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**ABSTRACT**

The high social costs of financial crises imply that economists, policymakers, businesses, and households have a tremendous incentive to understand, and try to prevent them. And yet, so far we have failed to learn how to avoid them. In this article, we take a novel approach to studying financial crises. We first build ten case studies of financial crises that stretch over two millennia, and then consider their salient points of differences and commonalities. We see this as the beginning of developing a useful taxonomy of crises – an understanding of the most important factors that reappear across the many examples, which also allows (as in any taxonomy) some examples to be more similar to each other than others. From the perspective of our review of the ten crises, we consider the question of why it has proven so difficult to learn from past crises to avoid future ones.

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## **1.Introduction**

Financial crises are often the major events in the lives of people who live through them, and even more often for those who do not. Periods of financial distress are associated with declines of 5.5% of real GDP on average and output losses are even larger when that distress culminates into a full-scale crisis; and the median fiscal costs associated with resolving distressed banks during crises are about 16% of GDP for the more than 100 banking crises that occurred around the world since 1980 (e.g., Baron et al 2021; Laeven and Valencia 2012). Economists, policymakers, and households thus have a tremendous incentive to understand, and perhaps prevent, financial crises. And yet, both within and across the histories of countries of all regions, political regimes, and eras, financial crises recur. Why is it so hard for us to learn from the past and avoid the severe costs that attend these events? Are crises so unique that we cannot learn usefully from them, or are there other reasons that we fail to do so?

Despite the vast literature on the topic, however, most studies take one of two approaches. A large number of authors (including ourselves) have examined individual crises seeking to provide a full analysis of the various factors that led to it. Often these authors point to specific shocks such as war, financial innovation, and fraud that they believe help explain the occurrence and depth of the crisis. But such idiosyncratic histories may offer little guidance about the future, given that the particulars of any crisis are never repeated.

Alternatively, others have examined a large number of financial crises in the hope of identifying a common factor that can help explain them all. They must forego the level of detail of single crisis studies and focus instead on broad trends and factors that exemplify what they regard as a common cause. The search for simplicity, however, makes the identification of convincing linkages harder, and the reader may suspect that over-simplification is at play to identify a single, common explanation to blame for crises.

In this article, we take a different approach. We first build ten case studies of financial crises that stretch over two millennia, and consider their salient points of differences and commonalities. We see this as the beginning of developing a taxonomy of crises – an understanding of the most important factors that reappear across the many examples, which also allows (as in any taxonomy) some examples to be more similar to each other than others.

History contains many examples of financial crises. What is a defining feature of them that can identify examples to be included in an historical sample to be studied, allowing one to

cast the broadest possible net to capture all of them? We find it useful to define financial crises as moments when there is a sudden change in the market valuation of risky assets, which often reflects a change in the forecasting of risk and its pricing. By keeping the definition broad, one is able to consider an array of events affecting many types of risky financial assets (stocks, bonds, currencies, land, and various types of loans). Different crisis episodes affect different assets, and display differences in crisis timing (relating financial events to other economic and financial conditions), differences in the market mechanisms at play for transmitting the effects of crises, and different asset valuation outcomes, but such differences do not necessarily imply that the factors leading to the crises are fundamentally different. It is only by examining all the various types of financial crises that a pattern can emerge to define a useful taxonomy of crises.

When collecting useful facts about causal influences in the history of crises, it is helpful to categorize specific influences into broad categories of causal factors that capture similar sorts of influences. Looking through the existing literature, four broad categories stand out for explaining why risk sometimes becomes suddenly repriced.

First, politically motivated risk subsidies can skew incentives. Calomiris and Haber (2014) argue that coalitions of politicians, bankers, and other interest groups often come together to generate policies that benefit themselves but leave the financial system fragile. This type of behavior is visible in many crises. For instance, in the 1980s land booms, Carey (1990) finds that risk subsidization by the Farm Credit System fueled agriculture land purchases, and Horvitz (1990) argues that deposit insurance led financially weak Texas banks to undertake risky real estate lending. More generally, the literature on deposit insurance has found that creating deposit insurance and making its coverage more generous tend to produce greater financial system risk, not less (Demirguc-Kunt and Detragiache 2002; Calomiris and Jaremski 2016, 2019; Calomiris and Chen 2023). The clear conclusion from the vast empirical literature on the history of deposit insurance is that governments enact deposit insurance in spite of its demonstrated contribution to increasing systemic risk. Deposit insurance is employed for political reasons – to protect weak, or because it is popular with depositors – in spite of the fact that it increases systemic risk.

Subsidizing risks related to housing credit is another example of a politically popular policy that tends to produce greater financial crisis risk. Worldwide, the last several decades have witnessed a growth in government policies to promote mortgage lending, usually by subsidizing mortgage risk to make borrowing more attractive. Real estate loans have grown substantially as a

percentage of total bank lending (see Figure 2). This often has been associated with financial crises. For example, in the Spanish housing boom and bust of the 2000s, Santos (2017) shows that local savings banks (*cajas de ahorros*) saw an increasing role, which reflected the fact that regional and municipal governments controlled their lending for political purposes.

Second, investor preferences or exogenous market influences (e.g., the riskless interest rate set by the central bank) can shift in ways that affect risk pricing. Preference shifts can be understood to result for various reasons. Changes in the tolerance for risk can be part of a General Equilibrium response to external factors such as a change in personal wealth or monetary policy (e.g., Friedman and Savage 1948). Some observers point to a common behavioral phenomenon in which investors extrapolate excessively from past returns when predicted future returns (e.g., Minsky 1975; Kindleberger and Aliber 2011; Barberis et al. 2018). Momentum can also be an issue as Greenwood et al. (2019) find that large cumulative positive stock market returns imply a substantially raised probability of a future crash. And, of course, exogeneous political shocks can shift preferences. For example, England's wars with France and the French's shift back to the gold standard led to a massive increase in British sovereign debt while simultaneously draining gold from the country, leading to a specie suspension in 1797 that lasted almost 25 years (O'Brien and Palma 2020).

Third, it takes time for investors to learn about new innovations and markets. Learning creates the basis for estimating the distribution of risks one is facing in new markets as they evolve. Looking at twenty-eight countries between 1973 and 2005, Kaminsky and Schmukler (2008) show that financial liberalization – which often takes the form of multiple simultaneous fundamental institutional innovations – is followed about three years later by larger amplitude booms and busts in stock markets as firms, investors, and institutions adjust to the new institutional environment. They find, however, that in the long run, markets tend to stabilize after liberalizations. This leads them to view liberalization as a learning process in which short-term pain from learning how to manage liberalization is followed by long-term gain from having done so. That learning curve can be painful; many of the largest crises of the volatile 1980s and 1990s (e.g., Mexico's Tequila Crisis of 1994 and crises of Thailand, Korea, and Indonesia in 1997-1998) took place in a few years after their liberalizations.

Individuals differ in their capacity to learn, which underlies differences in behavior between unsophisticated investors and more sophisticated ones (such as traditional funding

suppliers or market makers). For example, Temin and Voth (2013) show that an informed dealer during the South Sea Bubble reduced his positions before the crash but continued to execute purchases for clients, suggesting that the price boom reflected beliefs of uninformed traders.

Finally, another broad category of explanations for sudden changes in perceived risk is fraud. Risk can be hidden intentionally by those seeking to profit from doing so, and the revelation of disguised risks can lead to rapidly revised market beliefs. Fraud is best seen as a magnifier of losses that originate in some other category of influence. Once market participants who act as agents for others experience initial losses, they may be tempted to deceive others about the magnitude of those losses to avoid harmful consequences, such as funding withdrawals by their customers. Calomiris and Kahn (1991), for instance, develop a theoretical model in which bankers commit fraud rationally only in bad states of the world (states in which their risky loans have lost sufficient value). In the Florida land boom and bust of the mid-1920s, Calomiris and Jaremski (2023) show that fraud and loss obfuscation by bankers and developers only became a major problem once losses and risks were perceived by agents as elevated. They conclude that depositors (and even many bankers) behaved conservatively during the boom, but that invisible insider lending schemes and corrupt regulators allowed a few banks to take extraordinary unobserved risks. Fraud was not present in the early part of the boom when risks were low, but emerged as the boom deepened and the risk of loss had become meaningful.

In the next section of this paper we construct ten case studies of financial crises, which consider the historical political and economic environment in which the crises occur, and identify instances of each of these broad categories of influences. We then summarize the key facts from these cases and discuss similarities and differences. We see this ordered assembly of facts and weighting of influences from ten crisis examples as a first step toward developing a taxonomy of crises that can be potentially useful for identifying the risks of crises on a forward-looking basis. Finally, in light of the evidence, we consider the puzzling persistence of crises. Crises persist, despite the fact that they are costly, because they are connected inextricably to important elements of economic progress and political sustainability: learning about new opportunities, improving a nation's ability to compete with other nations, and satisfying political constraints imposed by powerful constituents. Politicians and economists typically react to crises by constructing lists of reforms (related to the perceived proximate causes of the crisis just experienced), and confidently pronounce that such reforms will ensure that crises will not recur.

But history shows such promises to be hollow, not just because reforms are ineffective (although they often are), but because the ultimate causes of crises are stapled to adaptive characteristics that are fundamental to the economic and political survival of societies and their governments.

## **Ten Cases Studies of Historical Financial Crises**

### **2.The Banking Crises of 2008**

The Banking Crises of 2008 originated in the developed economies, notably the U.S., Spain, and the U.K. The years preceding the 2008 crises were marked by unusual macroeconomic stability and low risk pricing in developed economies. There were major banking crises and recessions in several emerging market countries in the mid-1990s and early 2000s – Mexico (1994-1995), East Asia and Russia (1997-1998), and Argentina (2001-2002) – but it was a period of steady growth in the U.S. and other developed economies. With the exception of shallow and brief recessions, no banking crises, major stock market crashes or land value collapses occurred, and inflation was low and stable. The long duration of financial and economic stability led some to refer to U.S. Federal Reserve Chair, Alan Greenspan, as a “maestro” of economic management – a perception that was reflected in very low levels of perceived risk from mid-2004 until mid-2007. As Figure 1 shows, Baa corporate bond spreads and the VIX remained near historic lows in the three years from July 2004 to June 2007.

Apart from the stability of the post-1993 period, another factor contributed to the low pricing of risk in the years immediately prior to the crisis (2004-2007). That three-year period was one of unusually loose monetary policy. Taylor (2018) argues that, taking into account the existing levels of inflation and unemployment, short-term interest rates were very low in the developed world, and this was a major contributor to the housing boom and bust. A substantial body of research shows a link from loose monetary policy to low risk pricing, visible in low risk spreads on loans, low bond spreads and low values of the VIX (Adrian and Shin 2008, Jiménez et al 2014;, Beckart et al. 2013). From the perspective of that research, excessively loose monetary policy was a contributing cause of asset value inflation in the years prior to 2008.

