Notes

1 Financial Crises: An Overview

1. An important channel through which contagion is communicated stems from the fact that banks of numerous European nations own large quantities of bonds issued by the governments of Greece, Spain, Italy, and other European nations. If suspicion of impending default becomes prevalent, the prices of these bonds fall sharply as yields on the bonds rise. When Greek government bonds prices fell by 75 percent in 2011 and 2012 as Greece partially defaulted on its debt, this triggered crises for banks in other European nations. The two largest Cyprus banks, for example, lost more than $4 billion on the Greek bonds, causing a major crisis in Cyprus in March 2013. By forcing the Cypriot government to step in to prevent bank failures and protect depositors, the Cyprus banking crisis became a government debt crisis.
2. John Maynard Keynes famously described this process in his brilliant early polemic work, *The Economic Consequences of the Peace* (London: Macmillan, 1918), as follows: "By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens…There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner than not one man in a million is able to diagnose."
3. The highest U.S. inflation rate for any year since 1800 occurred in 1864, during the Civil War, when prices increased by 24 percent. In the past 60 years, U.S. inflation reached its highest level in 1980, when it peaked at approximately 12 percent. In the 50 years ending in 2013, U.S. inflation averaged 4.1 and 3.6 percent per year, as measured by the consumer price index and the GDP deflator, respectively.
4. Deleveraging is simply the application of leverage on the downside. If a bank traditionally maintains a ratio of loans to capital of 6 to 1 and it gains $100 million of capital, it may expand its loans by $600 million. Its capital is "leveraged" 6 to 1. If bad loans reduce the bank's capital by $100 million, it must reduce loans by $600 million to return to its customary loan/capital ratio. This latter phenomenon is termed "deleveraging." A massive loss of capital in lending institutions led to the enormously damaging phenomenon of deleveraging in the United States and other nations.

2 The Nature of Banking Crises

1. See two works by Hyman Minsky: *Stabilizing an Unstable Economy* (New Haven, CT: Yale University Press, 1986), and "The Financial Instability Hypothesis,"

Working Paper No. 74, Jerome Levy Economics Institute of Bard College, May 1992.

2. In the build-up to the Great Crisis, much of the new lending took place in the rapidly expanding "shadow-banking" sector, which by 2007 had grown in magnitude to approximately equal the size of the "regular" banking system. The shadow-banking system is discussed in chapter 4.
3. This phenomenon was first witnessed during the manic phase of the enormous late-1990s bubble in technology stocks that drove the NASDAQ 100 index up approximately ten fold in the seven years ending in early 2000.
4. The Federal Reserve advanced the proposition that the surge in credit that fed the U.S. housing bubble was largely the result not of Federal Reserve policy, but of a "global savings glut" that found an outlet in the United States and other nations. In this view, an enormous and persistent capital inflow to the United States and other countries from nations with persistent current account surpluses, like China and India, drove down U.S. interest rates and financed the bubble. See Ben Bernanke's speech entitled, "Monetary Policy and the Housing Bubble," available at http://www.federalreserve.gov/newsevents/speech/2010speech.htm. This hypothesis is contentious among economists.
5. As the crisis engulfed nations throughout the world, however, fearful investors in more vulnerable nations began liquidating domestic assets and moving funds into the United States, long regarded as the ultimate safe haven. The dollar thus appreciated strongly. This wholesale dumping of assets in many countries perceived to be highly vulnerable disrupted financial markets in those countries, contributing further to the severity of their crises.
6. This is a major theme of an important book of the same name by Carmen Reinhart and Kenneth Rogoff, *This Time is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2009). This book provides a detailed empirical analysis of the history of financial crises, commencing with those of the thirteenth century.
7. Prior to the 2007–2009 financial crisis, both Federal Reserve Chairman Ben Bernanke and his predecessor, Alan Greenspan, were adamant in their opposition to the view that the Fed should attempt to deflate asset bubbles before they become dangerous. However, having experienced the enormous cost of the Great Crisis, Bernanke has revealed a softening of his position on this issue.
8. See Reinhart and Rogoff, *op.cit.*, and "Is the U.S. Subprime Crisis So Different? An International Comparison," *American Economic Review*, 98 No. 2 (2008): 339–344.
9. The increase in the government budget deficit/GDP ratio in the crisis-related recessions experienced by Finland and Sweden were 11.8 and 15.4 percentage points, respectively. In contrast, these budget deficit swings experienced by Mexico, Thailand, Korea, and Indonesia in crisis-related recessions in the 1990s were less than six percentage points, as was the case for the United States during 2007–2010. See Reinhart and Rogoff, op.cit, *This Time is Different*, p. 231.

3 The Panic of 1907 and the Savings and Loan Crisis

1. For a detailed study of nineteenth century U.S. banking panics, see Charles Calomiris and Gary Gorton, "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in R. Glenn Hubbard, *Financial Markets and Financial Crises* (Chicago, IL: University of Chicago Press, 1991).

2. At the peak of the banking crisis a few months later, J. P. Morgan, steel industry magnate and eminent banker, was informed by Mayor George McClellan that New York City was likely to declare bankruptcy the following week. Acutely aware of the blow to public confidence and the fragile banking system such an announcement would cause, Morgan agreed to keep the city afloat by personally buying $30 million of New York City bonds.
3. The Panic of 1907 took a terrible toll on Barney and his family. Although the crisis was over by then and he remained a wealthy man, Barney died in his home of a self-inflicted gunshot on November 14, 1907. For a fascinating account of the personalities and events involved in the Panic of 1907, see Robert Bruner and Sean Carr, *The Panic of 1907:Lessons Learned From the Market's Perfect Storm* (Hoboken, New Jersey: John Wiley and Sons, 2009).
4. In 1981, for example, the 90-day Treasury bill yield averaged 14.2 percent while the 30-year Treasury bond yield averaged 13.4 percent.
5. Had the S&Ls not sharply boosted rates paid to depositors, depositor defection to money market funds and Treasury bills would have forced the S&Ls to liquidate large quantities of mortgages to obtain the funds to pay departing depositors. This would have severely depressed the value of the mortgages on the S&Ls' books. In the absence of a government bailout, this would likely have bankrupted many of them.
6. In December 1981, the low point of S&L valuation, a widely quoted estimate placed the net worth of the S&L industry at negative $100 billion. The 1981 spike in interest rates, by depressing the value of mortgages and bonds on the books of the S&Ls, temporarily put the net worth of the industry at an all-time low. By the end of 1983, long-term rates had come down appreciably from their peaks and the increase in bond and mortgage values returned the net worth of the industry to positive territory.
7. The infamous "Keating Five" scandal involved five U.S. senators who had collectively received $1.3 million in campaign contributions from Charles H. Keating, Jr., head of the Lincoln Savings and Loan Association in Arizona. Keating had been breaking rules and speculating with depositors' money for years. His S&L bought junk bonds, speculated in currency futures, and looted the company to transfer $30 million to his family. As regulatory authorities prepared to swoop in on Keating the five senators went to bat for him, complaining to top regulators that they were being inconsistent with the regulatory sentiment of the times. Jurisdiction was taken out of control of the Federal Home Loan Bank of San Francisco and Lincoln's books were not examined for more than a year. In 1992, Keating was convicted of numerous counts of fraud and served a sentence in federal prison. The senators were excused with a mild slap on the wrist. Ultimate cost to the Treasury of the Lincoln fiasco was in excess of $3 billion.

4 Development of the Housing and Credit Bubbles

1. Restrictions on institutions that purchased the MBS and related securities often required that only AAA-rated securities were eligible for purchase. Moody's, Standard and Poor's, and Fitch were the principal rating agencies and they were paid by fees collected from the investment banks that issued the bonds. The conflict of interest is palpable.
2. America's homeownership rate jumped sharply in the early post-World War II period from 45 percent in 1945 to about 65 percent in 1957, remained stable until 1994, and then increased to 69 percent in 2005. Hence, this recent increase in the

share of American households owning homes can account for only a minor portion of the increase in mortgage debt/disposable income. Typical homebuyers were taking on larger amounts of mortgage debt relative to take-home pay.

