

Banking Crises in Historical Perspective*

Carola Frydman[†] Chenzi Xu[‡]

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Abstract

This paper surveys the recent empirical literature on historical banking crises, defined as events that took place before 1980. Advances in data collection and identification have provided new insights into the causes and consequences of crises 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 negative effects on the real economy; and third, government interventions can ameliorate these costs. Contrasting historical episodes over time also reveals that the process of crisis formation and evolution is often context-dependent. Thus, we also highlight specific institutions and contexts that give rise to divergent experiences. We conclude by identifying important gaps in the literature and discussing avenues for future research.

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

1 Introduction

Banking crises rarely go unnoticed. Given their outsized disruptions to firms and individuals, they have received much attention from contemporaries, policymakers, and academics in the past and 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 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,

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[†]Northwestern Kellogg. Email: c-frydman@kellogg.northwestern.edu.

[‡]Stanford GSB. Email: chenzixu@stanford.edu.

every 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 the 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 about 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 participation. 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. 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. This has 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 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 toolkits 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 (very) broad

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 top quartile of leverage within each country is followed by 36% probability of financial crisis within 5 years compared to 22% for the bottom quartile.

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 et al. (2009) on asset price bubbles, Gray (2009) on vulnerabilities during financial crises, Laeven (2011) on policy interventions, Peek and 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 and Gorton (1991) and Monnet and Velde (2021) on the history of banking and intermediation.

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 (Section 2). In Section 3 we discuss the source and transmission of crises, and within that 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 to 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 and Rogoff (2009), Jordà et al. (2013a), and Laeven and 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 Sprague (1910), Kindleberger (1990) or Wicker (2000). Gathering such evidence often requires systematic historical records, and therefore much of the existing work is biased toward economies that have been relatively developed in modern history. More recently, scholars have begun 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 U.S., 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

⁴See Jalil (2015) for the U.S. and Kenny et al. (2021) for the U.K., for example.

⁵Sufi and Taylor (2022) provides a recent overview of the primary similarities and differences among several chronologies.

sufficiently severe made a lasting enough impact to be recorded (Romer and 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 et al. (2020) identifies 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 and Romer (2017) also uses a single qualitative record—annual 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 and Schmelzing (2021) develops 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 requirements imposed on the data. For instance, Baron et al. (2020) covers 24 advanced economies and 22 emerging economies over the years 1870 to 2016, and Romer and Romer (2017)’s measure is only available for 24 advanced economies from 1967 to 2012. By contrast, Reinhart and Rogoff (2009) covers a much larger set of 70 countries, both emerging markets and advanced economies, from 1800 until the present. Users of databases of historical banking crises need to be mindful of these tradeoffs, and the impact they may have on their analysis.

2.2 Focus of the Recent Literature and of this Survey

The literature on historical banking crises, defined as events taking place prior to 1980, is much too large to do justice in one survey. Our review is therefore not comprehensive. To highlight recent advances, we focus primarily on empirical work produced in the last twenty years. While we can only discuss a subset of these recent articles in detail, we begin by providing a broader overview of the recent literature, based on a systematic quantitative analysis of their focus and style.

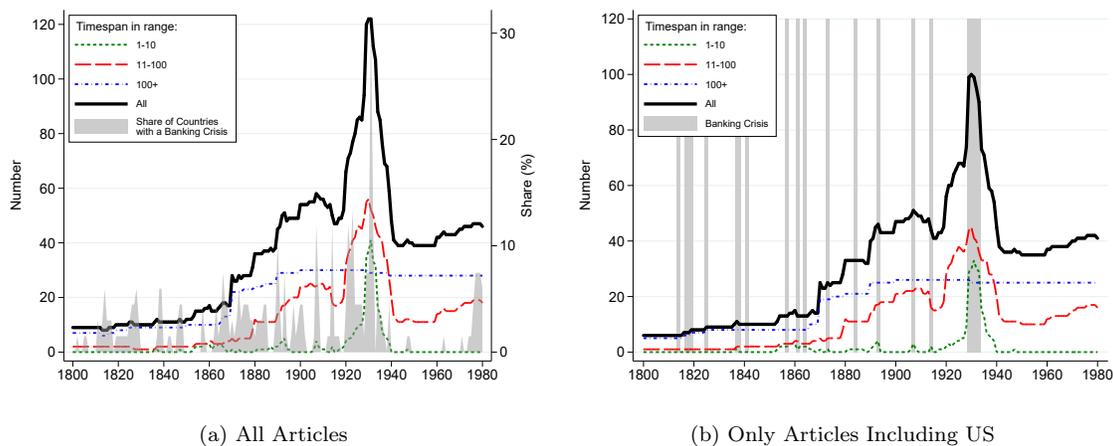
We base our statistics on all articles related to banking crises published in 24 leading general interest and field journals between 2000 and 2022. We concentrate on the 218 papers that cover the 1800-1980 period because there are few articles on crises prior to 1800, and no crisis in the last 40 years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