Financial intermediaries in developed countries also substantially changed the composition of their loan portfolios in the years leading up to 2008. Real estate lending, on average, had been stable at around 40 percent of total lending from 1970 to 1992, but from 1993 to 2007 it rose dramatically to about 55 percent, as shown in Figure 2 (Jorda et al. 2015; see also

Cournede and Denk 2015). Real estate loans tend to be vulnerable to correlated shocks related to the business cycle, and in the wake of adverse shocks, these loans can become illiquid due to the difficulty of valuing and liquidating real estate collateral. For these reasons, an increasing focus on real estate lending can entail higher systemic financial risk.

Several studies have argued that the rise in real estate lending throughout the world in the years prior to 2008 reflected political pressures to subsidize lending risk in housing. That choice reflected the popularity of using subsidized credit as a means of enabling low- and middle-income people to become homeowners. There were many means of subsidizing housing credit, either through special intermediaries that targeted this asset class, regulations that favored housing lending, or safety net subsidies that especially encouraged housing loans. In the latter category, Calomiris and Chen (2022) find that expansions in deposit insurance protection (see Figure 3) were a major factor in promoting growth in housing loans.

While many countries experienced real estate collapses during the early 2000s, the crises of Spain and the United States provide informative examples of these factors during the period.

### *2.1 Spanish Banking Crisis of 2008*

While the Spanish economy had been growing prior to 1999, the adoption of the euro in 1999 coincided with a substantial economic expansion. The elimination of foreign exchange risk and the near disappearance of country-specific risk premia in the euro area allowed Spain to borrow at significantly lower nominal interest rates, mitigating the sovereign debt spread between Spain and Germany. Spain experienced substantial capital inflows that drove up land prices and fueled construction. Spanish bank risk pricing was also substantially compressed by the reduction in interest rates (Jiménez et al. 2014).

In addition to the influence of lower sovereign rates of interest, Spain also saw a major expansion of real estate lending, which reflected public policies that subsidized mortgage credit risk. Between 2000 and 2007, the cumulative growth of mortgages to Spanish households exceeded 250%, and lending to the aggregate real estate sector rose to 513% (Baudino et al. 2023). In particular, savings banks (*cajas de ahorros*) saw an increasing role in the booming housing market, which reflected the fact that regional and municipal governments controlled the lending by these entities. The *cajas* operated under a legal framework that enshrined regional and municipal political representation in their governance. There is substantial research documenting



the link between political favoritism of high-risk borrowers and the growth of cajas' mortgages (Santos 2017). Much of the housing credit boom was made possible by the issuance of securities, especially covered bonds, and the securitization of mortgages.

While Spanish authorities initially tried to write off the crisis in light of the March 2008 election, they slowly came around to adopt measures to address the financial sector problems (Royo 2020). They tightened prudential regulation, introduced elements of market discipline for cajas, created a resolution fund and pushed for banking consolidation (Baudino et al. 2023).

By 2011, the prospective costs of resolving the banking crisis had produced concerns about Spain's sovereign creditworthiness. A memorandum of understanding with the European authorities in 2012 provided the resources and the credibility needed to introduce a forceful response to the banking sector crisis (Baudino et al. 2023). Weak banks were required to restructure or were resolved, following a thorough diagnostic exercise, comprising an asset quality review and a stress test. All banks requiring public support were required to transfer their real estate assets to an Asset Management Company. In addition, legislation was introduced to establish a fully-fledged bank resolution framework and to convert savings banks into regular commercial banks.

## *2.2 The U.S. Subprime Crisis*

The housing boom in the U.S. prior to the Subprime Crisis reflected the same combination of low interest rates and housing credit subsidies. Unprecedented availability of credit, drove a persistent boom in home prices from the mid-1990s to 2006, and the subsequent crash in prices led to a major financial crisis in the U.S. banking system that was felt worldwide.

From the perspective of monetary policy analysts, the Fed's loose monetary policy was clear even before the crisis (Taylor 2007). The real fed funds rate was substantially negative in the four years prior to the crisis, and the nominal fed funds rate was about two percentage points below the level that would be consistent with the simple Taylor Rule that had done a good job capturing monetary policy for the preceding decade.

Due to political pressure, lending standards were also lowered to facilitate homeownership. Beginning in 1992 with the Federal Housing Enterprises Financial Safety and Soundness Act (known as the GSE Act), Congress particularly pushed the two main government-sponsored enterprises devoted to mortgage lending, Fannie Mae and Freddie Mac (the GSEs), to

provide more loans to low-income borrowers. The GSE Act charged the Department of Housing and Urban Development with imposing minimum requirements for GSE holdings of mortgages to low-income recipients.

The standards were increased substantially during the 1990s, and it was not easy for the GSEs to meet the increasingly aggressive lending requirements to low-income borrowers imposed on them. While the GSEs initially confined themselves to purchasing and guarantying only prime borrowers and traditional types of mortgage loans, the GSEs lowered their standards for loans and securitization and became involved in subprime loans. They did so mainly by reducing down payment and mortgage documentation requirements, ultimately eliminating limits on the quantity of undocumented mortgages (also known as “liar loans”). The relaxation of lending standards by the GSEs was not confined to low-income mortgages because—as Calomiris and Haber (2014) explain, it was not possible for the GSEs to confine their reduction in lending standards to those mortgages. Thus, the relaxation of lending standards, although driven by the need to meet HUD guidelines, affected the credit risk of the entire mortgage market.

According to a Senate staff member who helped design the GSE Act (in his remarks at a private meeting at the Council on Foreign Relations in New York after the crisis), the Act was also designed to encourage merging banks to enter into more generous Community Reinvestment Act agreements with urban activist organizations. Leaders of urban activist organizations routinely testified about the good citizenship of banks applying for permission to merge, and commitments for subsidized mortgages were a main way for merging banks to demonstrate this good citizenship. Such banks typically signed ten-year agreements with the activist groups that committed them to fund mortgages and other loans, or even to make outright transfers. From 1992 to 2007, such commitments totaled about \$2.4 trillion. Together the CRA commitments and the GSE purchases ensured a steady stream of highly leveraged and risky mortgage credit.

In an environment skewed by these risk subsidies, other intermediaries that normally might have resisted the aggressive increases in risk were forced to choose between going along for the ride or being unable to continue to participate fully in the deal flow. Credit rating agencies, monoline insurers of mortgage risk, and mortgage brokers had to either fall in line with the debased credit standards or be quickly replaced by those who were willing to do so. Mortgage originators’ incentives were also affected. Although they often kept some portion of

loans on their balance sheets to encourage good underwriting, payments they received for the flow of loans worked to mitigate that favorable incentive. Mian and Sufi (2009) show that the largest increases in house prices 2001-2005 (and subsequently largest crashes 2005-07) were in areas that had larger increases in the share of mortgages quickly sold off and where a high share of risky borrowers had previously been denied mortgage applications.

The principal rating agencies who were supposed to be overseeing risk also had incentives to help fuel the boom. Securitizers could shop for ratings that were relatively favorable, and they found that institutional investors in their securities did not reward rating agencies that maintained high standards (Calomiris 2009). Such institutional investors appeared to welcome the chance to avoid the binding constraints they faced from their regulators on the riskiness of their securities purchases. Therefore, the use of ratings for prudential regulatory purposes (for regulating insurance companies, mutual funds and pension funds) likely contributed to the willingness of rating agencies to debase their ratings.

The boom in real estate prices peaked in 2006 and loan defaults began to grow as subprime borrowers could not refinance. In early April 2008, New Century Financial, one of the largest subprime mortgage lenders filed for bankruptcy sending ripples through the rest of the market. Over 2008, three of the largest U.S. investment banks exposed to the crisis either went bankrupt (Lehman Brothers) or were sold at fire sale prices to other banks (Bear Stearns and Merrill Lynch), and other leading investment banks (Morgan Stanley and Goldman Sachs) opted to subject themselves to more stringent commercial bank regulation. TARP provided substantial assistance in resolving loan losses to many commercial banks. Citibank and Bank of America, in particular, received substantial assistance from the government (Calomiris and Khan 2015). Many other banks failed and were sold off to prevent costly liquidations.

### **3. Emerging Market Crises of the 1990s**

By the end of World War II, the global economy had experienced three decades in which important international linkages in trade and finance had been essentially absent. Rebuilding those linkages was not a foregone conclusion. The thirty years of chaos itself discredited the strategy of economic openness, as it showed the hazards for a country of depending on trade with others. Furthermore, the new socialist doctrine of “dependency theory” argued that it was not

possible for developing countries to grow through a reliance on international trade. This point of view was taken seriously, and was perhaps the dominant view in the 1960s and early 1970s.

Global financial linkages also had few defenders after World War II. The International Monetary Fund saw its role as mainly to encourage the re-establishment of convertible currencies, which meant currencies that could be used in international trade (not currencies that were freely tradable in capital markets). The World Bank and other regional development banks for Latin America, Asia, and elsewhere were established to substitute for the largely absent capital markets. Even some prominent development economists who advocated free international trade argued that private market capital flows to liberalizing countries could be destabilizing to the domestic macroeconomy (McKinnon 1993).

Beginning in the 1970s, however, opinions started to shift, first about the effects of trade on growth, and later, about the effects of capital flows. The first developing countries to adopt development strategies based on free trade as an engine of growth – South Korea and Chile – had highly successful early records for promoting growth and reducing poverty. This encouraged other countries to imitate the strategy of “emergence” by limiting state control over the economy, leading to a boom in so-called “emerging market economies.” Emergence relaxed state control by reducing protectionism, privatizing domestic enterprises, reducing government control of the banking system by privatizing banks and reducing financial repression by limiting state regulation of lending and cutting high zero-interest reserve requirements, and lifting some of the barriers to capital inflows. By the end of the 1990s, dependency theory had been discredited and replaced by a new consensus that emphasized emergence as a developing strategy.

The evidence on the developmental consequences of capital inflows has been more nuanced, emphasizing differences in the economic consequences of different types of capital flows. On the one hand, foreign direct investment and foreign purchases of public equity and long-term debt have shown clear advantages for promoting investment, technology transfer, and economic growth (Henry 2000a, 2000b; Jansen 2003; Bekaert et al. 2005; Suarav and Kuo 2020; Calomiris et al. 2021). On the other hand, short-term debt inflows are prone to sudden reversals and those reversals can magnify the costs of financial crises (Calvo and Reinhart 2000).

The evidence in favor of emergence as a development strategy remains compelling (e.g., Frankel and Romer 1999; Dollar and Kraay 2004), which is quite an achievement considering the enormous macroeconomic costs that attended the major financial crises in many of the most

important Emerging Market countries (including Chile in 1982, Mexico in 1994, and Thailand, Korea, and Indonesia in 1997). These financial crises were unprecedented in world history in terms of their short-term economic costs. Not only did they coincide with collapses in GDP, but the failing banking systems of emerging market countries typically were bailed out by taxpayers at enormous costs, often in excess of 20 percent of GDP (Laeven and Valencia 2012).