3. From 1998 through 2005, the consumer price index increased at an average annual rate of 2.6 percent. In this period, the rate of inflation of houses nationwide averaged 10.4 percent per year. In major urban areas, house prices increased even more rapidly.
4. In the first case, the $10,000 investment led to a gain of $122,102 after five years. The average annual compounded rate of return on the investment is thus $[(\$122,102/\$10,000)^{1/5}-1]$ x 100 = 64.9 percent per year. At 14 percent per year appreciation, it is $[(\$185,083/\$10,000)^{1/5}-1]$ x 100 = 79.3 percent per year.
5. The data plotted in Figure 4-2 are backward-looking 12 month inflation rates. The Case-Shiller 20-City Home Price Index commences only in 2000, which is why the first observation plotted is for the first quarter of 2001.
6. The monthly payments typically increased by more than $300 after the first two years of the loan. Some 15 percent of these "teaser rate" mortgages issued in 2006 featured initial rates of less than 2 percent, while the rate on conventional 30-year fixed-rate mortgages was more than 6 percent.
7. This problem could be fixed by requiring the mortgage originator to retain, say, 20 percent of the mortgages on its books. This would change the pattern of incentives by ensuring that lenders had "skin in the game."
8. An excellent analysis of the subprime mortgage market can be found in Edward Gramlich, *Subprime Mortgages: America's Latest Boom and Bust* (Washington, D.C.: Urban Institute Press, 2007).
9. Tax breaks for homeowners not available to renters include deductibility from taxable income of mortgage interest payments and property taxes, along with favorable capital gains tax treatment, including a one-time exemption of up to $500,000 in capital gains realized on the sale of a principal residence.
10. It is likely that these firms will eventually be totally privatized (thus eliminating any implicit guarantees by the government), de-privatized and returned to their original status as strictly government organizations, left as privately owned GSEs but subjected to increased regulations that reduce the risks they are allowed to take, or maintained as privately owned GSEs but reduced dramatically in size to reduce taxpayer exposure to risk.
11. In 2004 Fannie Mae became engulfed in an accounting scandal, and in December 2006 federal regulators filed numerous civil charges against three top Fannie officials. These officials were charged with fraudulently manipulating Fannie's reported profits for purposes of boosting their annual bonuses. The suit sought to recover more than $115 million in bonus payments paid to these officials during the 1998-2004 period in addition to $100 million in fines for involvement in the accounting scandal. These fraudulent accounting activities appear similar to those engaged in concurrently by such purely private corporations as Enron, Tyco, and World Com, among others.
12. Banks themselves became participants in the shadow banking system during the mortgage boom. They established subsidiaries, so-called structured investment vehicles (SIVs). These SIVs issued commercial paper to finance purchase of a variety of higher yielding assets, including mortgage-backed and related securities. Banks placed these SIVs off balance sheet so they would not be subject to capital requirements on the securities held in the SIVs. By reducing required capital, this tactic enabled banks to increase their leverage.
13. Tim Geithner, remarks at the Economic Club of New York, June 9, 2009, available at http://www.newyorkfed.org/newsevents/speeches/2008.

14. Part of the jump in leverage in 2007 was due to the decline in capital resulting from major losses taken by investment banks that year, especially in mortgage-backed securities. This was particularly true in the case of Merrill and Lehman. The increases in leverage exhibited in 2005 and 2006 can be ascribed primarily to a careless increase in risk-taking as the investment banks got caught up in the manic phase of the Minsky cycle.
15. By the Taylor Rule standard, the federal funds rate was maintained too low on average during 2002–2005 by more than 250 basis points.

5 Bursting of the Twin Bubbles

1. Using monthly averages of daily figures, the Treasury securities yield curve has been inverted in only 12 months since 1982. That is, 90-day Treasury bill yields since 1982 have exceeded 30-year Treasury bond yields only in the periods extending from July through December of 2000 and October 2006 through March 2007. In the other 97 percent of the months since 1982 the yield curve has been upward sloping. See the FRED database at http://research.stlouisfed/org/fred2/.
2. Even before banks resorted to SIVs, they were encouraged to sell individual mortgages and purchase MBS by a series of accords known as Basel II. In these agreements, implemented in the early 2000s, bank capital requirements were based on the perceived risk structure of bank assets. Because the regulators who drew up the Basel II agreements believed that these MBS and CDOs were relatively safe instruments, capital requirements applied to them were low relative to requirements on individual mortgages in bank portfolios.
3. Occasionally, short-term Treasury bill yields became negative in 2008. How can this anomaly be explained? Because certain types of loans require that collateral be in the form of the ultra-safe Treasury bills, high demand for these instruments occasionally pushed their prices above face value, thus resulting in a negative yield. The same phenomenon also occurred in the early 1930s, although in that instance the negative yield may have been attributable to absence of federal insurance on bank deposits and the associated relative safety of Treasury bills.
4. For a riveting account of the developments of mid-September 2008, see James B. Stewart, “Eight Days,” *The New Yorker*, September 21, 2009. Other readable accounts can be found in David Wessel, *In Fed We Trust* (New York: Crown Publishing Group, 2009) and Andrew Sorkin, *Too Big to Fail* (New York: Viking, 2009).

6 The Great Crisis and Great Recession of 2007–2009

1. The Department of Labor does not attempt to measure the number of frictionally unemployed workers. This number, which fluctuates over time, can only be crudely estimated.
2. The problem of structural unemployment is probably best attacked through massive efforts to improve the educational attainment of children from economically and socially disadvantaged families. In the 1960s President Lyndon Johnson initiated the Jobs Corps program to provide young individuals from disadvantaged families with viable job skills. President Richard Nixon preferred to address the problem through the private sector by offering tax credits as incentives for firms to hire and train workers who would not otherwise have warranted employment.

3. See Douglas Staiger, James Stock, and Mark Watson, "How Precise Are Estimates of the Natural Rate of Unemployment?" in Christina Romer and David Romer, eds., *Reducing Inflation: Motivation and Strategy* (Chicago, IL: University of Chicago Press, 1997). The authors estimate that in 1990 the NAIRU was 6.2 percent. However, their statistical procedures indicated they could be 95 percent confident only that the true NAIRU was within a range of 5.1 to 7.7 percent.
4. During President Bill Clinton's two terms of office (January 1993-January 2001), the nation's unemployment rate declined in each of the eight calendar years encompassing 1993 through 2000, while the inflation rate also declined in six of these years. To a large extent Clinton was the beneficiary of fortuitous events, several of which are indicated above. However, his administration must be given credit for taking steps to bring down the large budget deficit it inherited, thereby facilitating a low interest-rate environment that was conducive to robust investment spending and economic growth. President Clinton also worked to open up trade and promote globalization, which helped hold down inflation in the United States.
5. Because various business cycle indicators often tell conflicting stories, several months typically elapse before the National Bureau of Economic Research (NBER) feels sufficiently confident to declare the beginning points (troughs) or ending points (peaks) of business cycles. For example, the beginning of the (December) 2007–2009 recession was not designated by the NBER until December 2008. The ending date of the recession (June 2009) was not determined until September 2010.
6. During the Great Depression stock prices ultimately declined by 87 percent. This means that $1,000 invested in the Dow-Jones index in September 1929 had declined to $130 by April 1933!
7. In 2009 and 2010 more than 250 U.S. banks failed, and several of the nation's largest banks (for example, Citigroup and Bank of America) would likely have joined the list had they not been saved by the U.S. government.
8. A more comprehensive index of unemployment takes account of the phenomena of discouraged workers and those involuntarily working part time because they cannot find a full-time job. The discouraged workers are those who give up looking for work and therefore are not counted as being in the labor force or being unemployed even though they prefer to be employed. This more comprehensive measure of unemployment jumped to 17.5 percent in October 2009 while the reported unemployment rate increased to 10 percent.
9. Carroll, Otsuka, and Slacalek, "How Large Are Housing and Financial Wealth Effects? A New Approach," *Journal of Money Credit and Banking*, February 2011, pp. 55–79.
10. The rising share of GDP constituted by consumption spending since the early 1980s was reflected in a declining household saving rate, defined as the percentage of disposable personal income saved. This rate slowly declined from an average of 10 percent in the 1980s to about 2.5 percent during 2000-2007, before increasing during the Great Recession as households reacted to the financial crisis with rare caution.

7 Aftermath of the Great Recession: The Anemic Recovery

1. The 1.3 percentage point average contraction in the share of GDP constituted by residential construction in the cyclical housing swings surrounding the six previous recessions pales in comparison with the 4.1 percentage point decline in the

2005–2011 period. The annual rate of residential investment declined from a peak level of $813 billion in 2006:1 to a low of $330 billion in 2010:3.

2. In fact, it is unique in these regards at least among the most recent 13 cyclical expansions dating to the recovery from the Great Depression of 1929–1933. On this, see Steven Gjerstad and Vernon Smith, *Prosperity and Recession* (Cambridge: Cambridge University Press, 2013).
3. Sequestration was put in place by a mid-2011 agreement between Congress and President Obama as a precondition for an agreement for Congress to pass an increase in the national debt ceiling. It was designed to be so distasteful to Republicans (because of large cuts in defense expenditures) and to Democrats (because of savage cuts in child nutrition programs and other programs benefiting vulnerable citizens) that it would ensure that a more rational and less costly path to deficit reduction would be enacted. Implementation of the sequester—the ultimate indicator of Congressional dysfunction—was initially postponed until March 1, 2013. It then went into effect as Republicans refused to endorse any new sources of revenue and Democrats refused to endorse any cuts in scheduled entitlement spending.

8 The European Sovereign Debt Crisis

1. The original members of the euro zone included Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain. Since 1999, five other nations have joined: Cyprus, Estonia, Malta, Slovenia, and Slovakia.
2. From 1999 to 2010, average inflation rates (using GDP deflators) in Ireland, Spain, Greece, and Portugal exceeded 3 percent per year. In Germany, Austria, and Finland, corresponding inflation rates were less than 1.5 percent per year.
3. Particularly compelling is the criticism of Germany, in view of its low inflation rate, huge trade surplus, and robust budgetary position, for being unwilling to implement fiscal stimulus and thereby aide the struggling GIPSI countries by boosting their exports and economic activity and thus reducing their trade and budget deficits.
4. A nation's inflation rate could not exceed by more than 1.5 percentage points the average inflation rate of the three countries with the lowest inflation rates. A nation's long-term government bond yield could not exceed by more than 2 percentage points the average bond yield of the three nations with the lowest yields.
5. Reinhart and Rogoff point out that Greece has been in default in more than 50 of the years since 1800. See Reinhart and Rogoff (2009, p.99).
6. Bond yields and bond prices are inversely related. Thus, the sharp 1995–1998 decline in bond yields in the peripheral euro-zone nations shown in the figure means prices of these bonds rose strongly. These bond prices stayed very high until the bond bubble collapsed as the financial crisis of 2008–2010 revealed the magnitude of the underlying fiscal problems in the GIPSI countries.
7. In a heavily cited paper, Reinhart and Rogoff (2010) reported that nations in which the debt/GDP ratio exceeded 90 percent experienced appreciably lower growth rates than nations with lower ratios. While the authors did not claim that the causation in the observed correlation necessarily runs from debt to growth (there are plausible reasons to think a reverse causation mechanism is also involved in the correlation), this study set off a contentious debate about whether the authors' findings support the widespread imposition of austerity measures in heavily indebted GIPSI nations.

