Regional Financial Crises*

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Abstract

Using a newly-constructed panel dataset of U.S. states from 1863 to 2022 that combines bank balance sheets, real economic activity, and a systematic survey of all major chronologies of U.S. financial crises, we document the following facts: (i) a measure of regional financial crises, combining narrative evidence with statistical indicators, predicts state-level output losses of 4%, (ii) these regional crises are costly not only for affected state but also for its geographic neighbors, even after controlling for U.S.-wide systemic crises episodes, and (iii) the share of states experiencing local financial distress predicts national output even after the inclusion of a binary crisis indicator. These findings suggest that existing studies of financial crises, by ignoring regionally-concentrated events, may have underestimated their costs.

Keywords: financial crises, regional crises, state-level business cycles

JEL classification: C38, N91, N92, O47

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1 Introduction

Financial crises represent defining moments in economic history, often imposing substantial and persistent costs on society. A large cross-country literature documents that systemic banking crises are followed by severe and protracted recessions (Cerra and Saxena, 2008; Reinhart and Rogoff, 2009; Schularick and Taylor, 2012). However, the intensity and aftermath of financial distress is highly heterogeneous across regions within countries, as suggested by episodic evidence from the Great Recession (Mian and Sufi, 2010; Huber, 2018) and the Great Depression (Gorton, Laarits and Muir, 2023). These individual crisis studies unearth a broader question that the cross-country work is not designed to answer: How damaging is financial distress to regional economies even when contemporaries and historians do not deem it sufficiently severe to qualify as a nationwide systemic crisis?

In this paper, we study this question using regional variation in financial distress within the United States from the Civil War until today. The United States offers a natural laboratory for studying financial crises. From the Panic of 1893 to the 2023 banking sector turmoil, it has experienced financial turbulence with remarkable regularity. Regional variation allows us to move beyond the small number of nationwide crisis episodes, to quantify the macroeconomic consequences of financial distress across a much broader set of events, and to net out common national shocks by comparing states that were differentially exposed within the same year. Our setting therefore permits both new estimates of the economic impact of regional crises and a comprehensive study of crisis dynamics in the United States.

However, two critical limitations have traditionally made it challenging to systematically study these local episodes. First, there is a lack of historical regional time series data. Because crises are relatively rare events, an analysis based on national time series alone is subject to small sample bias. The challenge is that few time series for regional data have been digitized; the Bureau of Economic Analysis, for example, only publishes state-level GDP data since 1963. We address this by assembling a new historical state-level macro-financial panel dataset covering 48 states from 1863 to 2022. To do so, we digitize and harmonize historical state-level bank balance sheets from several sources, which we combine with 62 annual indicators of economic activity constructed in a companion paper (Hoon et al., 2026).

Second, there is considerable disagreement among economic historians about which year should be considered a "crisis." To overcome this challenge, we conduct a comprehensive survey of 25

major financial crisis chronologies covering the entire history of the United States. For each list, we record its definition, the type of financial crisis it covers, and its time period. We then use this survey to classify years into three categories: (a) years flagged as crisis years by at least one chronology; (b) a "benchmark" list of major crises on which there is broad agreement; and (c) a list of minor crises and episodes of government interventions that appear in some chronologies but fall outside the benchmark list. Taken together, our survey of chronologies provides us with valuable narrative evidence which we harness to identify regional crisis events.

Equipped with these data, we establish three key findings about regional financial crises in the United States using (panel) local projections.

First, by combining our survey of narrative chronologies with objective statistical measures of local banking sector distress, we develop a new chronology of local financial distress. In particular, our baseline measure defines local financial distress as state-year observations where (a) at least one chronology indicates that the U.S. experiences a crisis and (b) there is evidence of a local deposit or wholesale liability contraction, together with at least one bank failure, within one year of that crisis year. This measure aligns closely with existing narrative evidence but identifies 1565 regional "crisis" episodes, considerably more than the 7 U.S.-wide benchmark crises in our post-1870 estimation sample. Our local projections show that local financial distress is followed by sizable output losses at the state level, on the order of 4% at a one-year horizon. Moreover, output remains below its pre-distress level (about 2.4%) even when we include year fixed effects to control common national shocks such as changes in nationwide monetary or fiscal policy. Finally, we show that local financial distress is costly even when it occurs entirely outside U.S.-wide systemic events, with output losses similar to the baseline. We find that these estimates are robust across a wide range of alternative definitions of what constitutes statistical evidence of local banking sector issues and econometric specifications.

Second, we document that local financial distress generates negative spillovers across state lines. To estimate a state's exposure to distress in its neighbors, we follow the approach of Huber (2023) and augment our local projection specification with a leave-out mean measure, constructed as a share of *other* states in the same geographical group (e.g., Census divisions or regions) that are in distress in a year. We find that an increase in the share of neighboring states experiencing local financial distress is followed by a negative response of output in the state itself, even after controlling for the state's own distress. The estimated spillover effect peaks one year ahead ($h = 1$), and then attenuates. These results are robust to controlling for whether the U.S. as a whole is experiencing

a benchmark crisis.

Third, we show that regional heterogeneity in financial distress contains important information about the future path of the U.S. macroeconomy. In particular, we construct a continuous measure of financial distress we call "states-in-crisis", defined as the fraction of the U.S. banking sector experiencing local financial distress at a given moment in time. In a time series analysis, states-in-crisis predicts U.S.-wide economic downturns even after including a traditional indicator variable for a financial crisis from our benchmark list. To further illustrate this, we apply a Shapley value decomposition to the R^2 of a regression of GDP growth on lagged versions of our states-in-crisis measure and a dummy for benchmark financial crises. We find that our states-in-crisis measure consistently contributes to a larger share of variation when compared to a binary crisis indicator, from one to five years before output is realized. This highlights that regional financial distress does not only matter for regional output, but also contains useful information for understanding aggregate fluctuations.

Our findings suggest that the economic costs of financial distress may have been underestimated. It is not only rare systemic nationwide crisis events that predict sizeable output losses, but also the much more frequent localized episodes of financial distress. Previous work on the output losses of crises has focused on cross-country variation in systemic events and aggregate time series that are unable to detect these patterns, and regional evidence has been based on individual episodic evidence. Our work suggests that financial distress is much more common than previously estimated, because it is often limited to particular regions. As we show, such regional distress also matters for aggregate fluctuations even outside of outright crisis episodes, suggesting that regional information is useful for monitoring the risks emanating from non-systemic events.

Related literature. Our paper relates to several strands of the literature. First, we contribute to the (cross-country) literature on the economic costs of financial crises. Among others, work by Cerra and Saxena (2008), Reinhart and Rogoff (2009), Schularick and Taylor (2012), Baron, Verner and Xiong (2021), and Jamilov et al. (2024) show that banking crises in particular are typically associated with severe and prolonged recessions; see Hall (2014) for a discussion focused on the United States. Our work complements cross-country analyses by focusing on state-level variation within the United States. By using within-country variation, we can address three limitations of existing studies, namely that they (a) are based on a small number of crisis events, (b) assume homogeneous responses across vastly different economies, and (c) entirely abstract from the often

localized nature of financial distress and thus underestimate the frequency and costs of negative shocks emanating from the banking sector.

Second, we contribute to the literature investigating historical financial crises in the United States using long time series (e.g., Friedman and Schwartz, 1963; Bordo, Dueker and Wheelock, 2002; Bordo and Haubrich, 2017; Gorton and Tallman, 2019). Giesecke et al. (2014) study the link between corporate bond defaults, banking crises, and GDP growth using time series regressions over the period 1866 to 2010. Correia, Luck and Verner (2026) use long-run historical bank-level data to study U.S. bank failures, and also show that the share of "banks at risk" predicts future U.S. output. Different from this existing work, we explicitly focus on historical state-level variation that allows us to identify regional financial distress and document the link of financial crises with state-level output over close to 160 years.

Third, we build on studies examining the regional effects of financial crises in and outside of the United States. Existing studies have used regional variation to estimate the link between U.S. crises and local output during the National Banking era (e.g., Carlson, Correia and Luck, 2022), the 1907 panic (e.g., Jaremski and Wheelock, 2024), the 1920s (e.g., Wheelock, 1992; Davison and Ramirez, 2014; Rajan and Ramcharan, 2015; Jaremski and Wheelock, 2020), the Great Depression (e.g., Calomiris and Mason, 2003*a*,*b*; Carlson and Mitchener, 2009; Cohen, Hachem and Richardson, 2021), and in the early 1990s (Peek and Rosengren, 2000; Ashcraft, 2005). Monnet, Riva and Ungaro (2021) show how bank runs affected real activity in France during the Great Depression, and Huber (2018) studies the real effects of pre-determined local exposure to Commerzbank during the Global Financial Crisis of 2007-08 in Germany. The limitation of these studies is that they focus on a single episode, with a particular emphasis on the U.S. Great Depression, and thus cannot speak to the question of what the costs of financial crises are more generally. We can overcome this limitation due to our newly constructed historical time series spanning 160 years of data.

