

Banking Crises in Historical Perspective

Carola Frydman¹ and Chenzi Xu²

¹Kellogg School of Management, Northwestern University, Evanston, Illinois, USA;
email: c-frydman@kellogg.northwestern.edu

²Stanford Graduate School of Business, Stanford University, Stanford, California, USA

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banking crises, intermediation, lender of last resort, financial stability, leverage, historical lessons

Abstract

This article surveys the recent empirical literature on historical banking crises, defined as events taking place before 1980. Advances in data collection and identification have provided new insights into the causes and consequences of crises both immediately and over the long run. We highlight three overarching threads that emerge from the literature: First, leverage in the financial system is a systematic precursor to crises; second, crises have sizable negative effects on the real economy; and third, government interventions can ameliorate these effects. Contrasting historical episodes reveals that the process of crisis formation and evolution varies significantly across time and space. Thus, we also highlight specific institutions, regulations, and historical contexts that give rise to these divergent experiences. We conclude by identifying important gaps in the literature and discussing avenues for future research.

1. INTRODUCTION

Banking crises rarely go unnoticed. Given their outsized disruptions to firms and individuals, they have received much attention from contemporaries, policy makers, and academics in the past and the present. Although banking crises are not rare, they are infrequent enough that we can only achieve a broad understanding by studying them across time and space. Indeed, the 2008 global financial crisis was a reminder that we have not solved the problem of banking crises, leading to renewed scholarly interest in historical precedents. Our survey takes a decidedly historical focus and seeks to uncover the common lessons and new insights that emerge from studying disruptions to banking systems of the past.

These renewed efforts stem partly from the recognition that documenting general stylized facts on the origins, evolution, and impact of crises requires a large number of events that only history can provide. Although some general patterns do emerge from centuries of financial disruptions, each time is indeed a little bit different. Our understanding of crises, and our ability to predict them and react to them, would be much impaired if knowledge was based only on a handful of recent episodes. Historical precedents are especially enlightening because they occurred at a time of different institutional and regulatory contexts and therefore have more potential to illuminate distinct underlying economic forces than events in the last four decades—what we would define as a modern crisis.

Academic research on historical banking crises spans many centuries, vast geographies, and a wide variety of topics, making it daunting to summarize.¹ Yet despite the diversity in financial system arrangements across time and space, our reading of many hundreds of papers in the literature reveals three main, general lessons.

First, leverage is an important source of financial fragility. Large buildups of bank leverage make financial crises approximately 1.6 times more likely to occur, and financial institutions with higher leverage are more likely to experience turmoil.² Importantly, banks are usually interlinked so that an adverse event on less robust institutions transmits domestically and internationally to others, amplifying the crisis. Second, banking crises have large negative effects on the real economy. Shocks to financial institutions affect a wide range of outcomes, from employment and output to political beliefs. Although the magnitudes of the effects of disruptions to credit intermediation on real outcomes are hard to contrast across studies, they are often large and long-lasting. We also document that in the aggregate for advanced economies, the recovery from crises is faster when the banking sector had lower levels of leverage pre-crisis. Finally, early and widespread interventions are an important tool to arrest panics, limit the contraction of the banking sector, and ameliorate their impact on the economy. Historical crises that have not benefited from intervention have been particularly costly. Our article is therefore organized around these three main lessons.

Compared to previous studies that focused mainly on describing historical crises, recent research has made great strides in using new data extraction and econometric techniques. These advances have allowed for a deeper understanding of both historical and more recent crises by documenting common patterns across larger datasets and revealing the causal relationship between financial crises, economic outcomes, and institutions. In this review, we therefore primarily

¹We are agnostic about the specific definition of a banking crisis, and we cover papers as long as the authors cast them as related to banking or financial crises. Readers should note that studies do not always identify crises in a similar fashion and that this distinction may affect the comparability of their findings.

²We provide more details on our calculation in Section 3.1.1. The likelihood of a financial crisis in the 5 years following a high-leverage event, defined as the top quartile of leverage within each country, is 36%, while it is only 22% for those in the bottom quartile of leverage.

highlight empirical work written in the last two decades.³ We focus on contributions that help to uncover different aspects of the three key lessons we identify above, as well as on selected work in which the historical elements are particularly unique to the analysis. Our review emphasizes that there are distinct advantages of historical settings: They provide a unique laboratory to isolate the role of certain financial institutions in a context of limited government intervention, and they are better suited to document potentially persistent effects.

We also use the historical perspective to highlight that the regulatory framework and policy tool kits in modern banking systems have largely evolved from the painful lessons of the past. Despite these efforts, the sources and consequences of financial sector fragility have been in broad terms surprisingly constant over the very long run. This suggests that while there may be common underlying economic forces that lead to costly crises, such as liquidity mismatch and deterioration in intermediation, the instruments and institutions that introduce risk in the system evolve and often outpace regulation.

Despite significant progress, important gaps in the literature remain. Studies can do more to identify the underlying economic forces that give rise to the relationships evidenced in the historical data, connect these to specific channels and mechanisms emphasized by theory, and reconcile the estimated economic magnitudes, which are currently challenging to contrast across studies. History offers opportunities for doing so: There is rich variation across countries over time that makes studying specific institutional features in isolation possible, which is particularly useful for complementing modern empirical estimates. Efforts on these fronts have potentially large payoffs by informing economic theory and providing clearer policy recommendations.

We begin by discussing the way crises have been identified in the literature and outlining their coverage in the articles that we survey in Section 2. In Section 3, we discuss the source and transmission of crises and the role of leverage as a source of financial sector fragility. We assess the real effects of crises, which impact many sectors of the economy, in Section 4 and survey the role of institutions and interventions that ameliorate or exacerbate the likelihood of crises and their impact in Section 5. Section 6 concludes with a discussion of potential avenues for future research.

2. QUANTIFYING HISTORICAL BANKING CRISES

2.1. Identifying Crises

A necessary starting point for studying historical banking crises empirically is to determine when and where these events took place. A large literature has long focused on creating chronologies of crises across a large set of countries over a long horizon (e.g., Bordo et al. 2001; Reinhart & Rogoff 2009; Jordà, Schularick & Taylor 2013; Laeven & Valencia 2020). These measurement efforts, which typically provide an indicator variable for the presence of crises in a given year, were initially based primarily on careful qualitative assessments of the historiography of particular events, as in the works by Sprague (1910), Kindleberger (1990), or Wicker (2000). Gathering such evidence often requires systematic historical records; therefore, much of the existing work is biased toward economies that have been relatively developed. More recently, scholars have begun

³We refer readers to many existing survey articles that cover various aspects left out of our review, including theoretical work, empirical work on modern crises, and earlier historical studies. See, among others, Allen, Babus & Carletti (2009) on asset price bubbles; Gray (2009) on vulnerabilities during financial crises; Laeven (2011) on policy interventions; Peek & Rosengren (2016) on the impact of crises on credit; Gorton (2017, 2018) on the role of short-term debt; Bernanke (2018) on the global financial crisis; and Calomiris & Gorton (1991), Taylor (2015), Bordo & Meissner (2016) and Monnet & Velde (2021) on banking, intermediation, and crises from a historical perspective.

to use newly digitized collections of historical newspapers at scale to broaden the determination of disruptions to the banking system.⁴ Similar strategies may have the potential to uncover new evidence for countries with no historical bank system records, which have been largely ignored by the literature.

Chronologies of crises are a useful starting point but are unfortunately not definitive. The decision of whether certain events should count as a crisis depends on the criteria applied in each particular series. These criteria may include, for instance, evidence of major bank failures, systemic bank failures, or banking panics. While these datasets generally agree on the classification of major events, such as the 1931 banking panics in the United States, they often disagree on others.⁵ These disagreements, in turn, can affect the findings of empirical studies. Moreover, this approach is largely retrospective and can therefore lead to survivorship bias, wherein only events that were sufficiently severe made a lasting enough impact to be recorded (Romer & Romer 2017).

