Franklin Allen
and Douglas Gale

UNDERSTANDING FINANCIAL CRISES

Clarendon Lectures in Finance

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Preface for Paperback Understanding Financial Crises

Franklin Allen and Douglas Gale
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Anyone reviewing the events of the last two years and trying to catalogue the factors that contributed to the recent instability in the financial markets might be reminded of the "perfect storm," the subject of Sebastian Junger's book and later the film of that name. This was the storm that occurred off Nova Scotia in 1990, where seemingly unrelated events reinforced one another to produce an overwhelming cataclysm. Although financial crises occur fairly frequently,[1] the series of events and coincidences that conspired to produce the current global financial crisis is, if anything, more complex and improbable than anything in Junger's book.

The United States economy has long been characterized by international imbalances in its current and capital accounts. Large current account surpluses earned by Japan in the 1980s and by China in the 1990s were recycled to the United States in the form of purchases of US government debt. This allowed the Japanese and later the Chinese to maintain low exchange rates and earn the foreign currency necessary for growth. It also allowed the United States to continue to run its twin current account and public sector deficits. This system came to be known informally as Bretton Woods II.

More important was the effect of Bretton Woods II on monetary policy. Low priced Chinese goods allowed the Fed to keep interest rates low without generating inflation. It also allowed consumers to finance consumption by increasing their indebtedness. It also led to the inflation of assets of all kinds. The recycled dollars from China were in effect fueling investment in the dot com bubble. When Federal Reserve Chairman Alan Greenspan decried "irrational exuberance," he did not mention the role of low interest rates and global imbalances in creating the bubble, causing distortions in investment and risk taking caused by the bubble.

When the dot com bubble burst, the enormous loss of paper wealth encouraged talk of recession and even deflation. The attacks on the World Trade Center and the Pentagon turned the probability of a recession into a certainty. The Fed did its part to support the administrations counter-cyclical policy

[1] See Chapter 1 for a brief history of crises.

(i.e., the Bush tax cuts) by reducing interest rates to historically low levels and holding them there for a very long time. Whatever effect it had on the economic recovery, it undoubtedly fueled a second bubble, this time in the housing market. When the bubble burst, the financial crises began.[2]

Although we will not have much to say about it in this book, government interference in the housing and lending markets had an unfortunate impact on the stability of the financial system. The Clinton administration, in particular, revised The Community Re-Investment Act in 1994 to require banks to extend a certain proportion of their loans to poor families that could not pass the usual underwriting standards. Clinton appointees at the Justice Department prosecuted mortgage companies for alleged discrimination against low income borrowers. Fannie Mae and Freddie Mac were forced by Congress to change their underwriting standards to make more mortgages available to low income borrowers. When the managements of the two GSEs were caught manipulating their accounts in 2003, their response was to appeal to Congress by making even greater efforts to increase home ownership among the poor in exchange for the maintenance of a light regulatory regime.

Many financial innovations helped to build up the pile of debt that eventually collapsed, damaging the financial system and causing markets to "freeze". The securitization of mortgages increases diversification and expands the supply of funds for investment in housing. It also allows mortgage originators to operate as "pass throughs," with no capital at stake. They have no incentive to follow prudent underwriting standards and every incentive to maximize volume, on which their fees depend.

The form of the mortgages offered to "sub-prime" customers also changed. Teaser rates and negative down payments made these products attractive but risky. And then there were various forms of fraud, inflated valuations, false borrower incomes, payments from developers, and so on. Some borrowers outsmarted themselves by trying to exploit serial introductory rates until they found themselves unable to re-finance their mortgages.

The sheer complexity of the products in which these mortgages are bundled makes risk assessments difficult and perhaps impossible for the purchasers. The lack of historical data on these financial instruments meant that it was always a matter of judgment, speculation, or guesswork how they would perform in practice.

At the same time, large-scale securitization required that MBS were peddled to a far broader range of financial institutions, local governments, and investors

[2] See Chapter 9 on Bubbles and Crises for an analysis of how credit expansions can lead to bubbles that in turn end in crises.

than ever before. This ensured that, when the bubble burst, the effects would be felt far and wide.

Banks were not slow to exploit the low interest rate environment that the Fed's policy had created. Rather than relying on retail deposits, funding for ABS came from wholesale markets, including the CP markets. As long as these sources did not dry up, high returns seemed to be guaranteed. But when the market "froze," even previously "sound" institutions were threatened.

