
*An Historical Perspective on the Quest
for Financial Stability and
the Monetary Policy Regime*

MICHAEL D. BORDO

This article surveys the co-evolution of monetary policy and financial stability for a number of countries from 1880 to the present. Historical evidence on the incidence, costs, and determinants of financial crises (the most extreme form of financial instability), combined with narratives on some famous financial crises, suggests that financial crises have many causes, including credit-driven asset price booms, which have become more prevalent in recent decades, but in general financial crises are very heterogeneous and hard to categorize. Moreover, evidence shows that the association across the country sample between credit booms, asset price booms, and serious financial crises is quite weak.

Economic development and growth in the past two centuries have been facilitated by stable monetary and financial regimes. Good macroeconomic institutions encourage growth and financial development directly through financial innovation and indirectly by allowing private agents to make economic decisions in a stable environment (King and Levine 1993; Rousseau and Sylla 2006). Macroeconomic stability comprises price level stability, limited volatility in the real economy, and financial stability. Traditionally, financial stability has meant preventing or managing financial crises, which can lead to and exacerbate recessions. More recently, it has come to mean heading off systemic risk especially

The Journal of Economic History, Vol. 78, No. 2 (June 2018). © The Economic History Association. All rights reserved. doi: 10.1017/S0022050718000281

Michael D. Bordo is Professor, Department of Economics, Rutgers University, New Jersey Hall, 75 Hamilton Street, New Brunswick, NJ 08901. E-mail: bordo@economics.rutgers.edu.

For excellent research assistance I thank Maria Sole Pagliari. For helpful comments and suggestions, I thank: Paul David, Harold James, John Landon-Lane, Chris Meissner, Hugh Rockoff, Myron Scholes, Lars E.O. Svensson, John Taylor, Aaron Tornell, David Wheelock, Eugene White, and Gavin Wright.

credit-driven asset price booms and busts, which may trigger financial crises.

This article examines the evolution of macroeconomic institutions, focusing on the connection between the monetary regime, defined as both the exchange rate regime and the monetary policy regime, and financial stability in the past two centuries. I see this as primarily a story of central banks developing their policy tools to provide both macroeconomic and financial stability.

Central banks have been evolving since the founding of the Swedish Riksbank in 1668 and the Bank of England in 1694. Originally established to provide fiscal support to the governments of emerging nation states to finance wars, later in the eighteenth and nineteenth centuries, central banks evolved to maintain the convertibility of their notes into specie (gold) and to manage the gold standard.¹ In the twentieth century, they learned how to stabilize the business cycle and to provide price stability. The central requirement of these tasks was the establishment of credibility (Bordo and Siklos 2016). The evolution of central banks occurred within the context of international exchange rate regimes which encompassed the nineteenth-century specie standard (bimetallism and gold), the interwar gold exchange standard, the Bretton Woods adjustable peg regime, and the post Bretton Woods managed float fiat money regime.

In the international exchange rate regime, central banks (monetary authorities) adhere to a monetary policy regime, taken to mean the relationship between the tools of monetary policy and the goals or objectives of the policy maker. Monetary policy tools have been: the policy interest rate, in use since the nineteenth century; monetary aggregates, used in the twentieth century; and various qualitative and quantitative controls. Policy objectives or goals have been: stable exchange rates (gold convertibility pre-WWII), price level (inflation) stability, real output stability, low unemployment, and financial stability.²

Learning to provide macroeconomic stability and to build credibility was long and difficult. Between the late nineteenth century and the twentieth century, credibility followed a pendulum process from relative

¹ These included Banque de France (1800), Norges Bank (1816), Reichsbank (1876), Bank of Japan (1882), Banca d'Italia 1893, Swiss National Bank (1907), and the Federal Reserve (1913). See Bordo and Siklos (2018).

² Another important distinction is between a monetary policy strategy and a monetary policy regime. A monetary policy strategy is defined in terms of the goals of monetary policy (price stability (low inflation), low unemployment and financial stability). By contrast, a monetary policy regime is characterized by the instruments used to achieve the strategy.

success to deep failure and back to success (Bordo and Siklos 2014). The Great Moderation from the mid-1980s to the mid-2000s is often viewed as the pinnacle of success for central banks in achieving their macroeconomic goals (Bernanke 2004; Taylor 2011).

Learning to provide financial stability has also been long and painful. Some central banks learned how to be effective lenders of last resort by the third quarter of the nineteenth century (Bordo and Siklos 2018), but for others, it was well into the twentieth century. Until the 1930s, banking crises were banking panics which required quick lender of last resort (LLR) actions to prevent a crisis. With the invention of the financial safety net and deposit insurance, banking panics evolved into fiscally resolved crises, whose resolution has become increasingly expensive (Bordo and Meissner 2016). Along with crisis management, the regulatory and supervisory regime for the financial system went through a lengthy learning process (Toniolo and White 2015).

Four key objectives emerged from this historical evolution prior to the Global Financial Crisis (GFC) of 2008: the importance of maintaining price stability (credibility for low inflation); maintaining real macroeconomic stability; providing a credible rules based LLR; and having a sound banking structure and effective supervision and regulation of the banking system. Since the GFC of 2008, central banks have focused increasingly on the financial stability mandate and especially on the link between credit-driven asset price booms and busts, referred to as the financial cycle, which many view as the key cause of financial crises (Borio 2014; Taylor 2012).

In what follows, I survey the co-evolution of monetary policy and financial stability along with a narrative on some famous financial crises and historical evidence on the incidence, costs, and determinants of financial crises. I focus on some empirical historical evidence on the relationships between credit booms, asset price booms, and serious financial crises. My exploration suggests that financial crises have many causes, including but not limited to credit-driven asset price booms, and that in general financial crises are very heterogeneous and hard to categorize.

Two key historical examples stand out in the record of serious financial crises linked to credit-driven asset price booms and busts: the 1920s and 1930s, and the GFC. The question that arises is whether these two “perfect storms” should be grounds for permanent changes in the monetary and financial environment. I raise some doubts. The article concludes with lessons, both for policy makers and for future historians of financial crises.

THE HISTORICAL EVOLUTION OF MONETARY
AND FINANCIAL STABILITY POLICY

Central banks have been evolving for close to four centuries. In the nineteenth century, central banks followed their key mandate to maintain the convertibility of their notes into specie and to follow the “rules of the game.”³ During WWI, they became subservient to governments and were turned into engines of inflation. In the interwar period, they began to develop the tools of countercyclical stabilization policy and to insulate their economies from international shocks. In this period, observance of the flawed real bills doctrine (in the United States)⁴ and adherence to the flawed gold exchange standard⁵ led to serious policy errors. The Great Contraction of 1929–1933 was such that central banks were blamed by subsequent scholars and government officials at the time (e.g., President Franklin Delano Roosevelt) for the contraction. They lost their independence to Treasuries and were forced to follow an inflationary low interest policy. They became an integral part of a regime of, what I term, financial repression.⁶

In WWII, central banks again became engines of inflation and beginning in the 1950s, central banks regained their independence. They returned to using their policy tools to stem inflation and stabilize the economy. In the 1960s, central banks, strongly influenced by Keynesian ideas, began following the Phillips Curve tradeoff favoring maintaining high employment at the expense of increasing inflation (Meltzer 2010; Romer and Romer 2002), which led to the Great Inflation of the 1970s.

³ Under the “rules of the game,” central banks were supposed to use their policy interest rate to speed up adjustment to shocks to the balance of payments. For example, when a harvest failure caused a balance of payments deficit and the central bank observed its gold reserves declining, it would raise its policy rate. This would discourage the demand for imports and also attract capital from abroad (Bordo 1984).

⁴ The real bills doctrine developed in nineteenth century England was a rule of thumb for commercial bankers to follow: lend only on the basis of very short-term self-liquidating commercial bills or bills to finance real transactions like inventories. Meltzer (2003) demonstrated serious flaws in this doctrine.

⁵ Most of the world’s central banks adopted the gold exchange standard at the international monetary conference, Genoa 1922. Under the gold exchange standard, central banks would hold foreign exchange in pounds sterling or dollars in addition to gold as their official international reserves. Many interwar problems were attributed to flaws in the gold exchange standard (Nurkse 1944; Eichengreen 1992).

⁶ I define financial repression as a series of government policies restricting financial intermediation. It encompasses interest rate controls or ceilings, quantitative controls on credit, state intervention or ownership of the financial system, government intervention in the allocation of credit for the domestic and international issues of loans, bonds, and stocks, requirements that commercial banks hold government bonds. See Reinhart and Sbrancia (2015) and Monnet (2018).

After the debacle of the banking panics of the 1930s central banks also accepted their LLR role. However, by the 1970s they no longer followed Walter Bagehot's (1873) strictures to lend freely at a penalty rate to solvent but illiquid banks but began to bail out insolvent banks believed to be "too big to fail."

The Great Inflation ended in 1979 with the tight monetary policies of Federal Reserve Chairman Paul Volcker. This brought the advanced countries into the Great Moderation from the mid-1980s to the early 2000s, a period of rapid and stable growth and low inflation. Central banks achieved the apex of learning to follow credible rule-like behavior (Taylor 2006). This ended with the GFC 2007–2008. Although central banks handled it much better than the Great Contraction of the 1930s, they and other regulatory authorities were blamed for not heading off the imbalances that led to the crisis. As in the 1930s, these events have led to pressure for regime change to elevate the financial stability mandate to paramount importance and to a possible return to financial repression.

The Classical Gold Standard 1880–1914

The specie standard evolved in the nineteenth century from bimetallism to the classical gold standard which prevailed from 1880 to 1914 (Redish 1992). The gold standard rule was a contingent rule where temporary suspension and the issue of fiat money was permitted in well-understood emergencies such as wars and financial crises. Once the emergency ended, the central bank was required to restore convertibility to gold at the official parity. Doing so would ensure its credibility (Bordo and Kydland 1995). Credible adherence to the gold standard rule allowed central banks some leeway to conduct stabilization policies (smooth shocks to the price level, real output, and interest rates) within the gold points (Bordo and MacDonald 2012).⁷ At the same time, minimal attention was attached to smoothing the business cycle or reducing unemployment. Wages and prices were relatively flexible, and the unemployed could migrate to the Americas or Australia.

The pre-1914 history of the gold standard shows how large economies, especially Britain, France, Germany, and the United States, had credible regimes. Western European countries like Italy, Spain, and Portugal tried to gain credibility but were less successful, as were all of the Latin

⁷ Gold points are the export and import points above and below official gold parity determined by the cost of shipping gold between countries. See Officer (1996).

American countries, reflecting their weaker institutional development (Bordo and Schwartz 1996).

Credible adherence to the gold standard rule also allowed central banks to conduct LLR actions without engendering capital flight. Through the nineteenth century, advanced countries learned through repeated financial crises to follow Bagehot's (1873) famous strictures "in the face of an internal drain (a banking panic) lend freely to solvent financial institutions on the basis of sound collateral. In the face of an external drain (currency crisis) raise the policy rate. In the face of both an internal and external drain, lend freely at a high rate" (paraphrased from Bagehot 1873 in Bordo 1984, p. 56; Flandreau and Ugolini 2013).

Before 1914, financial crises were caused by internal and external shocks including political upheaval, financial corporate malfeasance, and international lending booms and busts. Crises were transmitted between countries by the adjustment mechanism of the fixed exchange rate gold standard. Their incidence and severity were closely related to both the presence and absence of a LLR and banking structure. The United States, with unit banking, fared far worse than neighboring Canada, which had nationwide branch banking (Bordo, Redish and Rockoff, 2015). Country differences in banking structure and government responses to financial crises were clearly tied in with deep institutional and political factors, such as the nature and presence of property rights and rule of law and connection to the British Empire (Bordo and Meissner 2015; Calomiris and Haber 2014).⁸

The Interwar and WWII: 1914–1945

The classical gold standard ended with WWI. With the outbreak of hostilities in 1914, most of the belligerents suspended convertibility and imposed exchange and capital controls as they attempted to liquidate their vast foreign holdings of securities (Silber 2007; Roberts 2013). Each belligerent financed a considerable portion of its wartime expenditures by issuing paper currency, leading to high inflation. After the war, many countries tried to rebuild the prewar gold standard system, but restoring the prewar parity in the face of massive wartime inflation and changes in the political economy of the postwar order was difficult

⁸ Indeed, the Federal Reserve System was founded in 1914 in response to banking crises. However, the Federal Reserve Act did not reform the inherently unstable U.S. banking system, thereby putting more pressure on the LLR when crises did occur (Bordo and Wheelock 2011).