Recent work has levered improvements in data access and processing to enhance these classifications along several dimensions. Scholars have expanded the criteria to include quantitative measures intended to capture crisis severity. For example, Baron, Verner & Xiong (2020) identify crises based on the presence of sizable declines in the market value of bank equity.⁶ This crisis measure is continuous rather than binary, which makes it possible to examine heterogeneity by severity. Romer & Romer (2017) also use a single qualitative record—annual Organisation for Economic Co-operation and Development (OECD) reports of countries' financial health—to create continuous measures of severity. In both cases, relying on a single source standardizes the way crises are measured and helps to address concerns of survivorship bias.

Survivorship bias is also likely to be more severe when governments intervene early to arrest or alleviate the impact of the crisis. As we discuss later in the survey, government interventions have become broader and more common over time. Thus, these interventions obscure our understanding of how the factors that lead to crises or their potential economic impact evolved over time. Metrick & Schmelzing (2021) develop a database of government interventions from the 1200s to the present, which we anticipate will be helpful in addressing the survivorship bias that results from successful interventions reducing the costs of crises and thus the marks they leave on the economy.

Quantitatively driven crisis measurements from contemporary, as opposed to retrospective, sources have the advantage of being internally consistent and comparable. Yet they are understandably more limited in their coverage because of the higher data requirements. For instance, Baron, Verner & Xiong (2020) cover 24 advanced economies and 22 emerging economies over the years 1870 to 2016, and Romer & Romer's (2017) measure is only available for 24 advanced economies from 1967 to 2012. By contrast, Reinhart & Rogoff (2009) cover a much larger set of 70 countries, including both emerging markets and advanced economies, from 1800 until the present. Users of historical banking crises databases need to be mindful of these trade-offs and the impact such sample selection may have on their analysis.

2.2. Focus of the Recent Literature and of This Survey

The literature on historical banking crises is much too large to do justice to in one survey. Our review is therefore not comprehensive. To highlight recent advances, we focus primarily on

⁴See, for example, Jalil (2015) for the United States and Kenny, Lennard & Turner (2021) for the United Kingdom.

⁵Sufi & Taylor (2022) provide a recent overview of the primary similarities and differences among several chronologies. For a discussion, see also Bordo & Meissner (2016).

⁶This measure, however, does not capture the part of the banking sector that did not trade, either because banks were not listed or because the stock market was illiquid. Importantly, few American banks in the nineteenth century were listed on stock exchanges.

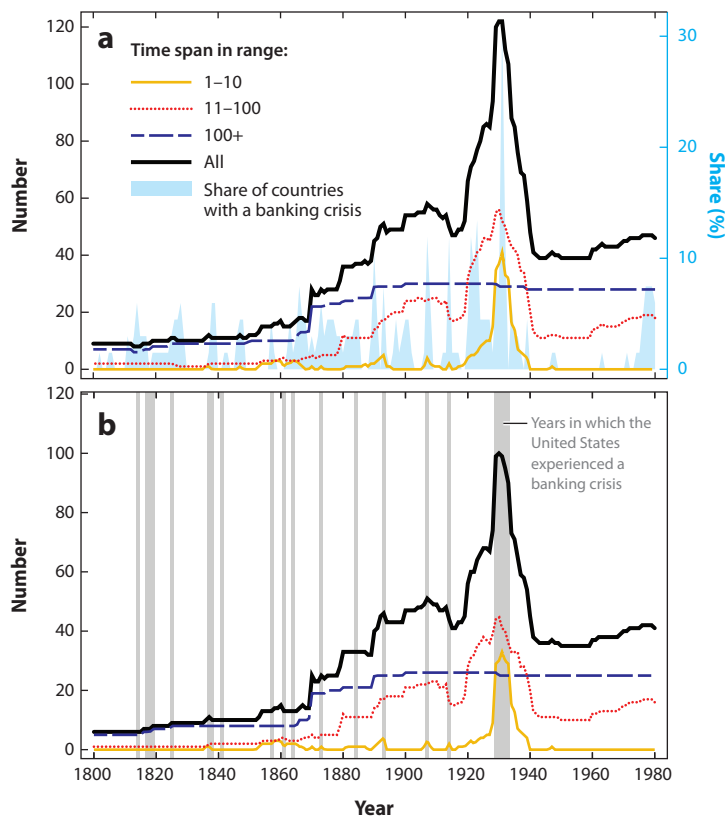


Figure 1

The figure plots the number of publications studying a year from 1800 until 1980 and historical banking crises patterns whose analysis includes a given year in this time period, including those with a sample period between 1 and 10 years (*yellow solid lines*), between 11 and 100 years (*red dotted lines*), more than 100 years (*blue dashed lines*), and all articles (*black thick lines*). Panel *a* includes all articles, while panel *b* includes only articles whose samples include the United States. Historical banking crises patterns are shown by plotting the share of countries experiencing banking crises (*blue shaded areas* in panel *a*) and years in which the United States experienced banking crises (*gray bar lines* in panel *b*). Number of publications can be read on the left vertical axis, and the share of countries experiencing a banking crisis can be read on the right vertical axis. Publication data are from authors' calculations, and historical banking crisis data are adapted with permission from Reinhart & Rogoff (2009).

empirical work produced in the last 20 years. While we can discuss only a subset of these recent articles in detail, we begin by providing a broader overview of this literature, based on a systematic quantitative analysis of their focus and style.

We base our statistics on all articles related to banking crises published in 24 leading general interest and field journals between 2000 and 2022. We focus on the 218 papers that cover the 1800–1980 period because there are few articles on crises prior to 1800 and because no crisis in the last 40 years is considered historical. In the following analysis, we use crisis dates from Reinhart & Rogoff (2009).

Figure 1a plots the number of publications studying a given year in the 1800–1980 period along with the share of countries experiencing a banking crisis in that year. We further subdivide papers by the total number of years covered in their study. A sizable number of papers study crises

over a long time span of 100 years or more, primarily relying on information from a large set of countries. Yet many papers follow a very different approach, covering only up to a decade. These papers tend to focus on a specific crisis within one country and disproportionately study the Great Depression, as reflected in the spikes around the 1930s, and the United States. To illustrate this point, **Figure 1b** looks only at the subset of papers that include the United States (with the timing of American banking crises displayed); the patterns are remarkably similar in both graphs. Finally, longer-run papers covering 11 to 100 years are also concentrated around the Great Depression in both samples. While some papers in this group analyze one main episode, others consider many.

Crisis episodes have not been evenly studied. A striking lack of correlation appears between the share of crises occurring around the world in any given year and the number of papers studying those particular events (0.18 including the Great Depression period and 0.07 excluding it). For example, there have been many periods of significant global banking crises, such as 1890 and 1907, that have received limited attention. This lack of correlation indicates that there are substantial gaps in the literature pertaining to episodes other than the Great Depression, which invite further study. Given the current focus of the literature, our review necessarily emphasizes events that took place in the United States and to a lesser extent in Europe, and it disproportionately discusses insights from the Great Depression.⁷

These quantitative findings align with our qualitative understanding of the shifts in approach and emphasis in the literature, which we have gained by reading a much broader range of papers and books. The earlier literature on historical banking panics (e.g., Kindleberger 1978) generally focused on providing descriptive, narrative, or correlative evidence, frequently for multiple but sometimes for individual events. Recent work has generally featured novel data collection and stronger quantification along two main, complementary styles. A first approach has been to lever large novel datasets on banking system characteristics and economic outcomes to study crises occurring across many countries over long periods. This approach is reflected in research covering more than 100 years, as reflected in **Figure 1**. By analyzing many crises together, these studies are well suited to establish stylized patterns that only a long-run perspective can illuminate.

The second primary methodology has been to delve into an in-depth examination of a particular crisis, frequently focusing on understanding its specific underlying causes or consequences. A distinguishing feature of recent historical work within this approach is to lever the unique institutional frameworks and contexts of specific crises in order to make causal arguments and to shed light on mechanisms. These papers show an important heterogeneity in experiences that is obscured by aggregating across crises. Relative to studies analyzing similar issues in a modern context, scholarly historical work provides unique insights by being able to isolate the role of certain institutions at a time of more limited government intervention and regulation. These studies also offer points of contrast and insight into long-term effects that only the distance of history can provide. When possible, we highlight these contributions.