Figure 1a plots the number of publications studying a given year in the 1800—1980 period (left axis) along with the share of countries experiencing a banking crisis in that year (in gray; right axis). 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 (in the blue dot-dash line), primarily using a country panel structure. Yet many papers follow a very different approach, covering only up to a decade (in the green dotted line). These papers tend to focus on a specific

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 19th century were listed on stock exchanges.

crisis within one country, and disproportionately study the Great Depression, as reflected in the spikes around the 1930s, and on the United States. To illustrate this point, Figure 1b looks only at the subset of papers that include the U.S. (with the timing of American banking crises displayed in gray vertical lines); the green lines are remarkably similar in both graphs. Finally, longer-run papers covering 11 to 100 years (in the red dashed line) are also concentrated around the Great Depression in both samples. While some papers in this group analyze one main episode, others consider many crises.

Figure 1: Number of Publications Studying a Year and Historical Banking Crises Patterns, 1800-1980



Notes: The figure plots the number of papers whose analysis includes a given year from 1800 until 1980. The green dotted line plots papers with a sample period between 1 to 10 years; red dashed lines between 11 to 100 years; blue dot-dash lines more than 100 years; and thick black includes all articles. 1a plots all articles and 1b only plots articles whose samples include the United States. Historical banking crises patterns are shown by plotting the share of countries experiencing banking crises (gray shaded areas in 1a) and years in which the U.S. experienced banking crises (gray bar lines in 1b). Number of publications can be read on the left vertical axis and banking crisis experience can be read on the right vertical axis.

Sources: Publication data from authors' calculations, and historical banking crisis data from Reinhart and Rogoff (2009).

Crisis episodes have not been evenly studied. There is a striking lack of correlation between the share of crises occurring around the world in any given year and the number of papers studying those particular events (18% including the Great Depression period and 7% 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 Depression that invite further study. Given the current focus of the literature, our review necessarily emphasizes events that took place in the U.S. and to a lesser extent in Europe, and it disproportionately discusses insights from the Great Depression.⁷

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

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 and Bernstein (2000)) 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 primarily reflected in the blue dot-dashed lines in Figures 1a and 1b. 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 leverage the unique institutional frameworks and contexts of specific crises in order to make causal arguments and to shed light on mechanisms. These papers show that there is 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 below.

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

3 Crisis Onset and Transmission

3.1 Sources of Bank Fragility

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 in, for example, Eggertsson and Krugman (2012) and Bordalo et al. (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. This leveraging can lead to the creation of financial bubbles, which eventually burst, leading to financial instability and economic crisis.

Minsky’s view suggests that the accumulation of debt may be particularly pernicious because it can create a positive feedback loop, in which the increased value of assets leads to even more borrowing and speculation, which in turn drives an even greater increase in asset values. This 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, this creates a sudden demand for debt repayment and leads to a sudden decrease in the value

Russia appear among the most “under” represented in the literature.

of assets. This can trigger a downward spiral of asset sales and fire sales, causing a crash in the financial system and a broader economic crisis.

Most of the empirical evidence correlating financial market conditions to banking crises indeed finds that leverage builds up in the years leading up to the crisis. Reinhart and 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 standard recessions, Schularick and Taylor (2012) show that recessions that follow a financial crisis are more likely to be preceded by credit growth to households and to the non-financial sector in the five years leading up to the event.