The turmoil in the financial markets since the summer of 2007 and its impact on financial institutions have been unprecedented.[3] The bankruptcy of Lehman Brothers in September 2008 has provided an extreme illustration of how relatively small events can have an enormous impact on the global financial system.[4] Finally, the extensive intervention by central banks and governments in the financial system has been unprecedented.[5]

It will take a long time to write the financial history of this period and untangle the many factors that conspired to create this mess. Much of the information needed to learn from past mistakes is proprietary and may never see the light of day. This makes theoretical analysis of the king contained in the book all the more important.

[3] See Chapter 3 on Intermediation and Crises, Chapter 4 on Asset Markets, and Chapter 6 on Intermediation and Markets.

[4] See Chapter 5 on Financial Fragility and Chapter 10 on Contagian.

[5] See Chapter 7 on Optimal Regulation and Chapter 8 on Money and Prices.

Preface for hardback 2007

This book has grown out of a series of papers written over a number of years. Our paper "Liquidity Preference, Market Participation, and Asset Price Volatility" was actually begun by one of us in 1988, although it appeared in 1994. Our interest in bank runs and financial crises began with "Optimal Financial Crises," and this led to further studies on the welfare economics of crises. Each paper seemed to leave questions unanswered and led to new papers which led to new questions.

When one of us was invited to give the Clarendon Lectures in Finance, it seemed the right time to begin the task of synthesizing the ideas presented in a variety of different places using different models. Our aim was to make these ideas accessible to a wider audience, including undergraduates and policy makers in central banks and international organizations, and also to put them in a coherent framework that might make them more useful for graduate students and researchers. This is far from being the last word on the subject, but it may provide a set of tools that will be helpful in pursuing the many open questions that remain.

Over the years we have had many opportunities to present our work in seminars and at conferences and have benefited from the comments and suggestions of many economists. In particular, we would like to thank Viral Acharya, Christina Bannier, Michael Bordo, Patrick Bolton, Mike Burkart, Mark Carey, Elena Carletti, Michael Chui, Marco Cipriani, Peter Englund, Prasanna Gai, Gary Gorton, Antonio Guarino, Martin Hellwig, Marcello Pericoli, Glen Hoggarth, Jamie McAndrews, Robert Nobay, Önür Ozgur, João Santos, Massimo Sbracia, Hyun Song Shin, Giancarlo Spagnolo, Xavier Vives, David Webb, Andrew Winton, and Tanju Yorulmazer.

We have included some of these topics in graduate courses we taught at New York University and Princeton University. Once we began writing the book, we were fortunate to have the opportunity to present lecture series at the Bank of England, the Banca d'Italia, the Stockholm School of Economics, and the University of Frankfurt. We developed an undergraduate course on financial crises at NYU based on the manuscript of the book. We are very grateful to the undergraduates who allowed us to experiment on them and rose to the challenge presented by the material. Antonio Guarino used several chapters for

an undergraduate course at University College London and offered us many comments and corrections.

We are sure there are others whom we may have forgotten, but whose contributions and encouragement helped us greatly. Thanks to all of you.

Contents

1

History and institutions

1.1 INTRODUCTION

What happened in Asia in 1997? Countries such as South Korea, Thailand, Indonesia, Singapore, and Hong Kong whose economies had previously been the envy of the world experienced crises. Banks and other financial intermediaries were put under great strain and in many cases collapsed. Stock markets and currencies plunged. Their real economies were severely affected and their GDPs fell significantly. What were the causes of these dramatic events?

To many people these crises were a new phenomenon. There had been crises in other countries such as Mexico and Brazil but these could be attributed to inconsistent government macroeconomic policies. In those cases taxes were too small relative to government expenditures to maintain a fixed exchange rate. This was not the case for the Asian crisis. Other causes were looked for and found. The institutions in these countries were quite different from those in the US. Many had bank-based financial systems. There was little transparency either for banks or corporations. Corporate governance operated in a quite different way. In many cases it did not seem that managers' interests were aligned with those of shareholders. In some countries such as Indonesia corruption was rife. These factors were seen by many as the cause of the crises. However, they had all been present during the time that these countries were so successful.

Others blamed guarantees to banks and firms by governments or implicit promises of "bail-outs" by organizations such as the International Monetary Fund (IMF). Rather than inconsistent macroeconomic policies being the problem, bad microeconomic policies were the problem. Either way it was governments and international organizations that were to blame.