8. The Stability and Growth Pact, implemented in 1997 (modified in 2005 to provide more flexibility, and in 2011 to tighten the rules) mandated that euro-zone countries limit their budget deficit/GDP ratio to no more than 3 percent and government debt/GDP ratio to no more than 60 percent after the 1999 introduction of the euro. By 2003 both Germany and France, the two largest euro-zone nations, had broken the rules. And the financial crisis boosted the ratios above these standards in all euro-zone nations.
9. A pertinent example involves Great Britain's experience in the 1920s. Prices had risen appreciably more rapidly during World War I in Britain than in the United States and other British trading partners. After the war, exchange rates were floated and the pound depreciated sharply. A young Winston Churchill, the British Chancellor of the Exchequer, made the decision in the early 1920s to return to the gold standard at the prewar parity of $4.86 dollars per pound at a time when price level phenomena suggested a 25 percent devaluation of the pound was warranted. This unwise decision meant that the British government was committed to sharply reducing the nation's price level through a protracted policy of fiscal austerity and high interest rates. The result was that while most other nations enjoyed high prosperity through the 1920s, the unemployment rate in Britain never fell below 10 percent until the arrival of World War II.
10. In the period extending from 2002 through 2012, Austria, Germany, and the Netherlands exhibited surpluses on current account that averaged 2.6, 5.2, and 6.8 percent of GDP, respectively. In the same period, Greece, Italy, Portugal, and Spain posted average deficits on current account amounting to 9.7, 2.0, 8.9, and 5.8 percent of GDP, respectively.
11. Assume prices are too high in Greece and Spain by 20 percent for these nations to be competitive in foreign trade with Germany. To alleviate the imbalance, Greek and Spanish price levels must be deflated by 20 percent, German prices must be boosted by 20 percent, or some combination of the two must occur. Over a five-year period, 4 percent annual deflation in Greece and Spain or 4 percent annual inflation in Germany would remove the imbalance. Many observers believe that aggregate euro-zone hardship would be minimized and European solidarity promoted if Germany would acquiesce in accepting somewhat higher inflation rates for a few years.

9 The Framework of Federal Reserve Monetary Control

1. Each member bank is required to invest in shares in the Federal Reserve in an amount equal to a small fraction of the bank's own capital accounts. In return, the Federal Reserve pays an annual dividend to the banks on these shares. While the member banks "own" the Fed, the structure of the Federal Reserve System was deliberately designed so that banks have minimal influence over the conduct of Federal Reserve policy.
2. Relative to the Treasury bonds held in huge quantities by foreign nations, these holdings of the Fed are miniscule and certainly would not in themselves suffice to prevent a severe depreciation of the dollar were there to be a massive run against it.
3. Normally, the Federal Reserve is authorized to make loans only to depository institutions. During the Great Crisis, however, the Fed invoked a provision in its statute that specifies that in rare times of exigency it can lend to other privately owned institutions as well.

4. Each bank is subject to the following reserve requirements in 2013: zero on the first approximately $12 million of demand deposits and other checkable deposits, 3 percent on such deposits up to a threshold of roughly $75 million, and 10 percent on all such deposits in excess of this threshold. This graduated reserve requirement system is rationalized as helping very small banks to better compete against larger banks that benefit from economies of scale and other advantages.
5. Note, however, that this action does not increase the monetary base. The increase in *Cp* you are holding means that the bank now holds less currency and its reserves (R) are therefore now lower by $80. As we will demonstrate, the Fed controls the monetary base. The public has no direct influence over the size of the monetary base.
6. *Cp*, a major component of M1, is defined as all currency and coins issued by the Fed and Treasury except for those currently held in the Fed, the Treasury, and depository institutions. Some of this *Cp* is hoarded in rare coin and paper currency collections, and a large part of it (estimated to be more than half the total) is believed to reside outside of the boundaries of the United States.
7. In 2008 Mexico imposed a tax on bank deposits, including checking accounts (*DDO*). Our analysis suggests that this would induce individuals and firms to hold more cash (*Cp*) and less *DDO*. Other things being equal, this increase in *k* reduces the money multiplier and the money supply. To prevent a decline in M1 and M2 being triggered by the tax, the Central Bank of Mexico would need to take actions to increase the monetary base.
8. In the distant past, the Federal Reserve sometimes changed reserve requirements to initiate significant changes in monetary policy. For example, the Fed boosted reserve requirements sharply in 1936 and 1937 to remove a large amount of excess reserves from the banking system at a time when the nation's unemployment rate exceeded 12 percent. This controversial action was implemented out of a misguided fear that the excess reserves were likely to lead to rapid money growth and high inflation. This policy error contributed to a severe economic downturn in 1937–1938. On this episode, see Exhibit 11-1 (pp. 179–180).
9. The Federal Reserve lowered its federal funds rate target to a range of 0-0.25 percent in December 2008 and kept it there more than five years. In the period extending from that point through this writing (June 2013), the 90-day Treasury bill yield ranged from 0.01 percent to 0.30 percent (monthly average of daily rates). This means banks were not sacrificing much (if any) income if they simply held large quantities of excess reserves rather than using them to purchase Treasury bills, given that the Fed was paying banks 0.25 percent interest on reserves.
10. Note that it does not matter what type of assets the Federal Reserve purchases. If it purchases candy bars from Walmart, the Fed would write a check to Walmart. When Walmart deposits the check in its bank, the bank is paid by the Fed by having its deposit at the Fed credited by the amount of the transaction. Both reserves and excess reserves increase. The Fed conducts its open market operations in Treasury securities because the market for these securities is highly developed. Transactions costs (bid-ask dealer spreads) are quite low in this highly efficient market. The Fed can conduct its large requisite volume of daily transactions in the government securities market with less disruption than would be the case if it conducted a similar magnitude of transactions in other financial markets such as the corporate bond market or the stock market.
11. Many decades ago, New York bankers would actually go in person to the discount window at the Federal Reserve Bank of New York to request a loan of reserves. Now, of course, banks simply contact the Fed and request that their deposit account at the Fed be credited by the amount of the requested loan.

10 Federal Reserve Policy in the Great Depression

1. A modern view is that important supply shocks also played a significant role. Massive bank failures disrupted normal personal relationships between bank managers and thousands of borrowers. As failed banks reopened under new ownership and management, previous relationships were severely disrupted. This indicates that a major setback to the financial intermediation process had occurred; this phenomenon may be regarded as an adverse supply shock that reduced potential GDP.
2. Not just homebuilding, but other forms of construction surged in the 1920s as well. For example, many buildings on the nation's older campuses date from the 1920s. Many of our college football stadiums were built in the 1920s and dedicated as memorials to former students who died in World War I.
3. A detailed account of the nonmonetary forces alleged to be the main cause of the depression can be found in Peter Temin, *Did Monetary Forces Cause the Great Depression?* (New York: Norton, 1976).
4. In the period from 1923 through 1929, 2408 of the 4841 banks that failed in the United States were located in seven states that extended northward from Missouri and Kansas to Iowa, Nebraska, Minnesota, and the Dakotas. In this same period only 11 banks in the six New England states failed.
5. This was a classic response of a central bank to crisis during the era of the gold standard. In such a regime each country defines the value of its currency in units of gold. A nation might devalue its currency vis-à-vis currencies of other nations by raising the official price of gold. Anticipation of such an event would lead foreign nations to rush to convert their dollar holdings into gold at the U.S. Treasury, which was legitimate under the "rules" of the gold standard system. To demonstrate its commitment to maintain constant the price of gold and eschew devaluation, the typical central bank response was to announce such a commitment by raising its discount rate. As part of the (later) deliberate policy of the Roosevelt administration and the Federal Reserve of pushing the U.S. price level back up to 1929 levels, however, the U.S. raised the price of gold from $20.67 per ounce to $35 per ounce in January 1934. This measure meant that the dollar had been sharply devalued, an action consistent with the desire to boost the U.S. price level.
6. For a fascinating account of the first 100 days of Roosevelt's presidency, see Jonathan Alter, *The Defining Moment (*New York: Simon and Schuster Paperbacks, 2006). Things were so dire in the early months of 1933 that serious discussion of proposals to grant Roosevelt dictatorial powers to implement measures to lift the nation out of depression surfaced. Roosevelt resisted such proposals, but was highly successful in getting unprecedented legislation aimed at boosting employment through a compliant Congress in his first few months in office.
7. This apparently was essentially a smart psychological ploy by the Roosevelt administration. Clearly, there is no way the government could determine which of the nation's 18,000 banks were "sound" in a one-week period. This successful ploy may have inspired Secretary Timothy Geithner's analogous 2008 announcement of "stress tests" to be administered 19 of the nation's largest banks. In the latter case, as in the former, a psychological lift was given to financial markets when it was later announced implicitly that banks were generally not in as bad shape as had been feared.
8. Fear of deflation is almost certainly the main reason the Greenspan Federal Reserve kept interest rates exceptionally low in the 2002-2005 period in which the housing bubble was inflating rapidly. Inflation had been trending downward to approximately 1 percent by 2003 and adverse demand shocks initiated by the terrorist

attacks of September 11, 2001 and the stock market crash of 2000–2002 meant that risk of deflation was not negligible. Greenspan was essentially taking out an insurance policy against deflation. Unfortunately, these exceptionally low interest rates fed the housing bubble. On this, review Figure 4-5 on page 55.