To give 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 for the 1870-2020 period in the Jordà et al. (2017) database.⁸ Leverage is defined as the ratio of private credit to GDP. In the five 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.⁹

Studies have used evidence across multiple crises to unpack the types of credit expansion that may contribute more to fragility. For example, Reinhart and Rogoff (2013) and Richter et al. (2021) point to housing market booms playing an outsized role. Moreover, the exact composition of debt buildup appears to matter. Using a sample of 117 countries since 1940, Müller and Verner (2021) finds that credit supplied to the non-tradable sector leads to financial crises, whereas credit flowing to the tradable sector does not. In a purely U.S. setting, Kumhof et al. (2015) uses cross-sectional variation around the Great Depression and 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 et al., 2018). In addition, the prolonged periods of low volatility are systematically followed by a banking crisis, indicating that the credit buildup is a potential 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 not only discusses the relationship between credit and crises in terms of quantities but also prices. Unusually high credit growth is correlated with unusually low credit spreads where widening spreads presage crises, at least among advanced economies since the 1870s (Krishnamurthy and Muir, 2017). Altogether, this body of scholarly work provides general consensus on several early warning indicators, based on quantities and prices, for policymakers 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 leveraging evidence across many events and countries. But this style of work requires to observe the same variable across countries and years, and therefore data limitations constrain the number of characteristics that can be analyzed. Moreover,

⁸We determine the top and bottom quartiles of leverage events using the full distribution of country-year observations in the sample. The interquartile range is 0.5. Results are qualitatively similar when we instead define quartiles of leverage events within each country.

⁹This difference is statistically significant at about the 90% level ($t = -1.64$). Moreover, the number of crises across quartiles differs importantly, with 27 events in the high-leverage group and only 17 in the low-leverage bucket.

in these studies crises typically arise out of the broader macrofinancial 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 3.1.3. Moreover, banking crises 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 Individual Depositor Behavior

Bank runs and panics are a classic way for crises to begin and spread once there is fragility. 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 (historical) settings without deposit insurance, especially if they actively monitor banks (Calomiris and Kahn, 1991).

It is challenging to provide direct evidence of depositors' private information that delineates the informed from the uninformed, and hence most of the literature relies on proxies for the likelihood of being informed. Kelly and O Gráda (2000) uses 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 and 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 et al. (2015) shows that this mechanism was key for the 1907 Panic in the U.S. and Xu (2022) for the 1866 U.K. crisis, even after controlling for bank health metrics, such as leverage. 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 there was no evidence of insolvency, uninformed depositors were more likely to close their accounts (O Gráda and White, 2003). Once the panic unfolded, more sophisticated depositors joined in, consistent with self-fulfilling runs without fundamental shocks to bank solvency (Diamond and 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 and Jagannathan (1988), may play an important role in diffusing financial instability.

3.1.3 Other 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 pre-crisis bank-level proxies intended to capture asset risk, liquidity, and leverage, among other

characteristics.¹⁰ 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 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 and Dybvig, 1983). This sort of fragility is not limited just to deposits, which are now fully insured for most depositors and no longer subject the same to risk of runs.¹¹ 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 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 and Mitchener, 2006; Quincy, 2021) but increased them in others (Calomiris and Mason, 2003; Carlson, 2004; Colvin et al., 2015). The sources of this discrepancy are not well understood, which 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, "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.

3.2 Crisis transmission

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.¹² For example, banks located in areas where other banks failed were more likely to experience distress during the Great Depression (Calomiris and

¹⁰For instance, pre-crisis liquidity shortage played an important role in triggering the 1893 bank panic (Carlson, 2005). Other examples include Calomiris and Mason (2003) for the Great Depression U.S.; Colvin et al. (2015) for 1920s Netherlands; Grodecka-Messi et al. (2021) for 1907 Sweden.

¹¹However, 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 and Metrick, 2012) and runs on money market funds in March 2020 (Li et al., 2021).

¹²The specific proxies for local conditions vary substantially across studies, depending on data availability. Examples include employment, business failures, the value and type of local production, building permits, or income.

