision**. Regulation refers to the process of writing rules that govern how banks operate and behave (for example, setting minimum levels of capital, or requiring banks to set aside a proportion of their deposits as a reserve) whereas supervision refers to the enforcement of those rules (for example, by examining a bank's financial statements or sending inspectors to speak to a bank's management).

Examples of central banks include the Central Bank of Bahrain, the Bank of Japan, the People's Bank of China, and the Federal Reserve System.

INTEREST RATES AND INFLATION RATES

An interest rate is the price of credit, or the rate a lender charges a borrower for using borrowed funds. The inflation rate is the change in the purchasing value of money.

Bank B lends EUR 1,000,000 to Compagnie Petit, a French corporation, for one year. In exchange for the corporation using these funds, the bank charges 6% interest rate per year. At the end of the year, Compagnie Petit must pay EUR 60,000 in interest to the bank as well as repay the original EUR 1,000,000.

At the beginning of the year, Jean Molineaux paid EUR 100 for various groceries at the store. At the end of the year, the same groceries at the same store cost EUR 105. Since the price of the same groceries increased by 5% during the year, the purchasing power of the money declined by approximately 5%. This decline in purchasing power is the inflation rate.

1.3 Banking Risks

There are multiple definitions of risk. Everyone has a definition of what risk is, and everyone recognizes a wide range of risks. Some of the more widely discussed definitions of risk include the following:

- The likelihood an undesirable event will occur
- The magnitude of loss from an unexpected event
- The probability that "things won't go well"
- The effects of an adverse outcome

Banks face several types of risk. All the following are examples of the various risks banks encounter:

- Borrowers may submit loan repayments late or fail to make repayments.
- Depositors may demand the return of their money at a faster rate than the bank has reserved for.
- Market interest rates may change and hurt the value of a bank's loans.
- Investments made by the bank in securities or private companies may lose value.
- A bank may discover that it has acted in a way that is contrary to a law or regulation and be fined by its regulator or by a court of law.
- Human input errors or fraud in computer systems can lead to losses.

To monitor, manage, and measure these risks, banks are actively engaged in risk management. In a bank, the risk management function contributes to

the management of the risks a bank faces by continuously measuring the risk of its current **portfolio** of assets and other exposures; by communicating the risk profile of the bank to others within the bank, to the bank's regulators, and to other relevant parties; and by taking steps either directly or in collaboration with other bank functions to reduce the possibility of loss or to mitigate the size of the potential loss.

From a regulatory perspective, the size and risk of a bank's assets are the most important determinants of how much **regulatory reserve capital** the bank is required to hold. A bank with high-risk assets faces the possibility that those assets could quickly lose value. If the market—depositors—perceives that the bank is unstable and deposits are in peril, then nervous depositors may withdraw their funds from the bank. If too many depositors want to withdraw their funds at the same time, then fear that the bank will run out of money could break out (Section 3.1 discusses how **bank runs** occur). And when there is a widespread withdrawal of money from a bank, the bank may be forced to sell its assets under pressure. To avoid this, regulators want a bank with high-risk assets to have more reserves available. Therefore, understanding banking regulation requires understanding financial risk management.

This section introduces the various types of risk a bank may face and provides examples that demonstrate each risk. Later chapters explore these risks and their regulatory implications in more detail. The key risks discussed below are those identified by the **Basel Accords**, the cornerstone of international risk-based banking regulation. The Basel Accords, described in greater detail in Section 3.3 and throughout the book, are the result of a collaborative attempt by banking regulators from major developed countries to create a globally valid and widely applicable framework for banks and bank risk management.

The Basel III Accord, the most recent of these accords, focuses primarily on four types of risk (see Figure 1.4):

1. Credit risk
2. Market risk
3. Operational risk
4. Liquidity risk

The Basel Accords also recognize that there are other types of risk that may include these different core risk types.