How and why did those Emerging Market financial crises occur? Why were they so much more costly, both in GDP lost and fiscal bailout costs, than the financial crises during the same period in developed economies? How do the causes of the Emerging Market crises of the 1990s differ from others? A large literature addresses those questions, pointing to institutional deficiencies in Emerging Markets at the root of their crises. That literature emphasizes two related, but distinct patterns – deficiencies rooted in poor fiscal and monetary policy, and deficiencies in microeconomic policy regimes. Although each Emerging Market crisis exhibits aspects of both sets of problems, the distinction between the two types of problems is illustrated by the experiences of Mexico and Korea, respectively.

### *3.1 Mexico's ("Tequila") Crisis of 1994*

After the debt crises of the early 1980s, Mexico opened up to international competition and capital flows, conducted a drastic privatization and deregulation of industry, privatized its entirely government-owned banking system, and established an exchange rate stabilization program. The international acclaim for these reforms was sizable despite relatively slow growth. Krugman (1995, p.33) argued that the optimism was a “leap of faith, rather than a conclusion based on hard evidence.” Investors particularly highlighted the North American Trade Agreement that went into effect January 1, 1994 as a reason for optimism.

The liberalization of the early 1990s occurred within a stable political environment, one in which the dominant Partido Revolucionario Institucional (PRI) continued to control the Mexican government as it had for decades (Calomiris and Haber 2014). The 1980s in Latin America generally, and in Mexico in particular, is sometimes referred to as a “lost decade” because of the depth of the problems that afflicted both the public and private sector during the period 1982-1990. In Mexico, oil discoveries and the high price of oil buoyed public spending and private investment until the collapse of oil prices in 1982, which also coincided with a severe recession in the U.S. and high dollar interest rates. The high expectations and government

spending of the period prior to 1982 made the fall especially severe, and made the government's fiscal position especially weak. While Mexico never formally defaulted on its sovereign dollar debts, it was unable to pay them during the 1980s and relied on forbearance from U.S. lenders and assistance from the IMF to avoid default.

In 1982, amidst these problems, the Mexican government expropriated the banking system. This was the last in a series of actions in which a government desperate for resources had been increasingly taxing the private banking system in the 1970s and early 1980s as a funding source of last resort. Prior to the expropriation of the banks, the government had used the "reserve tax" (a requirement that forced banks to give the government an interest-free loan in the form of balances at the central bank equal to a large proportion of their deposits) as its primary means of taxing the banks.

The Mexican government fixed the exchange rate in 1988 and then moved to a sliding ceiling by the early 1990s. The country had relatively limited central bank reserves to protect the rate, but the Brady debt reduction agreement of 1989 set the stage for a sizable flow of foreign capital into Mexico (Unal et al. 1993). Mexico was able to finance current account deficits averaging 7% of GDP in 1992-1994 (Edwards 1997). Foreign capital was mainly short-term funding of investments in the stock market, private sector debt, and government securities (Edwards et al. 1996). At their peak, foreign holdings of Mexican securities amounted to about 50 percent of the country's GDP.

To raise fiscal resources, the Mexican government privatized the banking system in 1991, and took radical steps to maximize revenues from the sales (Haber 2005). One might wonder how it was possible for the government to sell back to their partners in the Mexican elite the very banks that it had expropriated a few years earlier. The task was especially challenging because several years of government management of the expropriated banks had left them with loan portfolios of dubious value and little in the way of franchise value.

Nevertheless, there were some attractive features to the purchase of the banks from the perspective of buyers. First, foreign banks faced daunting obstacles to entering the Mexican market to compete with Mexican banks. Second, Mexico's accounting standards allowed the acquired banks to avoid recognizing problems in their loan portfolios that otherwise would have required substantial recapitalization. Third, the government gave the highest bidder time to finance most of the purchase. Funds came from a variety of sources, but in some cases, the

purchased bank provided the loans for its sale (Mackey 1999). As a result, the prices of the banks at auction carried a 45% premium over the value of equity (Unal and Navarro 1999), despite a decline in fundamentals over the previous years (Gunther et al. 1996). Effectively, the privileged elite were allowed to buy back the banks with little actual investments in bank stock.

Finally, and perhaps most importantly, the government enacted a deposit insurance law that guaranteed one hundred percent of the liabilities of Mexican banks. That meant that depositors would have little incentive to withdraw funds from newly privatized banks, even though it was widely known that those banks were weak or insolvent. This deposit guarantee can be seen as a device whereby the Mexican government of 1991 effectively borrowed from the Mexican government of the future by issuing a large government contingent liability (the potential cost of bailing out the banks) to raise the value of its auctioned state banks, thereby providing the government with more cash from the sale of the banks.

In 1992-1994, Mexican debt continued to grow dramatically, and monetary policy was highly accommodative. The central bank followed a policy known as sterilization, whereby outflows of reserves from the central bank (which occurred whenever someone asked to redeem pesos for dollars at the maintained exchange rate) led to expanded purchases of government debt by the central bank in an equal amount to the reserve outflow. This meant that any decline in confidence about the adequacy of reserves would be compounded by an expansion in the supply of pesos and a decline in the central bank's ratio of dollar reserves to peso liabilities. Mexico also entered a recession toward the end of 1993.

Exchange rate issues came to a head in 1994 as a result of political instability, and continuing fiscal problems heading into the 1994 election. The political problems included an uprising in the southern state of Chiapas in January, the assassination of the presidential candidate of the ruling party in March, and the assassination of the Secretary General of the ruling party in September. Demand for Mexican securities and pesos slowed and Mexico began to have trouble rolling over its maturing peso denominated debt. Rather than hurting struggling commercial banks by raising interest rates, the government switched out peso debt for dollar-linked debt called Tesobonos. By the end of November, reserves had fallen to \$12.5 billion and short-term debt had risen to over \$27 billion with much of it in dollar value-indexed Tesobonos (Edwards 1997). The government devalued the exchange rate by 15 percent on December 20<sup>th</sup>, but did not install any additional macroeconomic policy changes. The exchange rate continued to

depreciate. While some analysts voiced optimism in anticipation of the new government that would take control in December 1994 (Edwards and Savastano 1998), many investors started fleeing the country's markets.

Even before the exchange rate depreciation, bank loan losses had been high and rising. The rise was a result of a combination of risky lending and swap transactions undertaken by the weak banks and risky loans made to bank insiders (La Porta et al., 2003). Protected insolvent banks anticipating a bailout had little incentive to manage their risks prudently. Bank depositors had also begun to withdraw their funds and convert them to dollars. Although deposit insurance protected depositors against bank insolvency, it did not protect them from a devaluation.

After the newly elected government took control in December 1994, it became clear that it had no plan to announce to address the combination of a highly overvalued pegged exchange rate, a government bereft of fiscal capacity, and an insolvent banking system. The exchange rate collapsed, and the government was forced to borrow hugely from the IMF and the U.S. Treasury to avoid default. It also established an asset management fund to manage the disposition of its failed banks' assets. The cost of the bank bailout would exceed 20 percent of GDP.

The combination of high preexisting government debt and the high cost of the bank bailout magnified the government's fiscal problems because it implied that the fiscal cost of the bailout would have to be paid by printing pesos. The monetary implications of the fiscal cost of the bailout also magnified the size of the exchange rate depreciation. As Reinhart and Rogoff (2009) point out, "twin-crisis" risk (the risk of a combined collapse of the country's banking system and its exchange rate peg) is a common problem for Emerging Markets; bailouts of protected banks by impecunious Emerging Market governments often have enormous consequences for government default risk and for the exchange rate.

The large costs of the crisis and bailout had another effect: they ended the monopoly on political power that the PRI had enjoyed for decades. In 1996, the PRI lost control of the lower house, and it has never re-established its control over the Mexican government. This pattern is visible in many countries that experience costly financial crises. Whether in autocracies like Mexico or Indonesia, or democracies like the U.S., costly financial crises produce major political shifts and often cause incumbents to lose power.



### 3.2 *The Korean Financial Crisis of 1997*

The twin crises that gripped Thailand, Korea, and Indonesia in 1997-1998 resulted in exchange rate depreciations and banking system bailout costs relative to GDP that exceeded those of the Mexican crisis. The East Asian collapses of 1997 came as a surprise to many macroeconomists. Traditional macroeconomic warning signs of twin crisis risk – large outstanding government debt, high fiscal deficits, and high monetary growth, all of which had been visible in Mexico prior to its collapse in December 1994 – were absent in the East Asian crisis countries. Some of the macroeconomists who had failed to foresee the East Asian crises even struggled to understand them after the fact. For example, Radelet and Sachs (1998, p.2) write that: “Each of these [East Asian crisis] episodes displays elements of a self-fulfilling crisis, in which capital withdrawals by creditors cascade into a financial panic and result in an unnecessarily deep contraction.” In other words, according to some macroeconomists, the crises were unnecessary because they were not traceable to fundamentals. The East Asian crises also may have come as a surprise to the World Bank and its Chief Economist, Joseph Stiglitz, who had released a triumphalist summary of the progress of the crises countries in 1993, *The East Asian Miracle: Economic Growth and Public Policy*, openly admiring their centralized political control of economic decision making.

Strange, then, that as early as March and April 1997, both the *Financial Times* and *The Economist* noted concerns about possible financial crises in exactly the three East Asian countries that experienced them. A special center section of *The Economist* devoted to the East Asian economies in April 1997 forecasted that twin crises of the magnitude that hit Mexico in 1994 would soon strike Thailand, Korea and Indonesia. It is interesting that *The Economist* not only correctly forecasted the future crises in these three countries, their twin nature, and their magnitudes, but also correctly forecasted the absence of similarly deep problems in their neighbors, such as Malaysia and the Philippines. *The Economist's* analysis focused on the microeconomics of production and finance, and the political economy of the countries of East Asia, which they connected to flaws in industrial and banking outcomes. An even earlier hint at the looming problems in East Asia can be found in two articles written by Alwyn Young (1992, 1995) many years in advance of the crises. He noted that productivity had begun to decline in East Asia economies.

There is an important theorem about the real exchange rate (defined as the ratio of the nominal exchange rate between two countries' currencies divided by the relative price indexes of the same two countries), which has been credited to many economists (Ricardo, Harrod, and more recently, Balassa and Samuelson). According to this theorem, the real exchange rate between any two countries' currencies is determined by relative rates of productivity growth of the two countries in their tradable goods sector. If a country pegs its currency to the dollar, but then experiences a decline in productivity (relative to the U.S.) in its tradable goods sectors (e.g., automobile or other industrial production), then that country (say, Korea) will have to either suffer a recessionary deflation or depreciate its nominal currency peg relative to the dollar.

The point is that if there are forces pushing down industrial productivity in Korea, then even if its government fiscal deficits and accumulated sovereign debts are small and its monetary policy focuses on the single objective of maintaining its exchange rate peg, it will become increasingly hard to maintain its exchange rate, and an economic decline may occur to force the exchange to depreciate. The rate of productivity growth is determined by microeconomic factors (the efficiency of input use). Potential contributing factors include inadequate competitive pressure, inefficient financial markets (i.e., those that deprive the most productive firms of access to capital, or those that give unproductive firms favored access to capital), poor corporate governance practices (that allow entrenched managers to waste resources with impunity), or a lack of access to advanced technology. Of course, these factors, in turn, tend to be caused by deeper problems, such as an autocratic government that uses centralized control over the economy or its financial system to favor "cronies." In the case of Korea, Indonesia and Thailand, this was precisely the problem critics pointed to, both before and after their 1997 crises.