Mason, 1997; Carlson, 2010; Davison and 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 Federal Reserve System, created in 1913, reduced the concentration of interbank networks as banks shifted their correspondent relationships away from New York City and towards cities with Federal Reserve offices (Jaremski and Wheelock, 2019).¹⁴ Yet the role of interbank networks in transmitting liquidity shocks did not disappear. Historians have shown that 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 et al., 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 around 15 percent (Mitchener and 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 Depression.

Boissay et al. (2016) provides 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 micro-evidence from specific crisis episodes to the broader correlation that leverage precedes crises 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 (see, among others, Peek and Rosengren (2000), Schnabl (2012) and Bottero et al. (2020) in a modern context). 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 18th century Europe and spread domestic shocks over the continent (Schnabel and 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. In addition, it is more likely to suffer from "hot" flows in which foreign investors offload these risky investments during downturns in favor of holding safer assets. These fire sales impact all residual investors holding the asset. 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., White, 2016; Mitchener and Weidenmier, 2008).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 and Goldberg (2012) show was the case for the international propagation of the 2008 financial

¹³See for example Anderson et al. (2019) on the role of interbank networks in increasing systemic risk during the U.S. National Banking Era (1865–1913).

¹⁴More generally, the founding of the Fed had a significant impact on the functioning of financial markets, for example reducing volatility during crises (Bernstein et al., 2010).

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.

crisis. 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 that these failures not only 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 and Meissner (2011) and Reinhart and Rogoff (2011) find that capital inflows appear to import 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 (Devereux and Yu, 2019; Bordo and Meissner, 2011).

4 Real Effects of Crises

4.1 Financial Crises are Special

Financial crises have systematically been shown to be costly. Across centuries and countries, financial crises are associated with worse declines in output and consumption than other types of crises on average (Jordà et al., 2013*b*; Cerra and Saxena, 2008; Nakamura et al., 2013). Relatedly, Baron et al. (2020) shows 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 U.S. 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 and 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 before, it is possible that these more modest effects are partly attributable to the more widespread interventions of modern economies to ameliorate these negative impacts in recent years.

Prices also help highlight the uniqueness of financial crises. 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. The increase in risk premia has also been detected during the Great Depression in the U.S. (Duca, 2013).

4.2 Costs of Crises

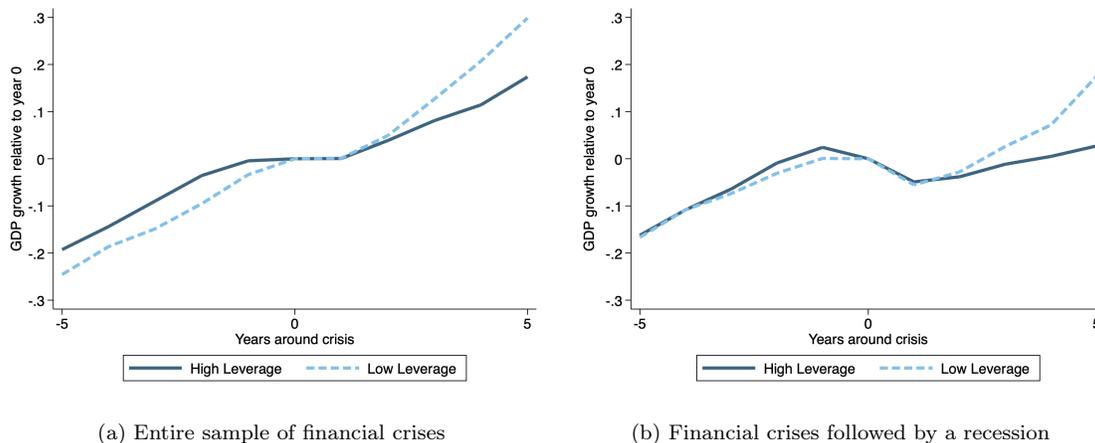
4.2.1 Role of Leverage in Recessions

Since leverage in the banking system is an important predictor of a crisis taking place, and the downturns that follow a financial crisis are more severe and persistent than those of a normal recession (e.g., Jordà et al., 2013*b*; Cerra and Saxena, 2008), it is only natural to consider whether the aftermath of crises is also affected by pre-crisis debt levels. We lever the availability of comprehensive data on credit, output, and crises for 18 advanced economies from 1870 to the present constructed by Jordà et al. (2013*b*) to present stylized facts on the relationship between leverage, financial crises, and output over the long run.

