Part One

Origination
WHAT IS CREDIT RISK?

Credit risk is the possibility of losing money due to the inability, unwillingness, or nontimeliness of a counterparty to honor a financial obligation. Whenever there is a chance that a counterparty will not pay an amount of money owed, live up to a financial commitment, or honor a claim, there is credit risk.

Counterparties that have the responsibility of making good on an obligation are called “obligors.” The obligations themselves often represent a legal liability in the form of a contract between counterparties to pay or perform. Note, however, that, from a legal standpoint, a contract may not be limited to the written word. Contracts that are made orally can be legally binding.

We distinguish among three concepts associated with the inability to pay. First is insolvency, which describes the financial state of an obligor whose liabilities exceed its assets. Note that it is common to use insolvency as a synonym for bankruptcy, but these are different events. Second is default, which is failure to meet a contractual obligation, such as through nonpayment. Default is usually—but not always—due to insolvency. Third is bankruptcy, which occurs when a court steps in upon default after a company files for protection under either Chapter 11 or Chapter 7 of the bankruptcy laws (in the United States). The court reviews the financial situation of the defaulted entity and negotiates with its management and creditors. Whenever possible, the court tries to keep the entity in business by selling assets and/or renegotiating financing arrangements with lenders. Bankruptcy proceedings may end in either a restructuring of the obligor’s business or in its dissolution if the business cannot be restructured.
In most cases, losses from credit risk involve an obligor’s inability to pay a financial obligation. In a typical scenario, a company funds a rapid expansion plan by borrowing and later finds itself with insufficient cash flows from operations to repay the lender. Other common cases include businesses whose products or services become obsolete or whose revenues simply no longer cover operating and financing costs. When the scheduled payment becomes due and the company does not have enough funds available, it defaults and may generate a credit loss for the lenders and all other counterparties.

Credit losses can also stem from the unwillingness of an obligor to pay. It is less common, but can lead to the same consequences for the creditors. The most frequent cases are commercial disputes over the validity of a contract. For instances in which unwillingness is at issue, if the dispute ends up in litigation and the lender prevails, there is recovery of the amount owed and ultimate losses are lessened, or even avoided entirely, since the borrower has the ability to pay.

Frequently, credit losses can arise in the form of timing. For example, if monies are not repaid on a timely basis, there can be either interest income foregone or working capital finance charges incurred by the lender or trade creditor, so time value of money is at stake.

Credit risk can be coupled with political risk. Obligors doing business in different countries may have both the ability and willingness to repay, but their governments may, without much warning, force currency conversion of foreign-currency denominated accounts. This happened in 2002 in Argentina with the “pesification” in which the government of Argentina forced banks to convert their dollar-denominated accounts and debts to Argentine pesos. Companies doing business in Argentina saw their U.S. dollar-denominated bank deposits shrink in value, and their loans and trade credits shrink even more, since the conversion rate was even more egregious for loans than deposits.

A common feature of all credit exposure is that the longer the term of a contract, the riskier that contract is, because every additional day increases the possibility of an obligor’s inability, unwillingness, or nontimeliness of repayment or making good on an obligation. Time is risk, which is a concept that we will explore further throughout the book.

For each transaction generating credit risk, we will address three fundamental questions in the forthcoming chapters:

1. What is the amount of credit risk? How much can be lost or what is the total cost if the obligor fails to repay or perform?
2. What is the default probability of the counterparty? What is the likelihood that the obligor fails to pay or perform?
3. How much can be recovered in case of bankruptcy? In the case of non-payment or nonperformance, what is the remedy and how much can be recovered, in what time frame, and at what expense?
TYPES OF TRANSACTIONS THAT CREATE CREDIT RISK

Managing credit risk requires first identifying all situations that can lead to a financial loss due to the default of a counterparty. Long gone are the days when it was an easy task. Today, there are many different types of financial transactions, sometimes very sophisticated, that generate credit risk.

Traditionally, credit risk was actively managed in bank lending and trade receivables transactions. A rule of thumb for identifying credit risk was to look for an exchange of cash or products at the beginning of a commercial agreement. The risk was that the money would not be repaid or the products not paid for. Recently, however, the development of modern banking products led to transactions generating large credit exposures without lending money or selling a product, as we explain in Chapter 5.