Korea's great industrial success in the 1970s and 1980s, for example, reflected high rates of savings that were mobilized through its banking system, which then provided credit to industry, which was organized through a *chaebol* system of industrial conglomerates, headed by politically powerful people. The banking system had been liberalized as early as the 1960s to make it possible to provide credit to industry. Government officials, bankers, and businesses operated as part of a single system of coordinated control.

For the first two decades, this system was able to deliver rapid growth, taking advantage of the many opportunities for investment and the low wages that Korea enjoyed during its early period of industrialization. But as the economy progressed, this growth model faced increasing

problems. If industrialists have ready access to funding, irrespective of their productivity, then they will not face the pressures to compete, or to use employees and capital to pursue only profitable activities. Pomerleono (1998) and Joh (2004) show that by the early 1990s, large government-protected Korean industrial firms with ready access to bank funding had become less and less profitable. Harvey and Roper (1999) pointed out that as profitability fell, these firms became increasingly indebted, as banks and bond markets continued to give funding to the unprofitable large firms based on political influence rather than productivity. They labeled this the “Asian bet,” a bet that somehow firms would reverse their productivity decline and be able to pay back their mountain of debts.

But without reforms that ensured competition and good governance, the process could not reverse. Ultimately, low productivity predictably implied both an exchange rate collapse and a banking system collapse (which can explain why the twin factors occur together). The exchange rate depreciation reflected both the macroeconomic effect of low productivity growth and the fiscal burden on the government to pay the cost of the bailout once this contingent liability had been made manifest by the collapse of the banks.

Capital flows in the presence of a currency peg to the dollar, and low productivity growth in tradable goods implies pressure on the prices of non-tradable goods due to overvaluation of the exchange rate. In the case of Asian countries, this took the form of a rise in real estate markets (Edison et al. 1998). Favored industrial firms also sought to borrow in dollars because dollar interest rates tended to be lower, especially as concerns about devaluation mounted (Arestis and Glickman 2002). Dollar indebtedness implied that the impending devaluation would substantially raise the burden of repaying those dollar-denominated debts.

Hanbo Steel collapsed in January 1997, making it the first bankruptcy of a Korean chaebol in a decade. Sammi Steel and Kia Motors also failed. The capital flight and currency collapse were sudden and large. Net capital inflows to the region decreased from US\$ 69.8 billion in 1996 to *minus* 18.2 billion in 1997 and to *minus* 105.2 billion in 1998 (Bustelo 2004). Estimates of the bailout cost for Korea totaled around 30 percent of GDP. The Korean crisis of 1997-1998 produced a strong movement for reforming corporate governance and ending favored access to finance for *chaebol*.

Post-crisis reforms in Korea illustrate the learning process of liberalization that is common for many emerging economies. Economic and financial liberalizations can be thought

of as moments of experimentation. Governments make many economic and political choices, and discover weak spots in their institutional design over time. Crises are often the means of discovering the need for reform. This pattern is visible in stock market volatility change over time for many emerging economies. On average, as Kaminsky and Schmukler (2008) show, economies see economic and financial risks rising about three years after liberalizations, but several years later, risk falls to levels below the pre-reform period. Liberalization has a learning curve.

#### **4. Interwar Period**

##### *4.1 Florida's Land Boom of the mid-1920s*

Galbraith (1955, p. 11) proclaimed that “the Florida land boom was the first indication of the mood of the Twenties, the conviction that God intended the American class to be rich.” Florida’s land boom represents the crescendo of America’s first nation-wide housing boom (e.g., White 2014) that was driven by rising incomes and low interest rates. However, Florida’s experience was among the most extreme in the nation and was the only one that experienced substantial bank failures during the bust. As we will describe below, Florida’s unique pattern is driven by factors present in the state but not others.

While Northern Florida was developed before 1900, the peninsula was devoid of any large cities until the 1910s. This all changed with new technology that expanded the frontier. Most obvious amongst these innovations was Henry Flagler’s construction of the Florida East Coast Railway which stretched from Jacksonville to Key West (through Miami). Railroads had stretched across the rest of the country for decades, but Flagler saw the potential attraction of southern Florida to wealthy northeasterners if the right infrastructure was in place. He, therefore, financed the railroad and built a series of grand hotels along the route to attract winter vacationers. An extensive series of roads and other railroads followed Flagler, allowing products and passengers to surge into southern Florida. As a result, the area became a national topic of conversation with millions of people visiting (and investing) in the state for the first time.

New digging and pumping technology also allowed greater settlement and development than ever before. Much of southern Florida was swamp land that required draining or raising before construction. The period’s new technology not only enabled this in rapid order, but even allowed for the creation of “new” beachfront property. Specifically, developers dredged up soil

from waterways to create new beaches and extend land into the state's waterways. This meant that most land developments reached past the standard coastal areas and into areas that had previously been uninhabitable.

Real estate developers jumped on the Flagler bandwagon. They planned communities around lavish hotels, nightclubs, sports clubs, golf courses, etc. and created elaborate themes to attract the attention of the nation (Turner 2015). With relatively little wealth or population native to Florida, developers spent large portions of their budgets on advertising the Florida lifestyle of fun, leisure, and sun. Advertisements ran in hundreds of nation-wide newspapers. Individuals across the country invested in the boom, even buying land sight unseen and through the mail. Most purchases could be made with relatively little down payment allowing the land contracts to be traded several times at increasing prices before full payment was made. At the peak, Knowlton (2021, p. Xiv) highlights there were upwards of 20 million lots being developed for sale in Florida.

Deposits at Florida banks surged from \$251 million in 1923 to \$830 million in 1925 with the largest rises in the peninsula. Real estate companies bought controlling interests in some banks, installed friendly directors, and extracted loans. Some corrupt state and national bank regulators seem to have been complicit in the schemes hatched by developers with controlling interests in some banks (Vickers 1994).

The boom peaked towards the end of 1925 as Florida real estate began to receive negative press throughout the nation (Sessa 1961). Some of the bad press was driven by non-Florida real estate companies and banks fighting to keep customers, but some of it was driven by two worrisome Florida events that increased the cost of development and cast doubt on its sustainability. First, a railroad moratorium was placed on the shipping of non-perishable goods in October 1925. The moratorium prevented building materials from reaching southern Florida except through steam ships, which were more expensive and slower. Second, the *Prinz Valdemar* became stuck in the mouth of Miami's harbor in January 1926, blocking traffic for nearly a month. The negative press reduced the demand for real estate and slowed price appreciation. Then market sentiment turned decidedly negative by Spring 1926. Many investors gave up their down payment, leaving developers with a liquidity problem and a crash in construction.

While substantial bank credit fueled the boom, it did not correspond to a significant general increase in the failure risk of Florida banks. Almost all the state's failures occurred

within a single chain of banks owned by Wesley Manley and James Anthony. Other banks, and even many of the banks in their chain, managed their risk well, but the failing banks in the chain pursued hidden, high-risk strategies that account for their banks' failures. In particular, those banks' managers allocated their depositors funds to the chain's managers (through interbank transfers to the chain managers' bank), to themselves and connected real estate developers (through bank loans), and to other similarly risky chain banks in system (through interbank transfers). Calomiris and Jaremski (2023) conclude that depositors in all banks, and most bankers, behaved conservatively during the land boom, but that invisible insider lending schemes and corrupt regulators allowed a few banks to take extraordinary unobserved risks. They also note that fraud only became an important factor after risks of loss had become apparent. Insiders themselves believed the boom would persist and lost their fortunes investing in it. Calomiris and Jaremski argue that the novelty of the Florida land market made it hard for even developers and banks to judge the risks they were taking. Learning about new risks happens in real time.

#### *4.2 US Stock market crash of 1929*

The foundation of the Stock Market Crash of 1929 lay in the "Roaring 20s". While the early 1920s experienced a wave of agricultural defaults due to declining crop prices after World War I (Jaremski and Wheelock 2020), the rest of the decade was a period of high economic growth, building, and most of all, booming stock prices for innovative industrial firms, new utilities companies, and New York City banks. Between August 1921 and September 1929, the Dow Jones Industrial Average increased six-fold, with most of the gains occurring in the final two years. The boom was fueled by three factors.

First, the 1920s were an era of optimism where ordinary people started to see that it was possible to make their fortune by investing in stocks and bonds. Middle class and inexperienced investors moved into the market for the first time. Some of the shift was likely due to people's experiences with the Liberty Bond drives of World War I. The drives taught financial literacy to individuals and exposed nearly half of the nation to bond ownership for the first time (Hilt et al. 2022). But the shift was likely also hastened by the market's steady increases and seemingly endless bounty.

Second, financial market innovation lowered entry barriers to investment and increased the amount of credit going to stock markets. Given restrictions on commercial banks, a new

industry of brokerage houses, investment trusts, and margin accounts came into being to allow people to purchase stocks with borrowed funds (Peach 1941, Carosso 1970). The credit allowed purchasers to put down a fraction of the price and borrow the rest, using stocks as collateral (Rappoport and White 1994). This expanded the number of people who could invest, the number of shares that could be purchased, and the number of institutions tied to the stock market.

Third, innovation not only was spurred by economic growth but also caused it. GNP grew at an annual rate of 4.7 percent from 1922 to 1929 (U.S. Department of Commerce 1975). This growth can be partially attributed to the emergence of large-scale commercial and industrial firms that took advantage of new continuous process technologies. Coordination produced more efficient vertically-integrated enterprises that captured economies of scale and scope (Chandler 1977). For instance, the electric utility industry boomed due to consolidation. New companies based on cutting-edge technologies (e.g., RCA, Radio-Keith-Orpheum, the Aluminum Company of America, and the United Aircraft and Transport Corporation) also entered the market to take advantage of rising prices.

The wealth of credit in the economy, however, slowed by the end of the decade. This was primarily the result of Federal Reserve policy, not a change in investor sentiment. Following its “real bills” doctrine, many leaders within the Federal Reserve System believed stock-market speculation diverted resources from productive enterprises, and that stocks were not an appropriate source of backing for bank loans. The Board thus asked reserve banks to deny requests for credit from member banks that loaned funds to stock speculators in January 1928, and began to pursue more contractionary monetary policy after the death of Benjamin Strong, the Governor of the Federal Reserve Bank of New York, in October 1928 (Friedman and Schwartz 1963). Loans to brokers by New York Fed member banks peaked in December 1927 and began to decline. Other investors and foreign banks stepped in to fill the gap, but call and time rates on brokers loans began to steadily rise (White 1990).

After a gruff Fed policy statement against speculation in February 1929, interest rates on call loans shot up and very nearly led to a crash on March 26, 1929. The Federal Reserve Bank of New York staved off the crash by injecting liquidity, but the event showed the fragility of the market. In August 1929, the Board raised New York’s discount rate to 6 percent which forced foreign central banks to raise their own interest rates. The US economy peaked as international commerce contracted, and the international economy slowed (Eichengreen 1992; Temin 1993).