For the remainder of the survey, we do not distinguish between these two complementary approaches and instead discuss them together within each topic we cover, emphasizing differences only when it is relevant to our understanding of the topic.

⁷The focus on developed economies partly reflects data availability but also the relative size of their banking systems and the frequency of recorded crises. When we correlate the share of published articles that include a given country with the country's average share of world GDP scaled by the number of banking crises it experienced, we find a strong relationship with a slope close to 1. This metric reveals that OECD economies are generally represented in the literature to a degree that accords with their economic size and crisis incidence. Some Latin American countries have received more scholarly attention than what would be predicted given their small overall size in the world economy. By contrast, Brazil, India, China, Mexico, and Russia appear among the most underrepresented in the literature, given their size and experiences with crises.

3. CRISIS ONSET AND TRANSMISSION

3.1. Sources of Bank Fragility

The literature has tried to uncover the sources of fragility in the banking sector, which are the precursors to bank runs. We discuss how leverage, other components of the bank balance sheets, and institutional features of the banking system have led to distress and crises. Bank runs and panics, usually triggered by depositors, are a classic way for crises to begin and spread once there is fragility in the financial sector. Historical evidence illuminates that depositors respond to the information available to them during runs.

3.1.1. The role of leverage. The first theme that emerges from the literature is that leverage in the financial system has long been an important predictor of financial crises and that it plays a significant role in exacerbating downturns. The idea of leverage as a source of fragility in the financial sector was qualitatively discussed in Minsky (1986) [and since formalized by, for example, Eggertsson & Krugman (2012) and Bordalo, Gennaioli & Shleifer (2018)]. The theory centers on the idea that, over time, financial systems tend to become more and more speculative, with increasing amounts of debt financing used to fund investments. The ramp-up in leverage can create financial bubbles that eventually burst, leading to economic instability and economic crises.

Minsky's view suggests that the accumulation of debt may be particularly pernicious because it can create a feedback loop, in which the increased value of assets leads to more borrowing and speculation, which in turn drives an even greater increase in asset values. Rising asset values creates a sense of false security and encourages further risk-taking, ultimately leading to an unsustainable level of leverage. When market conditions change, such as a rise in interest rates or a fall in asset prices, a sudden demand for debt repayment occurs that leads to a sudden decrease in the value of assets. The fast deleveraging can trigger a downward spiral of asset sales, causing a crash in the financial system and a broader economic crisis.

Most of the empirical evidence indeed supports the view that leverage builds up in the years leading up to the crisis (Kindleberger 1978, Minsky 1986).⁸ Reinhart & Rogoff (2013) document that banking crises in both developed and developing countries have been preceded by asset price bubbles and credit booms ever since 1800. Relative to recessions not accompanied by financial crises, Schularick & Taylor (2012) show that recessions that follow a financial crisis are more likely to be preceded by credit growth from the banking sector to households and the nonfinancial sector in the 5 years prior, and Jordà, Schularick & Taylor (2015) show that asset price bubbles are particularly dangerous when they are preceded by credit booms. Similarly, in the post-World War II period, elevated asset price and credit growth in the 3 years prior are correlated with a much higher probability of a financial crisis (Greenwood et al. 2022).

To provide a sense of the salience of leverage as a predictor of crises, we contrast the likelihood of a financial crisis following periods in the top and bottom quartiles of credit buildup, using data for 18 advanced economies from 1870 to 2020 in the Jordà, Schularick & Taylor (2017) database.⁹ Leverage in this dataset is defined as the ratio of private credit to GDP. In the 5 years following a high-leverage event, there is a 36% probability (0.9% standard deviation) of a financial crisis, relative to only a 22% probability (0.7% standard deviation) following a low-leverage event.¹⁰

⁸Early empirical work in this area includes Borio & White (2004), which links large fluctuations in asset prices across advanced economies to poor macroeconomic performance in the decades following financial liberalization movements in the 1970s.

⁹This database is available at <https://www.macrohistory.net/>.

¹⁰This corresponds to 27 financial crises in the high-leverage category and 17 in the low-leverage category, where the leverage quartiles are determined across all country-year observations. The difference in means is

Studies have used evidence across multiple crises to unpack the types of credit expansion that may contribute to fragility. For example, Reinhart & Rogoff (2013) and Richter, Schularick & Wachtel (2021) point to housing market booms playing an outsized role. Moreover, the exact composition of debt buildup appears to matter. Studying 117 countries since 1940, Müller & Verner (2021) find that credit to the nontradable sector leads to financial crises, whereas credit flowing to the tradable sector does not. In a purely US setting, Kumhof, Ranciè & Winant (2015) use cross-sectional variation around the Great Depression and the Great Recession to argue that household leverage, especially in housing, is a key predictor of bank failures.

These findings raise the question of what causes the expansion of credit in the run-up to a crisis in the first place. It is difficult to establish this relationship causally, but correlative evidence from 60 advanced and emerging economies since 1800 reveals that the expansion in credit is empirically preceded by periods with few adverse shocks and low stock market volatility (Danielsson, Valenzuela & Zer 2018). In addition, the prolonged periods of low volatility are systematically followed by a banking crisis, indicating that the credit buildup may be a channel linking the two phenomena. A potential explanation for these relationships is that low volatility increases risk appetite, leading to credit expansion and leverage, which in turn eventually creates losses that may culminate in a crisis.

The literature discusses the relationship between credit and crises in terms of not only quantities but also prices. Among advanced economies after 1870, high levels of credit growth with low credit spreads create “frothiness” that triggers a crisis once the spreads widen (Krishnamurthy & Muir 2017). Altogether, this body of scholarly work provides general consensus on several early warning indicators, based on quantities and prices, for policy makers to predict crises. Yet how to prevent them remains elusive.

The studies we reviewed, and others in a similar style, have been able to establish a general connection between leverage and the onset of crises by using evidence across many events and countries. But this style of work requires being able to observe the same variable across countries and years; therefore, data limitations constrain the number of characteristics that can be analyzed. In addition, the literature often focuses on historical GDP measures as the primary outcome, which is likely mismeasured in historical contexts and is often revised even for recent periods (Ursúa 2011, Barro & Ursúa 2012). Therefore, it is particularly important for studies of banking crises to assess broader arrays of data including unemployment, other forms of debt, and equity prices as in, for example, the work by Reinhart & Rogoff (2009).

Moreover, in these studies, crises typically arise out of the broader macro-financial environment without a role for individual financial institutions. In reality, however, the broader financial environment reflects the characteristics of its underlying entities. We discuss these aspects in Section 3.1.2. Banking crises also often begin within a specific segment of the financial sector but transmit to others, thereby snowballing into a crisis. This transmission chain is itself a source of fragility within the national and international banking sectors. We return to these factors in Section 3.2.

3.1.2. Additional determinants of bank fragility. During banking crises, some financial institutions are more affected than others, even controlling for overall macroeconomic conditions. What makes a specific bank more fragile? An extensive historical literature correlates the probability of bank failure or the value of deposit losses with precrisis bank-level proxies intended to

statistically significant at the 90% level ($t = 1.64$), and the interquartile range is 0.5. Results are qualitatively similar when we instead define quartiles of leverage events within each country.

capture asset risk, liquidity, and leverage, among other characteristics.¹¹ Although the estimated magnitudes and significance vary across studies, these studies typically find that riskier banks were more likely to experience distress, echoing the stylized facts on the role of leverage over multiple crises that we summarized in Section 3.1.1.

In addition to leverage, another source of bank fragility is the maturity mismatch between its on-demand liabilities and longer-term assets where self-fulfilling runs can lead to insolvency even when assets are safe (Diamond & Dybvig 1983). This sort of fragility is not limited just to deposits, which are now fully insured for most depositors and no longer subject to the same risk of runs.¹² Historically, banks funded themselves through a variety of short-term debt instruments, including bank notes that acted as paper currency and interbank deposits. Attempts to ameliorate this risk through regulatory constraints often proved difficult. For example, Jaremski (2010) shows that requirements to back bank notes with government securities, which were designed to make notes safer, in practice limited banks' ability to diversify their assets and increased the risk of runs and failure.