Credit risk is present in many types of transactions. Some are unique, but some are rather common. In the following paragraphs, we will describe seven common business arrangements that generate credit risk.

Lending is the most obvious area. There is a cash outflow up front, from the lender to the borrower, with a promise of later repayment at a scheduled time. A second transaction type involves leases, when a piece of equipment or a building is made available by an entity (the lessor) to another entity (the lessee) that commits to make regular payments in the future. The lessor typically borrows money to finance the asset it is leasing and expects the future cash flow from the lessee to service the debt it contracted. The third type is the sale of a product or a service without immediate cash payment. The seller sends an invoice to the buyer after the product has been shipped or the service performed, and the buyer has a few weeks to pay. This is known as an account receivable.

Prepayment of goods and services is a fourth type of transaction that involves credit risk. Delivery is expected at a certain time and of a certain quality and/or performance, and the failure of the counterparty may lead to the loss of the advanced payments and also generates business interruption costs. A fifth type of transaction that creates credit risk involves a party’s claim on an asset in the custody of or under the management of another party, such as a bank deposit. Most individuals choose their bank more for the services they offer or the proximity to their home rather than after a detailed analysis of its financial conditions. Large corporates think differently because they have large amounts of cash available. They worry that the banks with their deposits may default. Before trusting a financial institution, they review its creditworthiness. They also spread their assets among many banks to avoid a risk concentration. With the 2011 bankruptcy of MF Global, many more individuals and businesses will be thinking twice about funds left in brokerage accounts and carefully evaluating limits under the Securities Investor Protection Corporation (SIPC) or, outside the United States, its equivalent.
A sixth type of transaction is a special case of a claim on an asset: a contingent claim. The claim is contingent on certain events occurring, such as a loss covered by an insurance policy. At policy inception, the policyholder has no claim on the insurer. However, once the insured suffers a covered loss, the insured has a claim. If the insurer fails to pay the claim, this would constitute a credit loss. Another example of a contingent claim would be a pension fund that has a claim on the assets of its sponsor should the fund’s liabilities exceed its assets. Nothing has been prepaid and no funds were lent, but there is credit risk borne by the pension participants in the event that the sponsor cannot honor the fund’s liabilities.

Finally, a seventh type of transaction involves not a direct exposure, but a derivative exposure. It arises from derivatives transactions like interest-rate swaps or foreign-exchange futures. Both parties commit to make future payments, the amounts of which are dependent on the market value of an underlying product; for example, the exchange rate between the U.S. dollar and the Japanese yen. In Chapter 5 we explain how to calculate the amount of credit risk in these types of transactions. Although there is no up-front cash outflow as there is in a loan, the counterparty’s financial distress results in the same outcome: loss of money.

These transactions groupings, as described in Table 1.1, are general categories. Further breakdowns are possible that map to particular credit instruments frequently used in these transactions. For example, loaned money

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>Losses Result From</th>
<th>Loss Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaned money</td>
<td>Nonrepayment</td>
<td>Face amount</td>
</tr>
<tr>
<td></td>
<td>Slow repayment</td>
<td>Time value of money</td>
</tr>
<tr>
<td></td>
<td>Dispute/enforcement</td>
<td>Frictional costs</td>
</tr>
<tr>
<td>Lease obligation</td>
<td>Nonpayment</td>
<td>Recovery of asset, remarketing costs, difference in conditions</td>
</tr>
<tr>
<td>Receivables</td>
<td>Nonpayment of goods delivered or service performed</td>
<td>Face amount</td>
</tr>
<tr>
<td>Prepayment for goods or services</td>
<td>Nondelivery</td>
<td>Replacement cost</td>
</tr>
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<td></td>
<td>Performance on delivery not as contracted</td>
<td>Incremental operating cost</td>
</tr>
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<td></td>
<td>Slow delivery</td>
<td>Time value of money</td>
</tr>
</tbody>
</table>
Table 1.1 (Continued)

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>Losses Result From</th>
<th>Loss Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposits</td>
<td>Dispute/enforcement</td>
<td>Frictional costs</td>
</tr>
<tr>
<td></td>
<td>Nonrepayment</td>
<td>Face amount</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time value of money</td>
</tr>
<tr>
<td>Claim or contingent claim on asset</td>
<td>Nonrepayment/Noncollection</td>
<td>Face amount</td>
</tr>
<tr>
<td></td>
<td>Slow repayment/Slow collection</td>
<td>Time value of money</td>
</tr>
<tr>
<td></td>
<td>Dispute/enforcement</td>
<td>Frictional costs</td>
</tr>
<tr>
<td>Derivative</td>
<td>Default of third party</td>
<td>Replacement cost (mark-to-market value)</td>
</tr>
</tbody>
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can take the instrument form of a corporate bond, a bank loan, a consumer loan, asset-based lending, or commercial paper, among others.