(Eichengreen 1992). What was established in 1926—the fragile gold exchange standard—had considerably less credibility (Bordo and Siklos 2014). Its short-lived success depended upon the reputations of Benjamin Strong, Montagu Norman, Emile Moreau, and Hjalmar Schacht (Bordo and Schenk 2016). Despite their efforts, the system collapsed during the Great Depression when it suffered from the fatal flaws of maladjustment, illiquidity, and lack of credibility. The key problem was adjustment: the United Kingdom had restored convertibility at an overvalued parity and faced continuous deflationary pressure while France restored convertibility at a greatly undervalued parity. Both France and the United States sterilized gold inflows, aggravating the deflationary pressure on sterling, which since WWI was a declining reserve currency.

During the interwar period, many central banks began following macro stabilization policies to offset fluctuations in the price level and real output. To do so required sterilizing gold flows and preventing the classical adjustment mechanism from working.⁹ This was different from the pre-war gold standard and these sterilization policies ultimately led to the breakdown of the international monetary system (Meltzer 2003). Financial stability also suffered in the interwar period as most European countries, in the face of deflation and readjustment of competitiveness, suffered banking crises, most not resolved by effective LLR policies (Feinstein, Temin, and Toniolo 1997). A number of countries resorted to fiscal bailouts of banks deemed “too big to fail” during this period (Toniolo and White 2015).

The Federal Reserve’s policy actions in the late 1920s, while unsuccessful in deflating the stock market boom, led to a serious recession in the summer of 1929. An even more egregious error was the System’s failure to follow its LLR mandate and offset a series of ever worsening liquidity-driven banking panics from 1930 to 1933 (Bordo and Wheelock 2011; Bordo and Landon-Lane 2010) causing the money supply to collapse by one-third with a similar collapse in real output and prices and a rise in unemployment to 25 percent (Friedman and Schwartz 1963).

The U.S. Great Contraction spread to the rest of the world through the fixed exchange rate gold standard. The loss of credibility in the interwar period aggravated matters for most European countries which, faced with “golden fetters,” were unable to follow successful LLR policies to prevent banking panics and deflation (Eichengreen 1992; Bernanke and

⁹ Sterilization meant conducting open market operations in domestic securities sufficient to neutralize the effects of gold flows on the money supply.

James 1991). They escaped depression by cutting the link with gold and devaluing their currencies (Choudhri and Kochin 1980; Eichengreen and Sachs 1985).

Country after country raised tariffs, imposed exchange, and capital controls in an effort to protect their economies from foreign competition (Kindleberger 1973; Irwin 2011). They also followed beggar-thy-neighbor competitive devaluations (currency wars) (Nurske 1944). The outcome was the complete collapse of the global trade and international financial system by the eve of WWII.

In the United States and other advanced countries, the Great Contraction was blamed on the central bank and the commercial banks. This led to the subservience of the Fed to the U.S. Treasury from the mid-1930s until the Federal Reserve Treasury Accord of 1951. During this period the Fed followed a low interest rate policy to accommodate the Treasury's fiscal policy (Meltzer 2003). During WWII, the Fed fueled inflation as it had done in WWI by accommodating expansionary fiscal policy. The story was similar in the United Kingdom, Canada, and many other countries. Thus, in these decades central banks lost their independence to the fiscal authorities. They also administered controls over the financial system and became part of the general machinery of government directing credit allocation and financial repression.

Bretton Woods 1944 to 1973

The Bretton Woods System (BWS), inaugurated at the Bretton Woods conference in 1944, was created to restore both macroeconomic and financial stability (Bordo 1993). The BWS was rule based and in many ways similar to the gold standard. Each member was required to peg their currencies to dollars at \$35 per ounce of gold. As the key anchor currency, the United States was to use its financial policies to maintain the dollar peg. It was an adjustable peg whereby member countries could change their parities in the face of a "fundamental disequilibrium" (a change in the real exchange rate). In addition, the member countries were to institute capital controls.¹⁰ Unlike the gold standard, members were expected to use their monetary and fiscal policies to maintain full employment. Additionally, the International Monetary Fund (IMF) was established to provide temporary relief for current account imbalances.

¹⁰ Member countries were encouraged to restrict capital account transactions often done by central bank rationing access to foreign exchange (dollars) for current account transactions.

The BWS became fully operational in late 1958 when the Western European economies declared current account convertibility. The convertible BWS was associated with remarkable macroeconomic stability (Bordo 1993) but was short-lived (1959 to 1971), as it quickly evolved into the gold dollar standard, which had the fatal flaws of the interwar gold exchange standard.

The key problem, as in the 1920s, was adjustment. The United Kingdom, with an overvalued parity and slower growth than its competitors and an unwillingness to accept deflation, had continuous balance of payments deficits, currency crises, and rescues by the G10 (group of industrial countries), the IMF, and the United States. On the other hand, Germany had rapid productivity growth and ran continuous surpluses, but as in the interwar, was unwilling to let prices rise and sterilized the inflows. The United States, as the anchor country, ran continuous balance of payments deficits. However, because the dollar was used as international reserves to finance the growth of world trade, it did not have to adjust to its deficits.¹¹ After 1960, as outstanding dollar balances increased relative to the U.S. monetary gold stock, the threat of a run on gold (Fort Knox) loomed. In reaction in 1961, the U.S. authorities created an elaborate set of policies and controls, the most important of which were the swap lines, to preserve the monetary gold stock (Bordo, Humpage, and Schwartz 2015).¹² However, as long as the U.S. monetary authorities followed credible low inflation policies, the system would continue because the dollar had emerged as the key international currency. The BWS collapsed in 1971 with U.S. inflationary monetary and fiscal policies after 1965 to finance the Vietnam War and Lyndon B. Johnson's Great Society.¹³

Within this international background, the Federal Reserve slowly regained its independence from the Treasury. This was achieved in the Federal Reserve Treasury Accord of 1951. In other countries it took much longer for central banks to regain their independence, often into the 1980s and early 1990s.

The Federal Reserve tightened policy in the early 1950s and restored price stability. Under Chairman William McChesney Martin, it followed

¹¹ See Mundell (1969).

¹² A swap line involved an offsetting transaction between the United States and a foreign central bank. For example, the Federal Reserve would lend dollars for a short period of time to the Banque de France at a fixed exchange rate in exchange for an offsetting loan of equivalent value in French francs by the Banque. This obviated the need for the Banque to convert outstanding dollars into gold.

¹³ See George P. Shultz's Economic History Association (EHA) remarks in the Online Appendix.

a policy of low inflation, and the U.S. economy (and other advanced economies) performed well in terms of low and stable inflation and rapid and stable real growth through much of the 1950s and early 1960s. The return to monetary orthodoxy (low inflation) rested on the reputation of Chairman Martin. The Bundesbank and the Swiss National Bank also followed credible monetary policies dedicated to maintaining price stability.

This period saw financial stability. The controls on the financial industry and the regime of financial repression continued into the 1950s and 1960s. In the United States, the Federal Reserve System administered Regulation Q, which imposed a ceiling on time deposit interest rates and prohibited the payment of interest on demand deposits. Another important regulation was the Glass Steagall separation of commercial from investment banking.¹⁴ In the face of those regulations, and with the extension of Federal Deposit Insurance Corporation (FDIC) insurance, there were no financial crises, although there were speculative attacks on pegged exchange rates. Similar policies and institutions prevailed in the United Kingdom and virtually every other advanced economy (Toniolo and White 2015).

The Managed Float Regime 1973 to 2006

The era of macro stability and financial stability began to unravel in the mid-1970s. In the 1960s, central banks, with the exceptions of the Bundesbank and the Swiss National Bank, began following Keynesian policies of full employment at the expense of higher inflation. With the collapse of Bretton Woods and the indirect link to gold, the last constraint on monetary policy was removed. The subsequent Great Inflation destroyed credibility, as well as the reputations of central bankers especially Chairman of the Federal Reserve Arthur Burns (Bordo and Orphanides 2013; Bordo and Siklos 2016).

As inflation mounted in the 1970s, several attempts by Burns and the Federal Open Market Committee (FOMC) to reduce inflation faltered (Bordo and Orphanides 2013). Accommodation for two oil price shocks also contributed to the run up in inflation culminating in a run on the dollar in 1978. President Carter's appointment of Paul Volcker as chairman of the Federal Reserve with a mandate to end inflation and Volcker's adoption of monetarist-style tight monetary policy in 1979 broke inflationary expectations by 1982 at the end of a deep recession (Bordo et al. 2017).

¹⁴ Glass Steagall was designed to prevent excessive risk taking by commercial banks, hoping to prevent a repeat of the bank failures of the Great Contraction.

Similar strategies were followed in the United Kingdom, Japan, Canada, and other countries so that by the mid-1980s, the Great Moderation restored price stability along with the credibility of central bankers (Bordo and Siklos 2016). During this period, central banks developed new strategies that enhanced credibility (Bordo and Siklos 2014, 2018). Chief among these is inflation targeting (IT), developed in the late 1980s and early 1990s by New Zealand, Canada, Australia, the United Kingdom, and Sweden but not the United States.

As it was practiced, it became flexible IT. Under flexible IT, the policy interest rate is used to hit the explicit inflation target (e.g., 2 percent). But since changes in the policy stance influence inflation with long and variable lags, there is usually a tolerance range around the mid-point of the target. Flexible IT allows the central bank to influence its other main macroeconomic goal of low unemployment at the same time as achieving its mandated inflation target (King 1997; Svensson 2009).

The end of the BWS also led to the breakdown of financial stability. Bretton Woods failed because it became increasingly difficult to maintain capital controls in the face of financial innovations such as Eurodollars in 1950s by London based U.S. banks. Once capital controls ended, private capital flows, in addition to contributing to a return to financial globalization, increased the likelihood of both currency crises and banking crises driven by lending booms and sudden stops. Second, the Great Inflation made it more difficult for price controls in the financial sector to be maintained. With inflation came increasing financial innovation and competition between new institutions, designed to evade the domestic financial controls, and the older protected ones. Political pressure in the 1980s and 1990s led to the complete liberalization of the financial sector in the United States by 1999, with the elimination of Glass Steagall and the end of the prohibition on interstate branch banking in 1997. However, the supervision and regulation regime failed to keep up with the rapid changes under financial liberalization. The same process unfolded across the world, albeit under different institutional frameworks.

Banking crises, which had virtually disappeared since the mid-1930s, came back in the 1970s. After the debacle of the Great Depression, the Fed acknowledged its LLR role. With the return of banking crises in the 1970s, the Fed began following activist crisis management policies (Bordo 2014; Carlson and Wheelock 2015). Banking crises in this period were very different from those in the 1930s and earlier. With the advent of deposit insurance, old-fashioned banking panics disappeared and were replaced by expensive fiscal bailouts of insolvent firms (Bordo and Meissner 2016). Additionally, the Fed expanded its reach beyond the traditional “line in the sand” of protecting only the deposit-taking

institutions and the payments system, and began to allay turmoil in the non-banking sector (beginning in 1970 with the rescue of the commercial paper market in the Penn Central crisis, the rescue of the hedge fund Long Term Capital Management (LTCM) in 1998 and investment banks in 2008).

A key event in the progression towards fiscal bailouts and what became known as the “Too Big to Fail” doctrine was the bailout of Franklin National bank in 1974, which had made risky bets in the foreign exchange market. The justification for this violation of Bagehot’s (1873) strictures was to prevent contagion to other banks.

Bagehot (1873) was criticized by Charles Goodhart (1985), Robert Solow (1982), and others on the grounds that it was not possible to distinguish illiquidity from insolvency during a crisis and that the failure of a large bank would disrupt financial intermediation and lead to contagion. In response to the concern over moral hazard, Corrigan (1990), Giannini (1999), and others suggested that the Fed follow a strategy of “constructive ambiguity” by not declaring in advance which banks would be deemed too large to fail. Similar processes took place in the United Kingdom (Capie 2010; James 2017), and in other countries. These developments set the stage for the return of serious financial instability in advanced countries with the 2007–2008 subprime mortgage crisis.

