GLOBAL EDITION

Financial Markets and Institutions

TENTH EDITION

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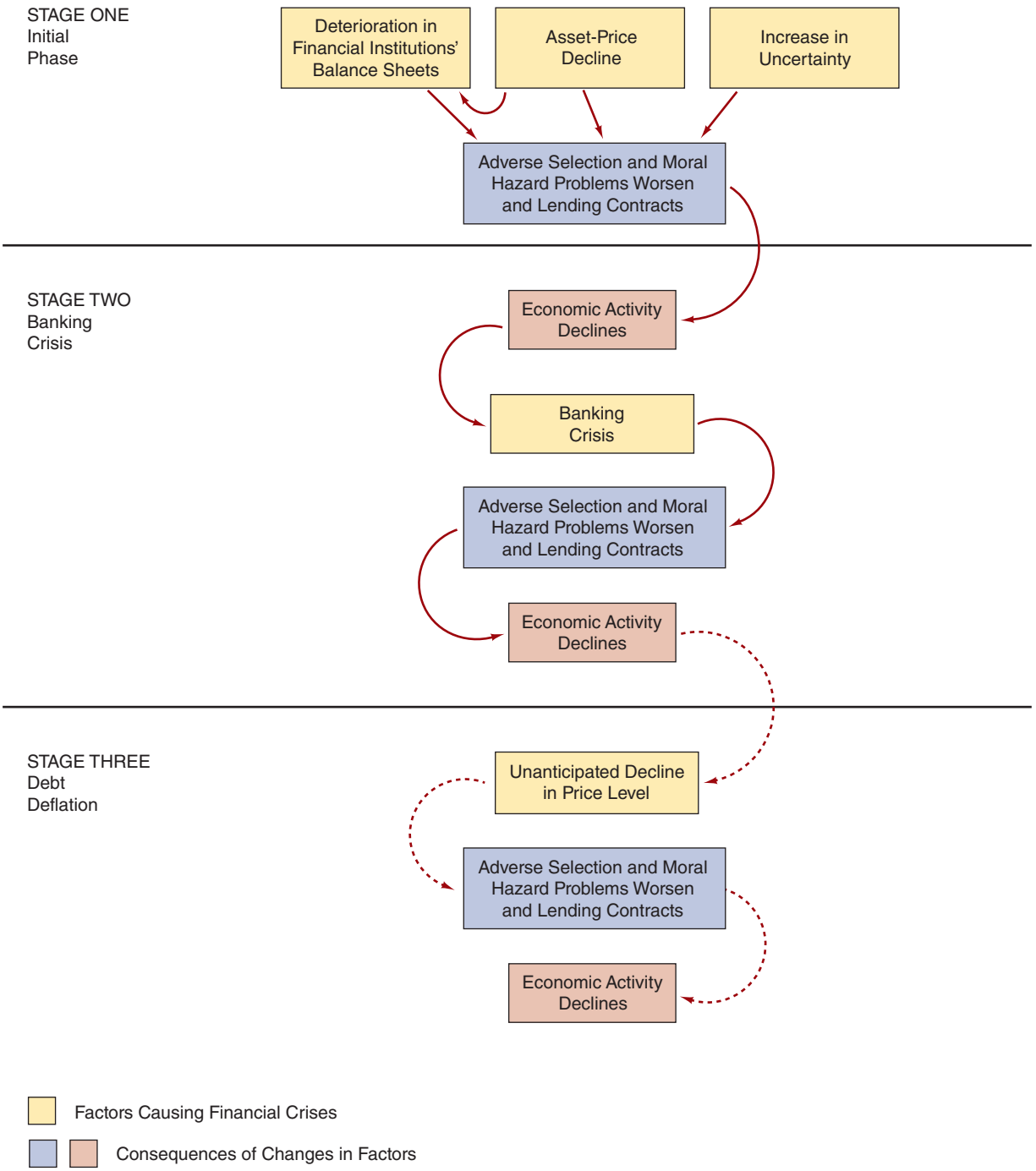