The literature has also studied the relationship between a broad array of institutional features and bank failures. One specific example is the ability of banks to branch, which may mitigate excessive exposure to local economic conditions but also affects competition and bank interconnections. Studies produce seemingly contradictory findings: Bank branching reduced failure probabilities and credit contraction in some cases (Carlson & Mitchener 2006, Quincy 2021) but increased them in others (Calomiris & Mason 2003, Carlson 2004, Colvin, de Jong & Fliers 2015). The sources of this discrepancy are not well understood, a fact that highlights a broader limitation of the literature. While an advantage of historical work is that it can explore a similar question in arguably different institutional settings of the banking system, attempts to identify and understand tensions in results across different episodes have been limited. Yet understanding the underlying reasons why findings differ across time and space could actually provide fundamental insights for economic theory and policy. In our view, this is a necessary and important next step in the literature.

Finally, the majority of historical (and modern) work has focused on the sources of fragility of regulated institutions, primarily because of data availability. But for centuries, so-called shadow banks have been the epicenter of financial panics (Rockoff 2022). These less-regulated institutions often become systemically relevant before regulators have the proper tools or information to understand their risks and successfully intervene. Future work could bring new insights by more systematically contrasting the experiences of shadow and regulated institutions over the long run.

3.1.3. Individual depositor behavior. Although bank-level characteristics, such as leverage, contribute to the fragility of the banking system, for runs to emerge at least some depositors must update their beliefs or change their liquidity preferences. A large theoretical literature models depositor behavior during banking panics [reviewed by Calomiris & Jaremski (2016)]. Historical settings are particularly well suited for studying individual behavior in deposit runs because privacy and legal considerations that constrain data access in contemporary settings are less likely in historical contexts. In addition, depositors are more likely to act in settings without deposit

¹¹For instance, precrisis liquidity shortages played an important role in triggering the 1893 bank panic in the United States (Carlson 2005). Other examples include Calomiris & Mason (2003) for the Great Depression in the United States; Colvin, de Jong & Fliers (2015) for 1920s Netherlands; and Grodecka-Messi, Kenny & Ögren (2021) for 1907 Sweden.

¹²However, other types of short-term debt can still be prone to runs. For example, there were runs on repurchase agreements during the 2008 global financial crisis (Gorton & Metrick 2012) and runs on money market funds in March 2020 (Li et al. 2021).

insurance, which was more common in the past, especially if they actively monitor banks (Calomiris & Kahn 1991).

It is challenging to provide direct evidence of depositors' private information that delineates the informed from the uninformed; hence, most of the literature relies on proxies for the likelihood of being informed. Kelly & Ó Gráda (2000) use unique depositor-level data from the Emigrant Industrial Savings Bank (EISB) to study bank runs in the 1850s. Most of the bank's clients were Irish immigrants living in enclaves. They find that social networks based on county of origin played a more significant role in information diffusion and contagion than personal characteristics such as the strength of depositor–bank relationships. Evidence from this episode suggests that once a few depositors perceive a bank to be in trouble, they share their views with others, who also act on it. This type of behavior is also evidenced in modern settings where deposit insurance is actually present (Iyer & Puri 2012).

In some historical contexts, depositors coordinated on relevant and publicly available information about personal connections of financial institutions to individuals known to be at the center of a scandal. Frydman, Hilt & Zhou (2015) show that this mechanism was key for the 1907 Panic in the United States, and Xu (2022) shows this in the 1866 UK crisis. This quantitative evidence highlights the importance of reputation and trust—a point that is often clear in narrative accounts of panic episodes (Rockoff 2022).

The way a panic unfolds can also inform models of bank runs. The failure of a savings bank triggered runs on the EISB in 1854. Although no evidence of insolvency was found, uninformed depositors were more likely to close their accounts (Ó Gráda & White 2003). Once the panic unfolded, more sophisticated depositors joined in, consistent with self-fulfilling runs without fundamental shocks to bank solvency (Diamond & Dybvig 1983). Yet during widespread runs across the country in 1857, informed depositors were the first to run on the EISB. This latter case is instead suggestive that changes in bank health information in an environment with incomplete information [as in Gorton (1985) or Chari & Jagannathan (1988)] may play an important role in diffusing financial instability.

3.2. Crisis Transmission

Banking sector linkages, both within and across countries, may lead to crises spreading beyond their initial focal point. Indeed, interbank liquidity markets, common exposures to major asset classes, and foreign capital flows have all been sources of crisis transmission historically.

3.2.1. Transmission within the banking system. Studies find ample evidence for the contagion of shocks across banks, even after controlling for local economic fundamentals that may affect bank solvency. For example, banks located in areas where other banks failed were more likely to experience distress during the Great Depression (Calomiris & Mason 1997, Carlson 2010, Davison & Ramirez 2014). Bank contagion may also arise in contexts where interbank deposits are an important source of funding, leading to chains of intermediation.¹³

The US Federal Reserve System, created in 1913, reduced the concentration of interbank networks as banks shifted their correspondent relationships away from New York City and toward cities with Federal Reserve offices (Jaremski & Wheelock 2019).¹⁴ Yet the role of interbank networks in transmitting liquidity shocks did not disappear. Economic historians have shown that

¹³For work on the role of interbank networks in increasing systemic risk during the US National Banking Era (1865–1913), see, e.g., Anderson, Paddrik & Wang (2019).

¹⁴More generally, the founding of the Federal Reserve had a significant impact on the functioning of financial markets by, for example, reducing volatility during crises (Bernstein, Hughson & Weidenmier 2010).

the presence of a lender of last resort lowered the incentives that systemically important banks had to build capital and cash buffers to protect against liquidity risk, which may have ultimately raised interbank contagion (Calomiris, Jaremski & Wheelock 2022). According to an analysis of high-frequency data from call reports, interbank networks during the Great Depression amplified local shocks and resulted in a reduction of aggregate commercial bank lending by approximately 15% (Mitchener & Richardson 2019). One wonders, however, whether the sizable aggregate contagion effect would have been more muted had the Federal Reserve reacted forcefully to interbank withdrawals during the Great Depression.

Boissay, Collard & Smets (2016) provide a theory to explain how interbank linkages can lead to bank failures absent fundamental shocks in the presence of moral hazard and asymmetric information frictions. Using post-1870 data from 14 advanced economies, they show that small total factor productivity (TFP) shocks can trigger financial recessions when leverage in the banking system is disproportionately high. This theory helps connect the microevidence from specific crisis episodes to the broader correlation that leverage precedes crises that we highlighted in Section 3.1.1.

3.2.2. International transmission. Shocks to domestic banking systems often transmit internationally through banks' investment in foreign assets (in a modern context, see, among others, Peek & Rosengren 2000, Schnabl 2012, Bottero, Lenzu & Mezzanotti 2020). History highlights that the specific assets that create international exposure evolve over time but can often be conceptualized as exposure to a common risky asset class. For example, the extensive use of acceptance loans interlinked merchant banks in eighteenth century Europe and spread domestic shocks over the continent (Schnabel & Shin 2004).

Sovereign debt markets were also a common source of crisis transmission because foreign government bonds were (and continue to be) a major asset class that allowed investors to have direct exposure to other countries. Sovereign bonds from emerging markets are particularly likely to suffer from hot flows, in which foreign investors are first a major source of capital, and then subsequently an absent market as they offload these risky investments during downturns in favor of holding safer assets (Reinhart & Reinhart 2009). These fire sales impact all residual investors holding the asset but could spread beyond them. Olmstead-Rumsey (2019) shows that the collapse of major London-based banks during the 1825 Latin American debt crisis propagated to small country banks in England through correspondent relationships, even though these banks had no direct balance sheet exposure to sovereign debt. Similarly, when Argentina defaulted in 1890, the crisis quickly spread to London because Barings Bank (the underwriter) kept a large amount of Argentinean debt on its books (e.g., Mitchener & Weidenmier 2008, White 2016).¹⁵

International banks may also contribute to spreading crises globally because their funding can be directly exposed to one market while their investment activity is elsewhere, as Cetorelli & Goldberg (2012) show was the case for the international propagation of the 2008 financial crisis. Historically, following the collapse of a major interbank lender in 1866 London, 17% of international banks headquartered there failed, many of which had to close their subsidiary operations abroad. Xu (2022) shows not only that these failures had a direct impact on the supply of credit where operations ended but also that bank connections transmitted the heightened cost of credit in the London interbank market to other countries.