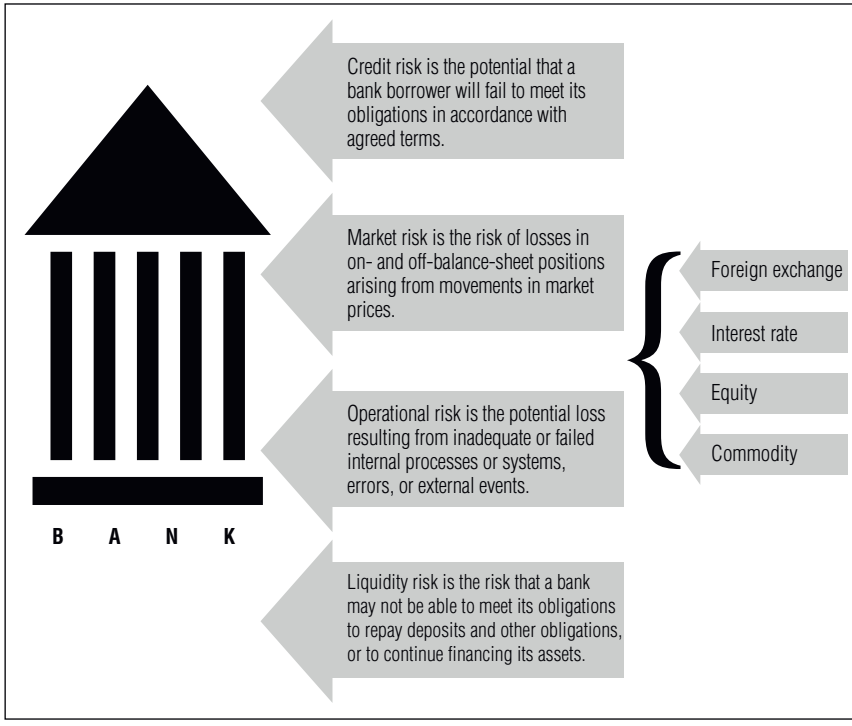

FIGURE 1.4 Bank Risks

1.3.1 Credit Risk

Credit risk is the risk that a bank borrower, also known as a counterparty, may fail to meet its obligations—pay interest on the loan and repay the amount borrowed—in accordance with agreed terms. Credit risk is the largest risk most banks face and arises from the possibility that loans or bonds held by a bank will not be repaid either partially or fully. Credit risk is often synonymous with default risk.

EXAMPLE

In December 2007, the large Swiss bank UBS announced a loss of USD 10 billion due to the significant loss in value of loans made to high-risk borrowers (subprime mortgage borrowers). Many high-risk borrowers could not repay their loans, and the complex models used by UBS to predict the likelihood of credit losses turned out to be incorrect. Other major banks all over the world suffered similar losses due to incorrectly assessing the likelihood of default on mortgage payments. The inability to assess or respond correctly to this risk resulted in many billions of U.S. dollars in losses to companies and individuals around the world.

Credit risk affects depositors as well. From the depositors' perspective, credit risk is the risk that the bank will not be able to repay funds when they ask for them.

The underwriting process aims to assess the credit risk associated with lending to a particular potential borrower. Chapter 4 contains a detailed description of the underwriting process. Once a loan is underwritten and the loan is received by the customer, the loan becomes a part of the bank's **banking book**. The banking book is the portfolio of assets (primarily loans) the bank holds, does not actively trade, and expects to hold until maturity when the loan is repaid fully. Section 2.2 discusses the banking book further. Nearly all of a bank's credit risk is contained in the credit risk of the assets in its banking book, although some elements of credit risk can also exist in the **trading book**.

1.3.2 Market Risk

Market risk is the risk of losses to the bank arising from movements in market prices as a result of changes in interest rates, foreign exchange rates, and equity and commodity prices. The various components of market risk, and the forces that give rise to them, are covered more extensively in Chapter 6. The components of market risk are as follows:

- **Interest rate risk** is the potential loss due to movements in interest rates. This risk arises because bank assets (loans and bonds) usually have a significantly longer maturity than bank liabilities (deposits). This risk can be conceptualized in two ways. First, if interest rates rise, the value of the longer-term assets will tend to fall more than the value of the shorter-term liabilities, reducing the bank's equity. Section 2.2 discusses bank assets, liabilities, and equity further. Second, if interest rates rise, the

bank will be forced to pay higher interest rates on its deposits well before its longer-term loans mature and it is able to replace those loans with loans that earn higher interest rates.

EXAMPLE

American **savings and loans** (S&Ls), also called thrifts, are essentially mortgage lenders. They collect deposits and underwrite mortgages. During the 1980s and early 1990s, the U.S. S&L system underwent a major crisis in which several thousand thrifts failed as a result of interest rate risk exposure.