FIGURE 8.1 Sequence of Events in Financial Crises in Advanced Economies

The solid arrows trace the sequence of events during a typical financial crisis; the dotted arrows show the additional set of events that occur if the crisis develops into a debt deflation. The sections separated by the dashed horizontal lines show the different stages of a financial crisis.

financial innovation, or when countries engage in **financial liberalization**, the elimination of restrictions on financial markets and institutions. In the long run, financial liberalization can promote financial development and lead to a well-run financial system that allocates capital efficiently. However, financial liberalization has a dark side: In the short run, it can prompt financial institutions to go on a lending spree, called a **credit boom**. Unfortunately, lenders may not have the expertise, or the incentives, to manage risk appropriately in these new lines of business. Even with proper management, credit booms eventually outstrip the ability of institutions—and government regulators—to screen and monitor credit risks, leading to overly risky lending.

Government safety nets, such as deposit insurance, weaken market discipline and increase the moral hazard incentive for banks to take on greater risk than they otherwise would. Because lender-savers know that government-guaranteed insurance protects them from losses, they will supply even undisciplined banks with funds. Banks and other financial institutions can make risky, high-interest loans to borrower-spenders. They will walk away with nice profits if the loans are repaid, and rely on government deposit insurance, funded by taxpayers, if borrower-spenders default. Without proper monitoring, risk taking grows unchecked.

Eventually, losses on loans begin to mount, and the value of the loans (on the asset side of the balance sheet) falls relative to liabilities, thereby driving down the net worth (capital) of banks and other financial institutions. With less capital, these financial institutions cut back on their lending to borrower-spenders, a process called **deleveraging**. Furthermore, with less capital, banks and other financial institutions become riskier, causing lender-savers and other potential lenders to these institutions to pull out their funds. Fewer funds means fewer loans to fund productive investments and a credit freeze: The lending boom turns into a lending crash.

When financial institutions stop collecting information and making loans, financial frictions rise, limiting the financial system's ability to address the asymmetric information problems of adverse selection and moral hazard (as shown in the arrow pointing from the first factor, "Deterioration in Financial Institutions' Balance Sheets," in the top row of Figure 8.1). As loans become scarce, borrower-spenders are no longer able to fund their productive investment opportunities and they decrease their spending, causing economic activity to contract.

Asset-Price Boom and Bust Prices of assets such as equity shares and real estate can be driven by investor psychology well above their **fundamental economic values**, that is, their values based on realistic expectations of the assets' future income streams. The rise of asset prices above their fundamental economic values is an **asset-price bubble**. Examples of asset-price bubbles are the tech stock market bubble of the late 1990s and the early 2000s housing price bubble that we will discuss later in this chapter. Asset-price bubbles are often also driven by credit booms, in which the large increase in credit is used to fund purchases of assets, thereby driving up their price.

When the bubble bursts and asset prices realign with fundamental economic values, stock and real estate prices tumble, companies see their net worth (the difference between their assets and their liabilities) decline, and the value of collateral they can pledge drops. Now these companies have less at stake because they have less "skin in the game" and so they are more likely to make risky investments because they have less to lose, the problem of moral hazard. As a result, financial

institutions tighten lending standards for borrower-spenders and lending contracts (as shown by the downward arrow pointing from the second factor, "Asset-Price Decline," in the top row of Figure 8.1).

The asset-price bust also causes a decline in the value of financial institutions' assets, thereby causing a decline in their net worth and hence a deterioration in their balance sheets (shown by the arrow from the second factor to the first factor in the top row of Figure 8.1), which causes them to deleverage, steepening the decline in economic activity.