Capital inflows, especially for emerging markets, may also play a role. For instance, both Bordo & Meissner (2011) and Reinhart & Rogoff (2011) find that capital inflows appear to import

¹⁵Indarte (2021) suggests that sovereign defaults may propagate by altering investors' perceptions of an underwriter's ability to monitor country risk, which raises yields for the debts of other countries those banks underwrote.

financial crises and can also be coupled with sovereign debt crises. But, while open capital flows may lead to contagion, they can also aid in recovery (Bordo & Meissner 2011, Devereux & Yu 2019).

4. REAL EFFECTS OF CRISES

4.1. Financial Crises Are Special

Financial crises have systematically been shown to be costly. Across centuries and countries, they are associated with worse declines in output and consumption than other types of crises on average (e.g., Cerra & Saxena 2008; Jordà, Schularick & Taylor 2013; Nakamura et al. 2013). Relatedly, Baron, Verner & Xiong (2020) show that bank equity crashes have similarly outsized effects on output gaps and that these crashes can occur even absent observable panics. In contrast, widespread corporate default crises (studied in the context of the United States after 1900) do not appear to have the same large negative real effects as banking crises (Giesecke et al. 2014). These results indicate that alternative quantitative measures of crises are empirically relevant for understanding their effects.

Moreover, the magnitude of the effects on the real economy appear to vary by time and place. Focusing on advanced economies in the post-1967 period, Romer & Romer (2017) argue that financial crises are followed by persistent but only moderate losses in output and that these effects vary significantly across episodes. As we pointed out in Section 2.1, it is possible that these more modest effects are partly attributable to the more widespread interventions of modern economies that seek to ameliorate the negative impact of crises.¹⁶

Prices also help highlight the unique nature of financial crises through their ability to uncover time-varying risk premia. Muir (2017) finds that consumption contracts in similar ways across financial crises, wars, and large recessions but that risk premia only increase substantially during financial crises, which sets financial crises apart from other disasters. The increase in risk premia has also been detected during the Great Depression in the United States (Duca 2013).

4.2. Costs of Crises

Banking crises have negative economic and social consequences. Using long-run evidence from many countries, we show that all financial crises stall economic growth. Moreover, recovery dynamics are systematically worse for economies that entered the crisis with more leverage in their banking sector.

Utilizing micro-level data and the institutional features of specific historical events, a large body of work establishes the causal relationship between crises and a range of real outcomes including output, employment, innovation, and political beliefs. The long arm of history also shows that these effects can be extremely persistent.

4.2.1. Role of leverage in recessions. Since leverage in the banking system is an important predictor of crisis incidence and the downturns that follow a financial crisis are more severe and persistent than those of a normal recession (e.g., Cerra & Saxena 2008), it is only natural to consider whether the aftermath of crises is also affected by precrisis debt levels. We utilize comprehensive data for 18 advanced economies from 1870 to 2020 constructed by Jordà, Schularick & Taylor (2017) to present stylized facts on the relationship between leverage, financial crises, and output over the long run.

¹⁶By contrast, Bordo & Meissner (2016) find that output losses in recent years were larger than losses in the pre-World War I period but lower than those during the interwar years.

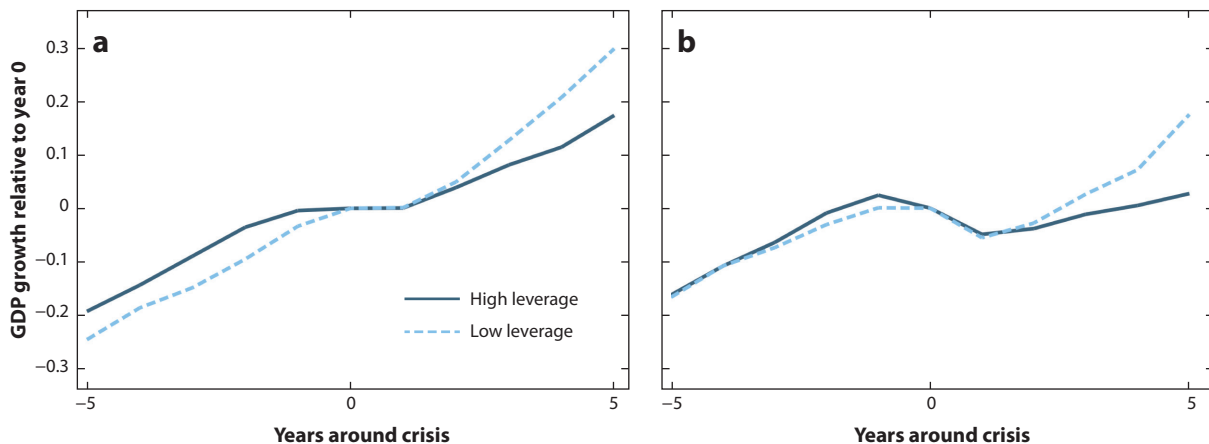


Figure 2

The figure plots the evolution of real GDP growth in the 10-year window around a financial crisis for 18 advanced economies from 1870 until 2020. The dark blue solid line shows the path for events that can be categorized as high leverage, and the light blue dashed line presents the low-leverage events, defined as events that fall above or below the median value of leverage in the sample. Panel *a* is constructed using the entire sample of financial crises, whereas panel *b* restricts the analysis to the financial crises that are followed by a recession, as in Jordà, Schularick & Taylor (2013). GDP is normalized to 1 in the year of the crisis. There are 88 financial crises in the full sample (*a*), 48 of which (55%) are followed by a recession (*b*). Historical banking crisis data used with permission from Jordà, Schularick & Taylor (2017).

In **Figure 2a**, we document the evolution of real GDP in a 10-year window around a financial crisis, where we normalize GDP to equal 1 in the year of the crisis for all 88 crisis events in the sample. The figure shows that countries that enter a financial crisis with low leverage experience a short-term stagnation in GDP for approximately 1 year. Growth appears to return to trend by the end of the 5 years following the crisis. However, within the set of high-leverage crises, GDP stagnates and does not recover the losses relative to the trend in the 5 years that follow.

Approximately 55% of the 88 financial crises in the sample coincide with a business cycle peak. In **Figure 2b**, we restrict the sample to the financial crises that are also followed by recessions, as in Jordà, Schularick & Taylor (2013). In this subset, preexisting levels of credit lead to a substantial difference in the severity of the crisis. Despite the fact that both high- and low-leveraged countries experience economic losses that are relatively similar in magnitude (the peak-to-trough losses in GDP in high-leverage events is 7.3% compared to 5.6% for low-leverage events), the gap in GDP growth deepens in the long-term: Low-leveraged countries' GDP growth is 6.4 times higher than high-leveraged countries' 5 years after the crisis. While these stylized facts cannot be used to point at causality, they do suggest that a more levered financial sector may have a more limited ability to respond, or that it suffers larger disruptions to intermediation (exacerbated by higher asset price buildups *ex ante* that lead to larger losses) when the economy contracts.

In addition to bank leverage, the literature has also identified other factors that affect the consequences of financial crises. For example, in both the longer historical record and more recently, the amount of public sector debt impacts both the degree to which the private sector can deleverage and the fiscal capacity for states to intervene directly (Reinhart & Rogoff 2013, Jordà, Schularick & Taylor 2016, Romer & Romer 2018). In addition, while bank equity does not appear to affect the likelihood of a financial crisis, having more equity mitigates their negative effects (Jordà et al. 2021). Larger credit spreads during crises also make them more severe (Krishnamurthy & Muir 2017).