Many failed thrifts had underwritten longer-term (up to 30-year) fixed-rate mortgages that were funded by variable-rate deposits. These deposits paid interest rates that would reset, higher or lower, based on the market level of interest rates. As market interest rates increased, the deposit rates reset higher, and the interest payments the thrifts had to make began to exceed the interest payments they were receiving on their portfolios of fixed-rate mortgages. This led to increasingly large losses and eventually wiped out the equity of thousands of S&Ls and led to their failures. As shown in Figure 1.5, as interest rates rose, the payments the S&Ls had to make on variable rate deposits became larger than the payments received from the fixed-rate mortgage loans, leading to larger and larger losses.

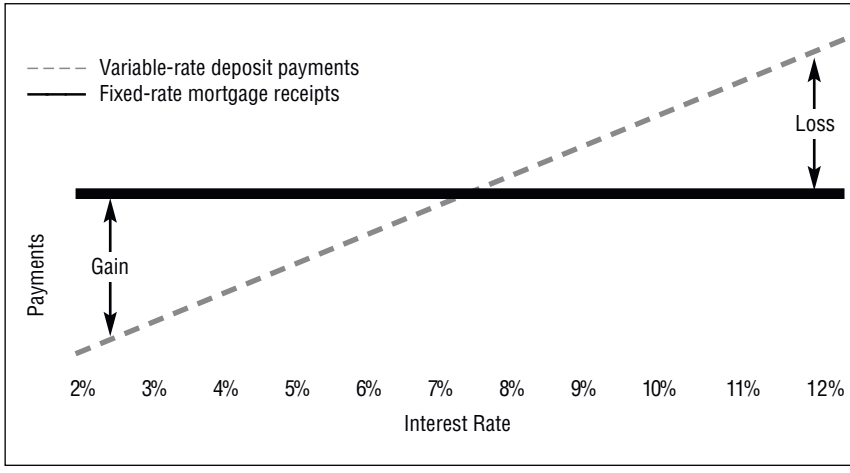

FIGURE 1.5 Gains vs. Losses for American S&Ls as Interest Rates Rise

- **Equity risk** is the potential loss due to an adverse change in the price of stock. Stock, also referred to as shares or equity, represents an ownership interest in a company. Banks can purchase ownership stakes in other companies, exposing them to the risk of the changing value of these shares.

EXAMPLE

In the early part of this century, the functionality and use of technology for social media grew rapidly. The Facebook networking site transformed the way in which hundreds of millions of people communicated. It also transformed the way companies advertised to existing and potential customers. When Facebook went "public" on May 17, 2013, investor excitement pushed the launch price higher based on expectations and forecasts of advertising revenue. The opening share price was USD 38, but the price soon fell, dropping to USD 20 shortly afterward due to questions being asked about the effectiveness of Facebook advertising and the company's growth potential. The share price later rebounded, but its initial opening volatility was reminiscent of the dot-com bubble of 1997–2001; when it burst, the share prices of many technology companies fell, causing losses (due to equity risk) of 50% or more.

- **Foreign exchange risk** is the risk that the value of the bank's assets or liabilities changes due to currency exchange rate fluctuations. Banks buy and sell foreign exchange on behalf of their customers (who need foreign currency to pay for their international transactions or receive foreign currency and want to exchange it to their own currency), and they also hold assets and liabilities in different currencies on their own balance sheets.

EXAMPLE

The Crimean Crisis that started in February 2014 put Russia and the United States, along with the European Union on a collision course. While military conflict, although unfortunate, was largely contained, by late 2014 the crisis continued and its main theatre of operation moved to the international financial markets and banking and payment systems. A number of sanctions were imposed by countries around the globe on Russian individuals, businesses, and on the Russian State herself.

The sanctions ranged from travel bans, money transfer bans, bans on access to foreign bank accounts, reduced or denied access to raising capital in international financial markets, bans on correspondent bank activity in favor of identified individuals and companies, bans of imports from and exports to Russia of certain defined goods, including energy-related goods.

The net effect of these sanctions was a slowdown of Russian business activity, reduction of personal freedoms, unavailability of international consumer products in Russia—and a collapse in the international value of the Russian ruble.