The Global Financial Crisis: 2007–2008

The Great Moderation of 1985 to 2005 was associated with macroeconomic and financial stability. The prevalent view was that monetary and price stability fostered financial stability because inflation volatility weakened bank balance sheets (Bordo 2000; Bordo, Dueker, and Wheelock 2002). An alternative view was that extended periods of low inflation and low interest rates created growing imbalances (Borio and Lowe 2002); that is, low interest rates and low inflation were conducive to creating bank-credit-fueled asset price booms and busts because low interest rates created the seeds for credit-financed asset price booms in an environment of price stability. At the end of the Tech boom of the 1990s and early 2000s, when the Bank for International Settlements (BIS) officials suggested the conditions under which the Fed should raise its policy rates to defuse an incipient bubble (BIS 2000, Chapter 1), Federal Reserve officials and some prominent economists (Greenspan 2002; Bernanke and Gertler 1999) argued that the proper way to treat an

asset price boom was to leave it alone, and if it burst, to clean up the mess afterwards (“cleaning,” Brunnermeier and Schnabel 2016).¹⁵ As it turned out, when the Tech boom burst in 2000, it did little damage to the real economy, justifying the Fed’s view. The 2007–2008 subprime mortgage crisis, by contrast, did have serious effects on the global financial system, reminiscent of 1931, and led to a very serious recession.

Debate over the causes of the 2007–2008 crisis continues. Many factors were at work, including major regulatory failure in the U.S. housing sector (Fanny Mae and Freddie Mac) encouraging risky mortgage borrowing (Rajan 2010; Poole 2017); the Fed (and other central banks) leaving its policy rate well below the Taylor Rule rate (2002–2005) for fear of a Japan-style deflation (Taylor 2007);¹⁶ financial innovation that created derivatives; the failure of the United States and other regulators to comprehend that their regulations of the global banking system were being evaded by the creation of off balance sheet entities (Gorton 2010; Calomiris 2017); a global savings glut (Bernanke 2005); and greed and malfeasance by many financial sector players (Gorton 2012; Blinder 2015).

Policy actions by the Fed and other central banks and international policy coordination eventually managed the crisis and the macro economy was stabilized. The central banks pursued classic Bagehot liquidity policies (expansionary open market operations and discount lending) but extended their discount window mandate from providing liquidity to deposit taking institutions to encompassing non-bank financial intermediaries (shadow banks).¹⁷ The monetary and fiscal authorities bailed out insolvent banks and investment banks deemed “too important to fail.” Central banks’ independence from the fiscal authorities was violated by the use of credit policy (e.g., extending credit to non-bank entities), which is a form of fiscal policy (Goodfriend 2014). Because they engaged in credit policy and bailed out insolvent banks—actions not included in the Federal Reserve Act—their future independence is threatened by congressional reaction.¹⁸

¹⁵ Bordo and Jeanne (2002) posited that with a perceived high probability of an asset boom burst and a serious recession the central bank should use its policy tools to head off the bust.

¹⁶ The Taylor Rule states that the central bank sets its policy interest rate based on a reaction function to its principle policy objectives—the deviation of inflation from its target and the deviation of the growth of real gross domestic product (GDP) from its potential. Taylor (1993) suggested weights on the output and the inflation objectives be set at one-half.

¹⁷ Orphanides (2016) and others emphasize that central banks took on too many responsibilities during the GFC and lost focus on their main mandate, price stability.

¹⁸ Similarly in other countries, for example, the United Kingdom.

Indeed, as in the 1930s, the GFC was blamed on the banks and the financial sector in general, leading to an increase in financial regulation (Dodd–Frank 2010). At the global level, the Financial Stability Board and Basel III recommended new regulations for national financial regulatory agencies.¹⁹ In addition, central banks have been urged by academics and policy makers to use their policy tools to head off incipient systemic risk, especially credit booms and entrusted with the use of the policy tools of macro prudential policy to deal with potential financial instability.²⁰ This increased emphasis on financial stability has created a sense of déjà vu from the 1930s when a regime of financial repression led to rent seeking and distorted resource allocation in the financial sector (Calomiris 2000; White 2000), which in subsequent decades had serious unintended consequences.

FINANCIAL CRISES IN HISTORICAL PERSPECTIVE: NARRATIVES

To understand more clearly the link between monetary policy and financial stability regimes, we must understand the record of the most extreme form of financial instability. I define a financial crisis as a banking crisis. Before the 1930s, they were banking panics—a scramble by the public for means of payment (an illiquidity event). Since the Great Depression, these have become fiscally resolved banking crises driven by insolvency.²¹

In what follows, I present narratives on several important financial crises in the past two centuries.²² They are drawn from 12 narratives discussed in Michael Bordo (2017).²³ I first present some famous British

¹⁹ The Financial Stability Board (founded 2009) is an international advisory body of key central banks and regulatory agencies to monitor and assess vulnerabilities faced by the global financial system. Basel III is an internationally agreed-upon set of measures developed by the Basel Committee on Banking Supervision at the BIS in response to the GFC. It contains a set of recommended reforms to replace the Basel II standards of 2004 (BIS 2017).

²⁰ These tools include counter cyclical capital requirements, liquidity ratios, leverage ratios, margin requirements, and loan to value ratios. Many were used in the post war period and abandoned in the 1970s and 1980s because they were seen as fiscal rather than monetary policy and because they were viewed as distorting the allocation of resources.

²¹ Other phenomena referred to as financial crises are: currency crises and debt crises. The combination of banking and currency crises is referred to as a twin crisis. The coincidence of banking, currency, and debt crises are referred to as triple crises. See Bordo and Meissner (2016).

²² My narratives are based on decades of studying financial crises and strongly influenced by my thesis advisor at the University of Chicago, Milton Friedman and later by collaborating with Anna Schwartz for 40 years.

²³ Other crisis narratives include Kindleberger (1978), Bordo and Eichengreen (1999), Reinhart and Rogoff (2009), and Brunnermeier and Schnabel (2016).

crises, then crises from the United States, and then other countries. This set of narratives illustrates successes and failures in attaining financial stability and the importance of institutions.

Table 1 summarizes all 12 narratives and provides some salient characteristics for each episode: the severity of each crisis, whether it was part of a global crisis, the exchange rate regime, whether it was accompanied by a currency crisis, whether it was associated with a credit boom, whether a central bank was in place, whether it was allayed by LLR actions, whether it was fiscally resolved, and the type of banking structure in place.

The United Kingdom: Overend Gurney 1866 and Barings 1890

From the early years of financial capitalism in the seventeenth century, the United Kingdom had a series of major banking crises (Hoppit 1986). After the Napoleonic wars, there was one almost every decade (1825, 1839, 1847, 1857, 1866, and 1890). All of these episodes were global in scope, and some involved credit booms. The progression of crises ended when, by 1890, the Bank of England had learned to be a LLR. Overend Gurney was a discount house that in the 1860s had taken on risky investments. It was the largest discount house and according to Batchelor (1986), the Directors of the Bank of England viewed it as a rival so when it became insolvent in 1866 the Bank refused to rescue it. Its failure led to the failure of a number of associated country banks and the English Joint Stock bank, followed by a run on London banks and finance houses by the country banks, which in turn led to a classic banking panic as the public tried to convert its deposits into Bank of England notes. The run spread to the Bank of England itself. The Bank hesitated in requesting a Treasury Letter, releasing it from the convertibility constraint of the 1844 Bank Charter Act, but the Chancellor of the Exchequer suspended the Act which ended the panic. Bagehot (1873, p. 67) criticized the Bank for hesitating in providing liquidity to allay the panic: "To lend a great deal, and yet not give the public confidence that you will lend sufficiently and effectually, is the worst of all policies, but it is the policy now pursued." Thus, the Overend Gurney panic began with bad business decisions by its directors and became a panic when the Bank of England failed to act as a LLR.

The 1890 crisis in London also resulted from unwise investment decisions by Barings directors (investing in securities financing a land boom in Argentina), which turned to bust in the face of financial mis-management and the external shock of a harvest failure. Like Overend Gurney in

TABLE 1
MAJOR BANKING CRISES 1825–2008

Crisis Year	Country	Severity (PercentΔGDP)	Output Loss (Percent)	Currency Crisis	Global Crisis	ER Regime	Credit Boom	CB in Place	LLR	Fiscal Resolution	Banking Structure
1825	UK	Yes (na)	NA	Yes	Yes	Gold	Yes (Latin America)	Yes	Ineffective	Treasury letter	Unit
1847	UK	Yes (-2.53)	NA	No	No	Gold	Yes (Railroad)	Yes	Ineffective	Treasury letter	Unit
1866	UK	Yes (-1.25)	NA	No	No	Gold	No	Yes	Ineffective	Treasury letter	Branch
1890	UK	No (-4.94)	8.91	No	Yes	Gold	Yes (Argentina)	Yes	Effective	Treasury backstop	Branch
1893	Australia	Yes (-20.5)	90.65	No	Maybe	Gold	Yes (Land)	No	No	Yes	Branch
1873	US	Yes (-19.33)	NA	No	Yes	Greenback (paper)	Yes (Railroad)	No	No*	No	Unit
1893	US	Yes (-11.11)	8.65	Yes	Maybe	Gold	No	No	No*	No	Unit
1907	US	Yes (-10.21)	55.65	No	Yes	Gold	No	No	No*	No	Unit
1929	US	Yes (-30.76)	101	Yes	Yes	Gold	Yes (Wall Street)	Yes	No	No**	Unit
1990–1992	Nordics†	Yes (-3.9)	45.65‡	Yes	No	Fixed	Yes (Real Estate)	Yes	Effective	Yes (bailouts)	Universal
1991	Japan	Yes (-0.025)	18.3	No	No	Floating	Yes (Real Estate)	Yes	Ineffective	Yes (bailouts)	Universal
2007	US	Yes (-5.71)	26.2	No	Yes	Floating	Yes (Real Estate)	Yes	Effective	Yes (bailouts)	Universal

Notes: † Finland, Norway and Sweden; ‡ Finland and Sweden; * Clearing houses; ** Reconstruction Finance Corporation.
Sources: Bordo (2003); Bordo and Landon-Lane (2012); Bordo and Meissner (2016).

1866, when insolvency loomed the Barings directors turned to the Bank of England for a rescue. The Bank complied and arranged what became known as a lifeboat rescue. The Bank arranged a rescue of Barings by a syndicate of banks, led by the Bank of England itself, to share in any losses from Barings liquidation. The Bank then split the old firm into a good bank, which was recapitalized, and a bad bank, which held the toxic securities—a technique used a century later in Sweden (White 2016) and in several cases in the GFC. The syndicate and the bad bank were guaranteed from loss by the British Treasury. Announcement of the rescue allayed the markets, and a panic was avoided. In addition, gold loans to the Bank by the Banque de France and the Russian Government (central bank cooperation) also helped backstop the Bank of England (Bordo and Schenk 2016). According to Hautcoeur, Riva, and White (2014), the model for the lifeboat came from a rescue the year before of a major financial institution, the Comptoir d'Escompte by the Banque de France. Unlike the other events that I discuss, this is one of the few potentially serious crises that was avoided by wise LLR actions.

The United States 1907 and 1929–1933

The United States, compared to other advanced economies, had the largest number of banking crises in the late nineteenth century. Much of this instability can be explained by the political economy of the federal system that came out of the 1787 Constitution which gave control over the currency to Congress without control over banking. Consequently, the U.S. banking system was based on often small state-chartered unit banks. Two attempts to establish a central bank—the First and Second Banks of the United States—failed through the forces of populism and states' rights.

In the pre-Civil War period without a LLR, several banking panics occurred, often brought about by a combination of speculation in infrastructure stocks, malfeasance, political shocks, and sudden stops in capital flows from England (1792, 1817, 1837, 1839, 1857, 1861). Frequent bank failures as well as panics created an unstable and inefficient payments system.

During the Civil War, the National Banking System was established to provide a ready market for U.S. securities and to provide a safe and uniform currency—national bank notes—to be issued by Federal government chartered national banks. The national banking system was successful in creating a uniform and safe currency, but it was still hit by a series of major banking crises. The continued high incidence of banking

panics reflected major flaws in the system: the inverted pyramid of credit which led to a connection between New York stock market crashes and banking panics, the absence of a LLR, and the unit banking system. The private sector substitute of clearing house loan certificates did succeed in preventing two minor crises (1884 and 1890) but did not prevent major panics in 1873, 1893, and 1907 (Gorton and Tallman 2016). The big panics of the national banking era were not driven by credit-fueled asset price booms, with the possible exception of 1873.