9. The 12-month change in the producer price index was negative for 50 consecutive months, from April 1929 through May 1933.
10. In three steps, implemented in August 1936, March 1937, and May 1937, the Federal Reserve nearly doubled the level of reserve requirements. Economists today view this action as a major policy mistake that contributed to the severe 1937–1938 recession. On this, see Exhibit 11-1 in the following chapter (pp. 179–180).
11. Annual averages of daily Treasury bill yields were as follows: 1.40 percent in 1931, 0.88 percent in 1932, 0.52 percent in 1933, 0.26 percent in 1934, and 0.14 percent in 1935. These yields of 1934 and 1935 are similar to T-bill yields that prevailed during 2009–2013 when, once again, banks were holding a huge amount of excess reserves.
12. Imagine a graph depicting the supply and demand for excess reserves, with the interest rate depicted on the vertical axis and the quantity of excess reserves on the horizontal axis. Assume a vertical supply curve (whose position is determined by the central bank) intersecting a bank demand curve for excess reserves that becomes horizontal at some very low interest rate. The Fed can shift this supply curve rightward by purchasing securities in the open market. Note in this case that the quantity of excess reserves demanded increases to exhaust the increase in supply. In this scenario, banks are willing to hold whatever amount of excess reserves the Fed might supply and do not use any of the excess reserves to extend loans or buy securities.
13. An indicator of the "flight to quality" phenomenon is the spread between yields on risky BAA corporate securities and safe Treasury securities. This spread or risk premium in corporate bond yields increased from 2.3 percentage points in mid-1929 to 7.9 percentage points in mid-1932. (A similar, albeit slightly smaller, increase in this spread occurred in 2008 following the Lehman Brothers' bankruptcy.) In any case, the associated increased demand for government securities artificially depressed yields on Treasury securities, helping create the illusion that the Fed was conducting a policy of "easy money."
14. A minority viewpoint is that top Federal Reserve officials believed that their policy was highly restrictive but thought such a policy stance was appropriate and ultimately beneficial. Proponents of a doctrine known as the "liquidationist theory" believed that in an economic boom bad loan commitments are made which must be liquidated for solid business revival to occur following an ensuing slump. In this view, increasing the money supply during a recession, by preventing this needed liquidation, is counterproductive. Adolph Miller, Governor of the Federal Reserve Bank of New York during the depression, was a proponent of this viewpoint. (Variations of this view appeared again in the recent Great Crisis). On various explanations of the conduct of Federal Reserve policy in the 1930s, see Exhibit 10-1 (pp. 165–166).
15. This is the view presented in a widely cited article by Christina Romer, "What Ended the Great Depression?," *The Journal of Economic History*, December 1992, pp. 757–784.

11 The Federal Reserve's Response to the Great Crisis: 2007–2009

1. See, for example, Robert Hetzel, "Monetary Policy in the 2008-2009 recession," Federal Reserve Bank of Richmond *Economic Quarterly*, Spring 2009, pp. 201–233.

2. In the meeting of June 25, there was one dissenting vote against the consensus to maintain rates constant. That vote was cast by Richard Fisher, President of the Federal Reserve Bank of Dallas, who preferred to *raise* interest rates. Fisher was also the lone dissenting member of the FOMC meeting of August 5, for the same reason. The vote at the September 16 meeting was unanimous in favor of maintaining the rate at 2 percent. To view the statements that the FOMC releases at the end of each meeting, as well as the minutes of FOMC meetings (released about three weeks after each meeting), go to http://www.federalreserve.gov/monetarypolicy/fomc.htm.
3. Oil prices are notoriously difficult to forecast. Among the factors that account for this are unexpected changes in weather patterns and the macroeconomic outlook, widespread use of the oil futures market for hedging purposes, and heavy speculative activity in the oil markets.
4. Unlike more than 20 other nations, the Federal Reserve did not adopt an official inflation targeting policy regime until 2012. Today, the Fed operates with an inflation target of 2 percent per year.
5. Actually, almost all of the expansion of the Fed's total assets took place in an eight-week period during the height of the panic in fall 2008. Total Federal Reserve assets increased from $905 billion on September 4, 2008 (just prior to the failure of Lehman Brothers) to $2,075 billion on November 6. However, the *composition* of these assets continued to change substantially through the end of 2009 and beyond.
6. On this episode, see the account in Chapter 1 of David Wessel, *In Fed We Trust: Ben Bernanke's War on the Great Panic* (New York: Crown Publishing Group, 2009).
7. As an example, on December 14, 2009 the Fed offered $75 billion in 28-day credit through its TAF program, with a settlement date of December 17. The minimum and maximum allowable bids were set at $5 million and $7.5 billion. In this announcement of December 14, the Fed indicated that the auction results would be published on December 17 on the Federal Reserve Board's website at www.federalreserve.gov/monetarypolicy/taf.htm. On December 17, the website indicated that 102 bidders had offered bids totaling $46.035 billion, for a bid/cover ratio of .61, that is, $46.035 billion/$75 billion. Because the total value of bids fell below the $75 billion offering, all bids were accepted at an interest rate of 0.25 percent, the lowest bid offered.
8. As of the end of 2009, some 240 banks had participated successfully in these auctions.
9. This differs from traditional discount window borrowing, in which banks may obtain immediate credit in their deposit account at the Federal Reserve.
10. Money market mutual funds, an important financial innovation, came on stream in the 1970s. From the 1930s to the 1980s, depository institutions were limited by statutory ceilings in the interest rate they were allowed to pay depositors. (This regulation, known as Regulation Q, was phased out in the 1980s). Market interest rates increased sharply in the 1970s in response to rising inflation, moving significantly above the ceiling rates payable by depository institutions. Enterprising financial entrepreneurs, noting a good opportunity, invented the money market mutual fund in the mid-1970s. These funds are not subject to the statutory interest rate ceilings, in spite of early banks' lobbying efforts to make them so. Money market funds issue "shares" to the public at the price of one dollar per share and use the proceeds to purchase relatively safe short-term liquid assets such as Treasury bills, commercial paper, and negotiable CDs issued by large banks. Owners of these shares may write checks on their MMMF accounts (albeit not typically in amounts less than $250) and earn interest on the accounts at rates normally higher

than those paid by banks on checking accounts. While not insured, money market fund shares had come to be regarded as being safe as bank deposits until the Lehman fiasco.

11. A current list of these 21 firms is available at http://www.newyorkfed.org/markets/pridealers_current.html.
12. A couple of the bankers initially objected on the basis that they did not need additional capital. Paulson quickly overruled them, insisting that all nine banks would be accepting government capital injections. Paulson feared that if it were announced that only a few of the large banks were to receive capital injections, depositors of those banks might withdraw funds en mass, thus leading to major systemic problems.
13. Of the $700 billion of TARP funds approved by Congress, only $50 billion was allocated to help distressed homeowners, and only a small fraction of that has been spent.

12 Unconventional Monetary Policy Initiatives: 2008–2013

1. In recent years, the prime loan rate has been set at 3 percentage points above the target federal funds rate. Hence, an increase in the FFR target rate from 2 percent to 2.5 percent would immediately boost the prime loan rate from 5 percent to 5.5 percent. This, in turn, would trigger an immediate 0.5 percent increase in various categories of bank lending rates.
2. As time passes, some of the bonds held by the Fed reach maturity and are repaid by the Treasury. To the extent that the Fed does not reinvest all of the proceeds of maturing bonds, the Fed balance sheet expands somewhat more slowly than Fed acquisition of bonds. As of 2013, however, the Fed has typically followed a policy of reinvesting the funds from maturing bonds by acquiring additional bonds.
3. Stock prices are determined by the present value of the stream of expected future corporate earnings or dividends. To make this calculation, the expected future flow of annual earnings or dividends is estimated and these flows are discounted using the current interest rate in order to estimate their present value. Stimulative Federal Reserve policies—whether conventional or unconventional—likely influence the present value (stock prices) both by boosting the expected annual earnings or dividends and by lowering the interest rate used to discount these expected future flows.
4. A comprehensive recent study estimates that QE1 reduced long-term Treasury bond yields by about 35 basis points, while QE2 reduced these yields by 45 basis points. This study also provides a useful perspective on the evolution of thinking—both by Federal Reserve officials and academic scholars—about the ability of the Federal Reserve to influence long-term interest rates and the technical mechanism through which this influence occurs. See Stefania D'Amico, William English, David Lopez-Salido, and Edward Nelson (2012), "The Federal Reserve's Large-Scale Asset Purchase Programs: Rationale and Effects," *Economic Journal,* vol. 122, no. 564, pp. 415–446.
5. Immediately following the FOMC meeting of June 19, 2013, Fed chairman Ben Bernanke announced that there was a consensus among FOMC members in the meeting that economic growth in the ensuing six months would be somewhat higher and that unemployment would decline somewhat more quickly than previously anticipated. Bernanke announced that if this forecast turned out to be accurate and was reinforced by other macroeconomic developments, the Fed would