On Black Monday, October 28, 1929, the Dow declined nearly 13 percent. On the following day, Black Tuesday, the market dropped nearly 12 percent. By mid-November, the Dow had lost almost half of its value. Despite a temporary partial recovery of stock prices in 1930, stocks continued to slide. The Dow did not return to its pre-crash heights until the end of 1954.

The amazing boom and bust of the stock market, and its connection to credit availability, have led some commentators to see it as an unwarranted boom fueled by a combination of uninformed optimism and available credit prior to 1929 (Galbraith 1955; Rappaport and White 1994). But other facts belie that interpretation. White (1990) shows that companies in traditional sectors that were not experiencing important changes in technology did not see a boom in their stock prices. Kabiri (2015) shows that the standard valuation models of professionals were consistent with market prices. In other words, sophisticated investors, not the uninformed, seem to have been driving the observed stock price increases. Nicholas (2007) uses citation-weighted patent information to explore whether market beliefs about the fundamental value of new technological improvements reflected in stock prices in the 1920s were warranted from the perspective of the future importance of the patents. He finds that the market correctly priced differences in technological prospects of individual firms during the boom.

Other research, however, questions whether fundamentals can explain all of the stock market boom. Calomiris and Oh (2018) highlight that Citibank and other New York City banks were publicly declaring that their stock prices were overinflated, and even delisted their bank stock in an attempt to reduce their stock prices. De Long and Shleifer (1991) also show that the prices of closed end mutual funds greatly exceeded the value of the underlying stocks, and while some of the difference could be explained by the franchise value added by the funds' managers, it is still suggestive evidence for some mispricing at the peak of the boom.

#### *4.3 US Banking Crisis of 1932-1933*

The economic contraction of the Great Depression in the United States (1929–33) was accompanied by a collapse of many banks. According to the Federal Reserve Board (1943), the number of banks fell 39 per cent from 24,633 in December 1929 to 15,015 in December 1933. However, despite this large number, most failed banks during the years 1930–33 tended to be small. Failed banks, as defined by the Federal Reserve (1943), represented 37 per cent of the banks in existence at the end of 1929, but their deposits were only 14 per cent of the average



level of bank deposits over the years 1930–33. Losses borne by depositors in failed banks represented 2.7 percent of the average amount of deposits in the banking system for the years 1930–33, and 2 percent of average annual GNP for 1930–33.

Although the Great Depression was not a very large bank insolvency crisis by current standards (Laeven and Valencia 2012), it was more severe than the crises of most other countries in the 1930s and other U.S. historical crises. For example, during the period 1873–1913, banking crises were plentiful in the U.S., but no year saw depositor losses in excess of 0.1 percent of GNP. Instead, most crises were either regional in nature driven by sectoral shocks (e.g., Carlson 2005) and exogenous factors or short-lived nationwide depositor runs that did not end up producing many bank failures (e.g., Calomiris and Gorton 1991; Jaremski and Wheelock 2023). The vulnerability of U.S. banks to crises throughout the 19<sup>th</sup> and early 20<sup>th</sup> centuries largely reflected restrictions that required unit banking, which meant that banks lacked the ability to diversify their loan and deposit portfolios across space and had to maintain interbank connections in financial centers to carry out transactions. Therefore, local shocks were often enough to force failures, and disruptions in financial centers had substantial consequences for connected banks despite those connected banks not having direct fundamental exposures.

The 1920s were a turbulent decade for agricultural states and saw a much greater number of bank failures than the national banking era (1863-1913). Still, the country as a whole did not see a bank failure rate or depositor loss rate similar to that of the 1930s. Although there is a popular misconception, the stock market crashes in October 1929 did in fact not lead to the Great Depression or a nationwide wave of banking or firm failures. Aggregate personal income, industrial production, wholesale prices, and government bond prices did not collapse until banking crises involving many bank failures occurred (Bernanke 1983).

Indeed, most bank failures during 1930-1931 remained regional in nature. For instance, the first wave of bank failures during October/November 1930 discussed in prominent books was largely confined in the West and South and have been traced to fundamental disturbances in those agricultural markets (White 1984). The agricultural distress brought down Nashville-based Caldwell & Co., the largest southern investment bank, causing runs at the many regional banks that it maintained relationships with (Wicker 1996). And while the center of the crisis then shifted North in December 1930, two banks (i.e., Bank of United States in New York and Bankers' Trust in Philadelphia) accounted for the bulk of suspended deposits, and there were no

major repercussions in the central money markets. Studies of both Caldwell and Co. and Bank of United States indicate that they were insolvent due to over-expansion during the 1920s (Lucia 1985, Friedman and Schwartz 1986, Trescott 1992, O'Brien 1992).

It follows, then, that the historical uniqueness of the large number of bank failures of the Great Depression comes down to explaining the wave of nationwide bank failures that occurred in 1932-1933. Central to explaining the banking collapse is the recognition that bank failures reflected fundamental weakness of banks, and that this fundamental weakness was the result of tight monetary policy that produced a general economic decline. The Federal Reserve kept monetary supply tight, and did not loosen policy in reaction to the severe deflation or waves of failing banks. Federal Reserve errors of commission (decisions to tighten) and omission (failure to address the problem of bank illiquidity) were central causes of the economic collapse. With rare exceptions, Fed leaders argued that they had been too accommodative of speculation and that their tight monetary policy was even too generous. They thus misjudged the panic unfolding around them and chose not to intervene until the train had left the station.

Bank failures were clearly traceable to preceding economic decline. Calomiris and Mason (1997) found that fundamentals in the Chicago banking panic of June 1932 determined both the contraction of deposits and pattern of bank failure. Calomiris and Mason (2003) find that banking distress was traceable to ex ante bank characteristics over the entire period. Structural shortcomings in the unit banking system also magnified the effect of macroeconomic decline on bank failures. As highlighted above, interbank network connections were a significant source of liquidity risk that contributed to bank failures. Mitchener and Richardson (2019) show that the network amplified financial distress and Calomiris et al. (2022) find that financial distress broadcast through the network contributed to bank closures.

How was the national banking crisis resolved? First, it is important to note that as of November 1932, banks were in an increasingly precarious position due to policy uncertainty after Roosevelt's victory in the presidential election of 1932. Concerns over a departure from gold and a consequent reduction in the real value of deposits (Wigmore 1987), given that many countries had already gone off gold in late 1931.

Concerns became critical first in Detroit. Specifically, the Union Guardian Trust Company, one of the largest banks in Michigan, requested assistance from the Reconstruction Finance Co (RFC). The RFC declined to help the bank unless Henry Ford (whose family was the

bank's largest depositors and stockholders) provided assistance. When Ford refused, Michigan's governor declared a bank holiday on Valentine's Day 1933. These events triggered bank runs in neighboring states, draining funds from banks at the center of the financial system in New York City (Mitchener and Richardson 2019).

After his inauguration, Roosevelt declared a nation-wide banking holiday on March 6, 1933 which closed all firms doing any banking business and lasted through March 12<sup>th</sup>. The holiday provided time for Congress to pass the Emergency Banking Act on March 9 which strengthened federal regulation of the banking system. In his first fireside chat on March 12<sup>th</sup>, Roosevelt explained that the reopening process was necessary "to enable the Government to make common sense checkups." Nearly 75% of banks were allowed to reopen by the end of March (Jaremski et al. 2023), and the process was met with a surge of deposits flowing back into the system and a stock market rebound. Additional banks were able to reopen after receiving preferred stock investments from the RFC, which had been made possible by additional Roosevelt Administration reforms (Calomiris and Mason 2004).

## **5. The Dawn of the Modern World**

Modern nation states, vying with one another across the globe to control trade and territory, emerged in Europe around 1600. They replaced a decentralized feudal power structure protected by castle fortresses, ruled by horse-riding, armored knights that formed a loose federation of warriors. The dawn of the modern world reflected fundamental changes in the technology of weapons, shipping, and navigation, which made the centralization of national power possible. The early modern era saw a new coalition of rulers and merchants who allied to expand the territorial reach and trade routes of the state. Trade routes expanded greatly as the primary focus of trade shifted from the Mediterranean to the Atlantic Ocean. Important tools of conquest and trade expansion included new institutions that guided the mercantilist system, such as the granting of monopoly rights, the chartering of privileged corporations funded by a wide range of investors, the issuance of new types of sovereign debt, and the chartering of banks (Calomiris and Haber 2014).

The period's financial crises were almost always the result of rising sovereign default risk or outright sovereign default. The larger scale of government under the modern state was matched by larger movements of people, ships, and trade, and by larger scaled wars involving

unprecedentedly large armies and navies. For all these reasons, modern states faced much greater fiscal challenges. For example, the Dutch fought the Eighty Years War from 1568 to 1648 with only a brief pause from 1609 to 1621. Anglo Dutch Wars were fought in 1652-1654, 1665, and 1672, and the Dutch fought the French in the War of the League of Augsburg from 1688 to 1697. The Dutch fought in the War of the Spanish Succession in 1702-1713 and the War of Austrian Succession from 1741 to 1748. In every year during the period 1618-1628 (also called the Thirty Years War) the Dutch fielded a fleet with substantially more ships than any other nation, employing more than 100,000 men at a time when the total population was roughly 1.5 million. Wars and the sovereign debts they required were the primary source of financial instability during the early modern period.

The main protagonists in the drama of international competition included Portugal, Spain, Netherlands, Britain, and France. Britain and France were latecomers to the game of mercantilism, as much of the world had already been claimed by Portugal, Spain and Netherlands before Britain or France had begun to pursue its international adventures toward the end of the 17<sup>th</sup> century. These latecomers necessarily had to adopt relatively risky strategies to compete with the incumbent empires, and so were particularly reliant on innovative institutional tools that would further national ambitions.

### *5.1 The Mississippi Bubble*

Scottish financial innovator, John Law, was at the center of the events that became known as the Mississippi Bubble. Historians of this debacle usually cannot resist reviewing John Law's career of scheming. As early as 1705, he published a plan for a Scottish land bank, which predates and shares many features with Benjamin Franklin's similar Pennsylvania scheme (Law 1705; Franklin 1729). Both proposals sought to increase capital and labor factors of production by unlocking the value of land as collateral for bank loans. As Law's proposal remarked: "...to be Powerful and Wealthy in proportion to other Nations, we should have Money in proportion with them; for the best Laws without Money cannot employ the People, Improve the Product, or advance Manufacture and Trade."

Law had a colorful personal story. He fled to Amsterdam after killing an adversary in a duel. Living in France as a fugitive, he sought to peddle his creative notions about financial innovation. It is important to note that his attempts to convince Louis XIV to follow his

ambitious plans were unsuccessful. Louis XIV was too preoccupied by his lavish lifestyle to concern himself with the competitive challenges of building France's international presence. After Louis XIV's death in 1715, the combination of the impecunious state of French finances and the new Regency (Louis XV was only five years old at the time) created an opening for bold proposals, and Law finally found fertile ground for his theories about how financial innovation could be used to promote economic development and sovereign power.