Increase in Uncertainty U.S. financial crises have usually begun in periods of high uncertainty, such as just after the start of a recession, a crash in the stock market, or the failure of a major financial institution. Crises began after the failure of Ohio Life Insurance and Trust Company in 1857; Jay Cooke and Company in 1873; Grant and Ward in 1884; the Knickerbocker Trust Company in 1907; the Bank of the United States in 1930; and Bear Stearns, Lehman Brothers, and AIG in 2008. With information hard to come by in a period of high uncertainty, financial frictions increase, reducing lending and economic activity (as shown by the arrow pointing from the last factor, "Increase in Uncertainty," in the top row of Figure 8.1).

Stage Two: Banking Crisis

Deteriorating balance sheets and tougher business conditions lead some financial institutions into insolvency, when net worth becomes negative. Unable to pay off depositors or other creditors, some banks go out of business. If severe enough, these factors can lead to a **bank panic**, in which multiple banks fail simultaneously. The source of the contagion is asymmetric information. In a panic, depositors, fearing for the safety of their deposits (in the absence of or with limited amounts of deposit insurance) and not knowing the quality of banks' loan portfolios, withdraw their deposits to the point that the banks fail. Uncertainty about the health of the banking system in general can lead to runs on banks, both good and bad, which will force banks to sell off assets quickly to raise the necessary funds. These **fire sales** of assets may cause their prices to decline so much that the bank becomes insolvent, even if the resulting contagion can then lead to multiple bank failures and a full-fledged bank panic.

With fewer banks operating, information about the creditworthiness of borrower-spenders disappears. Increasingly severe adverse selection and moral hazard problems in financial markets increase financial frictions and deepen the financial crisis, causing declines in asset prices and the failure of firms throughout the economy that lack funds for productive investment opportunities. Figure 8.1 represents this progression in the stage two portion. Bank panics were a feature of all U.S. financial crises during the nineteenth and twentieth centuries, occurring every twenty years or so until World War II—1819, 1837, 1857, 1873, 1884, 1893, 1907, and 1930–1933. (The 1933 establishment of federal deposit insurance, which protects depositors from losses, has prevented subsequent bank panics in the United States.)

Eventually, public and private authorities shut down insolvent firms and sell them off or liquidate them. Uncertainty in financial markets declines, the stock market recovers, and balance sheets improve. Financial frictions diminish and the financial crisis subsides. With the financial markets able to operate well again, the stage is set for an economic recovery.

Stage Three: Debt Deflation

If, however, the economic downturn leads to a sharp decline in the price level, the recovery process can be short-circuited. In stage three in Figure 8.1, **debt deflation** occurs when a substantial unanticipated decline in the price level sets in, leading to a further deterioration in firms' net worth because of the increased burden of indebtedness.

In economies with moderate inflation, which characterizes most advanced countries, many debt contracts with fixed interest rates are typically of fairly long maturity, ten years or more. Because debt payments are contractually fixed in nominal terms, an unanticipated decline in the price level raises the value of borrowing firms' liabilities in real terms (increases the burden of the debt) but does not raise the real value of borrowing firms' assets. The borrowing firm's net worth in real terms (the difference between assets and liabilities in real terms) thus declines.

To better understand how this decline in net worth occurs, consider what happens if a firm in 2024 has assets of $100 million (in 2024 dollars) and $90 million of long-term liabilities, so that it has $10 million in net worth (the difference between the value of assets and liabilities). If the price level falls by 10% in 2025 the real value of the liabilities would rise to $99 million in 2024 dollars, while the real value of the assets would likely remain unchanged at $100 million. The result would be that real net worth in 2024 dollars would fall from $10 million to $1 million ($100 million minus $99 million).

The substantial decline in real net worth of borrowers from a sharp drop in the price level causes an increase in adverse selection and moral hazard problems facing lenders. Lending and economic activity decline for a long time. The most significant financial crisis that displayed debt deflation was the Great Depression, the worst economic contraction in U.S. history.