The ruble was valued at 32.6587 against the USD on January 1, 2014—a value level it had held since the onset of the Financial Crisis in 2008—and was still valued at 33.8434 on July 1, 2014—a modest decline of 3.6%. However, towards the end of October and early November, the ruble fell dramatically. On November 1, 2014 its value was 39.3519, and on November 7, 2014, it was valued at 45.1854, or a 38% decline since the beginning of the year. These prices for USD/RUB were official Russian Central Bank prices, suggesting that the effective foreign exchange rate for Russian customers and companies were many times higher for real transactions. The effect on Russian businesses was an increase by at least 38% in the price of foreign goods and/or a 38% decline in earnings from exports to other countries.

Although designed to be a measure against Russia as a whole, and her leadership in particular, the measures were expected to impact small and medium-sized Russian companies much more than large corporations. So, although the currency movements were dramatic, at the end of 2014, it remained to be seen if any lasting impact on economic and commercial life in Russia would take place.

- **Commodity risk** is the potential loss due to an adverse change in commodity prices. There are different types of commodities, including agricultural commodities (e.g., wheat, corn, soybeans), industrial commodities (e.g., metals), and energy commodities (e.g., natural gas, crude oil). The value of commodities fluctuates a great deal due to changes in demand and supply.

EXAMPLE

During the 1970s, two American businessmen, the Hunt brothers, accumulated 280 million ounces of silver, a substantial position in the commodity. As they were accumulating this large position—approximately one-third of the world's supply—the price of silver rose. For a short period of time at the end of 1979, the Hunt brothers had cornered the silver market and effectively controlled its price. Between September 1979 and January 1980, the price of silver increased from USD 11 to USD 50 per ounce, during which time the two brothers earned an estimated USD 2 to 4 billion as a result of their silver speculation. At its peak, the position held by the brothers was worth USD 14 billion. Two months later, however, the price of silver collapsed back to USD 11 per ounce, and the brothers were forced to sell their substantial silver holdings at a loss.

Market risk tends to focus on a bank's **trading book**. The trading book is the portfolio of **financial assets** such as bonds, equity, foreign exchange, and derivatives held by a bank either to facilitate trading for its customers or for its own account or to hedge against various types of risk. Assets in the trading book are generally made available for sale, as the bank does not intend to keep those assets until they mature. Assets in the bank's banking book (held until maturity) and trading book (not held until maturity) collectively contain all the various investments in loans, securities, and other financial assets the bank has made using its deposits, loans, and shareholder equity.

Distinguishing between the trading and banking books is essential to understand how banks operate and how they manage their risks. The value of assets and liabilities in the trading book can change quickly, and the bank has to recognize those changes immediately. In contrast, changes to the value of the banking book generally take longer to happen.

The Basel Accord does not provide a definition for the term banking book; this is an important and easily forgotten point. In effect, what is included in the banking book is what is not included in the bank's trading book, which *is* defined by the Basel II and Basel III Accords. The trading and banking books will be discussed in later chapters (see Section 2.2).

1.3.3 Operational Risk

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events. This definition includes **legal risk**, but excludes strategic and reputational risk.

EXAMPLE

In 1995, Baring Brothers and Co. Ltd. (Barings) collapsed after incurring losses of GBP 827 million following the failure of its internal control processes and procedures. One of its traders in Singapore hid trading losses for more than two years. Because of insufficient internal control measures, the trader was able to authorize his own trades and book them into the bank's systems without any supervision. The trader's supervisors were alerted after the trades started to lose significant amounts of money and it was no longer possible for the trader to keep the trades and the losses secret.

Compared to credit, market, and liquidity risk, operational risk is the least understood and most challenging risk to measure, manage, and monitor.

A wide range of loss events can be categorized as operational risk events. Chapter 7 discusses how banks measure and manage the different types of operational risks they are exposed to as part of the banking business.

1.3.4 Liquidity Risk

Liquidity risk is the risk that a bank may not be able to meet its obligations to repay deposits and other funding, or to continue financing its assets. There has been far greater focus on banks' liquidity risk following the global financial crisis of 2007–2009 when several banks needed to be supported by their governments because they were unable to meet their obligations to repay depositors and bondholders. The most recent Basel Accord includes new standards on banks' liquidity to complement its standards on banks' capital levels: Basel I and Basel II had provided standards only for capital levels. Liquidity risk will be discussed in greater detail in Chapters 3 and 6.