Law's plans evolved in several stages. First, he created stand-alone companies that had many things in common with those that had already been created by France's competitors. These included a state-sanctioned bank and trading company. The Banque Générale, chartered in 1716, was similar to the Bank of England, having as its main objective the consolidation of sovereign debt with the objective of reducing debt service costs (Neal 1990). The Mississippi Company had been founded earlier (in 1684) and held a monopoly on trade between France and its Louisiana Territory in North America. Law acquired and renamed it as Compagnie d'Occident in 1717. The Compagnie received additional trading monopolies to the West Indies, North America, and Africa (Velde 2009, 2013).

Law understood that there are important potential synergies among the various chartered corporations that fostered French national interests, and as his plans evolved, they focused increasingly on those synergies. For example, to finance the Compagnie, Law took subscriptions on its shares, which could be paid partly in cash but mostly in government debt, which enhanced the value of government debt, and at the same time gave the company an added source of working capital through the receipts of coupon payments. Law converted the paid in sovereign debts into *rentes*, which the Bank of England had demonstrated is a reliable means of improving the liquidity of both sovereign debt and company shares. This liquidity added to the value of the Compagnie. Law continued his takeover of government functions in 1719 by purchasing the right to mint new coinage and collect direct and indirect taxes. He recognized that creating better incentives for tax collection could both be a source of enhancing revenue through both the sale of tax farming rights and improving tax collection incentives. This also boosted the value of sovereign debt and of the Compagnie's shares.

Law's plans evolved to create increasingly consolidated authority over all of his complementary innovations of statecraft. He had Louis XV take over Banque Générale, renamed the Banque Royale in January 1719. Law remained in control of the Banque and thus gained a

monopoly on note issuance that was guaranteed by the crown. The change furthered the conversion of France's money supply from specie into paper bank notes. In May 1719, Law further expanded his trade monopolies by acquiring the East India Company and the China Company and merging them with the Banque Royale and Compagnie d'Occident. The new conglomerate, the Compagnie des Indes, controlled nearly all taxes and all French trade outside Europe, leading to an increase in share prices due to the assurance of government protection and favorable financial policies. Law argued that the monopolies would allow the firm to raise sufficient capital to create economies of scale, and the Compagnie capitalized on investors' optimism about international trade (Frehen et al. 2013). Law became the manager of all government financial policy, as well, when he was appointed Controller General and Superintendent General of Finance in 1720.

To purchase more of the remaining national debt, the Compagnie des Indes issued more stock, and the Banque facilitated sales by increasing its note issues. Compared to the 159 million livres authorized before 1719, the Banque received authorization for over 1 billion in new note issues by early 1720 (Garber 1990, 2001). Law carefully managed stock prices to achieve higher and higher stock prices (Velde 2009).

Share prices began to decline in late January 1720 because of increasing attempts to convert capital gains into gold. Specifically, two aristocrats whom Law apparently neglected giving shares suddenly brought a large volume of paper currency to Banque Royale and demanded conversion to gold (Bruner and Miller 2020). Law first attempted to restore investor confidence by undermining the demand for specie. He prohibited specie payments above 100 livres, and made Banque Royale notes legal tender for larger payments. Louis XV also sought to set limits on the public holding of specie. When the restrictions did not stall the falling share prices, Law announced that the Banque would exchange its notes for Compagnie des Indes' stock at 9000 livres, essentially pegging the stock's price. The approach caused note circulation to double within a couple months.

The wave of new currency cast doubts on the value of the livre (Bruner and Miller 2020). Accordingly, the paper livre fell to a discount against coin, and banknote holders began redeeming their notes for gold en masse. When the value of shares in the Compagnie became impossible to sustain at 9,000 livres, Law slowly deflated share prices from 9,000 to 5,000 livres starting on May 21, 1720. The price, however, continued to fall past the new lower peg and gold

began to flow out of the country despite penalties for anyone caught. In October 1720, Louis XV removed all monopoly rights, management of the mint, and other advantages from the Compagnie, reducing it to a regular private firm. The Compagnie des Indes' stock price fell to 1000 livres by December 1720, and Law fled France (Garber 1990).

It is important that even after the decline in its stock price, the Compagnie continued to be a valuable enterprise. Although Law clearly had overreached in his use of paper money to prop up share prices to incentivize stock subscriptions, the fundamentals of the Compagnie, and the synergies, supply-side developmental enhancements, and sovereign debt cost improvements that he had engineered were real and deep. And the French government's willingness to undertake these innovations should be seen not as folly but rather as a creative response to the competitive pressures and fiscal imperatives that they faced.

## *5.2 South Sea Bubble*

Britain's modern history of innovative financial statecraft began in 1694 with the founding of the Bank of England. The ascendance of Willem of Orange to the English and Scottish thrones in 1688, and the Glorious Revolution that coincided with it, brought new ideas and political challenges, as it marked the beginning of Britain's wars with France, which would last until 1815. The chartering of the Bank of England, owned by a coterie of the political Whig elite, had a single initial objective: the consolidation of sovereign debts through an equity-for-sovereign debt swap, and a restructuring of the heterogeneous debts paid in by subscribers into a single new form of long-term sovereign debt (the consol).

The Bank was under constant attack by opponents of the Whigs in its early years. For example, in 1707, a group of merchants opposed to the growing power of the Bank staged a run which was only allayed through the assistance of Queen Anne and various nobles. The conflict over the Bank was just one example of the country's broader political struggles between the Crown and opposing groups of nobles and merchants. In contrast to France, Britain was a more contested political environment, which was reflected in its chartering of multiple competing companies. This competition spurred new ideas, companies, and innovations with the fiscal purpose related to funding the fight against France. The state reformed their tax system and began to raise funds from lotteries (e.g., the Million Adventure Lottery of 1694 and the Malt Lottery of 1697), life annuities (e.g., Tontines), and new institutions such as the New East India

Company. About 100 joint stock companies were also chartered between 1685 and 1695, stimulating rapid development of equity and derivative instruments.

To balance out the creation of Bank of England by Whigs and provide an alternative institution for the consolidation of public debt, a group of entrepreneurs associated with the Tories founded the South Sea Company (SSC) in 1711. The SSC was particularly intended to help national finances in wake of the War of Spanish Succession and the Great Northern War. The SSC negotiated monopoly rights on trade with Spanish colonies in Central and South America in exchange for sharing trade profits with the Crown and swapping SSC shares for outstanding government notes. The swap granted the government a reduction in interest expenses and investors a share of profits of the company's trading agreements. The SSC's shares sold quite well because they were more liquid than the government debt and public interest in global commerce was growing (Frehen et al. 2013). For instance, the largest increases in SSC share prices coincided with rumors of commercial treaties with Spain (Mackay 1852).

When war broke out again with Spain in 1718, the SSC's profit from its Latin American trade concessions was undermined and most scholars agree that, under the immediately foreseeable circumstances, those trade concessions added little to the value of the company. The SSC, therefore, overbid the Bank of England to further refinance the British government debt. Because the SSC issued more shares to finance the debt acquisition, they had a strong incentive to push prices as high as possible in order to make it more attractive for debt holders to exchange for existing government debt (Carlos and Neal 2006). The SSC offered four subscriptions between April and August in 1720. Each subscription had a higher price than the last. Market manipulation, bribes, and exploitation of government clout enabled the higher share prices. Dickson (1967) relates that 132 members of Parliament received 1.1 million pounds and 64 Peers received 686,000 pounds in loans against shares. Such relationships were common and signaled to investors that the SSC had the government on their side. As a result, the SSC were able to accumulate 80% of irredeemable and 85% of the redeemable debt in public hands (Garber 1990).

However, doubts emerged about SSC's ability to keep dividends high. Given the lack of any apparent value of the Latin American trade rights, the value of its cash and government debt holdings constituted nearly the entire value of the SSC. This made it possible for sophisticated investors to value the company fairly easily. Mathematically, the connection between government debt and SSC valuation implied that a rising share price was unsustainable.



Sophisticated investors were able to time their exit from the market to avoid the price fall. Temin and Voth (2013) show that a major dealer during the South Sea Bubble reduced its positions before the crash while it continued to execute purchases for clients.

After hitting its peak share price of over £1000 in mid-June 1720, the price of SSC shares sagged to around £850. Although financial historians would connect that drop to the arithmetic of the unsustainability of the stock price increase, SSC leadership blamed the numerous "bubble companies." The existence of competing companies, it was claimed, had two negative effects: first, it eliminated any premium that might have been attached to SSC stock because of a scarcity of alternative investment opportunities; second, many of these new companies were fraudulent (having been established in part to cash in on investor exuberance about the SSC), and as those companies became revealed as bad investments, the SSC might also be tainted by adverse market sentiment.

The SSC persuaded Parliament to enact the so-called Bubble Act on June 11, 1720, restricting firms from operating without a royal charter. In August 1720, court rulings required bubble firms to "justify their existence" under the Bubble Act forcing many companies to close. Despite enforcement of the Bubble Act, however, the decline in SSC share prices continued. Over the course of August and September 1720, SSC stock lost over half its market value, falling to £400 by September 19. Much of this was the result of investors having used SSC shares as collateral in loans to invest in the bubble companies. When the companies were forced out of business, investors scrambled for liquidity and there was a massive sudden sell off of SSC shares. Even conservative investors who had eschewed the bubble companies had begun to move funds into safe and liquid assets.

As the market crashed, the majority Whig Party encouraged the Bank of England to rescue the SSC. The Bank extended a loan to SSC and also made an equity investment, which prevented a total collapse and buoyed the broader market. Subsequently, the SSC was split between the Bank and the East India Trading Co.

## **6. The Ancient World**

Banks and lending were important features of the ancient Greek and Roman world since at least the 6<sup>th</sup> c. BC. Roman lending occurred both through deposit banks (*argentariae*) and money lenders, where the latter was dominated by the political elite (Kay 2018). Lending was

regulated for political purposes. By the time of Julius Caesar, two elements of lending regulation had been enacted: a usury ceiling on loans (which varied over time and by loan type), and a requirement that lenders hold a minimum fraction of their wealth in Italian land (Elliott 2015). Both of these rules can be seen as serving to strengthen the stability of the Roman autocratic network by ensuring that the elite remained powerful, and that their resources included significant land holdings close to the capital.

First, as Benmelech and Moskowitz (2010) document in the 19<sup>th</sup> c. American context, usury laws subsidize the incumbent elite because its members pose less risk to lenders, and therefore, can still compete for funds when interest rates are low. In essence, a usury limit made it harder for other members of society to compete for the given supply of loanable funds. Second, constraining lenders to staple credit supply to owning Italian land ensured that the interests of the most influential members of the elite would be aligned with the interests of the emperor (and more generally, the center of power in Rome). It was precisely Julius Caesar's success in expanding the empire that made this new focus on incentive alignment important.