CASE

The Mother of All Financial Crises: The Great Depression

With our framework for understanding financial crises in place, we are prepared to analyze how a financial crisis unfolded during the Great Depression and how it led to the worst economic downturn in U.S. history.

Stock Market Crash

In 1928 and 1929, prices doubled in the U.S. stock market. Federal Reserve officials viewed the stock market boom as excessive speculation. To curb it, they pursued a tightening of monetary policy to raise interest rates to limit the rise in stock prices. The Fed got more than it bargained for when the stock market crashed in October 1929, falling by 40% by the end of 1929, as shown in Figure 8.2.

Bank Panics

By the middle of 1930, stocks recovered almost half of their losses and credit market conditions stabilized. What might have been a normal recession turned into something far worse, however, when severe droughts in the Midwest led to a sharp

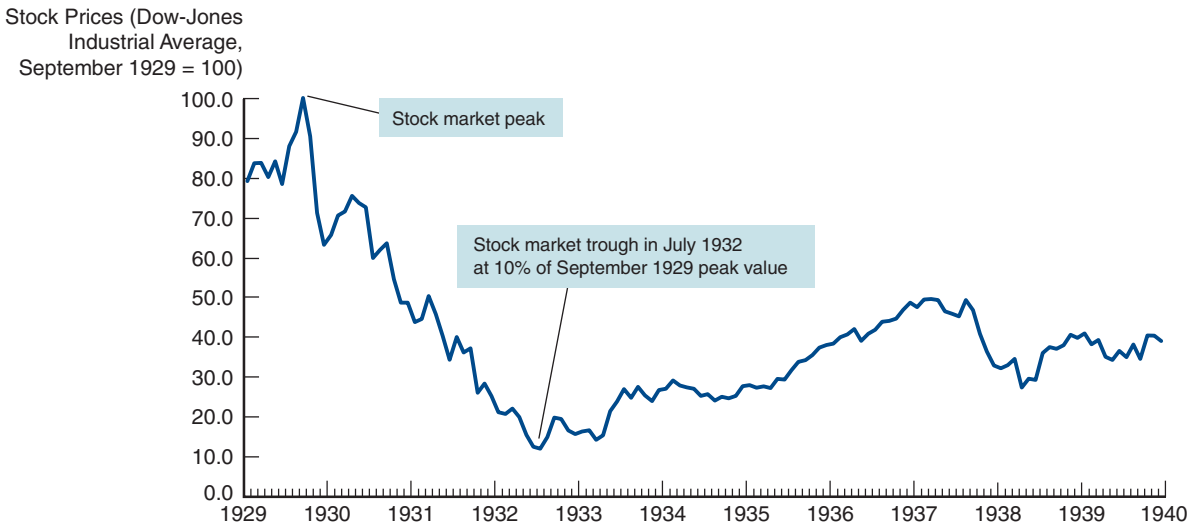

FIGURE 8.2 Stock Price Data During the Great Depression Period

Stock prices crashed in 1929, falling by 40% by the end of 1929, and then continued to fall to only 10% of their peak value by 1932.

Source: Yahoo Finance: https://finance.yahoo.com/.

decline in agricultural production, with the result that farmers could not pay back their bank loans. The resulting defaults on farm mortgages led to large loan losses on bank balance sheets in agricultural regions. The weakness of the economy and the banks in agricultural regions in particular prompted substantial withdrawals from banks, building to a full-fledged panic in November and December 1930, with the stock market falling sharply. For more than two years, the Fed sat idly by through one bank panic after another, the most severe spate of panics in U.S. history. After what would be the era's final panic in March 1933, President Franklin Delano Roosevelt declared a bank holiday, a temporary closing of all banks. "The only thing we have to fear is fear itself," Roosevelt told the nation in his first inaugural address. The damage was done, however, and more than one-third of U.S. commercial banks had failed.