Fourth, we engage with the literature on measuring financial stress and identifying crises. While there are many chronologies of (U.S.) financial crises we review in more detail below—from the classic work of Friedman and Schwartz (1963) to more recent contributions by Jalil (2015), Bordo and Haubrich (2017), or Baron, Verner and Xiong (2021)—substantial disagreements remain about which episodes constitute genuine systemic crises (see, e.g., Bordo and Meissner, 2016). Similar to Baron, Verner and Xiong (2021) and Jamilov et al. (2024), we employ a hybrid approach that combines narrative evidence with statistical indicators to identify episodes of financial distress. A key contribution to this literature is our comprehensive survey of all major existing U.S. crisis

chronologies and the construction of a regional list of financial distress events.

The paper proceeds as follows. Section 2 introduces our historical state-level macro-financial dataset. Section 3 surveys existing U.S. financial crisis chronologies and introduces our benchmark classification. Section 4 develops our methodology for identifying state-level financial distress. Section 5 analyzes how our states-in-crisis measure relates to U.S.-wide economic performance. Section 6 concludes.

2 A New State-Level Macro-Financial Dataset, 1863–2024

This section introduces the backbone of our empirical analysis: a new state-level panel dataset with consistent and comprehensive coverage of banking and economic variables for the period from 1863 to 2024. Compiling this dataset involved extensive digitization of historical records and the harmonization of time series across bank types, balance sheet categories, primary sources, and regulatory regimes affecting the comparability of the underlying statistics. Ultimately, our panel provides an unprecedented view into the history of state-level macro-financial linkages in the United States.

2.1 State-Level Banking Sector Balance Sheets

Historical data for 1863–1960 Our analysis of financial crises at the state level requires long-run, comprehensive, and consistent data on banking sector activities. To meet this need, we digitize and harmonize state-level aggregates from the Officer of the Comptroller of the Currency's (OCC) Annual Reports for the period 1863–1960. Figure 1 displays a sample page from these reports, illustrating the granular state-level financial data available throughout this period.

We describe details on the construction of these data in Online Appendix F.1. One important limitation is that, before 1890, the OCC only consistently report balance sheet information on nationally-chartered banks, while the reporting of state-chartered banks is infrequent. We illustrate the inclusion of national banks, state banks, and other institutions types in the OCC reports in Figure F.4, using total liabilities as an example. National banks are the most comprehensively reported, with around 80% or greater coverage from 1868 onward, and full coverage by 1889. State banks are well reported from 1890 onward, with over 80% of states covered, and complete coverage starting from 1936. White (1983) estimates that national banks had a market share (in terms of total assets) upward of 80% in the 1870s, which decreased after the Civil War and stabilized at

around 50% around 1900.[1] We further address the role of state banks in robustness checks by directly incorporating the irregularly reported data on state-chartered banks we observe in the OCC reports.

Modern data for 1960–2024 For the period starting in 1960, we draw on two sources: the Federal Deposit Insurance Corporation (FDIC) and the Federal Financial Institutions Examination Council (FFIEC)'s Consolidated Reports of Condition and Income, better known as "Call Reports". These data provide information on the consolidated balance sheets of all commercial banks operating in the United States that are regulated either by the Federal Reserve, FDIC, or the OCC.[2]

From 1961 to 1980, we use state-level aggregates from the FDIC.[3] From 1981 onwards, we source our data from the Call Reports. To construct state-level aggregates, we collapse the bank-level information from the Call Reports using weighted averages based on each bank's total assets. Doing so is challenging because our sample spans the deregulation of interstate branching, which fundamentally transformed the geographic structure of U.S. banking. Until the 1980s, U.S. banks were generally prohibited to operate branches outside of their headquarter state. As a result, the state of a bank's headquarter location served as a good proxy for its asset exposures. Starting in the late 1970s, several states began allowing banks from other states to open branches, either on a unilateral or reciprocal basis (Kroszner and Strahan, 1999; Goetz, Laeven and Levine, 2013). The Riegle-Neal Act of 1994 removed the remaining barriers, although its effective implementation varied considerably across states (Rice and Strahan, 2010). Unfortunately, the FDIC's historical statistics simply assign all bank activities to headquarter states. Starting in the 1980s, this results in erratic time series because it fails to capture the actual geographic distribution of bank assets after the liberalization of interstate branching.

To address this challenge, we develop a methodology to create consistent time series using the FDIC's Summary of Deposits (SOD) data, which provides branch-level information on bank deposits. Using these data, we directly construct time series on total bank deposits in a given state

[1] We compare the estimates of national banks' market share in White (1983), the All Bank Statistics and the Historical Statistics of the United States (Carter et al., 2006) in Appendix Figure F.3.

[2] Notably, the Call Reports also provide data on the balance sheets of savings banks (`RSSD9048` == 300), and of savings and loans institutions (`RSSD9048` == 310) as of 2012, following the merger of the Office of Thrift Supervision into the Office of the Comptroller of the Currency in July 2011. We consider these data for robustness checks. Prior to this, thrifts were required to file a Thrift Financial Report with the Office of Thrift Supervision.

[3] While most of this data is available on the FDIC Bank Find Suite, there are two exceptions: 1) capital from 1961-1967, and 2) real estate loans from 1961-1966. We digitize these data from the "Summary Report, Assets and Liabilities of Member Banks", as published by the Board of Governors of the Federal Reserve System.

and year by aggregating the branch-level information. To construct other balance sheet items, we use bank-state-year shares based on the proportion of each bank's deposits attributable to branches in a given state. In particular, we apply these deposit-based allocation shares to other balance sheet items, effectively distributing each multi-state bank's activities across the states where it operates. We outline further details in Appendix F.3 and show how influential these adjustments are in Figure F.7.

In order to avoid jumps due to series breaks, we splice the modern data together with the historical OCC data using overlapping data. We outline the methodology in detail in Online Appendix F.5. Note that, since our analysis focuses primarily on growth rates of bank balance sheet variables, this splicing approach has only a minimal impact on the underlying data.

Finally, we gather data on the number of bank failures and the total assets of failed banks from $1863-2021$. From $1863-1941$, we define a failed bank as one for which either a receiver is appointed by the OCC or one that undergoes voluntary liquidation. From 1942-2021, we follow the FDIC in defining a failed bank as one which involves the closing of a bank by regulators, for which the FDIC becomes the bank's receiver, or one which involves open bank assistance. We outline the details of our data collection in Online Appendix F.4.

Coverage and comparison with existing sources. For the historical period, Carlson, Correia and Luck (2022) and Correia, Luck and Verner (2026) also use the OCC reports to construct a historical bank-level database that covers $1865-1904$ and $1863-1941$, respectively. Our approach focuses on the state-level aggregates rather than the bank-level data but offers a complete time series for the entire period from $1863-1960$ that consistently accounts for bank mergers and changes in reporting standards. In addition, unlike Carlson, Correia and Luck (2022) and Correia, Luck and Verner (2026), we do not only collect data on national banks but also on state banks, private banks, saving banks, stock savings banks, mutual savings banks, and trust loan companies.

To check the validity of our data construction procedure, we aggregate our times series across the 48 contiguous U.S. states and compare to aggregated series from existing sources of historical data. In Section D of our online appendix, we plot our aggregated series against the aggregated bank-level data constructed by Carlson, Correia and Luck (2022) (`CCL2022`, covering 1867-1904) and Correia, Luck and Verner (2026) (`CLV2026`, covering 1863-1935 and 1960-2025), the aggregated state-level data from the All Bank Statistics (1959) digitized by Cao and Richardson (2022) (`CR2022`, covering 1896-1955), the Historical Statistics of the United States provided by Carter et al. (2006) (`HSUS`,

covering 1863-1960) and the Federal Deposit Insurance Corporation (FDIC, covering 1934-2025). Overall, our data follow similar trends as these existing efforts but cover a longer time period than any existing work. For the reasons explained above, our state-level aggregates differ considerably from the FDIC series, which allocates a bank's entire balance sheet to its headquarter state.

The coverage of our dataset varies somewhat across states and time, with more comprehensive data generally available for states with larger banking sectors and for more recent periods. We summarize the coverage across bank types and balance sheet categories in Table F.3. The entry of new states into the Union also creates an unbalanced panel, with western states typically entering the dataset later than eastern ones. Despite these limitations, our dataset provides remarkably consistent and complete coverage across the entire period, with core banking indicators available for over 95% of state-year observations after 1880. This gives us a uniquely comprehensive view of the U.S. banking sector at the state level, spanning from the Civil War until today.