Despite the natural importance of credit and output, other determinants and outcomes may also be salient, or act as intermediating forces that the literature has yet to take into account empirically. Obtaining consistent data on economic and financial characteristics for a large sample of countries over a long time span is difficult, especially for less-developed banking systems and economies with poor record keeping. Yet constructing more comprehensive datasets in a long-run panel format would allow researchers to analyze understudied events, control for relevant explanatory variables, and assess heterogeneity in relationships and would therefore provide a broader understanding of banking crises.¹⁷

4.2.2. Causal evidence. The stylized facts that emerge from the aggregate studies we discussed above point to an association between financial crises and downturns over the long run. Yet whether bank distress causes the economic declines is more difficult to ascertain. Studies pinpointing causal effects of banking crises in historical settings complement the modern literature by relying on varied sources of identification and by analyzing effects under different designs of the banking system. By delving deeper into a specific event, this line of work has also been able to connect the impact of banking crises to a much-varied range of outcomes—more so than studies that aggregate many events over a long time span.

Credible identification requires isolating the effects of credit supply shocks from changes in credit demand that may emerge from economic shocks. This is exceedingly challenging in a historical context where, for example, bank-borrower-level data needed for within-borrower estimators are typically not available. To overcome this challenge, researchers have exploited creative features of the historical environment to obtain variation in exposure to financial shocks unrelated to firm or local area health.

As discussed in Section 3.2, crises are often transmitted to institutions that themselves were not exposed to asset value declines. For example, runs on trust companies—the shadow banks of the era—during the 1907 Panic were triggered by fears that a few trust company directors were involved in a speculation scandal that was unrelated to their corporate clients. Frydman, Hilt & Zhou (2015) show that nonfinancial firms that had board interlocks with the most affected trust companies experienced worse outcomes. These affiliations alone can account for more than 18% of the aggregate decline in corporate investment in the United States in 1908. The effects were worse and more persistent for smaller firms, which suggests that information asymmetries played a role in aggravating the economic contraction.

Economists have long pointed to the importance of expansionary monetary policy to blunt the economic impact of banking crises (e.g., Friedman & Schwartz 1963). Yet causal evidence on the effects of monetary intervention is notoriously difficult to obtain. As we discuss in more detail in Section 5.2, the design of banking regulation in the 1920s and 1930s United States provides a unique context to answer this question convincingly. During the Great Depression, a discontinuity in monetary policy across Federal Reserve districts within Mississippi led to differences in bank failures and credit contraction. Contractionary monetary policy increased the rate of bank failures, which in turn led to declines in commercial activity (Richardson & Troost 2009), reduction in output and revenue for manufacturing establishments (Ziebarth 2013), and more firm exits (Hansen & Ziebarth 2017).

Financial frictions may have outsized implications for employment since firms typically need to finance wages in advance (Benmelech, Bergman & Seru 2021). Benmelech, Frydman

¹⁷Current efforts along these lines include systematic data on government interventions (Metrick & Schmelzing 2021), political outcomes (Funke, Schularick & Trebesch 2016), sovereign debt prices (Meyer, Reinhart & Trebesch 2022), and international trade flows (Xu 2022).

& Papanikolaou (2019) study this question in the context of the Great Depression, when the unemployment rate reached its historical peak, at 25%. Similar to Almeida et al. (2012), the study uses variation in the fraction of a firm's preexisting long-term bonds that matured during the crisis, when bond markets essentially froze, for identification.¹⁸ They find that lack of credit access accounted for a sizable fraction of the severe contraction in the employment of large firms, especially for those located in areas in which banks also failed. This finding supports Bernanke's (1983) assertion that disruptions to credit intermediation contributed to the severity of the Great Depression and shows that market freezes are also an important mechanism for the transmission of financial shocks to the real economy (Benmelech & Bergman 2018).

4.2.3. Long-term effects. A historical perspective is uniquely well suited to assess the persistence of real effects. Bank failures during the Great Depression may have had a long-term impact on the aggregate economy. For example, Nanda & Nicholas (2014) and Babina, Bernstein & Mezzanotti (2020) find that they are associated with reductions in patenting, suggesting that short-term financial shocks could have long-run implications by affecting an economy's ability to innovate, which compounds into the growth rate.¹⁹ The credit contraction of the 1930s also had long-run effects on individuals tracked over time in linked censuses. Even controlling for selective migration, credit-abundant labor markets experienced a reallocation of their workforce toward skilled, nontradable employment from 1930 to 1940 (Quincy 2021).

Outside of the United States and the Great Depression, the 1866 UK crisis was found to have a long-term impact on the patterns of international trade. The crisis originated in London but disrupted the provision of short-term financing provided by British international banks, which was the key source of finance for global trade. Using precrisis variation in the exposure to bank failures, Xu (2022) finds that the financing shock lowered export volumes and reduced exporter market shares within destinations. These market share losses persisted for close to four decades, in part because the initial financial shock caused importers to form new trade partnerships with other exporters.

Living through a banking crisis may also affect long-term outcomes by shaping the risk preferences of a generation. Individuals who experienced low stock market returns throughout their lives report in survey data to be less willing to take financial risk and to participate in the stock market (Malmendier & Nagel 2011). Koudijs & Voth (2016) lever a historical event to validate this view. In 1772, an investor syndicate speculating in Amsterdam went bankrupt. Lenders who were exposed but did not lose any money altered their behavior relative to unexposed ones, asking for much higher haircuts after this experience.

4.2.4. Political economy outcomes. Financial crises also appear to impact countries' political outcomes. Financial crises are correlated with political unrest and extremism over the very long run, but this relationship is not present during normal recessions (Funke, Schularick & Trebesch 2016). This connection is also evidenced in micro data. Doerr et al. (2022) provide evidence that German towns where a Jewish-managed bank failed during the 1931 banking crisis were more likely to be targets of anti-Semitic propaganda campaigns and to have higher growth in the Nazi

¹⁸A similar strategy is used by Janas (2022) to show that more constrained cities had to curtail their spending on public goods during the Great Depression.

¹⁹However, on aggregate, the 1930s were perhaps the most technologically progressive period of the twentieth century in the United States (Field 2003). Evidence from patents also suggests that the 1930s was a period of significant breakthrough innovations (Kelly et al. 2021).

vote share relative to towns exposed to the failure of a similar bank with no Jewish associations. When the imposition of the 1933 US silver purchase program drained Chinese banks of silver, firms reliant on those banks that were more exposed to silver outflow experienced more labor unrest and Communist Party membership growth among their workforce (Braggion, Manconi & Zhu 2020).²⁰ These two examples highlight that the more general relationship between banking disruptions and political outcomes may manifest in very different ways depending on the context.

4.3. Contextualizing Real Effects

While the role of credit expansion leading up to a crisis is well documented, the causes and mechanisms that may trigger such an event or exacerbate it as it unfolds are much more complex and varied. Evidence from specific episodes makes the case that many factors may play a role at different points of a crisis and that it is difficult to isolate them empirically.²¹ Where there seems to be consensus is that shocks to bank liabilities—expressed, for example, in deposit losses or outright failure—deteriorate bank assets.²² The contraction of credit that ensues has negative effects on the real economy, and these often persist far longer than the resolution of turmoil in the financial sector itself. This contrast suggests that information asymmetries may affect banks' abilities to fulfill their intermediary role during crises, as proposed in the seminal paper by Bernanke (1983).²³

We know much less about the specific mechanisms by which disintermediation happens. In some historical settings, fire sales of bank assets (e.g., Schnabel & Shin 2004, Rajan & Ramcharan 2016) or disruptions to the payments system (e.g., Olmstead-Rumsey 2019, Chen et al. 2020) appear to have played a role. More generally, there are ample opportunities for future work to test specific theories of disintermediation with historical data.

There are now many causal estimates of the effects of historical (and modern) financial shocks, but contrasting these estimates across studies is extremely challenging. Most identification strategies rely on reduced-form estimates based on fairly dissimilar bank treatment variables and are not straightforward to scale by the actual changes in bank health. Constructing estimates of relevant elasticities that are comparable across studies could be helpful for structural modeling and for improving our quantitative understanding of the impact of crises. Moreover, assessments of elasticities in a historical context may be particularly informative relative to those obtained from modern settings, where interventions are common and mitigate the impact of the initial financial shock.