In this book we will argue that it is important not to take too narrow a view of crises. They are nothing new. They have not been restricted to emerging economies even in recent times. The Scandinavian crises of the early 1990's are examples of this. Despite having sophisticated economies and institutions, Norway, Sweden and Finland all had severe crises. These were similar in many ways to what happened in the Asian crisis of 1997. Banks collapsed, asset prices plunged, currencies came under attack and their value fell. Output was severely affected.

Taking an historical view the period from 1945–1971 was exceptional. There were no banking crises anywhere in the world, apart from one in Brazil in 1962. There were currency crises when exchange rates were pegged at the wrong levels but that was all. Going back to the first half of the twentieth century and before there were many examples of financial crises. The stock market crash of 1929, the banking crises of the early 1930's and the Great Depression were some of the most dramatic episodes. There were many others, particularly in the US in the last half of the nineteenth century when it had no central bank. In Europe crises were much less frequent. The Bank of England had learned to prevent crises and the last one there was the Overend & Gurney crisis of 1866. Other central banks also learned to prevent crises and their incidence was significantly reduced. Prior to that crises were endemic in Europe as well.

Particularly after the experience of the Great Depression in the period prior to 1945–1971, crises were perceived as a market failure. It was widely agreed they must be avoided at all costs. The reform of the Federal Reserve System in the early 1930's and the extensive regulation of the financial system that was put in place in the US were part of this mindset. In other countries financial regulation went even farther. Governments controlled the allocation of funds to different industries through state-owned banks or heavily regulated banks. This extensive regulation was the cause of the virtual disappearance of banking crises from 1945–1971.

However, the elimination of crises came at a cost. Because of the extensive regulation and government intervention the financial system ceased to perform its basic function of allocating investment. There were many inefficiencies as a result. This led to calls for deregulation and the return of market forces to the allocation of investment. As a result crises have returned. Bordo et al. (2000) find that the frequency of crises in the recent period since 1971 is not that different from what it was before 1914.

We start in this chapter with an historical review of crises and the institutions involved. This provides a background for the theories that are subsequently developed.

1.2 HISTORICAL CRISES IN EUROPE AND THE US

Prior to the twentieth century banking panics occurred frequently. Kindleberger (1993, p. 264) in his book recounting the financial history of Western Europe points out that financial crises have occurred at roughly 10 year intervals over the last 400 years. Panics were generally regarded as a bad thing because they were often associated with significant declines in economic activity. Over time one of the main roles of central banks has become to eliminate panics and ensure financial stability. It has been a long and involved process. The first central bank, the Bank of Sweden, was established over 300 years ago in 1668. The Bank of England was established soon after. It played an especially important role in the development of effective stabilization policies in the eighteenth and nineteenth centuries. The last true panic in the UK was the Overend & Gurney crisis of 1866.

In his influential book *Lombard Street*, Bagehot (1873) laid out his famous principles of how a central bank should lend to banks during a crisis.

- Lend freely at a high rate of interest relative to the pre-crisis period but only to borrowers with good collateral (i.e. any assets normally accepted by the central bank).
- The assets should be valued at between panic and pre-panic prices.
- Institutions without good collateral should be allowed to fail.

Bordo (1986) documents that for the period 1870–1933 there were very few banking panics in the UK, Germany, and France. Kindleberger (1993) points out that many British economists ascribe the absence of crises in the UK to central banking experience gained by the Bank of England and their ability to skillfully manipulate discount rates. However, France also experienced no financial crises from 1882–1924 despite leaving its discount rate constant for many decades. Kindleberger suggests that France was perhaps stabilized by England.

The US took a different tack. Alexander Hamilton was influenced by British experience with the Bank of England and after the revolution advocated a large federally chartered bank with branches all over the country. This led to the foundation of the First Bank of the United States (1791–1811) and later the Second Bank of the United States (1816–1836). However, there was considerable distrust of the concentration of power these institutions represented. In a report on the Second Bank, John Quincy Adams wrote "Power for good, is power for evil, even in the hands of Omnipotence" (Timberlake 1978, p. 39). The controversy came to a head in the debate on the re-chartering of the Second Bank in 1832. Although the bill was passed by Congress it was vetoed by President Jackson and the veto was not overturned. Since then there has been a strong bias toward decentralization of the banking system and an aversion to powerful institutions of any kind. There was no central bank in the US from 1836 until 1914.