2.2 A Historical State-Level Macroeconomic Dataset

A critical limitation in the study of financial crises in the United States is the lack of long-run panel data on macroeconomic outcomes. To overcome this limitation, we draw on a comprehensive state-level panel dataset introduced in the accompanying work by Hoon et al. (2026). Based on an extensive digitization and harmonization effort, this dataset represents the most complete historical state-level dataset on macroeconomic outcomes, covering all 48 contiguous U.S. states annually from 1863 to 2021. By combining 135 individual sources, 98 of which are newly digitized, these time series provide a unique view into regional economic dynamics over more than 150 years of U.S. history. More details on the coverage and construction of these data can be found in Online Appendix G or by directly referring to Hoon et al. (2026).

The most important variable we take from Hoon et al. (2026) is their estimated state-level index of economic activity that covers the period 1870 to 2021, which they estimate using a mixed-frequency dynamic factor model. We also use their data on state-level unemployment rates, agricultural or manufacturing output, business failures, and state government finances.

3 A Survey of U. S. Financial Crisis Episodes

The dating of financial crises has a long tradition in the United States, and has been an ongoing source of debate. Much of the existing literature has been focused on the definition and identification

of nationwide crises, with the start dates of each crisis remaining a particular source of disagreement. On the other hand, comparatively little attention has been paid to the definition and identification of regional crises. In this section, we survey the existing landscape of crisis chronologies, review the major methodological approaches taken in constructing them and explore the sources of agreement and disagreement among researchers. Our survey of chronologies provides two key ingredients which enable us to work out when regional crises occur. First, we compile a set of years for which any chronology flags as a crisis year. While for many of these years there is no broad agreement that the U.S. is in a systemic nationwide crisis, they provide valuable narrative evidence that there are banking sector problems happening somewhere within the country - exactly what our regional crisis measure is intended to detect. As we will illustrate, one source of disagreement about these 'minor' crises comes exactly from their localized nature. Second, we develop a 'benchmark' chronology of systemic U.S.-wide crises. Although these events are few in number, they provide a reference point for interpreting the costs of regional financial distress, and for separating the costs of regional distress from those of full-blown nationwide crises.

Table 1 reports an overview of existing financial crisis chronologies for the United States. Overall, we draw on 25 existing crisis lists, spanning from early work by Sprague (1910) to recent work by Jamilov et al. (2024). While these chronologies differ widely in the time periods they cover, they jointly span the years from 1791 to 2023. For each chronology, we mark years identified as the beginning of a crisis by a "Yes", years associated with an ongoing crisis as "O", and years that are part of the study but without crisis years as "—".

Two patterns emerge from our survey of chronologies. First, researchers broadly concur on the incidence of major nationwide crisis episodes — events such as the Panic of 1907 or the Great Depression of 1930 appear in nearly all chronologies. However, this agreement comes with two caveats: i) There is substantial disagreement over the precise start dates - such as the commercial banking troubles and Savings and Loan Crisis of the 1980s, with disagreement about whether 1982, 1984, 1988, or all of these years represent distinct crisis events. ii) The major crises which are broadly agreed upon are small in number. In Appendix A.1.2, we leverage the agreement across chronologies for major episodes and construct a"benchmark" chronology of widely accepted major crises. Our survey identifies only 7 crises for which at least half of all available chronologies agree. Second, there is far less agreement about episodes which are localized or less severe. For example, the 1973-75 "bank capital sqeeze" surrounding the failure of Franklin National Bank appears in only a small subset of chronologies.

There are several potential reasons for the disagreement across chronologies. One is definitional: researchers place weight on different symptoms of distress, with some requiring bank runs, others focusing on bank failures, and still others emphasizing credit contractions or policy interventions. To understand how definitional differences affect the classification of crises in the 25 chronologies we consider, we provide the exact definitions used in several major chronologies in considerable detail in Table E.1 of the online appendix.

Second, researchers differ in how they treat periods with large policy interventions but small disruptions to the financial sector. Most series ignore these events, while Metrick and Schmelzing (2021) explicitly focus on interventions as a sign of potential troubles. As a result, Metrick and Schmelzing (2021) discuss several events during the 1960-70s that are not mentioned in most other crisis chronologies. For example, the 1973-75 period characterized by the failures of the United States National Bank of San Diego, Franklin National Bank, and the Security National Bank of New York appears in Metrick and Schmelzing (2021), Bordo and Haubrich (2017), and Lopez-Salido and Nelson (2010), but not in the widely-used chronologies of Reinhart and Rogoff (2009), Jordà, Schularick and Taylor (2017), Laeven and Valencia (2020), or Baron, Verner and Xiong (2021).

Finally, a key reason for disagreement is that researchers make different assessments about where a crisis can be considered severe enough to be considered a U.S.-wide financial crisis. As a result, some chronologies include more localized or minor episodes of financial distress, while others only focus on events they consider systemic. In fact, the crisis lists of Kemmerer (1910) and Jalil (2015), as well as the quantitative index of financial conditions by Bordo, Dueker and Wheelock (2002), explicitly differentiate between "minor" and "major" crises. Major crisis events typically feature multiple dimensions of financial distress, including bank runs, solvency issues, substantial policy interventions, and clear evidence of a widespread panic that spreads through the nation. For example, all of these elements were present during the Global Financial Crisis of 2007-08 or the Great Depression. In contrast, several events in the mid-1920s are classified as minor or localized crises by Davison and Ramirez (2014) and Jalil (2015), but are not included in chronologies such as Reinhart and Rogoff (2009), Jordà, Schularick and Taylor (2017), or Baron, Verner and Xiong (2021). Several years between the mid-1890s and 1907 also appear in the lists of Kemmerer (1910), DeLong and Summers (1986), Jalil (2015), and Metrick and Schmelzing (2021), but not in most others.

Taken together, these patterns point to an important asymmetry across chronologies. First, researchers broadly agree on the set of major nationwide U.S. crises, though there is frequent

disagreement about the precise start dates. Second, there is far less agreement, and little understanding about what constitutes a regional crisis, how frequently such episodes have occurred since the Civil War, or how costly localized distress is. What the existing chronologies do provide, however, is a useful starting point: a set of years in which at least one chronology identifies a crisis, indicating that banking-sector problems were unfolding somewhere within the nation. In the following section, we build on this information to develop a systematic approach to dating regional financial crises and to construct a chronology of regional crisis.

4 The Aftermath of Local Financial Distress

There has been a large literature focused on estimating the costs of individual crisis episodes within the U.S. context (see, e.g., Mian and Sufi (2010); Gorton, Laarits and Muir (2023)). However, there are two limitations that make it challenging to draw general conclusions about the costs of financial crises for the U.S. from this body of work. First, the number of U.S. financial crises is small and, as a result, how exactly one defines a crisis matters for estimates of their frequency and the output losses associated with them. Second, as we show in Appendix A.2.1, the striking heterogeneity in output losses across states suggests that regional differences are critical for understanding how crises unfold and can partly be predicted by local banking sector health.

In this section, we address both of these limitations by identifying episodes of local financial distress based on a combination of our census of U.S. crisis chronologies and the newly-constructed state-level statistics on deposits, wholesale funding liabilities, and bank failures. The key innovation relative to the existing literature is that we are able to identify hundreds of local distress events, which gives us unprecedented statistical power to estimate their output losses relative to the cross-country literature.

Section 4.1 proposes a measure of local financial distress by combining our survey of U.S. crisis lists with measures of state-level contractions in deposits or wholesale liabilities, as well as the incidence of bank failures. Section 4.2 presents the resulting chronology of state-level financial stress events and additional validation using narrative evidence. Section 4.3 estimates the output losses of local financial distress.

4.1 Identifying Local Financial Distress Episodes

We propose a method for identifying *state-level* financial distress since the Civil War. This approach combines the strengths of narrative chronologies with objective statistical indicators, allowing us to capture variation in crisis exposure across states and time. In that sense, we are building on previous work by Baron, Verner and Xiong (2021) and Jamilov et al. (2024), who also combine narrative and statistical evidence to identify banking sector distress in cross-country data.

Our baseline classification of local financial distress on the state-year level is any period that fulfills all of the following criteria:

1. *Any* crisis chronology indicates a crisis in a given year, and
2. There is at least *one* bank failure within one year of the crisis, and
3. Either deposits or wholesale liabilities decline in absolute terms within one year of the crisis.

This approach is based on two types of complementary criteria. First, we consider the timing of financial crises as identified by *any* existing chronology reviewed in Section 3. This builds on the insight that the discrepancies across crisis lists outside of a small number of "benchmark" events are best understood as disagreements about the severity of a given crisis, and in particular whether it only affects a certain region or the financial system as a whole. As highlighted by Romer and Romer (2017), narrative evidence helps to sharply distinguish between outright crises and periods where the banking sector contracts for unrelated reasons, such as changes in monetary policy or garden-variety business cycle downturns. Around one-third of years are classified as a "crisis" by at least one chronology.