²⁰Impressively, this study builds loan-level data between banks and firms in 1930s China and is therefore the only historical paper we know that can use within-firm variation to isolate credit supply channels as in Khwaja & Mian (2008).

²¹For example, scholars of the Great Depression continue to debate the relevance of several forces, including shocks to aggregate demand (Temin 1976), economic uncertainty (Romer 1990), monetary policy (Friedman & Schwartz 1963), constraints of the gold standard (Eichengreen & Sachs 1985, Bernanke & James 1991, Hsieh & Romer 2006), and disruptions to credit intermediation (Bernanke 1983).

²²Bernanke (2018) provides a review of this literature for the 2008 crisis. In a historical context, evidence from the Great Depression shows that banks responded to deposit outflows by contracting lending (Richardson & Troost 2009) and survey data corroborates that bank failures were the main reason for the lack of credit availability during this period (Carlson & Rose 2015).

²³In a historical context, when information asymmetries were likely more significant, relationships with financial intermediaries emerged as a way to ameliorate these problems (Frydman & Hilt 2017) but also propagated financial shocks to the real economy (Cohen, Hachem & Richardson 2021).

5. INSTITUTIONS AND INTERVENTIONS

5.1. Institutions

A complex set of institutions affects bank decisions, including laws and regulations, the structure of the banking system, and the information environment in which economic agents interacting with banks operate. Isolating the impact of specific forces on bank behavior and outcomes is challenging, in no small part because many of these constraints operate simultaneously and cannot easily be disentangled empirically. We examine lessons regarding specific institutional features that pertain to bank stability that can be gleaned from historical events. The presence of a less complex institutional design facilitates researchers in isolating their role within a context characterized by reduced government intervention.

5.1.1. Deposit insurance. Deposit insurance is a key feature of most modern banking systems. Intended to fend off bank runs, deposit insurance may exacerbate bank fragility if it reduces depositors' incentives to monitor, which thereby increases bank risk-taking. The trade-off between costs from increased moral hazard and benefits from reductions in liquidity risk is difficult to assess empirically. Modern evidence is inconclusive (see, e.g., Martinez Peria & Schmukler 2001, Demirgüç-Kunt & Huizinga 2004).

History provides unique within-country variation in deposit insurance. In the early twentieth century, several US states introduced insurance for deposits in state-chartered commercial banks. Calomiris & Jaremski (2019) contrast the experience of these institutions with that of uninsured banks. Insured banks attracted more deposits despite increasing lending and reducing cash reserves (and increasing leverage). During the downturn in the early 1920s, insured systems collapsed and depositors experienced heavy losses. Banks in the state deposit insurance system were also more likely to fail (Wheelock & Wilson 1995).²⁴ It is possible, however, that depositors lacked confidence in state governments' ability to honor their commitments. Today, insured depositors have confidence in the federal deposit insurance system, but runs can still be triggered by uninsured deposits, as experienced in the 2023 run on Silicon Valley Bank (Jiang et al. 2023) and in the earlier instance of Continental Illinois in 1984 (Carlson & Rose 2016).

5.1.2. Bank competition. Larger and diversified banks can be more efficient and profitable and therefore contribute to a more stable system, but they can also become "too big to fail" and exacerbate the risks and costs of crises. The rules that regulate the structure of the banking sector vary substantially across space and time and provide opportunities to understand their effects.

Until recently, the ability of US banks to branch within and across state lines was largely restricted, creating small and fragmented banks. What effects did limits to branch banking have on systemic stability? Scholars have qualitatively argued that this unit banking system made the United States more prone to crises (e.g., Bordo, Rockoff & Redish 1994, Grossman 1994). In the 1920s and 1930s, California allowed branching within the state through mergers and acquisitions of existing banks. Entry of branched banks induced other (unit) banks to reduce costs and made them more likely to survive the Great Depression (Carlson & Mitchener 2009).²⁵ Moreover, Californian cities where a branch of a large bank was present experienced a smaller contraction in lending and in economic activity (Quincy 2021). Altogether, these findings are consistent with the

²⁴Anderson, Richardson & Yang (2022) also find evidence consistent with a decline in depositor monitoring after the introduction of federal deposit insurance in 1935.

²⁵Increased bank concentration from 1885 to 1925 also appears to have contributed to bank stability in the United Kingdom (Braggion, Dwarkasing & Moore 2017).

work by Jayaratne & Strahan (1998), who find that bank deregulation in the late-twentieth-century United States improved bank stability.

The National Banking Era provides an opportunity to study the effects of bank competition unencumbered by concerns about selective bank entry. Capital requirement regulation required national banks opening in more populated towns to have more equity than those below a population threshold. Carlson, Correia & Luck (2022) exploit this arbitrary population cutoff to compare the behavior of incumbent banks in the 1890s.²⁶ Those in areas with lower barriers to entry increased loans by approximately 50% more than others in the decade following potential bank entry. The abundance of credit improved real economic activity, but banks in more competitive markets also took on more risks and were ultimately more likely to default. This paper provides a well-identified parallel to the stylized facts that emerge from analyzing many crises over time and space by showing that credit growth can have positive effects on the real economy while at the same time increasing financial fragility.

5.1.3. Prudential regulations. Causal evidence on the impact of prudential regulations in a historical context is scant. Some insights are obtained from the National Banking Era. Although both national and state banks provided similar services, minimum capital and reserve requirements for state-chartered financial institutions varied substantially across states, whereas national banks operating in the same areas were subject to uniform federal rules. Cross-state comparisons suggest that more stringent capital requirements were negatively correlated with bank failures, but higher reserve requirements were positively associated (Mitchener 2005).

Any insights from historical settings need to be interpreted with caution because solvency requirements tended to be much simpler in the past—for example, they did not typically take asset risk into account. Despite this caveat, this is an understudied area where historical settings may offer ways to isolate the role of prudential regulations in the absence of other institutions and interventions that mediate their impact in modern contexts.

5.2. Role of Interventions

During recent major crises, including the 2008 global financial crisis and the COVID-19 pandemic, governments around the world responded quickly by aggressively expanding money supply, injecting liquidity broadly, and providing fiscal stimulus. This policy handbook is not new and, in fact, has been learned and refined over many historical events. Bearing institutional differences in mind, historical settings are helpful for understanding which policies may be effective to mitigate the impact of banking panics, in part because, unlike today, participants did not have expectations of comprehensive central bank interventions.

5.2.1. Monetary interventions. From 1929 to 1933, close to 10,000 American banks suspended their operations, accounting for approximately 40% of the institutions in existence prior to the Great Depression. Whether these failures resulted from the reluctance of the central bank to arrest bank runs [i.e., address liquidity shortfalls as in Friedman & Schwartz (1963)] or it was instead a response to economic shocks that weakened bank balance sheets [i.e., bank insolvency, as proposed by Temin (1976)] is challenging to assess in any crisis. When monetary policy is conducted nationally, it is difficult to disentangle its effects from other government interventions

²⁶Xu & Yang (2022) use this discontinuity to study the effects of entry of the first national bank to an area on local money supply and find that reducing monetary frictions led to growth in the traded sector and structural transformation.

and a general economic downturn. However, the historical context provides a unique lens into the role of monetary policy because it was not uniform across Federal Reserve districts.