consider "tapering" the growth of its assets purchases by the end of 2013 and possibly terminate the program in the middle of 2014. He also announced that 14 of the 19 FOMC participants anticipated that the Fed would initiate the first increase in its federal funds rate target since December 2008 sometime in 2015. Financial market participants reacted to these announcements by massive selling of long-term bonds and stocks in the ensuing days. For example, the 10-year Treasury bond yield jumped from 2.20 percent to 2.57 percent in the four days following Bernanke's announcement, and mortgage rates also jumped. The Dow-Jones Industrials stock market index fell 660 points (4.3 percent) over this same four-day period, although it soon recovered. Bernanke and many others were taken aback and disappointed by the market's reaction, which apparently was triggered by an upward revision of market participants' expectations of future short-term interest rates. With hindsight, it appears that the announcement may have been premature and counterproductive, given the Fed's desire to continue to promote the recovery through a policy of fostering low long-term interest rates.

13 The Federal Reserve's Exit Strategy and the Threat of Inflation

1. Arthur Okun was an economics professor at Yale University and an economic advisor to Democratic Presidential candidate John F. Kennedy in the campaign of 1960. Kennedy charged that the Republican incumbents had run the economy with too much slack and unemployment in the previous eight years. Okun published a famous article in which he estimated that each one percentage point increase in the nation's unemployment rate resulted in an annual loss of national output of approximately three percent. This relationship became known as "Okun's Law."
2. Productivity growth contains both cyclical and trend elements. To minimize the distorting effect of the cycle and focus on the trend, 1986:1 and 2012:4 were selected as starting and ending dates because each represents the same number of quarters following cyclical troughs.
3. A negative gap means actual real GDP is less than potential real GDP. On the differing estimates of the output gap, See John Weidner and John Williams, "How Big is the Output Gap?," Federal Reserve Bank of San Francisco *Economic Letter*, June 12, 2009.
4. See Athanasios Orphanides, "Monetary Policy Rules and the Great Inflation," *American Economic Review*, May 2002, pp. 115-120. Orphanides argues that the Federal Reserve was fooled into overestimating the size of the output gap by failing to take account of the effect of the adverse supply shocks on potential GDP. This allegedly caused the Fed to err in conducting policy that was too stimulative, thus causing the severe inflation of the 1970s.
5. In many cases, because of regulations mandating that they meet standards governing minimum capital/total assets ratios, banks have no alternative to tightening lending standards. To the extent that a bank's capital has been reduced by write-offs of bad loans in a crisis, the decline in capital may necessitate that the bank reduce its assets, most of which consist of loans.
6. It should be pointed out that any positive correlation between money growth and inflation in the U.S. environment of relatively low inflation in the past quarter century has been almost nonexistent. For example, broad money (M2) growth increased sharply during 1995-2001 and again during 2005-2010, while inflation trended downward in both periods.

7. In the United States the Federal Reserve is prohibited by law from purchasing newly issued government debt. This does not necessarily prevent the Fed from monetizing government deficits because the Fed is free to purchase previously issued government bonds in secondary markets at the same time the government is issuing new bonds. The effect on the money supply would be the same as if the Fed purchased the new bonds as they are issued.
8. Inflation is less effective in reducing the budget deficit today than in earlier years because our federal income tax is now largely indexed for inflation. Prior to implementation of indexation, rising nominal incomes that kept pace with inflation pushed taxpayers into higher marginal income tax brackets, thus boosting tax revenues more rapidly than nominal income. Indexation prevents this disproportionate response of tax revenues to inflation. Nevertheless, a more stimulated economy with accompanying higher inflation will reduce the deficit to the extent that real incomes are boosted and tax revenues are induced to rise more rapidly than expenditures. And higher inflation more rapidly reduces the real value of the existing stock of debt, thus benefiting the government's real balance sheet.

14 The Need for Regulatory Reform

1. See Simon Johnson and James Kwak, *13 Bankers* (New York, Pantheon Books, 2010).
2. Suppose, over a 10-year period, an investment bank trader makes bets that result in profits to his firm of $100 million in each of five years, and equal losses in each of the other five years. Assume the firm's policy is to give traders annual bonuses equal to 5 percent of the year's profits accruing to the firm from the trader's activities, with no clawback provision for years in which losses are incurred. Over the course of the decade, the trader receives net bonuses of $25 million. If the trader were compensated on net profits accruing to the firm over the full decade, he would receive no bonus.
3. This is an example of the pervasive phenomenon of "regulatory capture," in which the regulated firm "captures" the regulatory authority. A viable financial reform package must come to grips with this pernicious phenomenon.
4. See Oliver Hart and Luigi Zingales, "Curbing Risk on Wall Street," *National Affairs*, Spring 2010.

Bibliography

Admati, Anat and Martin Hellwig, *The Bankers' New Clothes* (Princeton: Princeton University Press, 2013).

Alter, Jonathan. *The Defining Moment* (New York: Simon and Schuster, 2006).

Barofsky, Neil. *Bailout* (New York: Free Press, 2012).

Bernanke, Ben S. *Essays on the Great Depression* (Princeton, NJ: Princeton University Press, 2000).

Bernanke, Ben S. *The Federal Reserve and the Financial Crisis* (Princeton: Princeton University Press, 2013).

Bernanke, Ben S. and Mark Gertler, "Should Central Banks Respond to Movements in Asset Prices?" *American Economic Review*, March 2001, pp. 253–257.

Blinder, Alan S. *After the Music Stopped* (New York: Penguin Press, 2013).

Bordo, Michael D. "An Historical Perspective on the Crisis of 2007–2008," National Bureau of Economic Research, Working Paper 14569, December 2008.

Bruner, Robert F. and Sean D. Carr, *The Panic of 2007: Lessons Learned from the Market's Perfect Storm* (Hoboken, NJ: Wiley, 2007).

Calomiris, Charles and Gary Gorton, "The Origin of Banking Panics: Models, Facts, and Bank Regulation," in R. Glenn Hubbard (ed.), *Financial Markets and Financial Crises* (Chicago, IL: University of Chicago Press, 1991).

Carroll, Christopher, Misuzu Otsuka, and Jirka Slacalek, "How Large is the Housing Wealth Effect? A New Approach," National Bureau of Economic Research Working Paper No. 12746, December 2006.

D'Amico, Stefania, William English, David Lopez-Salido, and Edward Nelson. "The Federal Reserve's Large-Scale Asset Purchase Programs: Rationale and Effects," *Economic Journal*, 2012, pp. 415–46.

De Grauwe, Paul. *Economics of Monetary Union* (Oxford: Oxford University Press, 2000).

Diamond, Douglas and Philip Dubvig, "Bank Runs, Deposit Insurance, and Liquidity," *Journal of Political Economy,* 1983, pp. 401–419.

Eichengreen, Barry. *Golden Fetters: The Gold Standard and the Great Depression 1919–1939* (New York: Oxford University Press, 1992).

Financial Crisis Inquiry Commission. *The Financial Crisis Inquiry Report* (New York: Public Affairs, Perseus Book Group, 2011).

Fisher, Irving. "Debt-Deflation Theory of Great Depressions," *Econometrica*, 1933, pp. 337–357.

Friedman, Milton and Anna J. Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton: Princeton University Press, 1963).

Gjerstad, Steven and Vernon Smith, *Prosperity and Recession* (Cambridge: Cambridge University Press, 2013).

Gorton, Gary B. “The Subprime Panic,” National Bureau of Economic Research, Working Paper 14398, October 2008.

Kindleberger, Charles S. *The World in Depression* (Berkeley: University of California Press, 2013).

Kindleberger, Charles P. and Robert Aliber, *Manias, Panics, and Crashes: A History of Financial Crises*, 5th ed. (Hoboken, NJ: Wiley, 2005).

Gramlich, Edward M. *Subprime Mortgages: America’s Latest Boom and Bust* (Washington, DC: Urban Institute Press, 2007).

Hart, Oliver and Luigi Zingales, “Curbing Risk on Wall Street,” *National Affairs*, Spring 2010.

Hetzel, Robert. “Monetary Policy in the 2008–2009 Recession,” Federal Reserve Bank of Richmond *Economic Quarterly*, Spring 2009, pp. 201–233.

Jarsulic, Marc. *Anatomy of a Financial Crisis: A Real Estate Bubble, Runaway Credit Markets, and Regulatory Failure* (New York: Palgrave Macmillan, 2010).

Johnson, Simon and James Kwak, *13 Bankers: The Wall Street Takeover and the Next Financial Meltdown* (New York: Pantheon Books, 2010).

Keynes, John Maynard. *The Economic Consequences of the Peace* (London: Macmillan, 1918).