Figure 1.1 displays credit risk exposure stemming from loaned money by instrument as of September 30, 2011. The predominant source of credit exposure, at least in the United States, is corporate obligations. Although there is roughly $54 trillion of debt outstanding, representing borrowing in U.S. debt markets, these include noncredit risky instruments such as U.S. Treasury obligations, government sponsored enterprise (agency) obligations, and agency-backed mortgage obligations. Excluding these obligations, the figure is approximately $23 trillion, and of this, over $11 trillion, or 53 percent
consists of corporate debt (bonds and loans). The remaining obligations are largely corporate related, including bank and other loans ($4 trillion), and commercial paper ($1 trillion), most of which is issued by corporations.

Figure 1.2 displays the source of credit risk exposure by entity. Note that nonfinancial corporations are a far larger source of credit market debt than financial corporations are. Again, we choose not to include federal government debt or household-mortgage debt (the majority of which is agency backed), since one could argue that these forms of borrowing have no real associated credit risk exposure.

In the United States alone, $2.4 trillion of trade receivables are on the books of corporations, and this figure represents 72 percent of all trade receivables as of June 2011.1

Finally, the potential notional credit exposure arising from derivative transactions as of December 2011 is estimated to be in excess of $700 trillion. The vast majority of this exposure arises from over-the-counter (OTC) interest-rate derivative contracts. Figure 1.3 shows the relative sizing of counterparty credit risk exposure by derivative type, based on the notional value of the contracts. Note that the notional value corresponds to gross credit exposure, which we will discuss in Chapter 4 and is the most conservative measure of credit risk.

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1U.S. Federal Reserve Board of Governors, “Flow of Funds,” Table L.223 Trade Credit.
All institutions and individuals are exposed to credit risk, either willingly or unwillingly. However, not all exposure to credit risk is inherently detrimental; banks and hedge funds exist and profit from their ability to originate and manage credit risk. Individuals choose to invest in fixed income bond funds to capture extra return relative to holding U.S. Treasury bonds. For others, like industrial corporations or service companies, because they sell goods or services without pre-payments, credit risk is a necessary by-product of their main activities.

In Figure 1.4, we can see who bears the exposure to loaned money. We see that financial companies have the largest exposure, followed by the U.S. federal government, state and local governments, foreign entities, households, and, far behind, nonfinancial companies. This of course is reasonable since nonfinancial corporations are not in business to invest in debt instruments or to assume credit risk as a primary business endeavor.

Figure 1.5 shows the breakdown of the financial sector in terms of who holds the exposure to these debt instruments. Within the financial sector, depository institutions have the most exposure ($11 trillion), with finance companies, mutual funds, and insurers having about half as much. Pension funds, private and public, also have significant exposure. This figure paints a high-level picture of why some institutions, primarily financial institutions, employ large teams of credit risk managers since so much is at stake.
FIGURE 1.4 Exposure to Credit Market Instruments by Entity, Billions USD

FIGURE 1.5 Financial Institutions’ Exposure to Credit Market Instruments, Billions USD
Financial Institutions

Since financial institutions face the most credit risk exposure, we will naturally focus on these entities throughout this book. In the following subsections, we briefly describe how each of these financial institutions is exposed.

Banks  Because they are in business to extend credit, banks have the largest credit portfolios and possess the most sophisticated risk management organizations. Interestingly enough, their appetite for credit risk has declined over the years, as margins are low and regulatory capital requirements high. The recent activities of regulators across the globe to strengthen the financial system will lead to further reluctance to take on credit risk.