The 1907–1908 banking panic is considered the most important financial crisis in the U.S. before the Great Depression. It led to the successful movement towards monetary reform that created the Federal Reserve System (Bordo and Wheelock 2011). Although gold had been flowing into the U.S. preceding 1906, the San Francisco earthquake of 1906 led to major remittances to the United States by British insurance companies. The Bank of England became alarmed by these capital flows and gold drains from its reserves. Consequently, it raised its Bank rate and rationed credit to the merchant banks engaged in U.S. trade finance. In a sense, it was a sudden stop (Odell and Weidenmier 2004).²⁴ In the fall of 1906, European investors reduced their holdings of U.S. securities leading to a large gold outflow. This disinvestment was associated with a sharp drop in U.S. stock prices from March to August 1907 and a recession beginning in May. The crisis began on 14 October, when five member banks of the New York Clearinghouse and three others requested assistance from other clearing house banks.²⁵ Order was restored when requests were granted.

However, on 21 October, a run on the Knickerbocker Trust Company, the third largest trust company in New York, occurred because its President had had dealings with one of the affected banks. Not being a member of the Clearing House, it received no aid. It suspended payments the next day, whereupon a run started on the second largest Trust company on 23 October and another big trust company the day following. The New York Clearing House granted assistance to the trust companies but not fast enough to avoid precipitating a general alarm outside New York City. Pressure on New York banks reserves from other cities was initially allayed when the Treasury deposited \$25 million in key New York banks on 24 October as well as funds extended to the banks by a syndicate headed by JP Morgan. The New York Clearing House began issuing loan certificates on 26 October, but faced with increasing demands from

²⁴ A sudden stop occurs when foreign lenders (investors), alarmed by the possibility of significant losses, quickly pull out their funds leading to an economic collapse in the borrowing country (Bordo, Cavallo, and Meissner 2010).

²⁵ See Frydman, Hilt, and Zhou (2015) for an analysis of the crisis.

interior banks on their reserves, the New York banks restricted convertibility of their deposits into currency, quickly followed by the rest of the country ending the panic. Like 1893, the 1907 crisis resulted from a sudden stop in an environment without an effective LLR.

The main event of the 1920s was the Wall Street stock market boom from 1926 to 1929 and the crash in October 1929. The United States experienced a housing boom from 1922 to 1925 which did not lead to a serious bust or a financial crisis (White 2014). Following the sharp recession of 1920–1921, the economy of the 1920s was characterized by rapid real growth, rapid productivity advance, and slightly declining prices, punctuated by two minor recessions. Irving Fisher and other contemporaries believed that the stock market boom reflected the fundamentals of future profits from the new high growth industries. Ellen McGrattan and Edward Prescott (2003) concur with this view, although many others regard it as a bubble (Galbraith 1955; White and Rappaport 1993).

Regardless, the market crashed in October 1929 and the crash is usually blamed on tight Federal Reserve policy. Beginning in 1927, the Fed, following its adherence to the real bills doctrine was increasingly concerned over stock market speculation. Policy tightened through 1928 and early 1929 and a recession began in July 1929. This, according to White (1990), led to a revision of the prevailing optimism and the crash in equities.

The consensus view by economists is that the 1929 crash was not the pivot of the Great Contraction (Friedman and Schwartz 1963; Romer 1993), but that it had a major effect on the first year of the recession. It reduced output via wealth effects on consumption, reduced investment, and reduced velocity. The consensus view is that the recession became a “Great Depression” in 1930 after the Fed failed to act as a LLR to prevent a series of (liquidity driven) banking panics in the subsequent three years (Bordo and Landon-Lane 2010). The banking panics in turn impacted the real economy through the collapse in money supply, which produced massive deflation (Friedman and Schwartz 1963) and financial disintermediation (Bernanke 1983). The depression spread abroad through the fixed exchange rates of the gold standard.

Summary

As can be seen from the narratives, the environment in which crises occurred evolved from the classical gold standard to the interwar gold exchange standard to Bretton Woods and the post-WWII Managed Float. Key causes involved both domestic and external shocks (sudden stops), weak banking structure and supervision and regulation, lending booms

and busts, some driven by bank credit, others by foreign bond and equity capital inflows and financial innovation. Above all, the key ingredient in how a crisis played out and was resolved was the presence or absence or failure of the monetary authorities' provision of the LLR. In the past two decades, a key player has been the fiscal authorities because with the advent of the financial sector safety net and government guarantees, banking panics have morphed into fiscal crises.

Credit-driven asset price booms as the cause of financial crises, emphasized since the 2007–2008 crisis, were important in a few big crises before WWII, but not the majority. Even when credit booms were present, structural variables in the banking and financial system and the presence of significant adverse shocks also mattered. Since the collapse of Bretton Woods and the return of financial globalization and the liberalization of the domestic financial sector in every country, financial instability has returned. Since the 1970s, major financial innovation has allowed banks to fund themselves in the financial markets rather than rely on their deposit bases (Schularick and Taylor 2012). This has allowed bank credit to grow faster than the money supply, has increased leverage, and may have been a key factor triggering asset price booms and possible financial crises since the 1980s.

In addition, financial innovation, made possible by the growth of financial theory and financial innovation, has led to the growth of non-bank financial intermediaries (shadow banks), which lie outside the traditional supervisory and regulatory networks. These innovations both in the traditional banking sector and the shadow banking sector have increased leverage and liquidity in the financial system and has created a new source of systemic risk that can increase financial instability.

FINANCIAL CRISES IN HISTORICAL PERSPECTIVE: INCIDENCE, OUTPUT LOSSES, AND DETERMINANTS

Incidence of Financial Crises

There has been considerable research on measuring the incidence of financial crises from the nineteenth century to the present (Bordo and Meissner 2016). Figure 1 shows the frequencies of banking crises using four different databases.²⁶ Bordo and Christopher Meissner (2016) discuss

²⁶ Bordo et al. (2001) cover 21 countries from 1880–1997; Reinhart and Rogoff's (2009) begins in the nineteenth century with a few countries and increases to 76 countries; Jordà, Schularick, and Taylor (2011) cover 17 countries from 1870–2011; Laeven and Valencia (2013) cover 162 countries from 1970–2012.

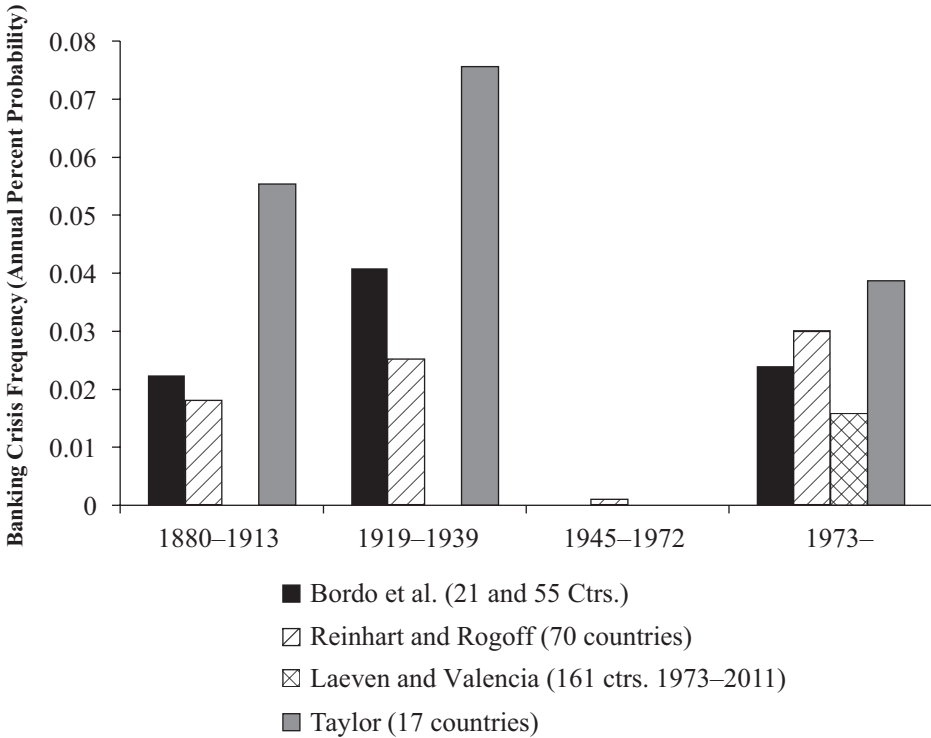


FIGURE 1
FREQUENCY OF BANKING CRISES WITH DIFFERENT DATABASES

Notes: Frequencies are calculated as the ratio of the number of years in which the set of countries in the sample is in the first year of a banking crisis (with no currency or debt crises) to the total number of country years.

Source: Bordo and Meissner (2016).

some of the measurement issues involved in comparing crises measured over different databases using different definitions of crises and different samples of countries.²⁷

I calculate crisis frequencies as the ratio of years in which the set of countries in the sample is in the first year of a banking crisis to the total number of country years. I compare outcomes across four different time periods: the classical gold standard 1880–1913; the interwar period 1919–1939; Bretton Woods 1945–1972; and the current period of managed floating from 1973 to the present. Adjusting for the differences in the sample sizes for the different databases, the incidence of banking crises is quite similar in the pre-1914 gold standard era to the post-1973 period

²⁷ Bordo and Meissner (2016) also present similar calculations for currency crises, debt crises, twin crises, and triple crises.

(the second era of globalization). Of course, the incidence of banking crises is much higher in the unstable interwar period and is almost nonexistent in the Bretton Woods era of financial repression.²⁸

Output Losses

A key reason why financial crises are deemed so important is that they often lead to large output losses. An extensive literature, surveyed by Bordo and Meissner (2016), is devoted to measuring the output losses of financial crises. Issues of measurement and endogeneity dominated the debate. Bordo and Meissner (2016) calculated unconditional output losses in different periods using the crisis dates from the various data sets that they surveyed. Their metric is the cumulative percentage deviation of GDP per capita from the pre-crisis trend level of per capita GDP. They use a window from the year of the crisis to three years after it starts. Pre-crisis trends are based on the average annual change of the log of per capita GDP up to 10 years prior to the crisis.

Figure 2 shows the output losses for banking crises for the four historical periods. In the pre-1914 era, the losses ranged from 3 to 6 percent of GDP. For the interwar period, driven by the Great Depression, the deviations from trend are much larger—minus 40 percent. In the post-Bretton Woods period, losses are smaller than the interwar but larger than under the gold standard.

An interesting phenomenon is that output losses between 1997 and 2010 are much larger than in the pre-1914 period, despite today's greater reliance on LLR policies and other policies designed to remedy the market failures associated with financial shocks. This may be because in recent years banking crises in a regime with government guarantees are associated with ever higher fiscal resolution costs (Bordo and Meissner 2016).²⁹ The evidence suggests that the stakes associated with financial crises in the past two decades have been rising and hence the imperative for monetary authorities to prevent them has increased.

The Determinants of Financial Crises and the Role of Credit-Driven Asset Price Booms

The evidence on the determinants of banking crises does not point to any one single factor as paramount. Bordo and Meissner (2016) points to the conclusion that not all banking crises are driven by credit booms as

²⁸ Bordo and Landon-Lane (2012) develop a methodology demarcating global financial crises, which resonates with Kindleberger's (1978) chronology. They identify: 1890–1891, 1907–1908, 1913–1914, 1931–1932, and 2007–2008.

²⁹ Resolution costs are the costs to taxpayers from recapitalizing insolvent banks.

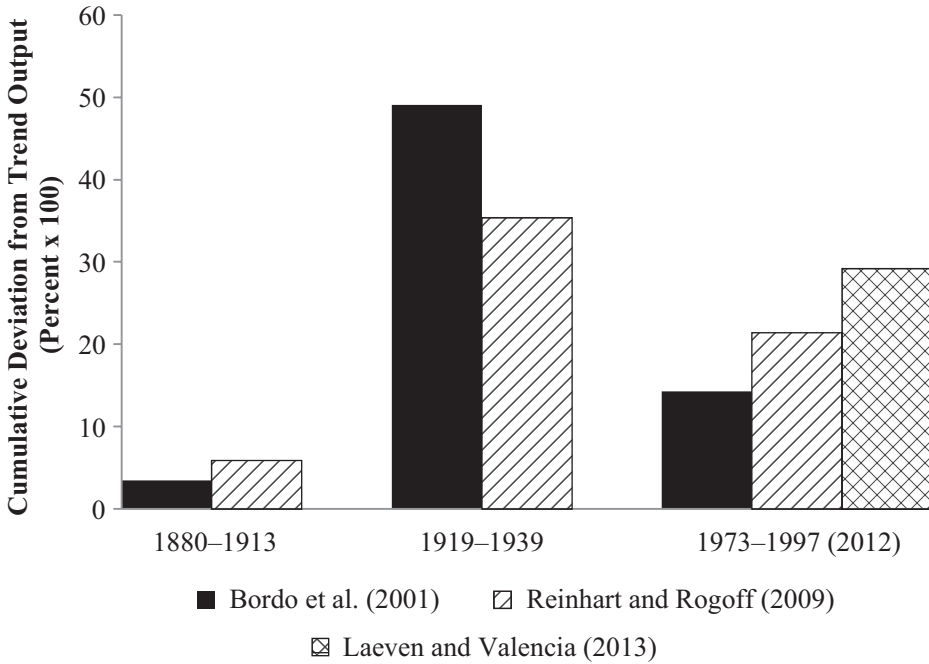


FIGURE 2
OUTPUT LOSSES

Notes: Output losses for the different samples and periods are calculated using the crisis dates from the various data sets mentioned in the text. The bars describe the cumulative percentage deviation of GDP per capita from the pre-crisis trend level of GDP per capita. The window used to calculate these deviations goes from the year of the crisis to three years after the crisis starts. Pre-crisis trends are given by the average annual change of the logarithm of GDP per capita up to 10 years prior to a crisis.