Second, we require statistical evidence of substantial financial distress at the state level. We focus on two statistical indicators that are key markers of crises: bank runs (proxied by contractions in deposits or wholesale liabilities) and bank failures. These measures are widely-accepted indicators of banking sector distress, and thus seem like a reasonable starting point for an objective, statistical criterion of banking sector distress. In fact, as we show in Appendix A.2.4, both local liability-side contractions and bank failures predict the severity of economic downturns following U.S. financial crises. This we take as a validation of the relevance of these indicators in episodes of banking sector distress.

While we allow for many other versions for robustness exercises, this baseline definition has several attractive features. It requires evidence for both bank failures *and* liability-side disruptions

on the state level, which abstracts from cases where bank liabilities contract for idiosyncratic reasons.[4] Because around one-third of all years in our sample are identified as a crisis by at least one chronology, this approach strikes a balance between identifying too few or too many state-year observations as experiencing financial distress. All in all, our baseline measure identifies 1565 instances of state-level financial distress.

Our approach addresses several limitations of existing work. Most importantly, it equips us with a considerably larger sample of "crisis" events relative to the cross-country literature. The most comprehensive dataset we are aware of is that of Jamilov et al. (2024), who identify 308 cases of bank runs around the globe since 1800. In contrast, depending on the exact definition, our measure of local financial distress identifies potentially thousands of distress events.

Another advantage is that we exploit geographical variation *within* a country, while existing work has treated financial crises as uniform shocks affecting all areas simultaneously. Our estimates thus sidestep the critique that institutional differences across countries make the estimates of cross-country panel regressions hard to interpret. It also accounts for the reality that crises are often a series of individual events that spread across regions through trade and banking linkages (see, e.g., Calomiris and Gorton, 1991).

Finally, our approach sidesteps disagreements across existing chronologies regarding what constitutes a "true" financial crisis. Rather than attempting to resolve these definitional disputes, we allow for the possibility that different types of financial stress may manifest with varying intensity across regions. By anchoring our identification to objective statistical markers—contractions of bank liabilities and bank failures—we focus on episodes with demonstrable local financial disruption regardless of the level of disagreement in the surveyed crisis chronologies.

4.2 A New Chronology of Local Financial Distress

Our state-level chronology of financial distress spans the entire 1870-2022 period. Figure 10 plots the underlying variation over time, where we differentiate between three types of local distress indicators (deposit growth, wholesale liability growth, and bank failures). Historically, local financial distress was often explained by contractions in deposits. After the introduction of federal deposit insurance in 1934, however, most episodes are due to a contraction of wholesale liabilities or bank failures. As such, our chronology of local financial distress also sheds light on the changing nature of financial stability risks over time.

[4] In this regard, our approach is similar in spirit to Davison and Ramirez (2014).

Table 2 provides an excerpt of the new chronology of local financial distress for selected states. We use our baseline definition, meaning we report all states and years in which (a) at least one surveyed chronology indicates a crisis, and (b) a state experienced either a deposit or wholesale liability contraction *and* at least one bank failure within one year of the crisis. We also show the growth rate of deposits and wholesale liabilities, as well as the number of bank failures.

There are considerable differences in crisis frequency and severity. California experienced relatively frequent and intense periods of distress historically, with particularly severe deposit contractions in 1893 (-24.0%), a large contraction in wholesale liabilities in 1907 (-37.5%), but also dozens of bank failures during the Great Depression.

Florida not only experienced historical banking sector issues but also saw a sizeable outflow of wholesale liabilities in 1893 (-38.2%) as well as during several other years in the 1990s and 2008. New York's crisis pattern reflects its central role in the U.S. financial system, with significant swings in liability growth rates and a wave of bank failures during the Great Depression. Texas shows yet another distinctive pattern with distress being increasingly characterized by wholesale funding disruptions and bank failures over time relative to more traditional outflows of deposits.

Table C.2 in the Online Appendix reports an extended chronology for selected states under a more generous definition. We show all state-year observations where (a) at least one surveyed chronology identifies a crisis, and (b) *any* of the state-level measures we construct—deposit contractions, wholesale liability contractions, or bank failures—indicate distress within one year of the crisis. This highlights how changing the "threshold" for what constitutes local distress can result in a different number of events.

To validate our new chronology, we compare it with existing but limited narrative evidence on which states experienced crises in particular years. We build on three key sources. First, Jalil (2015) includes a relatively detailed discussion of regional banking crises for the period $1825-1929$. Second, Davison and Ramirez (2014) identify local banking panics in the 1920s using a dataset on bank suspensions as well as newspaper articles. Third, Metrick and Schmelzing (2021), in their chronology of crisis interventions, also frequently discuss their exact location.

Table C.3 shows the states and years for which at least one of these chronologies finds narrative evidence of a crisis, together with three versions of our local financial distress measure. In particular, we consider whether, during a year identified as a U.S. crisis by any chronology, (i) *either* deposits or wholesale liabilities contract, *or* there is at least one bank failure within one year of the crisis (`broad`), (ii) *either* deposits or wholesale liabilities contract, *and* there is at least one bank failure

within one year of the crisis (`baseline`), or (iii) whether deposits *and* wholesale liabilities contract, *and* there is at least one bank failure within one year of the crisis (`narrow`). With the exception of Ohio in 1985, at least one of our financial distress metrics aligns with each of the narrative evidence on local crises.

4.3 The Output Losses of Local Financial Distress

Having established a new chronology of local financial distress, we now quantify the associated output losses. We use local projections (Jordà, 2005) in a panel setting and estimate the cumulative response of state-level economic activity to the onset of distress. Specifically, for each horizon h, we estimate:

$$\Delta Y_{i,t+h} = \alpha_i^h + \beta^h \mathbf{1}_{i,t}^{Local\ distress} + \sum_{k=1}^{5} \gamma^{k,h}(X_{i,t-k} - X_{i,t-k-1}) + \varepsilon_{i,t}^h \tag{4.1}$$

where $\Delta Y_{i,t+h}$ represents the change in real economic activity in state i between periods $t-1$ and $t+h$, measured by the natural logarithm of the state-level economic activity index from Hoon et al. (2026). α_i^h captures state fixed effects, accounting for time-invariant differences across states such as long-run growth rates. The indicator $\mathbf{1}_{i,t}^{Local\ distress}$ equals one when year t is identified as a regional financial distress episode for state i. The summation term $\sum_{k=1}^{5} \gamma^{k,h}(X_{i,t-k} - X_{i,t-k-1})$ represents a set of control variables, where the baseline specification only includes five lags of changes in state-level economic activity to account for pre-crisis economic conditions. We report confidence intervals based on standard errors clustered by state and year, but consider alternatives for robustness. In spirit, these estimations are closely related to cross-country regressions on the output losses of financial crises, which similarly relate future cumulative national output to the incidence of a national crisis.

Baseline estimates. Figure 5a presents the results from estimating equation (4.1). Local financial distress is followed by persistent output losses. State-level economic activity declines by approximately 2% on impact, with the contraction deepening to roughly 4% by the first year. We observe that the response on output gradually reverts back, albeit slowly. By the end of the fifth year, output remains close to 3% below its pre-crisis level.

For comparison, we estimate the state-level output losses after U.S.-wide systemic crises in Appendix A.2.1 and report the results in Figure B.3. After a U.S.-wide financial crisis, states

on average experience substantially larger contractions (approximately 14% at the trough). The smaller magnitude for local distress is consistent with its more limited geographic scope. Importantly, however, the estimated decline following local distress reveals that banking sector disruptions need not be nationwide to generate sizable economic costs on the local economy.

While many financial distress episodes we identify are localized in nature, others can occur simultaneously across multiple states during periods of a systemic financial crisis. This comparison uses within-year variation across states and therefore nets out confounding national factors (e.g., changes in monetary policy or fiscal spending) to the extent they affect all states similarly.

The results in Figure 5b suggest somewhat smaller but more persistent output loss that declines by around 2.4% five years after a crisis. The difference between results with and without time fixed effects highlights the importance of waves of local financial distress episodes. Many crises affect several states simultaneously, as we will explore in more detail in Section 5. The larger estimates in the specification without year fixed effects capture both the direct impact of local financial distress and the influence of these correlated national factors. The more modest estimates in the specification with year fixed effects isolate the predictive ability of local distress beyond what would be expected from U.S.-wide systemic crises, but discards potentially useful variation coming from the clustered incidence of crises across years.