Krugman, Paul. *The Return of Depression Economics and the Crisis of 2008* (New York: W.W. Norton, 2009).

Krugman, Paul R. *End This Depression Now* (New York: W.W. Norton, 2012).

Marsh, David. *The Euro* (New Haven: Yale University Press, 2009).

Minsky, Hyman. *Stabilizing an Unstable Economy* (New Haven, CT: Yale University Press, 1986).

Minsky, Hyman. “The Financial Instability Hypothesis,” Working Paper No. 74, Jerome Levy Economics Institute of Bard College, May 1992.

Orphanides, Athanasios. “Historical Monetary Policy Analysis and the Taylor Rule,” *Journal of Monetary Economics*, July 2003, pp. 983–1022.

Reinhart, Carmen M. and Kenneth S. Rogoff. “Is the 2007 U.S. Subprime Crisis So Different? An International Comparison,” *American Economic Review,* March 2008, pp. 339–344.

Reinhart, Carmen M. and Kenneth S. Rogoff. *This Time is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2009).

Reinhard, Carmen and Kenneth Rogoff. “Growth in a Time of Debt,” National Bureau of Economic Research Working Paper 15639, January 2010.

Romer, Christina. “What Ended the Great Depression?” *The Journal of Economic History*, December 1992, pp. 757–784.

Roubini, Nouriel and Stephen Mihm, *Crisis Economics: A Crash Course in the Future of Finance* (New York: Penguin Press, 2010).

Shiller, Robert J. *Irrational Exuberance*, 2nd ed. (Princeton, NJ: Princeton University Press, 2005).

Shiller, Robert J. *The Subprime Solution: How Today’s Global Financial Crisis Happened, and What to Do About It* (Princeton, NJ: Princeton University Press, 2008).

Sorkin, Andrew Ross. *Too Big to Fail: The Inside Story of How Wall Street and Washington Fought to Save the Financial System—And Themselves* (New York: Viking, 2009).

Staiger, Douglas, James Stock, and Mark Watson, “How Precise Are Estimates of the Natural Rate of Unemployment?” in Christina Romer and David Romer (eds.), *Reducing Inflation: Motivation and Strategy* (Chicago, IL: University of Chicago Press, 1977).

Stiglitz, Joseph E. *Freefall: America, Free Markets, and the Sinking of the World Economy* (New York: W.W. Norton, 2010).

Temin, Peter. *Did Monetary Forces Cause the Great Depression?* (New York: Norton, 1976).

Weidner, John and John Williams. "How Big is the Output Gap?" Federal Reserve Bank of San Francisco *Economic Letter*, June 12, 2009.

Wessel, David. *In Fed We Trust: Ben Bernanke's War on the Great Panic* (New York: Crown Business, 2009).

Zandi, Mark. *Financial Shock: A 360 degree Look at the Subprime Mortgage Implosion, and How to Avoid the Next Financial Crisis* (Upper Saddle River, NJ: FT Press, 2009).

Index

Page numbers in *italics* refer to notes or illustrations

adjustable-rate mortgages (ARMs), 42, 46, 48–50, 60, 77
aggregate demand, 29, 84–5, 87–8, 129, 138, 152, 155, 192, 200–201, 205
AIG, *see* American International Group
Aldrich-Vreeland Act (1908), 34
Alt-A mortgages, 47–9
American International Group (AIG), 66, *71*, 75–7, *101*, 180, 186, 236–7, 239
American Reinvestment and Recovery Act (ARRA) (2009), 103, 105–6, 191
AMLF, *see* asset-backed commercial paper and money market mutual fund facility
“animal spirits,” 56–7, 93
  see also Keynes, John Maynard
Argentina, 5–7, 17, 23, 216
ARMs, *see* adjustable-rate mortgages
ARRA, *see* American Reinvestment and Recovery Act
asset-backed commercial paper and money market mutual fund facility (AMLF), 186
auction-rate securities, 52, 69–70
austerity measures, *see* austerity programs
austerity programs, 4, 108, 121–2, 124–8, 195, 228, *249*

bank failures, 6, 8–10, 14–15, 28, 30, 33, 38, 146, 149, *150*, 152–8, 163, 174, *243*, *252*
  in Great Depression, 9–10, 146, 149, *150*, 152–8, *252*
banking crises, 2, 8–9, 11, 16–21, 24–7, 34, 38, 141, 146, *243*, *245*
  clustering of, 16–17
  and the creation of the Federal Reserve, 34, 38
  definition of, 8–9
  international transmission of, 16–18
  predictability of, 16, 18–21
banking panics, 9, 25–9, 31–9, 131, 140, 152–5, 158–9, 161–3, 166, 169, 179–80, *245*
  creation of the Federal Reserve System in response to, 29, 34, 38
  in Great Depression, 9, 38–9, 140, 152–5, 158–9, 161–3, 166, 169, 179
  Panic of 1907, 25–6, 29, 31–4, 38, *245*
  Savings and Loan Crisis, 34–9, 64, *245*
Bank of America, 49, 54, 67, *71*, 76, 180, 187–8, 226, 231, *248*
Bank of England, 30, *71*, 171, 204–5
Barclays, 76
Barney, Charles, 32–3, *245*
Basel Accords, 230, 234, *247*
Bear Stearns, 50, 67, 70, 71, *71*, 72, 75, 171, 186, 226, 231
Bernanke, Ben S. (Federal Reserve Chairman 2006–), 56, 63, 75–7, 131–2, 170, 179–80, 186–9, 208, 218, *244*, *254*, *255*, *256*
“black swan” events, 227
Black Tuesday (October 29, 1929), 71
BNP Paribas, *71*, 170
Brady Plan (1989), 7

bubbles, 2–3, 10, 11, 15, 17–22, 26, 30, 41–9, 54, 56–8, 59–63, 65–6, 69, 87, 91–2, 94, 98–100, 110, 114–15, 118, 122, 150–2, 169, 202, 204, 211, 214, 224–5, 231, *244*, *249*, *252–3*
  bursting of in Great Crisis, 10, 41, 59–63, 69, 87, 91–2, 94, 99, 110, 115, 202, 204, 214
  definition of, 19
  leading to Great Crisis, 10, 15, 17, 19–20, 41–9, 54, 56–8, 59–60, 65–6, 69, 91–2, 98–100, 150, 169, 211, 214, 224–5, 231, *244*, *252–3*
  leading to Great Depression, 10, 19, 150–2
  in U.S. stock market, 19–20, 54, 150–2, *244*
Bush, George W. (U.S. President 2001–2009), 42, 75, 78, 187

Case-Shiller National Home Price Indexes, *46*, *57*, *59*, *246*
CBO, *see* Congressional Budget Office
CDOs, *see* collateralized debt obligations
CDS, *see* credit default swaps
China, 5, 17, 20, 42, 55, 74, 85, 94, 215, *244*
Citigroup, 49, *71*, 188, 226, 229–30, *248*
CMBS, *see* commercial mortgage-backed securities
collateralized debt obligations (CDOs), 65–8, 71–2, 169, 232, 235–7, *247*
commercial mortgage-backed securities (CMBS), 93
commercial paper funding facility (CPFF), 181, *181*, 184–6
Commodity Futures Modernization Act (2000), 236
communications initiatives, 192, 195–8, 203–4
Community Reinvestment Act (CRA) (1977), 50, 224–6
compensation system, 232–3
conduits, 52, 67–8
Congressional Budget Office (CBO), 82, *82*, 84–5, 212–14
construction industry, 13, 18, 87–8, 91–4, 98–100, *100*, 101–4, 122, 153, 192, 195, 198, 200, 211, 214, 216, *248*, *252*
consumer confidence index, 107
consumer price index (CPI), 55, *150*, 156, *156*, *157*, *164*, 173, *243*, *246*
consumption expenditures, 88–91, 157, *157*, 165, 173, 198–201
convergence standards, euro-zone, 117–18
core PCE, *see* personal consumption expenditures
Countrywide Financial, 67, 231
CPFF, *see* commercial paper funding facility
CPI, *see* consumer price index
CRA, *see* Community Reinvestment Act
Credit Anstalt, 154
credit bubble, *see* bubbles
credit default swaps (CDS), 24, 48, 66, 72, 76–77, 169, 236–7, 240
credit rating agencies, 235–6
  see also Fitch; Moody's; Standard and Poor's
currency crisis, *see* exchange rate crisis
currency depreciation, 7–8, 114, 129
currency union, 113–17, 123
Cyprus, 3, 123–5, *243*, *249*

DDO, *see* demand deposits and other checkable deposits
defaults on mortgages, *see* mortgage defaults
deficit, U.S., 1, 3–4, *4*, 17, 41, 73, 105–6, 111, 191, 195, 204, 215–16, *244*, *248*, *249*, *257*
deflation, *see* price-level deflation
deleveraging, 10, 59, 69, 78, 98–9, 109–10, *243*
demand deposits and other checkable deposits (DDO), 137–9, 141, *143*, 144, 146, 158, 176, *251*
Department of Housing and Urban Development (HUD), 50
depreciation of currency, *see* currency depreciation
Depression, Great, *see* Great Depression
derivatives markets, 236–7
discount rate, 144–5, 154, 160, *160*, 162–4, *164*, 165–6, 170–1, 182, *252*
discount window policy, *see* Federal Reserve policy