The focus for large banks has shifted toward fee-generating services, such as mergers-and-acquisitions advisory services or debt and equity issuance. However, loans and lines of credit still constitute the largest sources of credit risk for a bank. For corporate clients, they are offered as a way to develop a relationship, and they often would not produce a sufficient return on capital on a stand-alone basis. However, because the loans and lines of credit represent the potential for large losses, banks employ teams of risk managers who do nothing but analyze the credit risk of borrowers and review the loans’ legal documents. In order to further reduce the credit risk exposure that these loans present, banks are increasingly turning to the capital markets to hedge the exposure created in extending the credit.

Loans include asset-based lending like repurchase agreements (“repos”) and securities lending. In short, banks lend money or securities against the provision of collateral such as Treasury bonds or equity. If the borrower cannot repay or give back the securities, the lender can sell the collateral, thus reducing or eliminating losses. In theory, the collateral held is sufficient to cover the amount of borrowed money or the value of the securities in case the counterparty defaults. When the financial markets are volatile, though, the value of the collateral can decline quickly, just at the time when the counterparty defaults. Banks, therefore, manage their exposures carefully. We introduce repos in more detail in Chapter 13.

After loans, the derivatives business generates the largest credit risk exposure for banks and comes from many directions. We will explain in Chapter 5 why derivatives generate a form of credit risk known as “derivative counterparty” exposure. For JPMorgan Chase & Co., the derivative receivables counterparty credit risk exposure on a fair-value basis at the end of 2011 was $92.5 billion, comprised of interest-rate derivative contracts, followed by foreign exchange, commodity, credit default swap and equity derivatives. Net of cash and liquid security collateral, the derivative receivables exposure was approximately $71 billion, which compares to its equity base of almost
$184 billion. Although the ratio appears large, the value of the receivables declines over time and the exposure metric represents what would be lost if all counterparties defaulted on the date that the exposure was valued.

Most of the examples that will be used in this book relate to banks’ exposures.

**Asset Managers** The asset management business consists of collecting money from individuals and institutions and investing it in order to meet the investors’ risk and return objectives. For instance, cautious investors anxious to protect their principal prefer money-market funds, primarily invested in short-term and high quality debt. Investors with more appetite for risk may favor mutual funds focusing on equities or emerging markets debt and equity.

Asset management is a huge business worldwide. In the United States, companies like State Street Global Advisors or Fidelity Investments manage more than $1 trillion of third-party money. The result is that asset managers, with huge amounts of money to invest, face credit risk exposures whose management is integral to their business model. When managers select their investments, they pay very close attention to the creditworthiness of a corporate or of a sovereign borrower that has the potential to reduce the performance of their fund, including causing losses to their clients. Whereas portfolio managers may be tempted to make investments that promise high return, the funds’ risk managers will discourage the portfolio managers from doing so due to the real possibility that the money may not be repaid.

**Hedge Funds** Hedge funds also have vast amounts of funds to invest daily and have a correspondingly large amount of credit exposure. Their investors have a greater risk appetite, but demand high returns to compensate for this risk. They are, therefore, more aggressive than typical investors, and they invest in riskier financial instruments, many of which traditional asset managers do not have access to. Their participation in financial markets has made many business transactions possible by allowing risk to be transferred that otherwise would not have occurred. For example, they may purchase distressed loans, sell protection against a decline in a borrower’s creditworthiness, or assume the riskiest positions in commercial real estate financing, all of which allow for the necessary transfer of risk to make a transaction possible. In many corporate restructurings, hedge funds play a proactive role to maximize their recoveries, as a result of their investment in risky debt.

What is unique though is that some hedge funds also view the possibility of an entity defaulting as an opportunity to deploy capital. In contrast to traditional financial institutions that hire credit risk managers to avoid the default of their counterparties and protect shareholders’ money, hedge
funds employ resources to identify entities that may default. They enter into transactions that make, not lose, money, in cases of financial distress.

Whereas a bank that has a credit exposure may want to hedge the exposure and collect if a credit-loss occurs, a hedge fund may profit from the financial distress of an obligor even if it has no direct exposure to that obligor. The growth in derivatives products has made the execution of such strategy relatively easy. We will describe in Chapter 16 how credit default swaps (CDSs) work and how they can be used to “short” credit; that is, to make money when the financial situation of a company or a country deteriorates.