Major vs. minor crisis years. Our baseline definition of local financial distress incorporates narrative evidence of a crisis from *any* chronology. To distinguish between the role of major systemic events and more minor events in explaining these results, we create two alternative indicators, based on narrative evidence of (a) a benchmark crisis, or (b) a "minor" crisis, defined as all years tagged as a crisis by any chronology that are not a benchmark crisis.

Figure 6 compares the output losses of local financial distress defined based on the combination of our baseline statistical indicators of state-level distress with these various measures of narrative evidence. Here, we include both state and year fixed effects. As one might expect, the output losses of benchmark crises are worse in states experiencing liability-side contractions or failures, consistent with the evidence for U.S.-wide crises in Appendix A.2.4. Importantly, however, we also find output losses during "minor" crises almost indistinguishable from the baseline measure, suggesting that financial shocks may also matter for the macroeconomy even when they are not associated with country-wide systemic disruptions.

Comparison with non-financial recessions The cross-country literature has demonstrated convincingly that financial-crisis recessions are more costly than normal recessions in terms of lost output (see, e.g. Schularick and Taylor (2012)). As we argue in Section 3, these results by design pertain to systemic nationwide crises, while the costs of local financial distress are relatively unexplored. Our evidence indicates that local financial distress is characteristically different from systemic benchmark crises, both in frequency and in severity. To investigate these patterns at the state-level, we identify non-financial state recessions in two steps. First, we identify state recessions using the Bry and Boschan (1971) algorithm and following the procedure in Hoon et al. (2026). Next, we identify non-financial recessions as state recession start years which do not coincide with either local financial distress or a benchmark financial crisis. In Figure 7, we benchmark the costs of local financial distress against the output response after systemic crises, in red, and non-financial state recessions in green. In line with the cross-country literature, we find that state's experience substantially more severe contractions after the onset of a benchmark systemic crisis ($\sim$ 14% at the nadir), compared to after non-financial recessions ($\sim$ 8% at the nadir). The contractions after a major crisis are more delayed, peaking three years after onset, compared to the average non-financial recession which peaks 1-2 years after onset. Different from the cross-country literature, we are able to examine the costs of local financial distress which occur outside of major crises events. In comparison to non-financial recessions, we find that these instances of local distress are followed by comparatively muted, but still substantial, output losses. However, there are 865 such instances of local distress outside of systemic years, which is several orders of magnitude more frequent than the 7 systemic nationwide crises that we observe. All in all, our findings suggest that local financial distress is characteristically distinct from benchmark nationwide crises - while they are followed by less severe output losses, they are still costly, and are also substantially more frequent.

Robustness We consider a wide range of alternative specifications. For example, Figure C.9b explicitly takes into account banks without a federal charter that we observe in the data (state banks, private banks, savings banks, and trust loan corporations). As outlined in Section 2, our main sample focuses on national banks for which we have consistently-reported time series. That said, Figure F.5 shows that the correlation of national and state bank deposit growth is 0.356. In Figure C.9b, we create a perturbation of our local financial distress dummy that incorporates deposit or wholesale liability contractions for *any* type of institution, not just national banks. For that exercise, we also extend the modern coverage beyond commercial banks to include savings

institutions. The results suggest that these changes make relatively little difference to our point estimates.

Figure C.9a asks whether changes in the sources of financial crises over time make a difference for our results. In particular, we create two perturbations of our baseline variable for the period before and after the Banking Act of 1933, which introduced federal deposit insurance. The first measure only incorporates a contraction of deposits as a liability disruption before 1934, and only a contraction of wholesale liabilities thereafter, and we continue to require either a liability-side contraction *or* bank failures to identify local financial distress. The second measure identifies local distress only based on liability-side issues before 1934 and only based on bank failures thereafter. Despite these changes, the resulting estimates are close in magnitude to those from our baseline indicator. The full list of robustness checks is detailed in Figure C.10.

4.4 Local Financial Distress Contagion

Thus far, we have studied the costs of financial distress within the state itself on future output. However, given the presence of interbank linkages and trade links that extend across state lines, it stands to reason that the costs of local financial distress can extend not only to the state itself but to its surrounding neighbors. To illustrate this, we first document in Figure 8 an example of contagion in the four years following the Failures & LDC Debt Threat of 1982. We draw red borders around states which experience local financial distress, as identified by our chronology, within a particular year, and assign colors to each state according to its bank failure rate in the same year. At the onset of the crisis in 1982, we observe that local financial distress is clustered around the Mid-West and and Mid-Atlantic, along with a number of Pacific states. We observe the contagion spreading gradually to states in the South and West, largely coinciding with spikes in bank failure rates. Such patterns of contagion have been well documented in case studies of major crises events, such as in 1907 (Jaremski and Wheelock (2025)) and in 1929 (Calomiris, Jaremski and Wheelock (2022)). That said, a priori the direction of spillovers may not be obvious, especially outside of systemic nation-wide events. For instance, states neighboring a state-in-distress may in fact benefit if we observe a strong a flight-to-safety effect away from the affected state. In this section, we examine the contagion effects of local financial distress, exploiting the variation afforded by our long-run state panel. To do so, we employ the leave-out mean method of Huber (2023) adapted to our context. In particular, we estimate the following specification:

$$\Delta Y_{i,t+h} = \alpha_i^h + \beta^h \, \mathbf{1}_{i,t}^{\text{Local distress}} + \beta^{S,h} \overline{\text{Local distress}}_{g(s),t} \tag{4.2}$$
$$+ \eta^h \mathbf{1}_t^{\text{U.S. Benchmark crisis}} + \sum_{k=1}^{5} \gamma^{k,h} \left(X_{i,t-k} - X_{i,t-k-1} \right) + \epsilon_{i,t}^h \quad \text{with} \quad h \in [0, 5].$$

where $\Delta Y_{i,t+h}$ continues to index changes in future state-level output and $\overline{\text{Local distress}}_{g(s),t}$ represents the leave-out mean of all other states within the geographic group (e.g. divisions, regions) apart from state s:

$$\overline{\text{Local distress}}_{g(s),t} = \frac{\sum_{j \neq s, g(j)=g(s)} \mathbf{1}_{s,t}^{\text{Local distress}}}{N_{g(s)} - 1} \tag{4.3}$$

We control for state fixed effects and lags of the dependent variable, and crucially also control for whether or not the U.S. as a whole is experiencing a systemic crisis in $\mathbf{1}_t^{\text{U.S. Benchmark crisis}}$. We report 90% confidence intervals based on standard errors clustered by state and year. The coefficient on the leave-out mean $\beta^{S,h}$ indicates the response of state-level output over the next h years when all neighbors of the state within the geography (division or region respectively) experience banking sector stress, holding fixed whether or not the state itself is in crisis that year and whether or not the U.S. as a whole is in a systemic crisis. β^h on the other hand indicates the response of state-level output over the next h years after financial distress occurs in the state itself, holding fixed the degree to which other states within the geography are in distress and controlling for U.S.-wide systemic crises. Figure 9 presents the results from estimating equation (4.2). We observe that the point estimates for $\beta^{S,h}$ are negative on impact both at the division and region level, with output losses peaking and exceeding the coefficient for local financial distress β^h one year after crisis onset. Importantly, we observe this trend even after controlling for whether or not the U.S. as a whole is in a systemic crisis. We further observe a weakening of the spillover as the coefficient attenuates towards zero, along with a widening of the confidence bands. We take this as suggestive evidence that local financial distress is costly not only for the state-in-crisis but also for its surrounding neighbors, especially in the short-run. On the other hand, the coefficient on β^h is not only negative but also remains depressed after 5 years. For both divisions and regions, the coefficient on spillovers exceeds that of the coefficient on local financial distress at the nadir, one year after the crisis, and recovers towards zero even when the latter is persistently depressed. Following the intuition laid

out in Huber (2023), we interpret this to mean that the share of total response (across divisions and regions respectively) that is associated with spillovers is decreasing over horizons.

5 States-in-crisis and U.S.-Wide Recessions

The analysis above shows that U.S.-wide and local crises contain information about future state-level output. But do local crises also contain information about U.S.-wide output? This section investigates this question by proposing a new continuous measure of financial distress in Section 5.1 and studying its predictive properties for U.S. business cycles in Section 5.2.

5.1 A Continuous Measure of U.S. Financial Distress

Traditional chronologies of financial crises are binary in nature, and thus only differentiate between crisis or non-crisis states; see Bordo and Meissner (2016), Sufi and Taylor (2022), and Frydman and Xu (2023) for recent surveys. A few existing cross-country studies have developed continuous measures of financial stress that capture crisis severity based on a more granular narrative coding (Romer and Romer, 2017), credit spreads (Krishnamurthy and Muir, 2025), bank equity declines (Baron, Verner and Xiong, 2021), deposit contractions (Jamilov et al., 2024), or natural language processing (Ahir et al., 2023; Chen et al., 2023). However, none of these papers have taken into account the extent to which different *regions* are experiencing financial distress.