“displacement,” *see* Minsky Theory of Financial Crises
Dodd-Frank Act (2010), 223, 229, 233–4, 236–7, 239, 241–2
“doom loop,” 3, 119, 121

Employment Act (1946), 225
England, 30, 34, 154, 163, 166
  see also Bank of England
euro, 113–15
  see also euro zone
European Central Bank (ECB), 3, 109, 113–14, 118, 121, 183, 205, 220
European debt crisis, 3–4, 108–9, 113–29, 184, 194, 199, 211, 215–16, *243*
European Union (EU), 117, 123–4
“euro skeptics,” 117
euro zone, 4, *4*, 5, 108–9, 111, 113–16, 125, *125*, 126, *126*, 127–9, 184, 228, *249*, *250*
exchange rate crises, 2, 6–8
exchange rate effects, 200
exit strategy, *see* Federal Reserve policy

Fannie Mae, *see* Federal National Mortgage Association
FDIC, *see* Federal Deposit Insurance Corporation
FDR, *see* Roosevelt, Franklin Delano
Fed, *see* Federal Reserve System
federal deficit, *see* deficit, U.S.
Federal Deposit Insurance Corporation (FDIC), 68, 70, 155, 182, 238
federal funds rate (FFR), 36, 55–6, 60, 102, 137, 170–2, *172*, 174, 191–2, 197, 204, 219–20, 224–5, *247*, *251*, *255*, *256*
Federal Home Loan Mortgage Corporation (Freddie Mac), 50, 53, 68, 72–5, 177, 186, 193, *193*, 194, 224, 226, 240–1
Federal National Mortgage Association (Fannie Mae), 47, 49–50, 53, 68, 72–5, 177, 186, 193, *193*, 194, 224, 226, 240–1, *246*
Federal Open Market Committee (FOMC), 171–3, *193*, 194, 197, 204, *254*, *255–6*
Federal Reserve Act (1913), 34
Federal Reserve Bank of New York, 34, 52, 75, 154, 160, *251*, *253*
Federal Reserve policy
  exit strategy from Great Crisis, 207–21
  in the Great Crisis, 169–90
  in the Great Depression, 149–67
  monetary control framework, 131–47
  tools of, 142–6
  unconventional initiatives, 191–205
  see also discount rate; monetary policy
Federal Reserve System
  chairmen of, *see* Volcker, Paul (1979–1987); Greenspan, Alan (1987–2006); Bernanke, Ben S. (2006–)
  creation of, 26, 29–34, 38
  see also Federal Reserve policy
Feldstein, Martin, 102–3
FFR, *see* federal funds rate
FHLMC, *see* Federal Home Loan Mortgage Corporation
financial crises, 1–10, 11–24, 85, 174, 186, 213–14, 223, 228, 231, 241, *244*
financial reform, 10, 74, 223–4, 231, 241, *257*
Fitch, 76, 235, *245*
FOMC, *see* Federal Open Market Committee
foreclosures, *see* home foreclosures
“forward guidance,” *see* communications initiatives
fractional reserve banking, 25–9, 38, 137–8, 143
France, 3, 17, 34, 116–17, 151, *249*, *250*
Freddie Mac, *see* Federal Home Loan Mortgage Corporation
frictional unemployment, 81, 83, *247*
Friedman, Milton (1912–2006), 161, *164*, 166, 207

Garn-St. Germain Act (1982), 38
Geithner, Tim, 52, 67, 75–7, 180, *246*, *252*
Germany, 3–4, *4*, 5, 30, 113–19, *119*, 121, 123–5, *125*, 126, *126*, 127, *127*, 128, *128*, 151–2, 225, *249*, *250*
GIPSI countries (Greece, Ireland, Portugal, Spain, Italy), 114, 118–20, *120*, 121, 124–9, 195, *249*

Glass-Steagall Act (1933), 223
Goldman Sachs, 47–8, 54, *54*, 121, 188, 226–7, 229, 231, 233, 241
goldsmiths, *see* fractional reserve banking
gold standard, 26, 152, 154, 163, 166, 169, *250*, *252*
government debt defaults, *see* sovereign debt crises
government-sponsored enterprises (GSEs), 44, 47, 49–51, 73–5, 193–4, 224, 240–1, *246*
  see also Federal Home Loan Mortgage Corporation; Federal National Mortgage Association
Gramm, Phil, 236
Great Crisis (2007–2009), 2, 8, 9–10, 11–12, 17–24, 26, 38–9, 41–58, 59–78, 79–95, 98, 111, 121, 128, 131–2, 139, 141, 143–5, 150, 167, 169–90, 202, 211, 216, 223–8, 231, 233–4, 236, 239, 241, *244*, *250*, *253*
  bubbles preceding, 41–58
  deflation of bubbles in, 59–78
  Federal Reserve exit strategy from, 207–21
  Federal Reserve policy in, 169–205
  and the Great Recession, 79–95
Great Depression (1929–1933), 3, 9–10, 17, 22, 26, 39, 41, 45, 60, 72, 75, 77, 79, 94, 97, 127, 131–2, 140, 146–7, 149–58, *158*, 159–67, 169–70, 174, 179, 186, 189, 208, 223, 228, 238, *248*, *249*, *252*, *253*
  Federal Reserve policy in, 131–2, 146–7, 149–58, *158*, 159–67, 169–70, 180, 189, 208, 223, 238
"Great Depression II," 223, 229
Great Moderation, 53
Great Recession (2007–2009), 3–4, 10, 17–18, 41, 45, 50, 79–95, 97–111, 120, 127, 149, 170, 195, 204, 207, 216–17, *248*
  aftermath and anemic recovery from, 97–111
  the Great Crisis and, 79–95
Greece, 3–4, *4*, 5, 108, 114, 117–19, 120, *120*, 121, 123–5, 127, *127*, 128, *128*, 184, 195, 216, *243*, *249*, *250*
Greenspan, Alan (Federal Reserve Chairman 1987–2006), 24, 53, 55–6, 190, *244*, *252–3*
GSEs, *see* government-sponsored enterprises

Hart, Oliver, 240, *257*
"headwinds," 99, 111, 211
"hedge finance," *see* Minsky Theory of Financial Crises
hedge funds, 2, 41, 43, 47, 52–3, 65, 68, 71, *71*, 72, 229, 232
Heinze, Fritz A., 31–3
"herding behavior," *see* Minsky Theory of Financial Crises
"high yield" market, *see* junk bond market
home foreclosures, 14, 41, 60–3, 78, 87, 92, 101–3, 110, 149, 157, 164
homeownership, 14–15, 34–6, 41, 44–6, 49–50, 60–2, 73, 77, 92, 98, 101–3, 111, 131, 149, 151, 155–6, 164, 187, 188–9, 200, 216, 240–1, *245*, *246*, *255*
home repossessions, 10, 60–1, 92
housing bubble, *see* bubbles
HUD, *see* Department of Housing and Urban Development
hyperinflation, 2, 5–6, 27

IMF, *see* International Monetary Fund
inflation, 2, 5–8, 13, 15, 19, 22, 27, 35–9, 42, 45, *46*, 53, 55, *55*, 57, 59, 79, 81–5, 99, 105, 117–18, 124, 126, 129, 150, 156, *156*, 157, 162, *164*, 165, 172–4, *174*, *193*, 195, 197, 200–202, *202*, 204–5, 207–8, 211–12, 214–17, 220–1, *243*, *246*, *248*, *249*, *250*, *251*, *252*, *254*, *256*, *257*
  see also hyperinflation
interest sensitive expenditures, 198
International Monetary Fund (IMF), 3, 121, 128, 133, 230
Internet, 17, 19, 84
investment expenditures, 14, 21–2, 88, 91, 93, 101, 129, 153, 157, 198–9
Ireland, 3–4, *4*, 17, 23, 114, 117–18, *119*, 120, *120*, 121–2, 124, 125, *125*, 127, *127*, 128, *128*, 184, 195, 216, *249*

Italy, 3–4, *4*, 108–9, 114, 117–19, 119, 120, *120*, 121–5, *125*, 126, *126*, 127, *127*, 128, 151, 195, *243*, *249*, *250*

Johnson, Lyndon B. (1908–1973; U.S. President 1963–1969), 73, *247*
Johnson, Simon, 229, *257*
JPMorgan Chase, 66, 72, 75, 186, 188, 231
  see also Morgan, J. P.
junk bond market, 52, 202, *245*

Keynes, John Maynard, 93, 160–1, *243*
  "animal spirits," 93
  "you can't push on a string," 160–1
Knickerbocker Trust Corporation, 32–3

Lehman Brothers, 18, 50–1, 54, *54*, 63, 69–70, *71*, 75–7, 144, 170–1, 180, 183–7, 189, 194, 226, 229, 231, 233, 237, 239, *247*, *253*, *254*, *255*
leverage, 13, 19, 21–2, 26, 41–2, 45, 50, 52–4, *54*, 67–9, 74–6, 109–11, 226–7, 232–3, 239, *243*, *246*, *247*
LIBOR (London Interbank Borrowing Rate), 77
liquidity swap lines (SWPs), *181*, 182, 183–4