EXAMPLE

In August 2007, Northern Rock, a bank focused on financing real estate in the United Kingdom, received emergency funding from the Bank of England. The bank was relatively small and did not have a sufficient depositor base to fund new loans from deposits. It financed new mortgages by selling the mortgages it had already originated to other banks and investors, and by taking out short-term loans. This strategy made it increasingly vulnerable to changes in financial markets. How much financing Northern Rock could raise depended on two factors. The first was the demand for mortgages it had originated to sell to other banks. The second was the availability of credit in the credit market to finance these mortgages. Both of these depended on how the overall banking marketplace, particularly the availability of funding to finance lending, was performing. When the credit markets came under pressure in 2007, the bank found it increasingly difficult to sell the mortgages it had originated. At the same time, the bank could not secure the short-term financing it required. Simply put, Northern Rock could not finance its assets, was unable to raise new funds, ran out of money, and, notwithstanding the emergency financing from the Bank of England, was ultimately taken over by the government.

1.3.5 Systemic Risk

Systemic risk refers to the possibility that an entire banking system may face losses or even collapse, with all banks operating in that system being affected.

Systemic risk can arise due to macroeconomic or monetary events, such as a currency devaluation, or it can result from the failure of a single "systemically important" financial institution, whose problems cause difficulties for all other banks in the system.

EXAMPLE

In 1991, Argentina pegged its currency to the U.S. dollar, but over time people came to believe that this relationship was not sustainable and that the Argentine government would be forced to devalue the peso. In November 2001, interest rates rose dramatically in response to expectations of a devaluation, and depositors began to withdraw funds from their banks. The following day, the minister of the economy announced restrictions on banks' ability to pay clients and on customers' ability to withdraw deposits. All banks in the system were affected by these restrictions. Even banks that had been financially strong and conservatively managed were not able to meet their obligations.

1.3.6 Other Risks That Banks Face

Beyond the types of risk mentioned previously, there are other risks banks face and must manage appropriately. Here is a listing of some of them:

- **Business risk** is the potential loss due to a decrease in the competitive position of the bank and the prospect of the bank prospering in changing markets.

EXAMPLE

In 2003 HSBC bought the U.S. consumer, credit card, and mortgage lender Household International (later named HSBC Finance Corporation) to gain a slice of the booming U.S. property market. Expansion into this new market was seen as the answer to improving profitability and return on capital, although it was a departure from HSBC's traditional conservative banking culture.

Household International was a poor fit with HSBC operations, as much of its business was in second-line mortgages (equity loans or lines of credit which use the home as collateral) known in the United States as piggyback loans, marketed to low-income homeowners who used the loans to make a down payment on their home to avoid mortgage insurance, or purchase cars and other consumables. These loans were ultimately considered of dubious quality and a result of poor underwriting standards coupled with high-pressure selling.

When house prices fell in the United States, the equity supporting these loans was reduced to the point that in many cases the total loans outstanding were greater than the value of the property, resulting in negative equity.

Household International, which was bought for USD 15.3 billion, by 2006 had lost USD 30 billion for HSBC. The chairman said that, in retrospect, HSBC should not have acquired Household International.

In 2009 HSBC Finance Corporation announced the discontinuation of loan origination of all products by its consumer lending business, but continued to service, assist, and collect the existing receivable portfolio as it closed down its business.

- **Reputational risk** is the potential loss resulting from a decrease in a bank's standing in public opinion. Recovering from a reputation problem, real or perceived, is not easy. Organizations have lost considerable business for no other reason than loss of customer confidence over a public relations problem, even with relatively solid systems, processes, and finances in place.

EXAMPLE

In 2012, Standard Chartered reached an anti-money-laundering settlement with the New York Department of Financial Services (NY DFS) for failures in its transaction surveillance systems. The bank had to suspend dollar-clearing activity for high-risk business clients, mostly small and medium enterprises (SMEs) in Hong Kong and the United Arab Emirates (UAE). It was also barred from accepting new clients without prior approval from NY DFS. The regulator believed that the bank allowed millions of suspicious payments to go unreported for several years.