Based on our state-level measure of local financial distress, we propose a U.S.-wide continuous measure for the fraction of states whose banking sector experiences distress. We call this measure "states-in-crisis". As a baseline, we calculate the weighted average of states experiencing distress using a state's banking sector assets as weight.

Our states-in-crisis measure differs in two ways from existing financial stress indices such as the OFR Financial Stress Index (Monin, 2019), St. Louis Fed Financial Stress Index (Amburgey et al., 2020), Kansas City Fed Financial Stress Index (Hakkio and Keeton, 2009), or New York Fed Corporate Bond Market Distress Index (Boyarchenko et al., 2025). First, it incorporates the geographical dimension of financial distress, rather than combining several national series or issuance-level data. Second, it has unique historical coverage starting shortly after the Civil War. Existing indices typically begin in the late 20^{th} century, with the notable exception of Bordo, Dueker and Wheelock (2002).

Figure 11 plots our measure of states-in-crisis—i.e., the fraction of U.S. banking sector assets

affected by local financial distress—between 1870 and 2022. In addition, we indicate the benchmark crisis events and the average of the states-in-crisis measure over the sample period. Several patterns stand out. First, the states-in-crisis measure is elevated during all major benchmark crises, with pronounced spikes during episodes like 1873, 1893, 1907, and 1930. A substantial majority of states, often exceeding 60%, experienced simultaneous local financial distress during or immediately after the benchmark crisis, confirming the truly systemic nature of these historical crises.

Second, the figure highlights significant variation in the geographic breadth of financial distress across different crisis episodes. Some crises, such as the Great Depression, affected many states simultaneously, reflecting the magnitude of the shock. Others, like the banking problems of the late 1880s affected a more limited subset of states, suggesting more regionally concentrated disturbances that did not fully propagate across the national banking system.

Third, the states-in-crisis measure identifies periods of significant regional financial distress that do not appear in most national crisis chronologies. For example, the figure shows banking sector stress during the late 1870s, the early 1920s, the late 1960s, the early 1990s, and even the early 2000s rarely classified as national financial crises but characterized by at times significant regional banking problems. For example, the bank failures of the 1920s have long been recognized as having an impact on the local economy (e.g., Rajan and Ramcharan, 2015; Jaremski and Wheelock, 2020) but are not widely recognized as a nationwide crisis.

The continuous nature of our states-in-crisis measure thus provides a more nuanced view of crisis episodes than binary classifications allow. Rather than simply asking whether a financial crisis occurred, we can assess the intensity of financial distress by measuring the proportion of states affected. This approach reveals that financial distress during the Great Depression evolved in waves, with successive peaks affecting different regions as banking problems spread across the country. Similarly, it suggests a more granular interpretation of the crises of the 1980s, with three major peaks in local financial distress spread across the mid 1980s, late 1980s, and early 1990s.

5.2 States-in-crisis and GDP Growth

Having established the states-in-crisis measure as a continuous indicator of financial distress, we now examine its relationship with subsequent U.S. economic performance, as measured by growth in GDP or industrial production. We are particularly interested in whether this measure has predictive power even after the inclusion of existing binary crisis indicators.

Table 3 presents the results from a set of time series regressions relating growth in national

GDP or industrial production to our benchmark crisis indicator and the states-in-crisis measure. To account for serial correlation in output growth, we control for five lags of the dependent variable and report Newey-West standard errors.

Column 1 confirms the negative relationship between benchmark financial crises and subsequent GDP growth. The coefficient of -5.210 indicates that, on average, output growth is around 5 percentage points lower in the year following a benchmark crisis compared to non-crisis periods. This large and statistically significant estimate aligns with our earlier findings on the substantial output costs of financial crises.

Column 2 examines the predictive power of our states-in-crisis measure. The coefficient of -1.256 indicates that when all states experience banking sector stress (states-in-crisis = 1), subsequent GDP growth is approximately 1.2 percentage points lower than when no states face financial distress. This is both economically and statistically significant, confirming that our continuous measure of financial distress provides valuable information about future economic performance.

Most importantly, column 3 includes both the benchmark crisis indicator and the states-in-crisis measure simultaneously. While both coefficients decrease somewhat in magnitude, the states-in-crisis measures remains fairly stable at -1.092 and highly statistically significant, suggesting that the spatial extent of financial distress provides additional information beyond the simple presence or absence of a benchmark crisis.

Columns 4 through 6 repeat the same exercise using industrial production as the dependent variable. Consistent with our results from local projections in Section A.2.2, U.S. financial crises predict a larger drop in industrial production than GDP. Importantly, however, we continue to find that the states-in-crisis measure has independent predictive power even after the inclusion of a crisis dummy.

To further illustrate the relative predictive power on future GDP growth of our states-in-crisis measure compared to the dummy for benchmark financial crises, we apply a Shapley value decomposition to the R^2 of a regression of GDP growth on lagged versions of our states-in-crisis measure and a dummy for benchmark financial crises:

$$\begin{aligned} 100 \times \Delta\text{GDP}_t = \alpha^l + \beta^l \mathbf{1}\{\text{BenchmarkCrisis}_{t-l}\} + \gamma^l \text{States-in-crisis}_{t-l} \\ + \sum_{v=1}^{5} \delta^l 100 \times \Delta\text{GDP}_{t-v} + \epsilon_t^l, \end{aligned} \tag{5.4}$$

where we allow $l \in \{1, \ldots, 5\}$ to examine the predictive power on national GDP growth up to five years ahead. We include both a dummy for benchmark systemic crises ($\mathbf{1}\{\text{BenchmarkCrisis}_{t-l}\}$) as well as our states-in-crisis measure, and control for five lags of GDP growth. We apply the Shapley decomposition to compare the relative share of variation, as proxied by the R^2, contributed by i) the dummy for benchmark systemic crisis, ii) our states-in-crisis measure and iii) the five lags of GDP growth. Figure 12 presents the results. For each lag order l, we plot only the share of variation contributed by the dummy for benchmark systemic crisis and our states-in-crisis measure, with the remaining fraction attributed to lags of GDP growth. One year before output is realized, we observe that our continuous states-in-crisis measure contributes nearly 30% of variation, while the dummy for benchmark crisis accounts for around 22%. From 2-5 years before output is realized, we find that most of the variation is contributed by lags of GDP growth. That being said, our states-in-crisis measure continues to contribute to a larger share of variation compared to a binary crisis measure.

These findings have several potential implications. First, they suggest that regional financial distress does not only matter for local economies, but is also informative about the future path of national output. Second, the results highlight the value of continuous measures of financial stress compared to traditional binary classifications. Third, this new index may also be useful in many other settings, and could thus be used to better understand why some financial disruptions are associated with severe recessions while others result in more modest slowdowns. As such, monitoring the geographic distribution of banking sector stress could also serve as a potentially useful early warning signal of broader economic slowdowns.

6 Conclusion

This paper studies the aftermath of financial crises in the United States. By constructing a novel historical dataset on state-level banking and economic activity from 1863 to 2022, we establish new facts about the incidence and economic costs of financial crises throughout U.S. history. Our work demonstrates the value of taking a regional perspective to studying financial crises, which complements the existing literature using regional variation in macroeconomics (e.g., Nakamura and Steinsson, 2018).

Our takeaway is that the existing literature may have underestimated the probability and consequences of financial distress for the real economy for two reasons. First, previous studies

have almost exclusively focused on systemic financial crises. By definition, these crisis chronologies abstract from smaller or geographically concentrated events. However, as we show, such local financial distress events are much more common than systemic ones: in the U.S. context, there are only a handful of widely agreed-upon crises, while there are many hundreds of local episodes. As such, the incidence of financial distress is higher than previously estimated based on aggregate data.

Second, local financial distress predicts output losses on the order of 4 percent over a period of three years. While these magnitudes are smaller than the outfall of full-blown systemic meltdowns, they are by no means negligible. To the extent that such state-specific events spill over to other states and ultimately affect a broader region, or if they occur in several large states, they may also affect the U.S. economy as a whole. In fact, as we show, the fraction of states experiencing financial distress—which we dub "states-in-crisis"—contains useful information about the future trajectory of U.S. output even after the inclusion of indicators of systemic financial crises.

These findings provide a rationale for the monitoring of local financial and real economic conditions. For example, the Board of Governors of the Federal Reserve conducts a detailed analysis of the regional economy in each Federal Reserve District as part of its Beige Book publication. What our results suggest is that this monitoring is not only important for local economies but potentially also U.S.-wide economic activity.

Future research could extend our work in several directions. One key question is how the transmission of monetary policy may differ across states depending on the state of their banking sector. Another would be how different regulatory frameworks and policy interventions affect the geographic distribution of crises. Finally, our banking dataset spanning the period from the Civil War until today should in and of itself be a useful resource for researchers in macroeconomics, finance, and economic history.