Maastricht Treaty (1991), 117
MBS, *see* mortgage-backed securities
Merrill Lynch, 41, 51, 54, *54*, 69–70, *71*, 75–7, 180, 188, 226, 231, 233, *247*
Mexico, 6–8, 17, 216, *244*, *251*
Minsky, Hyman P. (1919–1996), 11–12
  see also Minsky Theory of Financial Crises
Minsky Theory of Financial Crises, 11–16, 21, 24, 26, 31, 46, 53, *243*, *247*
misaligned incentives, 223, 231–42
MMMF, *see* money market mutual funds
M1 and M2, *see* monetary aggregates
m1 and m2, *see* money supply multipliers
monetarists, 153, 161–4
  see also Friedman, Milton; Schwartz, Anna
monetary aggregates (M1 and M2), 137, *137*, 138–9, 141–7, 151, 153, 155, 158, *158*, 159, 161, 164–5, 171, 174, 176, 207, 215–17
monetary base (B), 134–7, *137*, 138–47, 158, 160–2, 165, 169, 171, 174, 176, *176*, 178, 189–90, 207, 216–18, 221, *251*
monetary policy, 15, 19, 24, 82, 91, 98, 113–14, 117–18, 129, 153, 161–4, *164*, 191–205, 215, 225, 239, *244*, *251*, *253*, *256*
  see also Federal Reserve policy
monetization, 214–15
money market mutual funds (MMMF), 35–6, 43, 51–2, 63, 67, 69, 72, 77, 138, 180, 184, 186, 219, *254*
money multiplier, *see* money supply multipliers
money supply, measures of, *see* monetary aggregates
money supply multipliers (m1 and m2), 138–9, 141–2, *142*, 143–7, 158, *158*, 159, *159*, 161, 165, 174–5, *175*, 176–7, 189, 217, *251*
Moody's, 66, 76–7, 122, 235, *245*
moral hazard, 38, 75, 229, 233
Morgan, J(ohn), P(ierpont) (1837–1913), 33–4, *245*
Morgan Stanley, 47, *54*, 188, 226, 231
Morse, Charles, 31–2
mortgage-backed securities (MBS), 18, 39, 42–3, 47–8, *48*, 50–2, 63–4, 65–9, 71–8, 92–3, 101, 108, 110–11, 144, 170, *178*, 178, 187, 189, 193, *193*, 194–5, 198, 202, 216–18, 224, 226, 230, 233, 235, *245*, *246*, *247*
mortgage defaults, 22, 72, 87, 102

NAFTA, *see* North American Free Trade Agreement
NAIRU, *see* non-accelerating inflation rate of unemployment
National Banking Act (1863), 30
National Bureau of Economic Research (NBER), 30, 97, 207, *248*
Nationally Recognized Statistical Rating Organization (NRSRO), 235
  see also credit rating agencies

National Monetary Commission, 34
natural rate of unemployment, *see* non-accelerating inflation rate of unemployment
NBER, *see* National Bureau of Economic Research
“ninja” (no income, no job or assets) mortgage loans, 42
non-accelerating inflation rate of unemployment (NAIRU), 79–82, *82*, 83–5, *86*, 137, 201, 205, 208, 212, 214, *248*
nonmonetarists, 152–3
North American Free Trade Agreement (NAFTA), 7
NRSRO, *see* Nationally Recognized Statistical Rating Organization

Obama, Barack (U.S. President 2009–), 74, 78, 179, 223, *249*
Okun’s Law, 208–11, *256*
open market operations, *see* Federal Reserve policy
“Operation Twist,” 193, *193*, 194–5, 203, 218

Panic of 1907, *see* banking panics
Paulson, Henry “Hank” (U.S. Secretary of the Treasury 2006–2009), 63, 74–7, 180, 187–8, *255*
PCE, *see* personal consumption expenditures
PDCF, *see* Primary Dealer Credit Facility
personal consumption expenditures (PCE), 173–4, *174*, 201
PIIGS, *see* GIPSI countries
Ponzi, Charles (1882–1949), 151
“ponzi finance,” *see* Minsky Theory of Financial Crises
Portugal, 3–4, *4*, 114, 117, 119–20, *120*, 121–2, 124–5, *125*, 126, *126*, 127, *127*, 128, *128*, 195, *249*, *250*
potential real GDP (gross domestic product), 79–80, *80*, 84, 208, 212, *256*
PPI, *see* producer price index
price-level deflation, 55–6, 131–2, 149, 151–8, 162, 165–6, 174, 176, 189, 204, 225, *250*, *252*, *253*
Primary Dealer Credit Facility (PDCF), 185
producer price index (PPI), *55*, 156, *156*, 157, *157*, 253

QE, *see* quantitative easing
quantitative easing (QE), 171, 192–3, *193*, 194–5, 197–205, 207, *255*
quantitative easing programs (QE1, QE2, QE3), *see* quantitative easing

Reagan, Ronald (1911–2004; U.S. President 1981–1989), 42
real gross domestic product (RGDP), 21–3, 79, *80*, 84–5, *86*, 94–5, 97, 105, 110, 121, 127, *127*, 131, 149, 164, 204, 208–10, *210*, 211–12, *256*
recession, 3–4, 8, 11, 14, 17–19, 21–3, 30, 33, 37–8, 41, 53, 55, 60, 75, 79, *80*, 84–5, *86*, 87–8, 91, *91*, 92–5, 97–101, 103–7, 109–11, 114, 121–2, 127–8, 131, 141, 143, 162, 165, 179–80, 184, 189, 191, 194–5, 199, 204, 208, 211, 214, 220, *244*, *248*, *249*, *253*
  see also Great Recession
Recession, Great, *see* Great Recession
reciprocal currency arrangements, *see* liquidity swap lines
regulatory arbitrage, 235, 238–9
regulatory reform, 21, 223–42
Reinhart, Carmen M., 22–4, *244*, *249*
repos, *see* tri-party repurchase agreements
repossessed homes, *see* home repossessions
Reserve Primary Fund, 75, 77, 180, 184, 186, 239
Revenue Act (1932), 153
reverse repos, *see* reverse repurchase agreements
reverse repurchase agreements (reverse repos), 217–20
“revolving-door” syndrome, 236, 239
RGDP, *see* real gross domestic product
Rockefeller, John D., 33
Rogoff, Kenneth S., 22–4, *244*, *249*

Roosevelt, Franklin Delano (FDR) (1882–1945; U.S. President 1933–1945), 72, 149, 155, 164, 179, *252*
runs on banks, *see* banking panics

S&L Crisis, *see* Savings and Loan Crisis
S&P, *see* Standard and Poor's
Savings and Loan Crisis, 26, 34–9, 64, 239, *245*
Schwartz, Anna, 161, *164*, 166
SEC, *see* Securities and Exchange Commission
Securities and Exchange Commission (SEC), 75, 223, 233, 235–6, 238
securitization, 42–4, 47–9, 52–3, 68, 74–5, 92
sequestration, 106, *249*
shadow banking system, 2, 42, 44, 51–3, 57, 64–70, 78, 169, 234, 239, *246*
SIVs, *see* structured investment vehicles
Smith, Adam (1723–1790), 224
Smoot-Hawley Tariff Act (1930), 153
socially perverse incentives, *see* misaligned incentives
sovereign debt crises, 3–4, 8, 17, 99, 108, 113–29, 184, 194, 216
  see also European Debt Crisis
Spain, 1, 3–4, *4*, 17, 22–3, 108–9, 114–18, *119*, 120, *120*, 121–2, 124–5, *125*, 126, *126*, 127, *127*, 128, *128*, 195, *243*, *249*, *250*
"speculative finance," *see* Minsky Theory of Financial Crises
"stability breeds instability," 53
  see also Stiglitz, Joseph
Standard and Poor's (S&P), 56, 66, 76–7, 85, 88, 199, *199*, 200, 226, 235, *245*
Stiglitz, Joseph, 53
stock market bubble, *see* bubbles
Strong, Benjamin (1872–1928), 34, 165
structural unemployment, 81, 83, *247*
structured investment vehicles (SIVs), 67–8, *246*, *247*
subprime mortgage market, 1–2, 44, 47, 49–50, 66, 72, 74–5, 170, 224, 226, 236, *246*
SWPs, *see* Liquidity Swap Lines

TAF, *see* term auction facility
"tailwinds," *99*
TALF, *see* term asset-backed loan facility
TARP, *see* Troubled Asset Relief Program
Taylor rule, 225, *247*
"Tech Wreck" (2000–2002), 54
term asset-backed loan facility (TALF), 185
term auction facility (TAF), 182–3, *254*
term deposit facility, 219
Thailand, 6, 17, 23, *244*
tranches, types of, 65
tri-party repurchase agreements (repos), 66–7
Troubled Asset Relief Program, 186–9, *255*
Trust Company of America, 33
twin bubbles in credit and house prices, *see* bubbles

unconventional monetary policies, 191–205, *255*
unemployment, natural, *see* non-accelerating inflation rate of unemployment
Union Pacific Railroad, 30
unit labor costs, 124–5, *125*
U.S. deficit, *see* deficit, U.S.

Vietnam War, 73, 84
Volcker, Paul (Federal Reserve Chairman 1979–1987), 36
Volcker rule, 242

Wall Street Reform and Consumer Protection Act, *see* Dodd-Frank Act
wealth effects, 198–200
Wilson, (Thomas) Woodrow (1856–1924; U.S. President 1913–1921), 34

zero-bound problem, 157
Zingales, Luigi, 240
"zombie" institutions, 38