The bank also agreed to pay a fine of USD 340 million to the regulator as part of an overall USD 667 million settlement in 2012. In addition to the financial losses, the bank closed much of its SME business in the Middle East and received wide negative publicity.

EXAMPLE

Wonga, a so-called payday consumer lender in the United Kingdom, also suffered significant losses in 2014 when, under pressure from the Financial Conduct Authority, it had to write off more than GBP 220 million of nonperforming loans (333,000 customers), as Wonga had not followed underwriting due diligence with individual borrowers to ensure they were in a position to repay the loans and pass an affordability test.

The firm suffered serious financial and reputational damage and had to rethink its business model.

- **Compliance risk** is the risk that a bank may suffer losses as a result of its failure to comply with laws and regulations or with internal policies and procedures that govern the way it operates. This risk has been increasing in recent years, and oversight and scrutiny of banks have intensified following the global financial crisis of 2007–2009. The result is that the number of laws and regulations that a bank has to comply with has greatly increased, and so has the risk of non-compliance. Furthermore, regulations on money laundering and financial crime (including tax evasion) have become stricter in recent years, and governments and regulators are far less tolerant of any breaches than they were in the past.

1.4 Forces Shaping the Banking Industry

There are numerous other aspects of banking that have not been covered in this chapter but will be briefly touched upon in later parts of the book—either directly or as part of a discussion about other topics.

- ***Regulation, deregulation, and globalization.*** In the 1990s and the early years of the 21st century, deregulation led to a relaxing of restrictive banking regulations in many countries around the globe. This allowed many banks to compete against each other and other financial services providers with less direct government oversight. The theory behind less oversight was that increased competition among banks would increase their efficiency. Deregulation puts market pressures on banks from organizations that offer similar banking services.

  Additionally, it was felt that banks would, in their own self-interest, effectively regulate themselves with little need for heavy-handed oversight from government regulators. The idea was that it is in a bank's self-interest to ensure that it functions properly to compete in an increasingly competitive world. However, as became apparent during the global financial crisis of 2007–2009, banks were unable to police themselves effectively. Their lack of discipline resulted in a virtual collapse of the global financial system. It has also become clear that many banks are now considered **"too big to fail"** due to their global connectivity and importance to the worldwide financial system. Since then, governments have introduced numerous banking regulation reforms and have, for the first time, been considering adopting some type of cooperative system to allow for the rapid sharing of information among world

financial regulators with the intent of more proactively addressing future financial services–related risks and issues.

The trend toward deregulation of financial markets that was seen in the years that preceded the global financial crisis has now been put into reverse. Not only are banks more heavily regulated than before, but there is general agreement among policy makers and regulators that this heavier regulation is justified. There has also been much more attention given to how banks conduct themselves and whether they are treating customers fairly, regardless of whether they are operating in a financially prudent manner.

- ***Competition.*** Banks are facing increasing competition from specialized financial services providers. Examples of such non-depository financial intermediaries that now compete with banks include:

  - Retirement systems—pension plans and retirement funds
  - Collective investment pools—mutual funds, unit trusts, and hedge funds
  - Finance companies—leasing and equipment finance
  - Payment services
  - Insurance companies
  - Hedge funds
  - Private equity companies

- ***Securitization.*** Bundling together various debt capital assets, such as mortgages, credit cards, and loans, and selling securities representing various types of ownership in the resulting portfolio, is a relatively new financial product. The securitization process is explained in greater detail in Section 5.2.3. Securitization is a threat to banks since it enables non-banks to offer loans and financing at a lower cost than what banks historically charge. Securitization, however, can also benefit banks by offering them a way to sell some of the higher-risk assets they would prefer not to hold on their books.
- ***Technological advances.*** Improvements in computing power, telecommunications, and information technology have allowed banks to offer new ventures such as Internet-based banking. Technological advances continue to reduce the cost of routine banking services, such as payments and withdrawals.

- ***Inflation and interest rate uncertainty.*** Both bank balance sheets and profits are highly sensitive to changes in interest rates. When inflation increases, interest rates tend to increase, and many banks—as we will see in later sections—suffer. When interest rates change considerably and frequently, banks must focus on managing these risks.

In this chapter, the foundations were laid for understanding banks, the banking industry, and the risks they face. Later chapters discuss in greater detail the relationship between bank risks and regulation.