### *6.1 The Roman Financial Crisis of 33 AD*

The first well-documented financial crisis of the ancient world, in 33 AD, resulted from the jockeying within the Roman elite about the degree to which these two limits would be enforced. Historians of Rome have emphasized that Julius Caesar's conquests were associated with money supply increases that produced a low-interest rate environment, which rendered the usury ceiling less binding. As the result of a reduction in government spending under Emperor Tiberius, the Treasury's holding of money expanded, and the money supply held by the public contracted (Frank 1935; Thornton and Thornton 1990; Temin 2013). This caused interest rates to rise. Many members of the elite (including a substantial number of Senators) benefited from choosing to neglect to enforce the regulations on usury and Italian land holding. In 33 AD, however, a (presumably self-interested) coalition within the elite pressed for the enforcement of the regulations. The Emperor granted eighteen months for lenders to bring their loans and land holdings into compliance with the regulations (Tacitus 1996)

The enforcement of the lending laws did not occur in the midst of an economic expansion, but rather, seems to have come at a time of flat or declining growth in production and

credit. Tiberius' announcement led to an immediate real estate market crisis, and collapse in the supply of credit, as lenders sought to reduce their illegal loans.

Trying to alleviate the issue, the Senate passed an ill-conceived resolution that sought to boost land values by requiring creditors to invest even more (two-thirds) of their wealth in Italian land. Because this added lender portfolio restriction further limited the supply of credit, it made credit and land prices decline even more precipitously. As Tacitus writes:

And the very device intended as a remedy, the sale and purchase of estates, proved the contrary, as the usurers had hoarded up all their money for buying land. The facilities for selling were followed by a fall of prices, and the deeper a man was in debt, the more reluctantly did he part with his property, and many were utterly ruined. The destruction of private wealth precipitated the fall of rank and reputation...

The crisis was ended when Tiberius distributed a 100 million *sestertii* to specially chartered banks, who were required to lend those funds in three-year, interest-free loans secured against Italian land at twice the value of the loan. The loans allowed Rome's elite to avoid embarrassing losses, encouraged the reemergence of private lenders, and stabilized land values.

## 7. Conclusion

We summarize our ten financial crisis narratives in Table 1. Table 1 reviews eleven salient sets of facts about each crisis: when it occurred, which markets were involved initially, what was the nature of the political and economic context within which the crisis occurred, was there a pre-crisis asset price boom, were the factors that precipitated the crisis known in advance (implying some predictability to the collapse), did the crisis correspond to an identifiable shift in preferences or interest rates, was ex ante uncertainty associated with new markets in which learning had not yet occurred, and was fraud an endogenous outcome during the crisis?

The ten crises span a great deal of variation across time and our summary provides different combinations of answers to the eleven sets of facts we review in Table 1. That is not a coincidence; we chose this list of crises precisely to illustrate the wide range of facts that have accompanied financial crises through time. While our sample of ten span much of the variation of the population of historical crises, it would be possible to add other examples that are distinct from the patterns illustrated in these ten cases (e.g., the Global Crisis of 1825, and the Panics of the U.S. National Banking System in the period 1873-1907, would provide a combination of eleven sets of facts that would be different from any shown in Table 1). Our point in constructing

a sample of distinct examples is that crises narratives differ from one another; there is no single crisis narrative that describes the past.

Crises affected different markets (land, banks, stocks, bonds, currency), and occurred under different political regimes (the mature Roman Empire, the competition of early nation states in the 1720s, the autocratic crony capitalist regimes of Mexico or Korea in the 1990s, and the mature 20<sup>th</sup> c. democracies of the U.S. and Spain) and very different economic circumstances – sometimes they occurred after economic booms, as in the cases of the Mississippi and South Sea Bubbles, the Florida Land Collapse, the Crash of 1929, and the Subprime and Spanish crises, but sometimes they were preceded by static or declining economic circumstances, as was true for Rome in AD 33, the Great Depression Bank Crises, and the Mexican and Korean Crises.

Price booms sometimes preceded the crisis (in the Mississippi and South Sea Bubbles, the Florida Land Collapse, the Crash of 1929, the Spanish Crisis of 2008 and the Subprime Crisis), but in other cases, that was not true (Rome in AD 33, the Great Depression Bank Crises, and the Mexican and Korean Crises of the 1990s).

Some crises were predicted or were predictable based on unsustainable economic circumstances of the pre-crisis period. For example, any economist aware of the policies implemented by John Law to prop up his stock price would have understood that such a policy could not succeed indefinitely. Similarly, Rudiger Dornbusch forecasted the collapse of the Mexican peso a year before it occurred, and the *Economist* and *Financial Times* anticipated the Asian Crises of 1997. Other crises were not predictable, either because of the novelty of the markets involved and the lack of information available to market participants (e.g., Florida in the 1920s), or the unpredictable nature of the shock that caused it (e.g., Rome in AD 33, or the Great Depression Bank Crises). In still other cases, we mark predictability as unclear: there are arguments that the Subprime Crisis should have been predictable (and some did predict it), but others can point to lack of information and the novelty of subprime mortgages as factors that made it hard to see the depth of the problems brewing. Historians are still debating whether the Crash of 1929 reflected overpriced stocks or just the Federal Reserve's desire to deflate the stock market.

Contributing factors that helped produce a crisis could include politically motivated risk subsidies to special interests (Rome's lenders, borrowers and landowners, with their sometimes opposing interests, or the monopolists connected to the Mississippi or South Sea Companies, or

the GSE Act's favored mortgage borrowers, borrowers from the Spanish Cajas, or the protected crony capitalists and banks of Korea and Mexico), but political favors were not precipitating factors in the Florida Land Collapse, the Crash of 1929, or the Great Depression Bank Crises.

Economic shocks (or perhaps behavioral changes) that were visible in interest rate or risk preference shifts sometimes accompanied crises (most obviously in both the 2008 crises, in the AD 33 one, and in the Crash of 1929), but sometimes not (in the Florida Land Collapse, or in the Mexican and Korean Crises). Some of the crises occurred in new markets where learning about risks and opportunities had not yet occurred (stock and sovereign debt markets in France and Britain around 1720, Florida land, growth stocks of the 1920s, and Subprime mortgages), but other crises occurred in long-established markets (Rome in AD 33, U.S. banks in the 1930s, Mexican and Korean borrowers in the 1990s).

Fraud was a common feature of crisis collapses, as people with an interest in disguising problems did so once problems began to surface, but this was not always the case. For example, we are unaware of evidence about fraud in the Roman Crisis of AD 33, in the South Sea Co., in the Crash of 1929, or in the Great Depression Bank Crises. When dishonest actions occurred, those behaviors should not be seen as causes of crises, but rather, as reactions to them. John Law's actions in propping up his stock price reflected the increasing difficulties he had in sustaining the boom. Bankers fraudulently hid losses or disguised insider lending in the Florida Land Collapse, in Mexico and Korea in the 1990s. The U.S. GSEs in the 1990s and early 2000s disguised their exposures to credit risk (for which the SEC made them pay after the Subprime Crisis).

Our point in emphasizing all this variety of experience is not that crises should just be studied as idiosyncratic events without common patterns. On the contrary, we think there are common patterns illustrated by Table 1. We believe that the history of crises illustrates a countable number of types of events, but not just one. In the book we are working on to identify those types, we will include roughly thirty crises and show that, although particular crises never repeat prior ones, they often rhyme with them.

Our review also highlights some facts that help address the motivational question of our article: why do crises persist? Why is it so hard to learn to avoid them. We think there are at least four (non-mutually-exclusive) answers that our case studies illustrate.

First, it may be that the risks that lead to a crisis have a purpose for those with decision making power, even if those risks and the crises that result from them are harmful to the general population. Political coalitions, after all, receive risk subsidies through their willingness to take on risks.

Second, financial history is replete with examples of new risks, new products, new technologies, new territories whose risks are necessarily unknown. You cannot learn the value of Florida land in 1924 by introspection. And, it was very challenging to learn about aggregate supply and demand for Florida land in real time.

Third, it may be individually worthwhile for individuals to undertake risks because they can act without the knowledge of others (who might otherwise stop them). John Law had a strong vested interest in the upside of the Mississippi Company, but he fled the country once its costs were felt, and thereby avoided those costs.

Fourth, it may be that the financial system and economy as a whole benefit from taking the risks that sometimes lead to crises. England and France began the 17<sup>th</sup> century in inferior competitive positions to the other powers. The statecraft of employing new innovative financial mechanisms to build trading monopolies, expand tax revenues, create liquid sovereign debt markets and stock exchanges, charter banks, and assemble armies and navies was very risky, but what was the alternative? Nations that failed to compete found themselves acquired by those better able to play the empire building game.

As we continue to approach the goal of constructing a useful crisis taxonomy, we would emphasize an important methodological point. Crises should be studied as historical events, which can be understood only by using a combination of narrative and quantitative tools. The appropriate methodology for studying history is closer to evolutionary biology than to physics. Financial systems, and the crises that accompany them, evolve from political and economic environments, and cannot be studied in isolation from those histories as data points in a panel econometric analysis. We believe that a useful taxonomy of crises has yet to be constructed, but we are optimistic about the possibility of constructing one. Like the taxonomies employed in zoology and paleontology, we also believe that a financial crisis taxonomy will emerge only from a comprehensive study of many crises and the times and places in which they occurred.

As we noted in the introduction, economists and politicians typically end their discussions of financial crises with laundry lists of policy implications, accompanied by

promises that crises can be averted by adopting key suggested reforms. But our historical review reveals why this exercise has failed to prevent crises, and why it will continue to fail. Financial crises are inextricably connected to the international competition among nations, to learning about risks that are connected to economic progress, and to satisfying powerful political constituencies that control government policy. That does not mean that politicians and economists (especially those employed by government regulators or central banks) will ever give up pretending that they know how to prevent crises; after all, that is part of how they preserve their political power. But it does mean that serious analysts of public policy should take a different view, recognizing that making financial crises is not desirable: they are one of the costs we pay for adaptive social constructs like national sovereignty, capitalist growth and representative government.