**Insurance Companies**

Insurance companies are exposed to credit risk in two main areas: their investment portfolio and reinsurance recoverables. The insurance business is similar to asset management in that the company has vast amounts of cash to invest. It collects premiums from policyholders, invests the money, and later pays claims when losses occur. It is not unusual for an insurance company to show losses on its core underwriting operations (i.e., claims paid exceed premiums collected for a block of policies) yet record profits, thanks to their investment results. Every year, in his annual letter to Berkshire Hathaway shareholders, Warren Buffett, who owns insurance companies like GEICO, spends pages explaining why he likes a business that provides him with cash flow and the means to do what he likes and does best, invest.

An insurance company’s balance sheet is, therefore, characterized by large amounts of claims reserves on the liability side and corresponding investment positions on the asset side. The reserves do not belong to the shareholders but to the policyholders who, in the future, may claim money from the insurance company after a loss. The largest U.S. life insurance group, MetLife, Inc., holds nearly $500 billion of assets on its balance sheet as of the third quarter of 2011.

As a result, insurance companies are among the largest and most active institutional investors. With each dollar of their investment portfolios comes the possibility not to be paid back. In the insurer’s strategic asset allocation process, one of the most important criteria is credit risk. Management of this risk is key since there is a trade-off between expected return, which favors shareholders, and maintaining a low risk profile, which favors policyholders. Their portfolio will include large proportions of safe Treasury bonds, which require little to no credit analysis, as well as riskier and higher returning debt issued by commercial real estate vehicles or even leveraged equity investments in hedge funds. Insurance companies have large dedicated teams of professionals in charge of managing all credit positions they hold, even when these positions are managed on a day-to-day basis by a third-party asset manager.
In addition, life insurance companies manage money on behalf of their policyholders in separate accounts, and from this perspective they are similar to a mutual fund. In the case of MetLife, Inc., it manages more than $200 billion of customer funds. For many of these accounts, there is no risk sharing between policyholders and shareholders. However, in these instances, if the insurer makes poor investment decisions for their policyholders, the insurers may suffer damage to their reputation and jeopardize future business opportunities. For other accounts, the insurer may guarantee minimum returns and failure to earn the minimum, say due to credit losses, would deplete the insurer’s capital base or even cause insolvency.

The other area of credit risk faced by the insurer relates to their reinsurance activities. Insurers first originate policies that carry the risk of claims becoming far larger than premiums collected. If so, reserves set aside will be inadequate to cover losses, and insurers’ capital would be tapped. Thus, behind the scenes, insurance companies all over the world transfer some of the risks they originate to reinsurers. The reinsurance business is dominated by a handful of large, primarily European companies like Munich Re (Germany).

The transfer of the risk from primary insurers to reinsurers happens via commercial agreements. The model is straightforward: Insurers who originate policies and collect policyholder premiums transfer part of the risk by buying a policy and paying a premium. Once a policyholder reports a claim to the insurer, the insurer reports part of this claim to the reinsurer. The insurer’s claim then becomes a reinsurance receivable and it has to be paid within a few weeks. During this period, reinsurers verify and sometimes question the validity of the claims. For small and frequent losses, the credit risk stems essentially from this time lag. The amount of premium paid equates more or less to the amount of losses to be claimed, with the risk being that the reinsurer has disappeared in between. For catastrophic losses, the credit risk is much larger. When an earthquake or a hurricane occurs, reinsurers may have inadequate resources to make payments. Thus, primary insurers must carefully choose their reinsurance partners, and try to avoid “putting all their eggs in one basket;” that is, they distribute risks among many reinsurers, which is not an easy task because the industry is highly concentrated.

Another form of credit risk associated with reinsurance is the contingent claim that the insurer has on the reinsurer. In the preceding example for receivables, the primary insurer knows its losses and submits its claim to the reinsurer. However, in the case of some liability policies, there can be decades between collecting premiums and the policyholder’s report and ultimate settlement of a claim. The insurer must estimate what these claims might be, and these estimates generate a contingent claim on the reinsurer, that is, an asset on its balance sheet contingent on the event that it ultimately pays those estimated losses to policyholders. This asset is called a
reinsurance recoverable, and it represents an even larger item on an insurer’s balance sheet than receivables on paid losses, and for the typical insurer, it is usually the largest single item on the asset side of the balance sheet after invested assets.