Throughout the nineteenth century the US banking system was highly fragmented and unlike every other industrializing country the US failed to develop nationwide banks with extensive branch networks. Prior to the Civil War, states were free to regulate their own banking systems and there was no national system. Many states adopted a "free banking" system which allowed free entry. There were serious banking panics in 1837 and 1857 and both were followed by depressions and significant economic disruption.

The advent of the Civil War in 1861 and the need to finance it significantly changed the role of the Federal Government in the financial system. The National Bank Acts of 1863 and 1864 set up a national banking system. They granted limited powers to banks. In particular, the 1864 Act was interpreted as confining each to a single location. When the question of whether banks could hold equity arose, the Supreme Court ruled that since the 1864 Act had not specifically granted this right they could not.

The creation of the National Banking system did not prevent the problem of panics and the associated economic disruption and depressions. There were panics in 1873, 1884, 1893 and 1907. Table 1.1, which is from Gorton (1988), shows the banking crises that occurred repeatedly in the US during the National Banking Era from 1863–1914. The first column shows the business cycles identified by the National Bureau of Economic Research (NBER). The first date is the peak of the cycle and the second is the trough. The second column shows the date on which panics occurred. In a banking panic people worry

Table 1.1. National Banking Era panics.

NBER cycle Peak–Trough	Panic date	%Δ(Currency/ deposit)*	%Δ Pig iron†
Oct. 1873–Mar. 1879	Sep. 1873	14.53	−51.0
Mar. 1882–May 1885	Jun. 1884	8.80	−14.0
Mar. 1887–Apr. 1888	No Panic	3.00	−9.0
Jul. 1890–May 1891	Nov. 1890	9.00	−34.0
Jan. 1893–Jun. 1894	May 1893	16.00	−29.0
Dec. 1895–Jun. 1897	Oct. 1896	14.30	−4.0
Jun. 1899–Dec. 1900	No Panic	2.78	−6.7
Sep. 1902–Aug. 1904	No Panic	−4.13	−8.7
May 1907–Jun. 1908	Oct. 1907	11.45	−46.5
Jan. 1910–Jan. 1912	No Panic	−2.64	−21.7
Jan. 1913–Dec. 1914	Aug. 1914	10.39	−47.1

*Percentage change of ratio at panic date to previous year's average.
†Measured from peak to trough.
(Adapted from Table 1, Gorton 1988, p. 233)

about the soundness of the banks they have deposited their funds in. As a result they withdraw their money and hold it in the form of currency. The third column shows the percentage change in the ratio of currency to deposits. It is a measure of the severity of a banking panic. The higher the change in the currency/deposit ratio, the more serious is the crisis. It can be seen that the panics of 1873, 1893, 1896, and 1907 were particularly severe. The final column shows how much the production of pig iron changed from the peak of the cycle to the trough. GDP figures for this period have not been reliably compiled. Economic historians often use production of pig iron as a proxy for GDP. The final column is therefore meant to indicate how serious the recessions were. It can be seen that the troughs occurring after the panics of 1873, 1890, 1893, 1907, and 1914 were particularly severe.

After the crisis of 1907, a European banker summed up European frustration with the inefficiencies of the U.S. banking system by declaring the US was "a great financial nuisance" (Studenski and Krooss 1963, p. 254). The severity of the recession following the 1907 banking panic led to a debate on whether or not a central bank should be established in the US. The National Monetary Commission investigated this issue and finally in 1914 the Federal Reserve System was established.

The initial organization of the Federal Reserve System differed from that of a traditional central bank like the Bank of England. It had a regional structure and decision making power was decentralized. During the years after its creation it did not develop the ability to prevent banking panics. In 1933 there was another major banking panic which led to the closing of banks for an extended period just after President Roosevelt took office. The problems faced by the banking system led to the Glass–Steagall Act of 1933, which introduced deposit insurance and required the separation of commercial and investment banking operations. The Banking Act of 1935 extended the powers of the Federal Reserve System and changed the way it operated. These reforms finally eliminated the occurrence of banking panics almost seventy years after this had happened in the UK.

1.3 CRISES AND STOCK MARKET CRASHES

So far we have focused on banking crises. Often banking crises and stock market crashes are closely intertwined. For example, Wilson et al. (1990) consider four major banking panics accompanied by stock market crashes in the US during the National Banking Era. These are the crises of September 1873, June 1884, July 1893, and October 1907.