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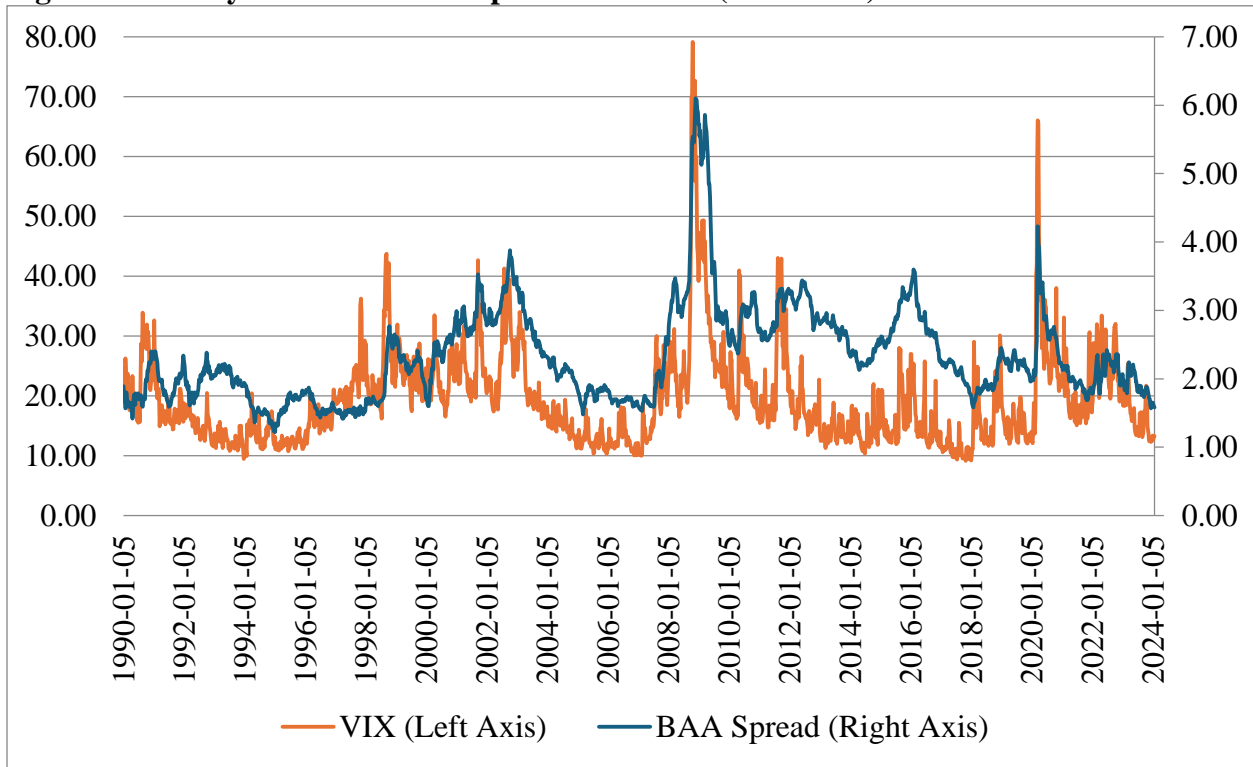
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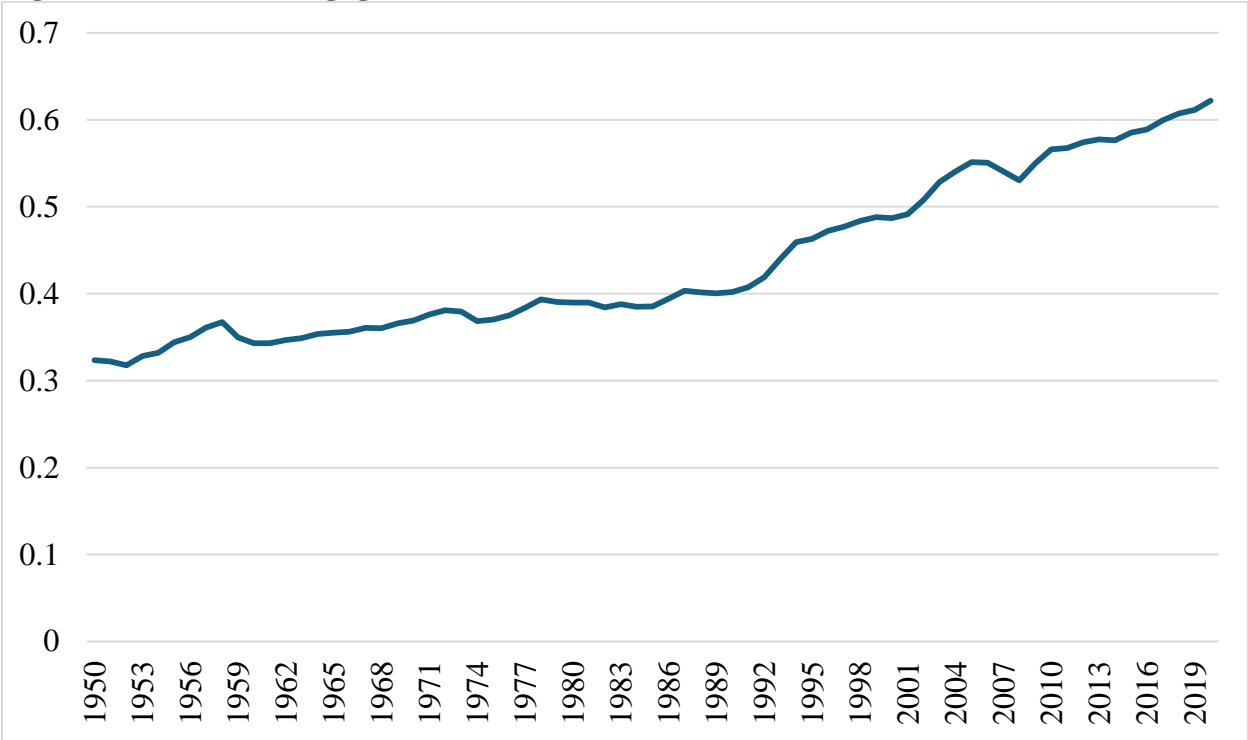
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**Figure 1: Weekly U.S. BAA Bond Spreads and VIX (1990-2024)**



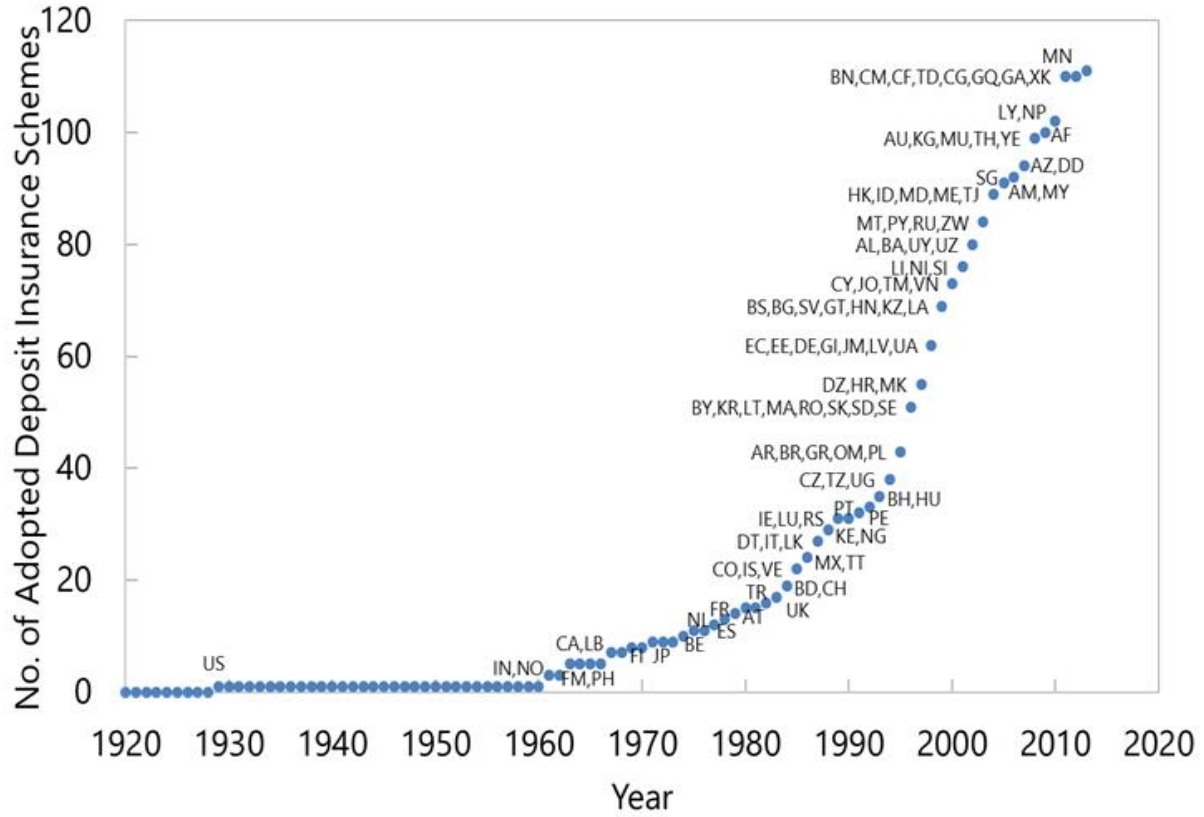
Notes: Figure provides Moody's Seasoned Baa Corporate Bond Yield Relative to Yield on 10-Year Treasury Constant Maturity and CBOE Volatility Index. Data taken from St Louis Fed and Chicago Board Options Exchange. Information provides for end of each week.

**Figure 2: Ratio of Mortgage Loans to Total Non-Financial Private Loans (1950-2020)**



Notes: Figure provides the average ratio of mortgage loans to non-financial private sector to total loans to non-financial private sector for the 18 countries contained in Jorda et al. (2015).

**Figure 3: Deposit insurance adoption (1920-2020)**



Notes: Figure plots the year of deposit insurance adoption by country. Taken from Calomiris and Chen (2020, Figure 1).



**Table 1: Summary Characteristics of 10 Financial Panics**

	<b>Panic of AD 33</b>	<b>Mississippi Bubble</b>	<b>South Sea Bubble</b>	<b>Florida Land Boom</b>	<b>US Stock Crash of 1929</b>	<b>Great Depression Bank Crises</b>	<b>Mexican Crisis</b>	<b>Korean Crisis</b>	<b>Spanish Crisis</b>	<b>US Subprime Crisis</b>
Period	Early Roman Empire	1720s	1720s	1920s	1920s	1930s	1994-1995	1997-1998	2008	2008
Initial Affected Markets	Bank Credit/ Italian Land	Sov. Debt/ Stocks/ Currency	Sov. Debt/ Stocks	Florida Land/ Banks	Stocks	Banks	Banks/ Currency	Banks/ Currency	Spanish Land/ Mortgages	US Land/ Mortgages
Political Environment	Preserving Imp Expansion	Global Early Modern Comp	Global Early Modern Comp	US 20th C. Democracy	US 20th C. Democracy	US 20th C. Democracy	PRI Dominance	Crony Capitalism	EU and ECB Formation	US 20th C. Democracy
Economic Environment	Static/ Declining	Nascent Expansion	Nascent Expansion	New Frontier	Roaring 20s	Global Recession/ Ag Decline	FX Peg/ 1993 Recession	FX Peg/ Product. Slowdown	Cajas/ Low Int. Rates	GSE Act/ CRA/Low Int. Rates
Collapse Predictable Pre-Crisis?	No	Yes	Yes	Unclear	Unclear	No	Yes	Yes	Yes	Yes
Prior "Excess Price Boom"?	No	Yes	Yes	Yes	Unclear	No	No	No	Yes	Yes
Political Risk Subsidies?	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Preference, Interest rate, Risk shifts?	No	No	No	No	Yes	Yes	No	No	Yes	Yes
Learning about new markets?	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes
Endogenous fraud?	No	Yes	No	Yes	No	No	Yes	Yes	No	Yes