In Figure 2*a*, we document the evolution of real GDP in a ten-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 solid line shows the path for events that can be categorized as "High" leverage and the dashed line presents the "Low" leverage events, defined as being above or below the median leverage in the sample.¹⁶ The figure reveals that countries that enter a recession with low leverage experience stagnation in GDP growth for about a year, but that growth resumes quickly and continues on-trend. In fact, financial crises are not followed by deep recessions on average. However, within the set of high-leverage crises, GDP does stagnate for about two year, and it does not recover the losses relative to the trend in the five years that follow.

Figure 2: The evolution of real GDP growth around financial crises



Notes: The figure plots the evolution of real GDP growth in the ten-year window around a financial crisis for 18 advanced economies from 1870 until 2020. The blue (red) line categorizes crises that correspond to “high” (“low”) leverage event. Figure 2a is constructed using the entire sample of financial crises, whereas Figure 2b restricts the analysis to the financial crises that are followed by a recession as in Jordà et al. (2013b). GDP is normalized to 1 in the year of the crisis. There are 88 financial crises in the full sample, 48 of which (55%) are followed by a recession.

Sources: Historical banking crisis data from Jordà et al. (2017).

This modest effect of leverage on output, however, does obscure substantial heterogeneity. About 55% of the 88 financial crises in the sample are followed by a recession. In Figure 2b, we restrict the sample to these events, as in Jordà et al. (2013b). In this case, pre-existing levels of credit make a substantial difference in the severity of the crisis. Despite the fact that both high- and low-leveraged countries experience economic losses that are of similar magnitude (the peak to trough losses in GDP in high-leverage events is 4.9% compared to 5.5% 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 five 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 more limited ability to respond, or suffer larger disruptions to intermediation (exacerbated by higher asset price buildups ex-ante that lead to larger losses) when the economy suffers.

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 and Rogoff, 2013; Jordà et al., 2016;

¹⁶As before, results are similar when we calculate the median level of leverage within a country, as opposed to across all country-years.

Romer and 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 and Muir, 2017).

Despite the natural importance of credit and output, other economic and financial 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 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 to 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 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 is typically not available. Researchers sometimes exploit 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 during the 1907 Panic were triggered by fears that a few trust company directors were involved in a speculation scandal, even though they had no connection to their corporate clients. One likely reason the panic was spread to other sectors was that there was no central bank at that time that could quickly intervene and ameliorate the runs. Frydman et al. (2015) show that non-financial firms that had board interlocks with the most affected trust companies experienced worse outcomes. These affiliations alone can account for more than 18 percent of the aggregate decline in corporate investment in the U.S. in 1908. The effects were worse and more persistent for smaller firms, pointing to a potential role for asymmetries of information in aggravating the contraction.

Economists have long pointed to the importance of expansionary monetary policy to blunt the economic impact of banking crises (Friedman and 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. More bank failures in turn led to declines in commercial activity (Richardson and Troost, 2009), reduction in output and revenue for manufacturing establishments

¹⁷Current efforts along these lines include systematic data on government interventions (Metrick and Schmelzing, 2021), political outcomes (Funke et al., 2016), sovereign debt prices (Meyer et al., 2022), (Xu et al., 2020), and international trade flows (Xu, 2022).

(Ziebarth, 2013), and more firm exits (Hansen and Ziebarth, 2017).

Financial frictions may have outsized implications for employment since firms typically need to finance wages in advance (Benmelech et al., 2021). Benmelech et al. (2019) study this question in the context of the Great Depression, when the unemployment rate reached its historical peak, at 25 percent. Similar to Almeida et al. (2012), they exploit 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 access to credit accounted for a significant fraction of the severe contraction in the employment of large firms, especially for those located in areas in which banks also failed.¹⁹ This finding supports Bernanke (1983)’s 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 and 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 Depression may also plausibly have a long-term impact on the aggregate economy. For example, Nanda and Nicholas (2014) and Babina et al. (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.²⁰ 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, non-tradable employment from 1930 to 1940 (Quincy, 2021).