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Table 1: Chronologies of Financial Crises in the United States, 1791–2023

Year	B/V/X	B/D/W	B/H	B/W	C/G	C	D/R	DL/S	F/S	G	J	J/K/M/S	J/S/T	Ju	K	L/V	LS/N	M/S	R/R	Rb	Ro	So	Sp	T	W
1791		—		—		—								—				Yes		—				—	
1792		—		—		—								—				Yes		—		Yes		—	
1797		Yes		Yes		—								—				—		—		—		Yes	
1809		—		Yes*		—						—		—				—	—	—		—		—	
1814		—		—	Yes	—						Yes		Yes				Yes	Yes	—		—		—	
1815		—		Yes	O	—						—		—				—	—	—		—		Yes	
1816		—		—	O	—						—		—				—	—	—		—		—	
1817		—		—	O	—						—		—				—	Yes	—		—		—	
1818		—		—	—	—						—		Yes				Yes	O	—		—		—	
1819		Yes		Yes*	Yes	—						Yes		—				—	O	Yes	Yes	—		—	
1820		—		—	—	—						—		—				Yes	—	—	—	—		—	
1825		—		Yes*	—	—					—	—		Yes				—	Yes	—	—	—		Yes	
1826		—		—	—	—					—	—		O				—	—	—	—	—		—	
1829		—		—	—	—					—	—		—				Yes	—	—	—	—		—	
1831		—		—	—	—					—	—		Yes				—	—	—	—	—		—	
1833		—		Yes*	—	—					Yes	—		—				Yes	—	—	—	—		Yes	
1834		—		—	—	—					O	—		—				—	—	—	—	—		—	
1837		Yes		Yes	Yes	Yes					Yes	Yes		Yes				Yes	Yes	Yes	Yes	Yes		Yes	
1838		—		—	—	—					—	—		O				—	O	—	—	—		—	
1839		—		Yes	Yes	—					Yes	—		O				Yes	—	—	Yes	—		Yes	
1840		—		—	O	—					—	—		—				—	—	—	—	—		—	
1841		—		—	O	—					Yes*	Yes		—				—	Yes	—	—	—		—	
1842		—		—	O	—					Yes*	—		—				—	—	—	—	—		—	
1847		—		Yes	—	—					—	—		—				—	—	—	—	—		Yes	
1848		—		—	—	—					—	—		Yes				—	—	—	—	—		—	
1851		—		—	—	—					Yes*	—		—				—	—	—	—	—		—	
1854		—		—	—	—					Yes*	—		—				—	—	—	Yes	—		—	
1857		Yes		Yes	Yes	Yes					Yes	Yes		Yes				Yes	Yes	Yes	Yes	Yes		Yes	
1860		—		—	—	—					Yes*	—		—				—	—	—	—	—		—	
1861		—		—	Yes	—					Yes*	—		—				Yes	Yes	—	—	—		—	
1864		—		—	—	—				—	—	—		—				Yes	Yes	—	—	—	—	—	—
1869		—		—	—	—			—	—	—	—		—				—	—	—	—	Yes	—	—	—
1871	—	—		—	—	—			—	—	—	—	—	—				Yes	—	—	—	—	—	—	—
1873	Yes	—		Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1876	—	—		—	—	—			—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1878	—	Yes		—	—	—			—	—	—	—	—	—	—			—	—	—	—	—	—	—	—
1879	—	—		—	—	—			—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1880	—	—	—	—	—	—			—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1882	—	—	—	—	—	—			—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1884	Yes	—	Yes	—	Yes	Yes			Yes	Yes	Yes*	Yes	—	Yes	Yes*			Yes	Yes	Yes	Yes	Yes	Yes	—	Yes*
1885	—	—	O	—	—	—			—	—	—	—	—	—	—			—	—	—	—	—	—	—	—
1887	—	—	—	—	—	—			—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1888	—	—	—	—	—	—			—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1890	Yes	—	—	—	Yes	Yes		Yes	Yes	Yes	Yes*	—	—	Yes	Yes*			Yes	—	—	Yes	—	Yes	—	Yes*
1892	—	—	Yes	—	—	—		—	—	—	—	—	—	—	—			—	—	—	—	—	—	—	—
1893	Yes	—	O	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1894	—	—	—	—	—	—		—	—	—	—	—	—	O	—			—	—	—	—	O	—	—	—
1895	—	—	—	—	—	—		—	—	—	—	—	—	—	Yes*			—	—	—	—	O	—	—	—
1896	—	—	—	—	Yes	—		Yes	—	Yes	Yes*	—	—	—	Yes*			—	—	—	—	—	—	—	—
1898	—	—	—	—	—	—		Yes	—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1899	—	—	—	—	—	—		Yes	—	—	Yes*	—	—	—	Yes			—	—	—	—	—	—	—	—
1901	—	—	—	—	—	—		Yes	—	—	Yes*	—	—	—	Yes			—	—	—	—	Yes	—	—	—
1902	—	—	—	—	—	—		—	—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1903	—	—	—	—	—	—		Yes	—	—	Yes*	—	—	Yes	Yes			—	—	—	—	—	—	—	—
1904	—	—	—	—	—	—		—	—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1905	—	—	—	—	—	—		Yes	—	—	Yes*	—	—	—	Yes*			Yes	—	—	—	—	—	—	—

Continued on next page

Table 1: Chronologies of Financial Crises in the United States, 1791–2023 (*continued*)

Year	B/V/X	B/D/W	B/H	B/W	C/G	C	D/R	DL/S	F/S	G	J	J/K/M/S	J/S/T	Ju	K	L/V	LS/N	M/S	R/R	Rb	Ro	So	Sp	T	W
1906	—	—	—	—	—	—		—	—	—	—	—	—	—	Yes*			—	—	—	—	—	—	—	—
1907	Yes	—	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1908	—	—	—	—	—	—		—	—	—	Yes*	—	—	—	Yes*			—	—	—	—	—	—	—	—
1909	—	—	—	—	—	—		Yes	—	—	—	—	—	—				Yes	—	—	—	—	—	—	—
1913	—	—	—	—	—	—		—	—	—	—	—	—	Yes				—	—	—	—	—		—	—
1914	—	—	Yes	—	Yes	—			—	Yes	—	—	—	—				Yes	Yes	—	—	Yes		—	—
1917	—	—	—	—					—		—	—	—					Yes	—	—	—	—		—	—
1920	—	—	—	—					—		Yes*	—	—					Yes	—	—	—	—		—	—
1923	—	—	—	—			Yes*		—		—	—	—					—	—	—	—	—		—	—
1924	—	—	—	—			Yes*		—		—	—	—					—	—	—	—	—		—	—
1926	—	—	—	—			Yes*		—		Yes*	—	—					—	—	—	—	—			—
1927	—	—	—	—			Yes*		—		Yes*	—	—					—	—	—	—	—			—
1929	—	—	—	—			Yes*		—		Yes*	Yes	—					Yes	Yes	Yes	—	Yes			—
1930	Yes	—	Yes	Yes					Yes			Yes	Yes					—	O	—	Yes	—			Yes
1931	—	Yes	O	Yes					Yes			—	—					—	O	—	—	—			Yes
1932	—	O	O	—					—			Yes	—					—	O	—	—	—			Yes
1933	—	—	O	Yes					Yes			—	—					—	O	—	—	—			Yes
1939	—	—	—						—			—	—					Yes	—	—	—	—			
1958	—	—	—						—			—	—					Yes	—		—	—			
1962	—	—	—									—	—				—	—	—		—	Yes			
1966	—	—	—									—	—				—	Yes	—		—	—			
1969	—	—	—									—	—				—	Yes	—		—	—			
1970	—	—	—									—	—			—	—	Yes	—		—	—			
1973	—	—	Yes									—	—			—	Yes	—	—		—	—			
1974	—	—	O									—	—			—	O	Yes	—		—	—			
1975	—	—	O									—	—			—	O	—	—		—	—			
1976	—	—	—									—	—			—	—	Yes	—		—	—			
1980	—	—	—									—	—			—	—	Yes	—		—	—			
1982	—	Yes	Yes									Yes	—			—	Yes	—	—		—	—			
1983	—	O	O									Yes	—			—	O	—	—		—	—			
1984	Yes	O	O									Yes	Yes			—	O	Yes	Yes		—	—			
1985	—	O	—									Yes	—			—	—	—	O		—	—			
1986	—	O	—									—	—			—	—	—	O		—	—			
1987	—	—	—									—	—			—	—	—	O		—	—			
1988	—	—	Yes									—	—			Yes	Yes	—	O		—				
1989	—	—	O									—	—			—	O	—	O		—				
1990	Yes	—	O									—	—			—	O	—	O		—				
1991	—	—	O									Yes	—			—	O	—	O		—				
1992	—	—	—									Yes	—			—	—	—	—		—				
1998	—		—									—	—			—	—	Yes	—		—				
2001	—		—									—	—			—	—	Yes	—		—				
2007	Yes		Yes									Yes	Yes			Yes		Yes	Yes		—				
2008	—											Yes	—			—		—	O		Yes				
2009	—											—	—			—		—	O						
2010	—											—	—			—		—	O						
2023												Yes													

Notes: This table summarizes existing financial crisis chronologies in the United States from 1791 to 2023. For each chronology, years identified as the start of a crisis are marked "Yes"; years associated with an ongoing crisis are marked "O"; years included in the sample but without a crisis are marked "—"; and years identified as minor crises are marked "Yes*". The chronology definitions are provided in Table E.1 of the online appendix.