Source: Bordo and Meissner (2016).

is emphasized today (Jordà, Schularick, and Taylor 2016; Brunnermeier and Schnabel 2016), nor have all housing and equity booms ending in busts contributed to crises as is also recently posited (see Bordo and Landon-Lane 2014a, 2014b; Mishkin and White 2014).

Using varied techniques to predict banking crises, many studies find that financial sector liberalization in environments with weak regulatory capacity play an important role (Demirgüç-Kunt and Detragiache 1998; Kaminsky and Reinhart 1999). Other studies emphasize current account deficits and capital inflows, which contribute to twin crises (Caballero 2016). Still others, focusing primarily on the past three decades, emphasize the growth of the ratio of credit to GDP (Jordà, Schularick, and Taylor 2011). A number of studies of banking crises emphasize the absence of a central bank, weak bank structure (unit versus branch banking), financial innovation, poor regulation and supervision, weak property rights and failure to follow the rule of law, and more volatile emerging economies

subject to shocks (Bordo 1990; Bordo and Meissner 2015). Of key importance across time is the role of the LLR. Absent that function financial crises became much worse.

In sum, the determinants of banking crises are varied. No one factor dominates across all countries and time. The fact that some of the recent crises have been associated with credit-driven asset price booms does not necessarily imply that all future crises will be.

Credit Booms, Asset Price Booms, and Financial Crises

As my historical narratives has shown, there were major credit booms that led to financial crises before WWII, but most crises were not driven by them. They have become more important with the post Bretton Woods liberalization of the domestic and global financial systems. To provide some empirical perspective on the issue of the relationship between credit booms, asset price booms, and financial crises associated with deep recessions, I examined, using a business cycle methodology and a sample of 15 advanced countries, the evidence from 1880 to the present.³⁰ Answers to several questions are of interest. What is the incidence of credit booms associated with banking crises? More specifically, do they peak slightly before or are they coincident with banking crises? What is the incidence of equity boom busts and housing price boom busts associated with banking crises; more specifically, do they occur shortly before or coincident with banking crises? What is the relationship between these types of events and banking crises associated with severe recessions? These questions relate to a key motivation for why central banks today are so keen on using financial stability policy to prevent these events before they happen.

To identify a credit boom, I use the approach taken by Gary Gorton and Guillermo Ordoñez (2016) who define a good credit boom as one that is related to the growth of total productivity such as occurred with the adoption of railroads in the nineteenth century, electricity in the early twentieth century, and the internet in the late twentieth century tech boom. A bad credit boom is one that ends in a banking crisis and in which the underlying technical innovation did not pan out.³¹

³⁰ I followed Harding and Pagan (2002) and Pagan and Sossounov (2003) in identifying National Bureau of Economic Research (NBER) peaks and troughs (business cycles) using real GDP data for my sample of countries (Bordo and Landon-Lane 2014a).

³¹ The Gorton–Ordoñez identification rule is that a credit boom starts with three periods of growth averaging more than 5 percent per year and ends with two periods of negative growth. I first identify expansions, checking to see if during that expansion there is a three-year span where growth is higher than 5 percent on average. Then I check if subsequently there are two periods of negative growth. Expansions shorter than three periods do not count and similarly contractions without credit declining for the first two periods are ruled out.

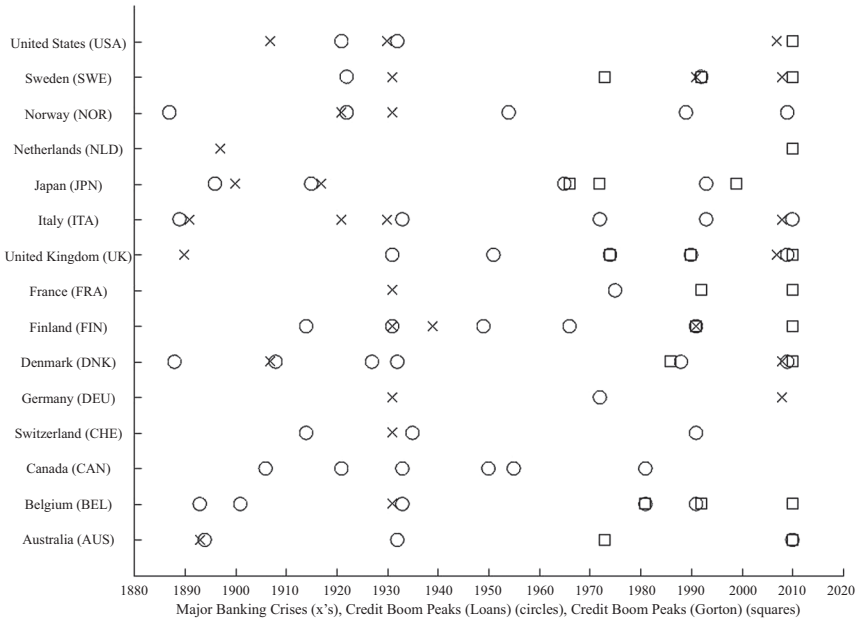


FIGURE 3
MAJOR BANKING CRISES AND CREDIT BOOMS (LOANS AND CREDIT)

Sources: Bordo (2017), Bordo and Meissner (2016).

To measure the ratio of credit to nominal GDP I use two annual databases: (1) total loans divided by GDP for the period 1880 to 2010 for 15 advanced countries, which comes from the Jordà, Schularick, and Taylor web data base (2017); and (2) the annual data used by Gorton and Ordoñez (2016), domestic credit to the private sector divided by GDP, which comes from the World Bank Macro data set for the same group of countries. This variable is defined as the financial resources provided to the private sector, such as loans, purchases of non-equity securities, trade credit and other accounts receivables that establish a claim for repayment.³²

Figure 3 compares credit booms to major financial crises defined as crises associated with a 5 percent drop in real GDP. The percentage of credit boom peaks associated with crises at 3.7 percent is much lower than in the previous figures, and the percentage of credit booms that precede or occur in the same year is even lower at 2.6 percent.³³ These results are quite dramatic. They suggest that credit-boom-induced big crises like the Great Contraction or the GFC are very rare—about once in every

³² For the credit cycle calculations see Bordo (2017).

³³ A number of credit busts occurred after banking panics which may reflect the fact that after a crisis with many bank failures that bank lending and the extension of credit collapses.

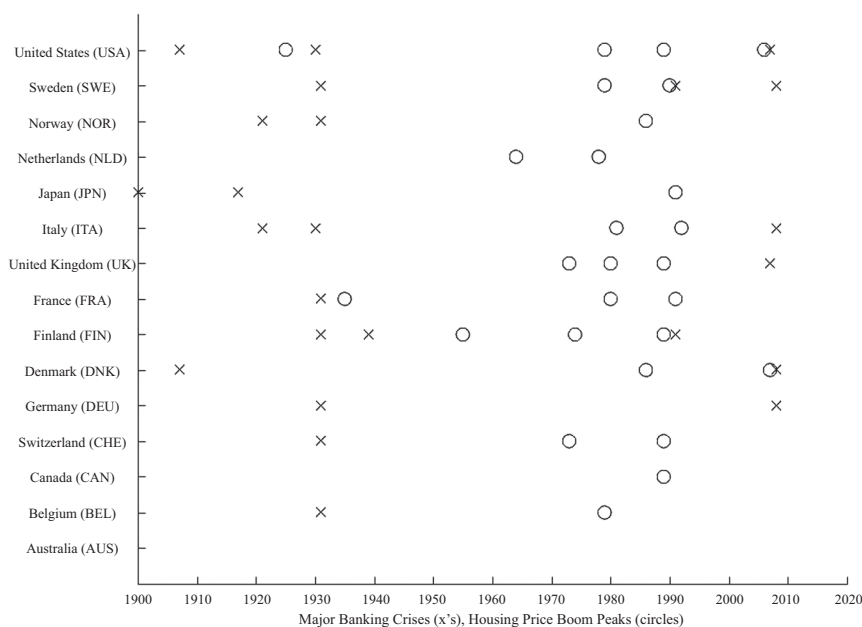


FIGURE 4
MAJOR BANKING CRISES AND HOUSE PRICE BOOMS

Sources: Bordo and Meissner (2016), Bordo and Landon-Lane (2014a,b).

50 years raising the question whether there should be a major financial stability policy regime change if these events are so rare.

I next compare asset price boom busts (house prices and equities) with major banking crises.³⁴ My measures of asset-price booms and busts come from Bordo and Landon-Lane (2014a, 2014b) and cover the period 1900 to 2010. Figure 4 compares housing boom busts with major banking crises. Only 11 percent of house price busts occur within one year of a major banking crisis. Also, 11 percent of house price boom peaks occur one year before or coincident with a major crisis.

Figure 5 compares stock market boom busts with major banking crises. Only 3 percent of stock market boom peaks occur within one year of a banking crisis. Also, 3 percent of stock market peaks occur one year before or coincident with a crisis. These findings are similar to those of many studies (e.g., Reinhart and Rogoff 2009) showing housing busts

³⁴ Bordo and Landon-Lane (2014a) defined a boom as a sustained expansion in asset prices lasting at least two years and averaging at least 5 percent per year for real house prices and similarly for real stock prices. The definition of a bust is a price correction following the expansion in prices greater than 25 percent of the rise in prices during the expansion.

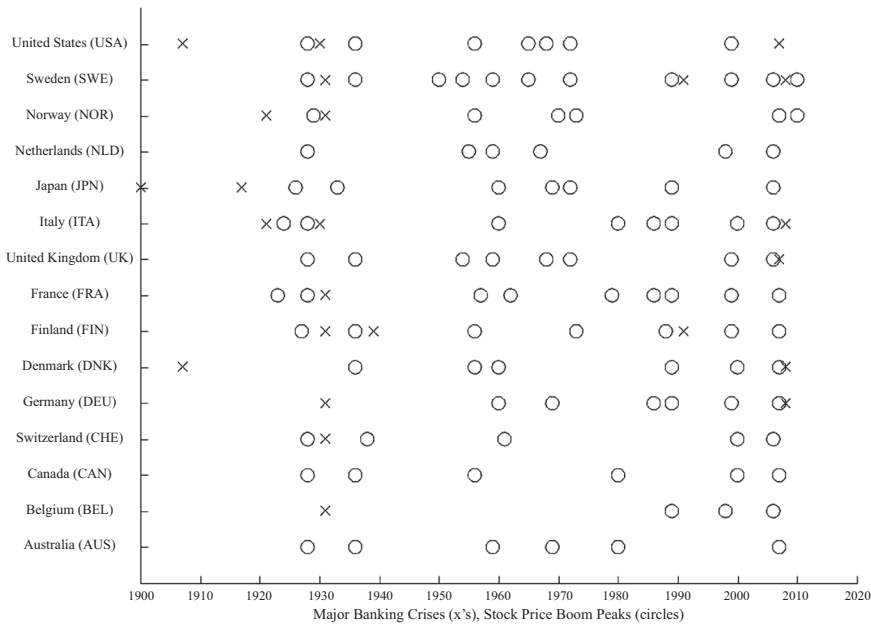


FIGURE 5
MAJOR BANKING CRISES AND STOCK PRICE BOOMS

Sources: Bordo and Meissner (2016), Bordo and Landon-Lane (2014a).

tend to be more associated with major financial crises than stock market boom busts.