In what is arguably the first causal evidence on the role of monetary intervention, Richardson & Troost (2009) isolate the effect of monetary policy during the Great Depression by focusing on the unique case of a Federal Reserve District border within Mississippi. The northern half of the state is under the purview of the St. Louis Federal Reserve, while the southern half is within the Atlanta Federal Reserve District. Mississippi was homogeneous economically and demographically, especially closer to the district border, but the two districts pursued dramatically different monetary policies early in the Great Depression. St. Louis adhered to a real bills doctrine and largely did not provide liquidity to financial markets, keeping a tight discount window and strict collateral requirements. By contrast, the Atlanta Federal Reserve followed Bagehot (1873) and aggressively assisted banks, for example, by extending emergency loans and aiding member banks to extend credit to country banks.²⁷

When panic struck in 1930, banks suspended operations at much higher rates in the St. Louis District. Richardson & Troost (2009) estimate that, in the absence of Atlanta's intervention, the number of failed banks would have increased by approximately 40%. Starting in July 1931, the St. Louis Federal Reserve adopted Atlanta's policies. Following this change, the impact of shocks on bank failure rates became similar across the state, providing further evidence that the liquidity injections by the monetary authority were a key driver of the divergent regional experiences in 1930. Extending the analysis beyond Mississippi to the entire border of the Atlanta Federal Reserve District further corroborates these findings (Jalil 2014).

France experienced a banking crisis in the same period. Baubeau et al. (2021) trace the flight of deposits from unregulated banks into safer savings institutions and the central bank itself. The shift in the institutions holding deposits led to persistent declines in business lending because of the change in banking relationships as in Bernanke (1983) and the classic gold standard objective to increase metallic reserves during periods of instability. Therefore, deposits were channeled into gold rather than redeployed into the economy in another manifestation of the "golden fetters" (Eichengreen 1996).

5.2.2. Liquidity injections by the lender of last resort. An analysis of historical crises offers valuable insights into not only how and why policies for intervention have evolved over time but also how banking systems have responded to these events and the effectiveness of those responses. Examining historical events can help identify patterns and recurring issues that may inform future policy decisions and the development of more effective safeguards against future crises.

One of the earliest institutions to take on a central bank role was the Bank of Amsterdam. Following a period of expansion in lending activity during the Seven Years' War, the bank was confronted with the failure of a major banking house in 1763. Merchant banks, which relied on short-term credit, were unable to roll over funding (Quinn & Roberds 2015) and had to liquidate assets at fire sale prices (Schnabel & Shin 2004). To arrest the panic, the bank broadened the types of assets eligible for a repo-like lending facility (Quinn & Roberds 2015). While the intervention was modest by modern standards, it helped to prevent other major bank failures in Amsterdam.

Early central bank interventions often targeted specific institutions and were, in that sense, more akin to specialized rescue missions than widespread liquidity injections. For example, when the Comptoir d'Escompte found itself in financial difficulties in 1889, the Banque de France

²⁷Differences in discount rates across districts were relatively small and moved almost in unison and thus should not be used on their own to characterize monetary policy during this era. Rather, it was the additional policy tool of the collateral that was acceptable at the discount window that varied across districts.

promptly provided liquidity and ensured an orderly liquidation of what was clearly an insolvent institution (Hautcoeur, Riva & White 2014). To counter moral hazard, the bank applied severe and observable penalties to managers and directors.

Where no central bank existed, lender of last resort interventions were sometimes engineered by private organizations or prominent individuals. Prior to the establishment of the Federal Reserve, privately organized clearinghouses helped restore confidence in the banking system in the United States. Their tool kit, which developed over time, included the issuance of loan certificates, suspension of convertibility, and halting provision of bank-specific information (Gorton & Tallman 2018). They also often provided emergency loans to troubled member banks. Yet not all financial institutions had access to these private mechanisms for coinsurance, which made the system more fragile. The Panic of 1907 is a good example. The New York Clearing House provided loans to member commercial banks that had engaged in fraud and were experiencing runs. But shadow banks (trust companies) had no access to similar liquidity, and when the runs spread to them, panic ensued (Frydman, Hilt & Zhou 2015). Ultimately, J.P. Morgan organized a series of timely rescues that were instrumental in resolving the crisis. Even when central banks did exist, scholars have emphasized that external constraints, such as the gold standard, limited countries' abilities to use expansionary monetary policy during the Great Depression (e.g., Eichengreen & Sachs 1985, Eichengreen 1996, Bouscasse 2022).

The British experience over the course of four separate crises in the nineteenth century is also consistent with the central bank learning that fast and aggressive intervention in the form of discount window lending can successfully arrest panics (e.g., Bignon, Flandreau & Ugolini 2012, Anson et al. 2017). Yet most of the conclusions that interventions mitigate banking panics are descriptive. Exogenous cross-sectional variation in policies is hard to come by, in part because interventions often apply nationally and may be correlated with economic shocks.

Recent work attempts to provide causal evidence on the relationship between central bank interventions and real outcomes in a broad set of countries since the 1870s. Instrumenting for interventions with the central bank governor's precrisis ideological beliefs, Ferguson et al. (2023) find that liquidity injections led to milder crises and quicker recoveries.

The historical development of central bank intervention shows that governments have become more proactive in their approach. This raises the question of whether earlier policy makers were too cautious or the increasing complexity of financial markets demands more comprehensive interventions.²⁸ To determine the optimal approach, it is necessary to accurately measure the impact of interventions on the economy. Currently, the literature is mostly descriptive and does not address this issue. We also have a limited understanding of how the specific tools used in interventions impact their outcome, making it an area ripe for further investigation.

5.2.3. Moral hazard considerations. The rich and varied literature on historical banking crises makes a clear case that the causes and consequences of bank fragility are varied and complex and often dependent on the specific institutions and design of the banking system. Yet financial intermediaries have long been a key lubricant for the economy, and bank failures, today and in the past, are costly. The painful consequences of inaction in the past have greatly influenced modern policies and are the source of the modern central bank practice of early and widespread interventions.

²⁸It is also worth noting that, for much of history, governments were more conservative with budget deficits (outside of wars) and fiscal stimulus was too small to make a difference. For example, the literature argues that fiscal policy during the Great Depression was too timid to have substantive economic impact (Romer 1992, Almunia et al. 2010, Payne & Uren 2014).

Central banks have intervened in financial markets due to growing awareness of the adverse consequences of nonintervention, as illuminated by academic literature. However, these interventions, especially when substantial in scale, can result in moral hazard where excessive risk-taking leads to more severe and costly crises. Although moral hazard is a well-established concept, quantifying it remains a challenge. As financial intermediation evolves and becomes more complex and as the global economy expands, it is crucial not only to implement crisis management mechanisms but also to prevent excessive risk-taking. In the past, the expectation that troubled banks would be allowed to fail may have curbed risk-taking *ex ante* and increased monitoring incentives.²⁹ Despite concerns over moral hazard, there is limited quantitative understanding of how bailout expectations impact financial institutions, how these decisions vary with the banking system design, and the direct and indirect costs of interventions. Further progress in this area would benefit from both historical and modern perspectives.

6. CONCLUSION AND AREAS FOR FUTURE RESEARCH

Recent work on historical banking crises has made tremendous progress by uncovering general stylized facts and by leveraging specific episodes to provide a more nuanced understanding of their genesis and consequences, as well as the policies that can ameliorate their impact. Yet there are still large gaps in the literature. First, existing work is primarily centered around the United States and a small set of developed economies, and within those, regulated financial institutions for which data are available. Detailed knowledge of events other than the Great Depression is also more limited. Second, the empirical evidence in many of the areas we cover in this review is still primarily correlative rather than causal.

Finally, while theoretical work on the sources of panics, their transmission, and the breakdown in financial intermediation is well developed, the empirical evidence does not usually cleanly test specific theories. The lack of a clear mechanism also makes it difficult to compare magnitudes across studies. Efforts to provide estimates that can be standardized across studies would allow researchers and policy makers to connect the stylized facts that emerge from analyzing a large number of crises to the more nuanced and causal evidence from episode-specific studies and to provide valuable insights to guide theoretical work and structural estimation. The historical perspective is instrumental in this process, as it enriches our understanding of modern crises and uncovers patterns and trends that may be missed in contemporary analyses. By broadening data coverage, providing additional causally identified evidence, and testing theories in different environments, historical work will continually support and bolster our comprehension of banking panics. By incorporating historical evidence, researchers and policy makers can gain a deeper appreciation of the complex and interrelated factors that drive financial crises and develop more effective strategies for preventing and mitigating future crises.

DISCLOSURE STATEMENT

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²⁹Ferguson et al. (2023) show that larger central bank balance sheet expansions during crises lead to subsequent crises being more likely.

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