Outside of the U.S. and the Great Depression, the 1866 banking 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. Exploiting pre-crisis 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 economic outcomes over the long run by shaping the risk preferences of a generation. Individuals that 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 and Nagel, 2011). Koudijs and Voth (2016) lever a historical event to validate this view. In 1772, an investor syndicate speculating in Amsterdam went bankrupt. While distress was publicly known, 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.

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

¹⁹Lee and Mezzanotti (2015) and Ziebarth (2013) provide broadly consistent findings from manufacturing establishments, though these data do not allow to control for important characteristics such as profitability.

²⁰However, on aggregate the 1930s were perhaps the most technologically progressive period of the twentieth century in America (Field, 2003).

4.2.4 Political Economy Outcomes

Financial crises also appear to impact countries' political outcomes. Funke et al. (2016) shows that there is a correlation between historical financial crises and political unrest and extremism over the very long run that is not present during normal recessions (Funke et al., 2016). Doerr et al. (2022) provides 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 vote share relative to towns exposed to the failure of a bank with no Jewish associations.

Braggion et al. (2020) shows that the imposition of the 1933 U.S. Silver Purchase program drained Chinese banks of silver, and firms reliant on banks more exposed to silver outflow experienced more labor unrest and Communist Party membership growth among their workforce. The study amasses loan-level data between banks and firms in 1930s China (and is the only historical paper we know that uses a within-firm variation to isolate credit supply channels) to show that firms with borrowing relationships with banks with more pre-shock silver reserves experienced a more severe contraction in their loans.

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 be at play 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' ability 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 and Shin, 2004; Rajan and 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 is ample opportunity 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 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

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 and Schwartz, 1963), constraints of the gold standard (Eichengreen and Sachs (1985), Bernanke and James (1991) and Hsieh and Romer (2006)), and disruptions to credit intermediation (Bernanke, 1983).

²²(Bernanke, 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 and Troost, 2009) and survey data corroborates that bank failures were the main reason for the lack of credit availability during this period (Carlson and 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 and Hilt, 2017) but also propagated financial shocks to the real economy (Cohen et al., 2021).

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.

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 the 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.

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 and increases bank risk-taking. The tradeoff between costs from increased moral hazard and benefits from reductions in liquidity risk is difficult to assess empirically. Modern evidence is inconclusive (see, for example, Martinez Peria and Schmukler (2001) and Demirgüç-Kunt and Huizinga (2004)).

History provides unique within-country variation in deposit insurance. In the early twentieth century, several U.S. states introduced insurance for deposits in state-chartered commercial banks. Calomiris and Jaremski (2019) contrast the experience of these institutions with that of noninsured banks. Insured institutions attracted more deposits despite increasing lending and reducing cash reserves (and increasing leverage). During the next 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 and Wilson, 1995).²⁴ It is possible however that depositors lacked confidence in state governments' ability to honor their commitments. Further studies analyzing whether the relationship between insurance and bank failures is robust to historical contexts with stronger credibility would further our understanding of this institutional design.

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.

²⁴Anderson et al. (2022) also finds evidence consistent with a decline in depositor monitoring after the introduction of federal deposit insurance in 1935.

Until recently, the ability of U.S. banks to branch within and across state lines was largely restricted, creating small and fragmented banks. Scholars have qualitatively argued that this “unit banking” system made the U.S. more prone to crises (e.g., Grossman, 1994; Bordo et al., 1994). What effect did limits to branch banking have on systemic stability? 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 and Mitchener, 2009).²⁵ Moreover, Californian cities with a large bank branch experienced a smaller contraction in lending and in economic activity (Quincy, 2021). Altogether, these findings are consistent with Jayaratne and Strahan (1998), who find that bank deregulation in the late twentieth century U.S. 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 the population threshold. Carlson et al. (2022) exploits the 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 about 50 percent 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 nice episodic and 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.

Prudential Regulations

Direct causal evidence on the impact that prudential regulations have played in a historical context is scant. Some insights are obtained from the National Banking Era. Though 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 had a negative correlation with bank failures, but higher reserve requirements had instead a positive effect (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 government 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

²⁵Increased bank concentration from 1885 to 1925 also appears to have contributed to bank stability in the U.K. (Braggion et al., 2017).

²⁶Xu and Yang (2022) uses 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.

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.