Finally, I compare asset price boom busts with credit booms. Figure 6 compares house price boom busts with credit boom peaks. I do this for both the loan data and total credit. For loans, 6.3 percent of credit booms occur within one year of a housing price boom bust. For total credit it is 7.2 percent. I find that no credit boom peaks occur one year before or coincident to a housing bust for loans. For total credit, it is 1.4 percent.

Figure 7 shows the connection between credit booms and stock price busts. Using the loan data I find that 8.5 percent of credit booms occur within one year of a stock market crash. For total credit it is 10.5 percent. Using the loans measure, 6.3 percent of credit booms occur within one year before or coincident with a stock market crash while 7.2 percent occur using total credit.

In sum, the results comparing credit booms with asset price booms suggest that credit booms have only a limited connection with asset price busts. My evidence suggests that the coincidence between credit boom

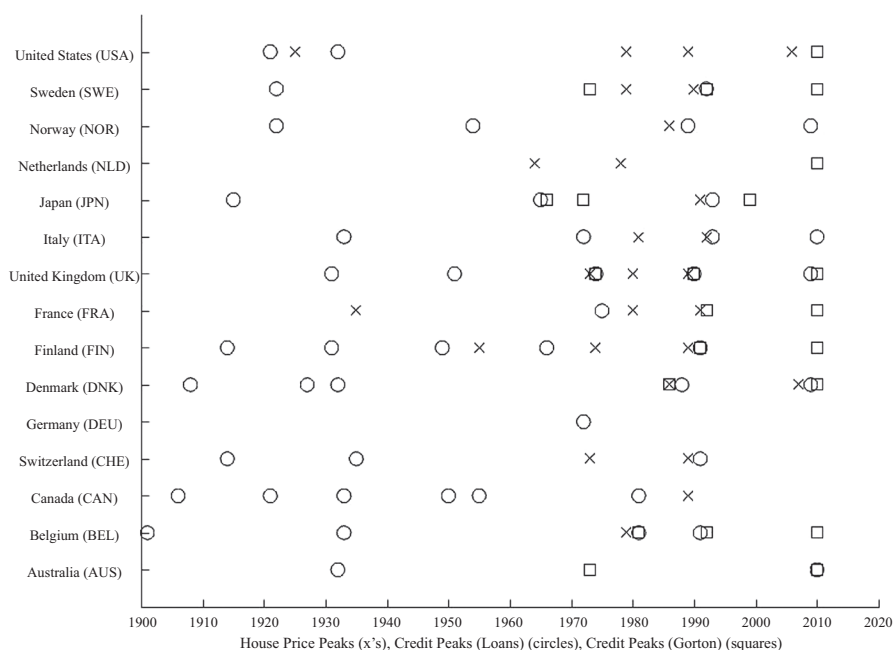


FIGURE 6
HOUSE PRICE BOOMS AND CREDIT BOOMS (LOANS AND CREDIT)

Sources: Bordo (2017), Bordo and Landon-Lane (2014b).

peaks and serious financial crises is quite rare. It also suggests that credit booms are not closely connected to asset price booms.³⁵ Indeed, a look at when most of the coincidence occurs was in two episodes: the Great Contraction 1929–1933 and the GFC. This leads to the question whether such rare events should lead to a sea change in monetary policy and financial stability policy. After the Great Contraction, the world's monetary authorities believed that it should, and repressed both the domestic and international financial system for 40 years. That strategy led to unintended consequences driven by the dynamics of financial innovation and may in turn have possibly set the seeds for the GFC 80 years later (Gordon 2014; Bordo and Haubrich 2010).

The current obsession with financial stability (and the increased use of the tools of macro prudential policy and Leaning Against the Wind (LAW)) raises the risk of repeating the experience of the 1930s and creating a new regime of financial repression which may have unintended

³⁵ Goetzmann (2015) also shows that equity booms followed by big crashes are rare.

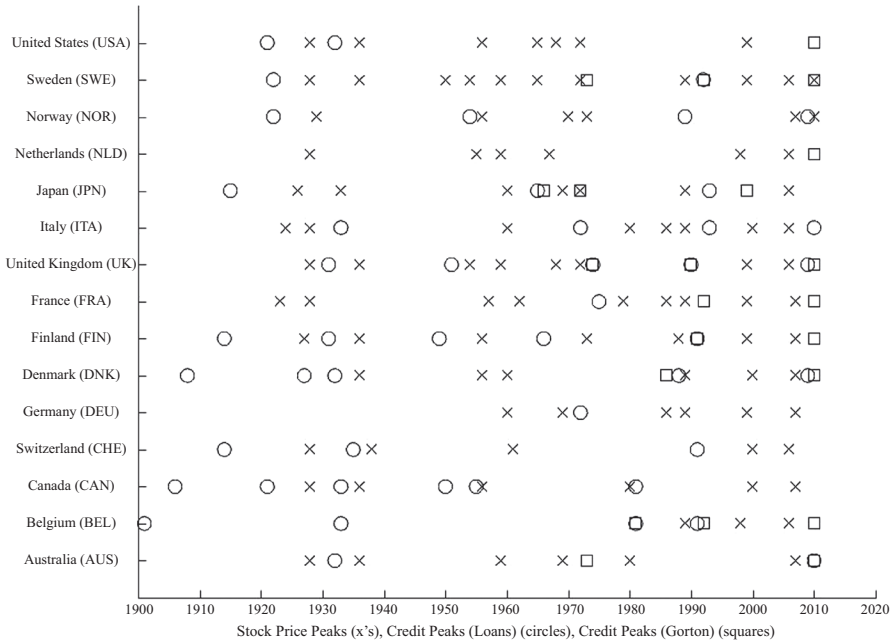


FIGURE 7
STOCK PRICE BOOMS AND CREDIT BOOMS (LOANS AND CREDIT)

Sources: Bordo (2017), Bordo and Landon-Lane (2014a).

consequences.³⁶ It may head off a few minor financial crises in the next few decades but much later in the future may precipitate an even bigger financial crisis than 2007–2008.

The analogy between policies designed to suppress natural disasters should be kept in mind. Myron Scholes (2009, p. 105) gives the analogy of when “fire fighters put out every small fire in Yellowstone National Park...The underbrush grew, setting the stage for multiple lightning strikes to cause fires to destroy much greater areas in the park than if fires initially had been left to burn of their own accord.” He further argues that “financial regulators do the same thing when they dampen volatility:

³⁶ I do not mean to critique all New Deal policies. The Banking Holiday of March 1933 ended the banking panics, and leaving the gold standard and devaluing the dollar also contributed greatly to the recovery (Romer 1992; Edwards 2018; Jalil and Gisela 2015; Eggertsson 2008). There is a contentious debate on the New Deal policies and their contribution to the recovery (Hausman, Rhode, and Wieland 2017; Cole and Ohanian 2004). My point is that the financial repression policies had serious negative and long consequences. These included the inefficiencies associated with artificial firewalls, distortions associated with interest rate ceilings (regulation Q) on the transmission mechanism of monetary policy, rent seeking behavior by the protected industries, etc. See White (2000).

they put out small fires but encourage risk-taking and thus increase the likelihood of a major conflagration.”³⁷ Hyosong Kim et al. (2017) apply this analogy to attempts to smooth recessions, which they show are not serially correlated events. They argue from physics that eventually power law dynamics will set in leading to a much worse depression.

LESSONS FROM HISTORY

My survey of the link between monetary regimes and financial stability in advanced countries in the past two centuries shows a varying evolution between monetary stability and financial stability which involved a slow learning process by the advanced countries’ central banks.

The process of evolution of both monetary and financial stability across regimes swung like a pendulum. Under the gold standard, the convertibility rule and Bagehot’s rule provided some stability for advanced economies, which was disturbed by WWI. The interwar period was characterized by monetary and financial instability reflecting both a decline in credibility and serious policy errors. Under the BWS, monetary stability was largely restored until the Great Inflation beginning in 1965, and under the thumb of financial repression the financial system was remarkably stable. Under the Managed Float, the Volcker shock produced the Great Moderation from the mid 1980s to the early 2000s—the most stable period in macroeconomic history.³⁸ However, liberalization of the financial system in reaction to the earlier era of repression as well as the advent of the “too big to fail” doctrine led to a resurgence of the financial crisis problem.

A key lesson from the historical record through the Great Moderation period is that if four key principles are followed, a stable monetary policy regime can be compatible with financial stability: (1) price stability (credibility for low inflation); (2) real macro stability (via, for example, flexible IT); (3) a credible rules based LLR; and (4) sound financial supervision and regulation and banking structure.

Indeed, one country that has avoided banking crises altogether is Canada, which pretty closely followed these principles.³⁹ A key difference between Canada and its southern neighbor has been its sound bank

³⁷ See Ip (2015).

³⁸ See Davis and Weidenmier (2017) for an earlier Great Moderation in the period 1841 to 1856.

³⁹ During the Great Inflation period Canada performed as badly as most advanced countries (Bordo and Siklos 2016).

structure and prudent financial regulation (Bordo, Redish, and Rockoff 2015). The Canadian experience may offer lessons to other countries.

The GFC of 2007–2008 began with the Subprime Mortgage crisis. It was caused by flawed U.S. housing policy, aggravated by loose monetary policy in a departure from the rule-like behavior of the Great Moderation. Other forces were the failure of the financial regulatory and supervisory authorities to contain the growth of credit derivatives, the growth of leverage and the evolution of the shadow banking system, and the proliferation of global imbalances.

The GFC and the Great Recession were contained by effective monetary and fiscal policies and an unorthodox extension of the LLR by the Fed and other authorities who had learned the lessons of the 1930s. However, like the 1930s, the GFC was blamed on the banks and the financial system which led to the creation of a new regime of financial regulation and the elevation of the financial stability mandate to primary importance.

The current case for elevation of the financial stability mandate to paramount importance is based on the assumption that serious financial crises are largely driven by credit-driven asset price booms and the failure of the monetary (and regulatory) authorities to head them off. Along these lines central banks have been encouraged to use their monetary policy tools (LAW policy) as well as new tools of macro prudential policy.

My empirical evidence casts doubt on this assumption. Financial crises are very heterogeneous. Moreover, the record suggests that these events are very rare. Indeed, the recent GFC may have been a one-off event, a perfect storm (with multiple causes) possibly like the Great Contraction of 1929–1933. This raises the question whether such rare events should lead to a sea change in monetary policy and financial stability policy as occurred after the Great Contraction. That strategy created an environment of financial repression which did provide financial stability but which may also have set in place forces which led to unforeseen and eventually serious threats to financial stability and may have sown the seeds for the GFC 80 years later. An alternative might have been to create an incentive compatible regulatory regime which would provide the advantages of a safety net without the disadvantages of a regime of financial repression (White 2000).

The current obsession with financial stability risks recreating some of the mistakes of the 1930s, 1940s, 1950s and 1960s. In addition to financial repression, adoption of many of the tools of macro prudential regulation that have been proposed may recreate many of the problems with

the use of the tools in the past.⁴⁰ Many of these macro prudential policies were actually credit or fiscal policies which involved monetary authorities inefficiently picking winners and losers and influencing the allocation of resources.⁴¹ They also impinged on central bank independence because these policies strayed from their mandates and opened central banks up to scrutiny and criticism by their legislatures⁴² (Goodfriend 2014). Pursuit of an enhanced financial stability strategy may head off a few minor crises in the next few decades but much later precipitate an even bigger crisis than we saw a decade ago.

My survey of the historical record of the connection between the monetary regime and financial stability teaches us that a knowledge of history matters. Basing important regime-changing decisions on the record of the last crisis ignores the heterogeneity of the crisis problem. History teaches us the importance of relearning the details of the events of the past which often contain important and long forgotten clues to aid in our understanding of the “crise du jour.”

REFERENCES

- Admati, Anat, and Martin Hellweg. *The Bankers New Clothes: What's Wrong with Banking and What to Do about It*. Princeton: Princeton University Press, 2013.
- Bagehot, Walter. *Lombard Street: A Description of the Money Market*, 1st ed. New York: Scribner, Armstong & Co., 1873.
- Bank for International Settlements (BIS). *70th Annual Report*. Basel, Switzerland: BIS, 2000.
- . *Basel Committee on Banking Supervision; High Level Summary of Basel III Reform*. Basel, Switzerland: BIS, December 2017.
- Batchelor, Roy A. “The Avoidance of Catastrophe: Two Nineteenth Century Banking Crises.” In *Financial Crises and the World Banking System*, edited by Forrest Capie and Geoffrey E. Wood, 41–73. New York: St. Martin’s Press, 1986.
- Bernanke, Ben S. “Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression.” *American Economic Review* 73, no. 3 (1983): 257–76.
- . “The Great Moderation.” Remarks at the meetings of the Eastern Economic Association. Washington, DC: Eastern Economic Association, 20 February 2004.
- . “The Global Saving Glut and the U.S. Current Account Deficit.” No 77, Speech, Board of Governors of the Federal Reserve System (U.S.). Richmond, VA: Sandridge Lecture, Virginia Association of Economics, 2005.