**Pension Funds** Similar to a life insurer that invests monies on behalf of a policyholder, a pension fund sponsor (e.g., corporate employer) invests funds on behalf of pension beneficiaries. As of September 2011, assets under the management of all U.S. private pension funds totaled $1.2 trillion, and those under U.S. public pension plans sponsors (state and local governments) totaled $989 billion. A significant portion of these funds, from one-quarter to one-half, is invested in credit risky assets. Private pension funds must abide by ERISA (Employee Retirement Income Security Act of 1974) prudent-investor rules, and public funds have similar standards; as such, both must be active managers of credit risk even if the asset management of the funds is outsourced to third-party managers. On a final note, federal pension funds do not have significant assets, mainly because their obligations are largely unfunded.

**Corporates**

Corporates do not like credit risk but cannot avoid it. It is a by-product of their operations, and their position is not enviable. Investors, rating agencies, and other stakeholders have little tolerance for credit losses, and yet credit risk management is outside of their core competency. To make matters worse, when the customer of a corporation files for bankruptcy, a list of the customer’s creditors is published and often relayed by the mass media. The bankruptcy of a customer creates negative publicity and can have a negative effect on the corporation’s stock price performance and raises questions about the quality of its operations.

The biggest source of credit risk for a corporate is account receivables. Sales are generally not paid in advance, and, thus, corporates have effectively extended short-term credit to their customers. The stronger the customer, the longer and more favorable the terms of payment are for that customer. Well-known examples in the retail industry of a company’s ability to extract long and favorable terms from suppliers are Wal-Mart in the United States, and Carrefour in France.

Assessing the credit quality of a customer can be very challenging. Most corporates have a few large clients for whom public information is current and easily available. However, the majority of a company’s business customers are often small firms for which reliable financial data are more difficult to obtain. In the past 20 years in developed economies, progress has been
made toward making the publication of updated statements compulsory, but there is still a long way to go.

Risk managers working in corporations have to make credit decisions based on spotty information. They are helped by specialized companies that have developed databases with millions of records related to financial information and payment patterns. A credit score that summarizes the most relevant criteria to assess the probability of getting paid can complement raw data. The most well-known vendor in the United States is Dun & Bradstreet; in Europe, Bureau Van Dijk; and in Japan, Teikoku Databank.

Faced with the decision of whether to sell to a customer, corporates have options to mitigate this credit risk exposure:

- They can buy insurance on their receivables, and an insurer indemnifies them in the event they are not paid.
- They can sell their receivables to factoring companies, which provide cash and credit insurance at the same time.
- Foreign transactions can be secured by documentary credit.

These mitigation tools will be explored in Chapter 15.

The second source of credit risk for corporates stems from the circumstance in which they have significant amounts of cash to invest. When investor demand for long-dated bonds is high and yields are low, large corporates take advantage of the market conditions to draw on their credit lines or they issue large amounts of bonds even though they have no immediate funding needs. They build war chests that they can use when acquisition and other business opportunities arise. For example, in 2012, corporates had a record amount of cash borrowed at record low yields. Yet, due to the recession and the dearth of investment opportunities, the cash was not deployed into the business but instead was deposited in banks and invested in short-term securities, both of which bear credit risk.

Generally speaking, corporates are prudent and favor safe investments like cash and cash-equivalent products, thereby limiting the amount of credit risk they are taking. Certainly, it makes little sense for bondholders to hand over cash for the corporate to buy securities or deposit in banks, since the bondholders could do that directly. However, as we saw in the recent financial crisis, even cash was not safe. Corporates re-evaluated creditworthiness of the banks that held their deposits and then diversified their deposits across banks, knowing that, ultimately, no bank is “too big to fail.” Another consequence of the financial crisis and the re-evaluation of credit was that the demand for U.S. Treasury bills grew by an unprecedented amount, to the point where nominal yields became negative. Corporate and other investors literally paid to park their investable funds, arguably due to fear of
credit losses. Oddly enough, one reason the demand for corporate bonds has been so high in recent years is that nonfinancial corporations emerged from the financial crisis and the ensuing recession as arguably the most prudent stewards of investor funds, unlike state and local governments, government sponsored enterprises, and others, so parking cash with a corporation never looked so safe.

For certain industry sectors, the third source of credit risk, is—by choice or by obligation—derivative trading activities, such as the trading of commodity futures. Given the volatility of the price of commodities, corporates that need these raw materials usually enter into long-term fixed-price contracts. Examples include food companies, which buy agricultural futures, and utilities, which buy combustible product futures to lock in the cost of running their power plants.