Monetary Interventions

From 1929 to 1933, close to 10,000 American banks suspended their operations, accounting for about 40 percent of the institutions in existence before the onset of 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 and Schwartz (1963)), or whether 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 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 and Troost (2009) isolates the effect of monetary policy during the 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 Fed, while the southern half lays 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 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 Fed 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 and Troost (2009) estimate that in the absence of Atlanta’s intervention, the number of failed banks would have increased by about 40 percent. Starting in July 1931, the St. Louis Fed 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, and Baubeau et al. (2021) document the evolution of the crisis on the financial sector. Using detailed balance sheets, they 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” in Eichengreen (1996).

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.

Lender of Last Resort

An analysis of historical crises offers valuable insights not only into how and why policies for intervention have evolved over time, but also into how banking systems have responded to these events and the effectiveness of those responses. Additionally, 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 and Roberds, 2015) and had to liquidate assets at fire sale prices (Schnabel and Shin, 2004). To arrest the panic, the Bank broadened the types of assets eligible for a repo-like lending facility (Quinn and Roberds, 2015). While the intervention was modest by modern standards, it helped 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 promptly provided liquidity and ensured an orderly liquidation of what was clearly an insolvent institution (Hautcoeur et al., 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 during American panics. Their toolkit, which developed over time, included the issuance of loan certificates, suspension of convertibility, and halting provision of bank-specific information (Gorton and Tallman, 2018). They also often provided emergency loans to troubled member banks. Yet not all financial institutions had access to these private mechanisms for co-insurance, which made the system more fragile. The Panic of 1907 is a good example. The New York Clearing House (NYCH) 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 et al., 2015). In the end, J.P. Morgan organized a series of timely rescues that were instrumental in resolving the crisis.

The British experience over the course of four separate crises in the 19th century is consistent with the central bank learning that fast and aggressive intervention in the form of discount window lending successfully arrests panics (e.g., Bignon et al., 2012; Anson et al., 2017). As with the evidence in the U.S., 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. Richardson and Troost (2009) and Carlson et al. (2011) are two examples where the deviation in the Federal Reserve Bank of Atlanta's policies from other Fed districts provides quantitative support for broad liquidity injections mitigating bank panics and failures.

The historical development of central bank intervention shows that governments have become more proactive in their approach. However, this raises the question of whether earlier policymakers were too cautious or whether the increasing complexity of financial markets demands more comprehensive interventions. To determine the optimal approach, it is necessary to accurately measure the impact of interventions on the economy. Currently, the literature in this field is mostly descriptive and does not address this issue. There is also limited understanding of how the specific

tools used in interventions impact their outcome, making it an area ripe for further investigation.

Interventions in the Real Economy

The pernicious effects of historical bank failures on the real economy serve as a hard-earned lesson to modern policymakers. To the extent that they can, governments not only seek to ameliorate the impact of crises by resolving the financial dislocations as quickly as possible but also they are also more likely to use fiscal policy than in the past.

A comparison of the Great Depression with the Great Recession reveals that both monetary and fiscal responses were faster and more aggressive in the twenty-first century. Scholars have emphasized the role of the gold standard in constraining countries' ability to use expansionary monetary policy during the Depression (e.g., Eichengreen, 1996; Eichengreen and Sachs, 1985; Bouscasse, 2022). The gold standard may have also limited the use of fiscal stimuli, but countries were accustomed to follow more conservative budget deficit and debt policies historically. Regardless of the reason, the consensus that emerges from the literature is that fiscal policy was too timid during the Depression to have substantive economic impact (Romer, 1992; Almunia et al., 2010; Payne and Uren, 2014).

5.2.1 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 banks 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.

Central banks have intervened in the financial markets due to growing awareness of the adverse consequences of non-intervention, 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 the global economy expands, it is crucial to not only implement crisis management mechanisms but also prevent excessive risk-taking. In the past, the lack of rescue in the case of bank failure may have curbed risk-taking and increased monitoring incentives. Despite concerns over moral hazard, there is limited quantitative understanding on 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 U.S. 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 policymakers 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 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 a historical environment, historical work will continually support and bolster our comprehension of banking panics. By incorporating historical evidence, researchers and policymakers 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.

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