⁴⁰ One tool of macro prudential policy—raising capital requirements—many argue may be the most effective and simple way to improve financial stability. See Admati and Hellweg (2013) and Calomiris (2017).

⁴¹ I also am not suggesting that there is not a strong role for micro prudential regulation policy.

⁴² To the extent these tools are used at all, they should be implemented by an agency other than the central bank. See Svensson (2018) and Bordo (2018).

Financial Stability and the Monetary Policy Regime 351

- Bernanke, Ben S., and Mark Gertler. "Monetary Policy and Asset Price Volatility." In *Proceedings - Economic Policy Symposium - Jackson Hole*, 77–128. Kansas City, MO: Federal Reserve Bank of Kansas City, 1999.
- Bernanke, Ben S., and Harold James. "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An international Comparison." In *Financial Markets and Financial Crises*, edited by Glenn Hubbard, 33–68. Chicago: University of Chicago Press, 1991.
- Blinder, Alan. *After the Music Stopped*. New York: Penguin Publishers, 2013.
- Bordo, Michael D. "The Gold Standard: The Traditional Approach." In *A Retrospective on the Classical Gold Standard, 1821–1931*, edited by Michael D. Bordo and Anna J. Schwartz, 23–120. Chicago: University of Chicago Press, 1984.
- . "The Lender of Last Resort: Alternative Views and Historical Experience." *Federal Reserve Bank of Richmond Economic Review* 76, no. 1 (1990): 18–29.
- . "The Bretton Woods International Monetary System: A Historical Overview." In *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*, edited by Michael D. Bordo and Barry Eichengreen, 3–108. Chicago: University of Chicago Press, 1993.
- . "Sound Money and Sound Financial Policy." *Journal of Financial Services Research* 18, no. 2 (2000): 129–55.
- . "Historical Perspectives on Booms, Busts and Recessions." In *When Bubbles Burst*, Chapter III, 64–66. Washington, DC: IMF World Economic Outlook, April 2003.
- . "Rules for a Lender of Last Resort; An Historical Perspective." *Journal of Economic Dynamics and Control* 49, no. C (2014): 126–34.
- . "An Historical Perspective on the Quest for Financial Stability and the Monetary Policy Regime." NBER Working Paper No. 24154, Cambridge, MA, December 2017.
- . "An Historical Perspective on Financial Stability and Monetary Policy Regimes: A Case for Caution in Central Banks Current Obsession with Financial Stability." Norges Bank Working Paper 5/2018, Oslo, Norway, March 2018.
- Bordo, Michael D., Alberto F. Cavallo, and Christopher M. Meissner. "Sudden Stops: Determinants and Output Effects in the First Era of Globalization, 1880–1913." *Journal of Development Economics* 91, no. 2 (2010): 227–41.
- Bordo, Michael D., Michael J. Dueker, and David C. Wheelock. "Aggregate Price Shocks and Financial Instability: A Historical Analysis." *Economic Inquiry* 40, no. 4 (2002): 521–38.
- Bordo, Michael D., and Barry Eichengreen. "Is Our Current International Financial Environment Unusually Crisis Prone?" In *Capital Flows and the International Financial System*, edited by David Gruen and Luke Gower, 18–74. Sydney: Reserve Bank of Australia, 1999.
- Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, et al. "Is the Crisis Problem Growing More Severe?" *Economic Policy* 16, no. 32 (2001): 52–82.
- Bordo, Michael D., Christopher Erceg, Andrew Levin, et al. "Policy Credibility and Alternative Approaches to Disinflation." *Research in Economics* 71, no. 3 (2017): 422–40.
- Bordo, Michael D., and Joseph G. Haubrich. "Credit Crises, Money and Contractions: An Historical View." *Journal of Monetary Economics* 57, no. 1 (2010): 1–18.

- Bordo, Michael D., Owen F. Humpage, and Anna J. Schwartz. *Strained Relations: US Foreign-Exchange Operations and Monetary Policy in the Twentieth Century*. Chicago: University of Chicago Press, 2015.
- Bordo, Michael D., and Finn E. Kydland. "The Gold Standard as a Rule: An Essay in Exploration." *Explorations in Economic History* 32, no. 4 (1995): 423–64.
- Bordo, Michael D., and Olivier Jeanne. "Monetary Policy and Asset Prices: Does 'Benign Neglect' Make Sense?" *International Finance* 5, no. 2 (2002): 139–64.
- Bordo, Michael D., and John S. Landon-Lane. "The Banking Panics in the United States in the 1930s: Some Lessons for Today." *Oxford Review of Economic Policy* 26, no. 3 (2010): 486–509.
- . "The Global Financial Crisis of 2007–08: Is It Unprecedented?" In *Global Financial Crisis; Impact, Transmission and Recovery*, edited by Maurice Obstfeld, Dongchul Cho, and Andrew Mason, 195–214. New York: Edward Elgar, 2012.
- . "Does Expansionary Monetary Policy Cause Asset Price Booms: Some Historical and Empirical Evidence." In *Macroeconomic and Financial Stability Challenges for Monetary Policy*, edited by Sofia Bauducci, Lawrence Christiano, and Claudio Raddatz, 109–16. Santiago, Chile: Central Bank of Chile, 2014a.
- . "What Explains House Price Booms? History and Empirical Evidence." In *Macroeconomic Analysis and International Finance. International Symposia in Economic Theory and Econometrics*, edited by Georgios Kouretas and Athanasios P. Papadopoulos, 1–36. London: Emerald Publishers, 2014b.
- Bordo, Michael, and Ronald MacDonald. *Credibility and the International Monetary Regime*. New York: Cambridge University Press, 2012.
- Bordo, Michael D., and Christopher M. Meissner. "Growing Up to Stability? Financial Globalization, Financial Development and Financial Crises." In *Financial Systems and Economic Growth: Credit Crises, and Regulation from the 19th Century to the Present*, Chapter 1, edited by Peter L. Rousseau and Paul Wachtel, 14–51. New York: Cambridge University Press, 2015.
- . "Fiscal and Financial Crises." In *North Holland Handbook of Macroeconomics, Volume 2A*, edited by John Taylor and Harald Uhlig, 355–412. Amsterdam: Elsevier (North Holland Publishing Company), 2016.
- Bordo, Michael D., and Athanasios Orphanides, eds. *The Great Inflation: The Rebirth of Modern Central Banking*. Chicago: University of Chicago Press, 2013.
- Bordo, Michael D., Angela Redish, and Hugh Rockoff. "Why Didn't Canada Have a Banking Crisis in 2008 (or in 1930, or 1907, or...?)" *Economic History Review* 68, no. 1 (2015): 218–43.
- Bordo, Michael D., and Catherine R. Schenk. "Monetary Policy Cooperation and Coordination: An Historical Perspective on the Importance of Rules." In *Rules for International Stability: Past, Present and Future*, Chapter 5, edited by Michael D. Bordo and John Taylor, 205–62. Stanford, CA: Hoover Institution Press, 2016.
- Bordo, Michael D., and Anna J. Schwartz. "The Specie Standard as a Contingent Rule: Some Evidence for Core and Peripheral Countries, 1880–1990." In *Historical Perspectives on the Gold Standard: Portugal and the World*, edited by Barry Eichengreen and Jorge Braga de Macedo, 11–84. London: Routledge, 1996.
- Bordo, Michael D., and Pierre L. Siklos. "Central Bank Credibility, Reputation and Inflation Targeting in Historical Perspective." In *FLAR (Fondo Latinoamericano de Reservas) Papers and Proceedings*. Cartagena, Colombia: FLAR, 2014.

Financial Stability and the Monetary Policy Regime 353

- . “Central Bank Credibility: An Historical and Quantitative Exploration.” In *Central Banks at a Crossroads: What Can We Learn From History?*, Chapter 3, edited by Michael D. Bordo, Oyvind Eitrheim, Marc Flandreau, and Jan F. Qvigstad, 62–144. New York: Cambridge University Press, 2016.
- . “Central Banks: Evolution and Innovation in Historical Perspective.” In *Sveriges Riksbank and the History of Central Banking*, edited by Rodney Edvinsson, Tor Jacobson, and Daniel Waldenstrom, 26–89. New York: Cambridge University Press, 2018.
- Bordo, Michael D., and David C. Wheelock. “The Promise and Performance of the Federal Reserve as Lender of Last Resort 1914–1933.” In *The Origins, History, and Future of the Federal Reserve: A Return to Jekyll Island*, edited by Michael D. Bordo and William Roberds, 59–98. New York: Cambridge University Press, 2011.
- Borio, Claudio. “The Financial Cycle and Macroeconomics: What Have We Learnt?” *Journal of Banking & Finance* 45, no. C (2014): 182–98.
- Borio, Claudio, and Philip Lowe. “Asset Prices, Financial and Monetary Stability: Exploring the Nexus.” BIS Working Paper 114, Bank for International Settlements, Basel, Switzerland, 2002.
- Brunnermeier, Markus K., and Isabel Schnabel. “Bubbles and Central Banks: Historical Perspectives.” In *Central Banks at a Crossroads: What Can We Learn from History?*, edited by Michael D. Bordo, Oyvind Eitrheim, Marc Flandreau, and Jan F. Qvigstad, 493–562. Cambridge, UK: Cambridge University Press, 2016.
- Caballero, Julián A. “Do Surges in International Capital Inflows Influence the Likelihood of Banking Crises?” *Economic Journal* 126, no. 591 (2016): 281–316.
- Calomiris, Charles. *U.S. Bank Deregulation in Historical Perspective*. New York: Cambridge University Press, 2000.
- . *Reforming Financial Regulation after Dodd-Frank*. New York: Manhattan Institute for Policy Research, 2017.
- Calomiris, Charles, and Stephen H. Haber. *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit*. Princeton: Princeton University Press, 2014.
- Capie, Forrest. *The Bank of England: 1950s to 1979*. Cambridge: Cambridge University Press, 2010.
- Carlson, Mark A., and David C. Wheelock. “The Lender of Last Resort: Lessons from the Fed’s First 100 Years.” In *Current Federal Reserve Policy Under the Lens of Economic History*, edited by Owen F. Humpage, 49–101. Cambridge University Press, 2015.
- Choudhri, Ehsan U., and Levis A. Kochin. “The Exchange Rate and the International Transmission of Business Cycle Disturbances: Some Evidence from the Great Depression.” *Journal of Money, Credit and Banking* 12, no. 4 (1980): 565–74.
- Cole, Harold L., and Lee E. Ohanian. “New Deal Policies and the Persistence of the Great Depression: A General Equilibrium Analysis.” *Journal of Political Economy* 112, no. 4 (2004): 779–816.
- Corrigan, Edward G. “Statement before the United States Senate Committee on Banking, Housing and Urban Affairs.” Washington, DC, 3 May 1990.
- Davis, Joseph, and Marc D. Weidenmier. “America’s First Great Moderation.” *Journal of Economic History* 77, no. 4 (2017): 1116–43.
- Demirgüç-Kunt, Asli, and Enrica Detragiache. “The Determinants of Banking Crises; Evidence from Developing and Developed Countries.” IMF Staff Papers 45, 81–109. International Monetary Fund, Washington, DC, 1998.