Inherent in these trades is a counterparty’s inability to make or take delivery of the commodity, and both parties in the trade are exposed to each other’s credit risk—the seller who must make delivery and the futures buyer who must make a payment. In the past two decades, the futures markets have become adept at mitigating these inherent sources of credit risk with the clearinghouses requiring margins, or collateral, which vary with the price of the commodity, and providing a backstop to these transactions in the event that the margin proves insufficient. However, many corporates are engaged in the buying and selling of commodities for delivery at a future date that does not happen on an organized exchange, that is, using forward contracts, and in these cases, the credit risk exposure is large on both sides. The counterparty can default on its obligation, forcing the corporate to buy or sell in the spot market at prevailing conditions, which can result in a mismatch of costs and revenues with the potential for significant losses. In Chapter 5, we will review examples of contracts that create large credit exposures, especially compared to the company’s income and capital bases. Corporates engaged in these industries—agriculture, food, energy, and utilities—generally have the most well-developed credit management teams.

Finally, some large corporates that produce expensive equipment have financing arms to help their clients acquire or lease their products. This activity is known as vendor financing. IBM Global Financing (technology), Caterpillar Financial Services (heavy equipment), or Ford Motor Credit Company (automobile) are good examples. They work exclusively for their parent company’s clients, and they function like nondepository banks. The business model is to buy equipment from their parents with borrowed money (bank debt and capital markets) and to rent or lease the equipment to customers. The risk is that customers may default on their repayments and leave the lenders with credit losses.
Individuals

Few individuals worry about credit risk, but the reality is that all households are exposed. Think of the situation in which a family loses money because they made advance payments to a contractor who does not complete the home-renovation project. This is credit risk!

Individuals also bear credit risk in their investment activities, just as insurers and corporates do. The individual manages credit risk in his or her selection of the mutual fund to invest in. The investor may choose to invest in a high-yield fund versus an investment-grade bond fund to extract more yield by taking more credit risk.

Finally, money deposited at banks generates credit risk. Regulators frequently shut down banks, which can lead to losses for their clients. In most countries, some protections are in place. In the United States, the Federal Deposit Insurance Company (FDIC) guarantees all deposits up to $250,000 per account.

WHY MANAGE CREDIT RISK?

An important aspect of credit risk is that it is controllable. Credit exposure does not befall a company and its credit risk managers out of nowhere. If credit risk is understood in terms of its fundamental sources and can be anticipated, it would be inexcusable to not manage it.

Credit risk is also the product of human behavior; that is, of people making decisions. Precarious financial circumstances that obligors may find themselves in result from the decisions that the company’s managers have made. The decisions that they make are consequences of their incentives and the incentives of the shareholders whom they represent. Understanding what motivates the shareholders and managers is an important aspect of a counterparty’s credit risk profile. We explore more of this thinking in Chapter 6, “Fundamental Credit Analysis.”

In summary, weak management of a credit portfolio can be costly and can even lead to bankruptcy. As we will review in Chapter 10, exposure to credit risk is capital intensive. A large equity base must be built to survive large and unexpected losses. With a credit portfolio, a large number of small losses are expected and manageable. However, there is also a small chance to face large losses, which can be lethal.
All firms should devote significant attention and resources to credit risk management for their own survival, profitability, and return on equity:

- **Survival.** It’s a concern primarily for financial institutions for which large losses can lead to bankruptcy, but even a nonfinancial corporation can have credit losses that can cause bankruptcy.
- **Profitability.** It sounds trivial to state that the less money one loses, the more money one makes, but the statement pretty much summarizes the key to profitability, especially of low-margin businesses.
- **Return on equity.** Companies cannot run their business at a sufficient return on equity if they hold too much equity capital. Holding large amounts of debt capital is not the solution either, because debt does not absorb losses and can introduce more risk into the equation. The key to long-term survival is a sufficiently high amount of equity capital complemented by prudent risk management.

During the recent financial crisis, certain global players performed much better than their peers thanks to very powerful credit risk management principles that kept them afloat. In any economic environment and for any type of company, actively managing a credit portfolio can help increase the company’s return on equity. We will review in Chapter 9 the basic principles of portfolio management. In short, the objective is to maximize profits for a given amount of capital allocated to credit activities.