Continuing Decline in Stock Prices

Stock prices kept falling. By mid-1932, stocks had declined to 10% of their value at the 1929 peak (as shown in Figure 8.2), and the increase in uncertainty from the unsettled business conditions created by the economic contraction worsened adverse selection and moral hazard problems in financial markets. With a greatly reduced number of financial intermediaries still in business, adverse selection and moral hazard problems intensified even further. Financial markets struggled to channel funds to borrower-spenders with productive investment opportunities. As our analysis predicts, the amount of outstanding commercial loans fell by half from 1929 to 1933, and investment spending collapsed, declining by 90% from its 1929 level.

A manifestation of the rise in financial frictions is that lenders began charging businesses much higher interest rates to protect themselves from credit losses. The resulting rise in **credit spread**—the difference between the interest rate on loans to households and businesses and the interest rate on completely safe assets that are sure to be paid back, such as U.S. Treasury securities—is shown in Figure 8.3, which displays the difference between interest rates on corporate bonds with a Baa (medium-quality) credit rating and similar-maturity Treasury bonds.

Debt Deflation

The ongoing deflation that started in 1930 eventually led to a 25% decline in the price level. This deflation short-circuited the normal recovery process that occurs in most recessions. The huge decline in prices triggered a debt deflation in which net worth fell because of the increased burden of indebtedness borne by firms. The decline in net worth and the resulting increase in adverse selection and moral hazard problems in the credit markets led to a prolonged economic contraction in which unemployment rose to 25% of the labor force. The financial crisis in the Great Depression was the worst ever experienced in the United States, and it explains why the economic contraction was also the most severe ever experienced by the nation.

International Dimensions

Although the Great Depression started in the United States, it was not just a U.S. phenomenon. Bank panics in the United States also spread to the rest of the world, and the contraction of the U.S. economy sharply decreased the demand for foreign

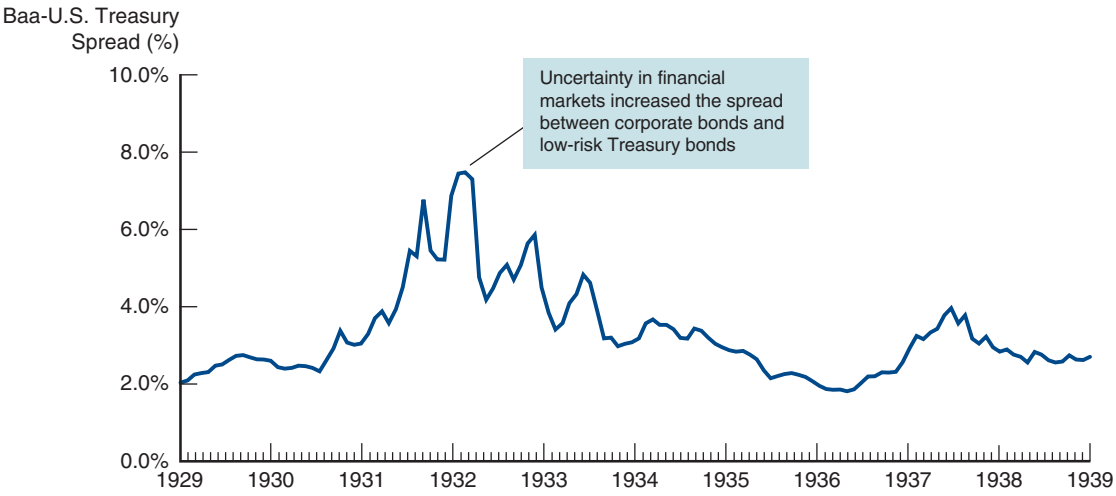

FIGURE 8.3 Credit Spreads During the Great Depression

Credit spreads (the difference between rates on Baa corporate bonds and U.S. Treasury bonds) rose sharply during the Great Depression.

Source: Federal Reserve Bank of St. Louis, FRED database: https://fred.stlouisfed.org/series/M13036USM193NNBR, https://fred.stlouisfed.org/series/LTGOVTBD