- Dodd–Frank Wall Street Reform and Consumer Protection Act, Public Law 11-203. 21 July 2010.
- Edwards, Sebastian. *Broken Promises: When America Defaulted*. Princeton: Princeton University Press, forthcoming 2018.
- Eichengreen, Barry. *Golden Fetters*. New York: Oxford University Press, 1992.
- Eichengreen, Barry, and Jeffrey Sachs. “Exchange Rates and Economic Recovery in the 1930s.” *Journal of Economic History* 45, no.4 (1985): 925–46.
- Eggertsson, Gauti B. “Great Expectations and the End of the Depression.” *American Economic Review* 98, no. 4 (2008): 1476–516.
- Feinstein, Charles H., Peter Temin, and Gianni Toniolo. *The European Economy between the Wars*. London: Oxford University Press, 1997.
- Flandreau, Marc, and Stefano Ugolini. “Where It All Began: Lending of Last Resort at the Bank of England during the Overend-Gurney Panic of 1866.” In *The Origin, History and Future of the Federal Reserve: A Return to Jekyll Island*, edited by Michael D. Bordo and William Roberds, 133–61. Cambridge University Press, 2013.
- Friedman, Milton, and Anna Jacobson Schwartz. *A Monetary History of the United States, 1867–1960*. Princeton: Princeton University Press, 1963.
- Frydman, Carola, Eric Hilt, and Lily Y. Zhou. “Economic Effects of Runs on Early ‘Shadow Banks’: Trust Companies and the Impact of the Panic of 1907.” *Journal of Political Economy* 123, no. 4 (2015): 902–40.
- Galbraith, John K. *The Great Crash*. Cambridge: Riverside Press, 1955.
- Giannini, Curzio. “Enemy of None but a Common Friend of All: An International Perspective on the Lender of Last Resort Function.” *Essays in International Finance*, No. 214. Princeton: International Finance Section, Princeton University, 1999.
- Goetzmann, William N. “Bubble Investing: Learning from History.” NBER Working Paper No. 21693, Cambridge, MA, October 2015.
- Goodfriend, Marvin. “Lessons from a Century of FED Policy: Why Monetary and Credit Policies Need Rules and Boundaries.” *Journal of Economic Dynamics and Control* 49 (2014): 112–20.
- Goodhart, Charles A. E. *The Evolution of Central Banks*. London: London School of Economics and Political Science, 1985.
- Gordon, Jeffrey N. “The Empty Call for Benefit-Cost Analysis in Financial Regulation.” *Journal of Legal Studies* 43, no. S2 (2014): S351–78.
- Gorton, Gary B. *Slapped by the Invisible Hand: The Panic of 2007*. New York: Oxford University Press, 2010.
- . *Misunderstanding Financial Crises: Why We Don’t See Them Coming*. New York: Oxford University Press, 2012.
- Gorton, Gary, and Guillermo Ordoñez. “Good Booms, Bad Booms.” NBER Working Paper No. 22008, Cambridge, MA, February 2016.
- Gorton, Gary B., and Ellis W. Tallman. “How Did Pre-Fed Banking Panics End?” NBER Working Paper No. 22036, Cambridge, MA, February 2016.
- Greenspan, Alan. “Issues for Monetary Policy.” Remarks at the Economic Club of New York. Board of Governors Federal Reserve System, 2002.
- Harding, Don, and Adrian Pagan. “Dissecting the Cycle: A Methodological Investigation.” *Journal of Monetary Economics* 49, no. 2 (2002): 365–81.

Financial Stability and the Monetary Policy Regime 355

- Hausman, Joshua K., Paul W. Rhode, and Johannes F. Wieland. "Recovery from the Great Depression: The Farm Channel in Spring 1933." NBER Working Paper No. 23172, Cambridge, MA, February 2017.
- Hautcoeur, Pierre-Cyrille, Angelo Riva, and Eugene N. White. "Floating a 'Lifeboat': The Banque de France and the Crisis of 1889." *Journal of Monetary Economics* 65 (2014): 104–19.
- Hoppit, Julian. "Financial Crises in Eighteenth-Century England." *Economic History Review* 39, no. 1 (1986): 39–58.
- Ip, Greg. *Foolproof: Why Safety Can Be Dangerous and How Danger Makes Us Safe*. New York: Little Brown, 2015.
- Irwin, Douglas. *Peddling Protectionism: Smoot Hawley and the Great Depression*. Princeton: Princeton University Press, 2011.
- Jalil, Andrew, and Rua Gisela. "Inflation Expectations and Recovery from the Depression in 1935: Evidence from the Narrative Record." *Finance and Economics Discussion Series*. Washington, DC: Division of Research and Statistics and Monetary Affairs, Federal Reserve Board, 2015.
- James, Harold. "The Bank of England 1979–2003." Mimeo. Princeton: Princeton University, 2017.
- Jordà, Òscar, Moritz Schularick, and Alan M. Taylor. "Financial Crises, Credit Booms, and External Imbalances: 140 Years of Lessons." *IMF Economic Review* 59, no. 2 (2011): 340–78.
- . "The Great Mortgaging: Housing Finance, Crises and Business Cycles." *Economic Policy* 31, no. 85 (2016): 107–52.
- . "Macrofinancial History and the New Business Cycle Facts." *NBER Macroeconomics Annual* 31, no. 1 (2017): 213–63.
- Kaminsky, Graciela L., and Carmen M. Reinhart. "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems." *American Economic Review* 89, no. 3 (1999): 473–500.
- Kim, Hyosong, William Newman, Keyyong Park, et al. "Economic Recessions and Wildfires." Mimeo. Los Angeles: UCLA, 2017.
- Kindleberger, Charles P. *The World in Depression, 1929–39, History of the World Economy in the Twentieth Century*. Berkeley and Los Angeles: University of California Press, 1973.
- . *Manias, Panics and Crises*. New York: Basic Books, 1978.
- King, Mervyn. "Changes in UK Monetary Policy: Rules and Discretion in Practice." *Journal of Monetary Economics* 39, no. 1 (1997): 81–97.
- King, Robert G., and Ross Levine. "Finance and Growth: Schumpeter Might be Right." *Quarterly Journal of Economics* 108, no. 3 (1993): 717–37.
- Laeven, Luc, and Fabian Valencia. "Systemic Banking Crises Database." *IMF Economic Review* 61, no. 2 (2013): 225–70.
- McGrattan, Ellen R., and Edward C. Prescott, 2003. "Average Debt and Equity Returns: Puzzling?" *American Economic Review* 93, no. 2 (2003): 392–97.
- Meltzer, Allan H. *A History of the Federal Reserve, 1913–1951, Volume 1*. Chicago: University of Chicago Press, 2003.
- . *A History of the Federal Reserve, Volume 2, Book 1, 1951–1969*. Chicago: University of Chicago Press, 2010.

- Mishkin, Frederic S., and Eugene N. White. "Unprecedented Actions: The Federal Reserve's Response to the Global Financial Crisis in Historical Perspective." In *The Federal Reserve's Role in the Global Economy: A Historical Perspective*, edited by Michael D. Bordo and Mark A. Wynne, 220–58. New York: Cambridge University Press, 2014.
- Monnet, Eric. *Controlling Credit: Central Banking and the Planned Economy in Postwar France, 1948–1973*. Cambridge: Cambridge University Press, forthcoming 2018.
- Mundell, Robert A. "Problems of the International Monetary System." In *Monetary Problems of the International Economy*, edited by Robert A. Mundell and Alexander Swoboda, 21–38. Chicago: University of Chicago Press, 1969.
- Nurske, Ragnar. *International Currency Experience: Lessons of the Interwar Period*. Geneva: League of Nations, 1944.
- Odell, Kerry A., and Marc D. Weidenmier. "Real Shock, Monetary Aftershock: The 1906 San Francisco Earthquake and the Panic of 1907." *Journal of Economic History* 64, no. 4 (2004): 1002–27.
- Officer, Lawrence H. *Between the Gold Points; Exchange Rates, Parities and Market Behavior, 1791–1931*. New York: Cambridge University Press, 1996.
- Orphanides, Athanasios. "Fiscal Implications of Central Bank Balance Sheet Policies." CEPR Discussion Paper No. DP11383, Washington, DC, 2016.
- Pagan, Adrian R., and Kirill A. Sossounov. "A Simple Framework for Analysing Bull and Bear Markets." *Journal of Applied Econometrics* 18, no. 1 (2003): 23–46.
- Poole, William. "The Man Who Knew: The Life and Times of Alan Greenspan by Sebastian Mallaby: A Policy Wonk's Extended Review." *Business Economics* 52, no. 1 (2017): 15–31.
- Rajan, Raghuram. *Fault Lines*. Princeton: Princeton University Press, 2010.
- Redish, Angela. *Bimetallism: An Economic and Historical Analysis*. New York: Cambridge University Press, 1992.
- Reinhart, Carmen M., and Kenneth S. Rogoff. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press, 2009.
- Reinhart, Carmen M., and M. Belen Sbrancia. "The Liquidation of Government Debt." *Economic Policy* 30, no. 82 (2015): 291–333.
- Roberts, Richard. *Saving the City: The Great Financial Crisis of 2014*. London: Oxford University Press, 2013.
- Romer, Christina D. "What Ended the Great Depression?" *Journal of Economic History* 52, no. 4 (1992): 757–84.
- . "The Nation in Depression." *Journal of Economic Perspectives* 7, no. 2 (1993): 19–39.
- Romer, Christina, and David Romer. "The Evolution of Economic Understanding and Postwar Stabilization Policy." In *Rethinking Stabilization Policy*, 11–78. Kansas City, MO: Federal Reserve Bank of Kansas City, 2002.
- Rousseau, Peter L., and Richard Sylla. "Financial Revolutions and Economic Growth: Introducing This EEH Symposium." *Explorations in Economic History* 43, no. 1 (2006): 1–12.
- Scholes, Myron. "Market-Based Mechanisms to Reduce Systemic Risk." In *The Road Ahead for the Fed*, edited by John D. Ciorciari and John B. Taylor, 103–22. Stanford, CA: Hoover Press, 2009.
- Schularick, Moritz, and Alan M. Taylor. "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870–2008." *American Economic Review* 102, no. 2 (2012): 1029–61.

Financial Stability and the Monetary Policy Regime 357

- Shultz, George P. "Dreams Can Be Nightmares." Online Appendix to Michael D. Bordo. "An Historical Perspective on the Quest for Financial Stability and the Monetary Policy Regime." *Journal of Economic History* 78, no. 2 (2018).
- Silber, William L. *When Washington Shut Down Wall Street: The Great Financial Crisis of 1914 and the Origins of America's Supremacy*. Princeton: Princeton University Press, 2007.
- Solow, Robert M. "On the Lender of Last Resort." In *Financial Crises: Theory, History and Policy*, edited by Charles P. Kindleberger and Jean-Pierre Laffargue, 237–47. Cambridge: Cambridge University Press, 1982.
- Svensson, Lars EO. "Evaluating Monetary Policy." NBER Working Paper No. 15385, Cambridge, MA, September 2009.
- . "Monetary Policy and Macroprudential Policy: Different and Separate." *Canadian Journal of Economics* (forthcoming 2018).
- Taylor, Alan M. "The Great Leveraging." In *The Social Value of the Financial Sector: Too Big to Fail or Just Too Big?*, edited by V. V. Acharya, T. Beck, D. D. Evanoff, G. G. Kaufman, and R. Portes, Vol. 29. World Scientific Studies in International Economics, 33–66. Hackensack, NJ: World Scientific Publishing, 2012.
- Taylor, John B. "Discretion Versus Policy Rules in Practice." *Carnegie Rochester Series on Public Policy* 39 (December, 1993): 195–214.
- Taylor, John B. "Lessons Learned from the Implementation of Inflation Targeting." In *Stability and Economic Growth: The Role of the Central Bank*, 229–36. Mexico City, Mexico: Banco de Mexico, 2006.
- . "Housing and Monetary Policy." In *Proceedings - Economic Policy Symposium - Jackson Hole*, 463–76. Kansas City, MO: Federal Reserve Bank of Kansas City, 2007.
- . "Macroeconomic Lessons from the Great Deviation." *Macroeconomics Annual* 25, no. 1 (2011): 387–95.
- Toniolo, Gianni, and Eugene N. White. "The Evolution of the Financial Stability Mandate: From Its Origins to the Present Day." In *Central Banks at a Crossroads; What Can We Learn from History?* edited by Michael D. Bordo, Oyvind Eitheim, Marc Flandreau, and Jan F. Qvigstad, 424–92. New York: Cambridge University Press, 2015.
- White, Eugene N. "The Stock Market Boom and Crash of 1929 Revisited." *Journal of Economic Perspectives* 4, no. 2 (1990): 67–83.
- . "Banking and Finance in the Twentieth Century." *The Cambridge Economic History of the United States* 3 (2000): 743–802.
- . "Lessons from the Great American Real Estate Boom and Bust of the 1920s." In *Housing and Mortgage Markets in Historical Perspective*, edited by Eugene N. White, Kenneth Snowden, and Price Fishback, 115–60. Chicago: University of Chicago Press, 2014.
- . "How to Prevent a Banking Panic: The Barings Crisis of 1890 Revisited." In Federal Reserve System Conference on Economic and Financial History, Richmond, VA, 10 May 2016.
- White, Eugene N., and Rappoport, Peter. "Was There a Bubble in the 1929 Stock Market?" *Journal of Economic History* 53, no. 3 (1993): 549–74.