Sources: B/V/X (Baron, Verner and Xiong, 2021); B/D/W (Bordo, Dueker and Wheelock, 2002); B/H (Bordo and Haubrich, 2017); B/W (Bordo and Wheelock, 1998); C/G (Calomiris and Gorton, 1991); C (Conant, 1915); D/R (Davison and Ramirez, 2014); DL/S (DeLong and Summers, 1986); F/S (Friedman and Schwartz, 1963); G (Gorton, 1988); J (Jalil, 2015); J/K/M/S (Jamilov, König, Müller and Saidi, 2024); J/S/T (Jordà, Schularick and Taylor, 2017); Ju (Juglar, 1916); K (Kemmerer, 1910); L/V (Laeven and Valencia, 2020); LS/N (Lopez-Salido and Nelson, 2010); M/S (Metrick and Schmelzing, 2021); R/R (Reinhart and Rogoff, 2009); Rb (Rothbard, 2002); Ro (Rockoff, 2021); So (Sobel, 1988); Sp (Sprague, 1910); T (Thorp, 1926); W (Wicker, 2000, 2006). We use the most recent updates of these chronologies when available, as in the cases of J/K/M/S, J/S/T, and R/R.

Table 2: Chronologies of Regional Crises for Selected States, 1870–2021

State	Year	Deposits (pct. growth)	Wholesale liabilities (pct. growth)	Bank failures	State	Year	Deposits (pct. growth)	Wholesale liabilities (pct. growth)	Bank failures
California	1878	-4.4	-40.1	2		1992	-2.4	-22.1	20
	1879	-4.4	-32.7	2		1998	6.8	-1.5	1
	1880	25.9	-32.7	2		2001	8.1	-13.6	1
	1882	4.9	-42.8	1		2008	9.3	-6.1	16
	1884	-21.6	-50.8	1	Florida	1887	2.3	-33.0	1
	1887	-19.1	2.6	3		1888	2.3	-33.0	1
	1888	-19.1	-20.6	3		1890	-3.0	-24.5	1
	1890	-6.4	-20.6	2		1892	-19.9	-38.2	3
	1892	-24.0	-12.0	2		1893	-19.9	-38.2	3
	1893	-24.0	-12.0	2		1895	-18.9	-20.3	2
	1895	-3.3	-0.5	2		1896	-18.9	-20.3	2
	1896	-3.3	-0.5	2		1898	6.6	-9.1	2
	1906	-15.3	-37.5	6		1906	-6.1	-4.5	2
	1907	-15.3	-37.5	6		1907	-6.1	-4.5	2
	1908	-15.3	-37.5	6		1908	-6.1	-4.5	2
	1913	5.3	-22.7	4		1913	4.4	-11.9	1
	1914	5.3	-22.7	4		1914	4.4	-11.9	1
	1917	7.8	-4.2	7		1917	15.6	-12.4	3
	1920	-9.6	-22.7	13		1920	-7.6	-25.6	2
	1923	-5.9	-5.5	34		1926	-18.7	-25.1	3
	1924	-5.9	-5.5	24		1927	-18.7	-25.1	5
	1930	0.2	-21.9	18		1929	-12.0	-24.1	14
	1931	-16.8	-35.5	19		1930	-12.0	-24.1	14
	1932	-16.8	-35.5	19		1931	-11.3	-37.1	7
	1933	-16.8	-35.5	21		1932	-11.3	-37.1	6
	1966	5.0	-32.3	1		1933	-8.9	-37.1	3
	1973	10.6	-14.3	1		1939	-5.5	3.9	1
	1974	7.7	-14.3	1		1966	8.0	-54.6	1
	1982	6.6	-10.9	5		1990	4.6	-7.3	10
	1983	4.1	-10.9	6		1991	1.5	-15.0	10
	1984	4.1	-10.9	7		1992	1.5	-15.0	10
	1985	2.5	-8.6	8		2001	4.3	-20.5	2
	1988	2.1	-5.4	8		2007	4.7	-3.4	2
	1990	1.3	-16.6	4		2008	4.7	-18.1	10
	1991	-1.4	-22.1	12					

Continued on next page

Table 2: Chronologies of Regional Crises for Selected States, 1870–2021 (*continued*)

State	Year	Deposits (pct. growth)	Wholesale liabilities (pct. growth)	Bank failures	State	Year	Deposits (pct. growth)	Wholesale liabilities (pct. growth)	Bank failures
New York	1871	-9.6	-3.0	6		1991	-1.1	-2.2	2
	1873	-14.1	-8.5	9		1992	-1.5	2.4	2
	1876	-22.9	-5.7	4		2008	-4.0	-10.7	1
	1878	-1.7	-3.6	5	Texas	1878	-0.3	3.3	1
	1882	-15.3	-0.9	6		1879	-0.3	3.3	1
	1884	-13.3	-11.3	6		1884	-5.5	-13.3	1
	1887	-5.9	-2.9	5		1890	-3.7	-4.9	6
	1888	-2.1	1.7	7		1892	-17.3	-24.9	14
	1890	-3.6	-6.1	7		1893	-17.3	-24.9	14
	1892	-4.3	3.9	4		1895	-9.2	-17.2	9
	1893	-4.3	3.9	2		1896	-9.2	-17.2	9
	1895	-4.6	-10.6	10		1898	12.1	-2.8	9
	1896	-4.6	-10.6	10		1899	12.1	-2.8	9
	1898	-15.4	-13.4	5		1901	0.3	-19.4	4
	1899	-15.4	-13.4	5		1902	0.3	-19.4	8
	1901	2.6	-1.8	8		1903	0.3	-2.6	8
	1902	-11.3	-1.8	8		1906	-16.6	-52.6	18
	1903	-11.3	-1.8	5		1907	-16.6	-52.6	14
	1904	-11.3	-15.3	11		1908	-16.6	-52.6	19
	1905	-3.1	-15.3	11		1909	-11.7	-32.0	19
	1906	-3.1	-15.3	11		1913	-11.3	-24.2	16
	1907	-1.3	-12.7	5		1914	-11.3	-24.2	12
	1908	-4.7	-16.7	5		1917	-8.3	-47.4	10
	1909	-4.7	-16.7	5		1920	-21.0	-53.3	24
	1913	-4.4	-5.1	5		1923	6.6	-5.9	11
	1914	-4.4	-5.1	7		1924	6.6	-5.9	10
	1917	2.7	-9.1	12		1926	2.2	-7.7	24
	1920	-13.6	-17.7	8		1927	2.2	-7.7	24
	1923	-14.1	-9.9	9		1929	-4.9	-19.5	40
	1924	-14.1	-9.9	6		1930	-10.5	-19.5	65
	1926	2.3	-5.6	15		1931	-18.2	-33.5	65
	1927	0.9	-2.2	15		1932	-18.2	-33.5	65
	1929	-8.8	-32.6	15		1933	-18.2	-33.5	43
	1930	-11.6	-32.6	34		1958	-0.9	-9.0	1
	1931	-24.0	-35.9	35		1962	4.4	-68.4	1
	1932	-24.0	-35.9	35		1966	4.9	-54.3	3
	1933	-24.0	-35.9	36		1973	10.3	-19.9	1
	1939	-0.8	15.9	8		1974	10.3	-19.9	2
	1973	8.3	-1.4	1		1985	0.4	-4.2	26
	1974	-4.7	-13.0	1		1988	-5.4	-20.4	175
	1976	-4.7	-13.0	1		1990	-0.6	-20.4	134
	1984	-0.3	-1.0	2		1991	2.2	-19.4	103
	1985	-0.3	-1.0	2		1992	0.1	-19.4	31
	1988	-0.7	-4.7	3		2008	1.3	-10.9	4
	1990	-0.7	-4.7	3					

Notes: This table reports the identified episodes of regional crises for California, Florida, New York, and Texas, along with three financial indicators: percentage growth of deposits, percentage growth of wholesale liabilities, and the number of bank failures. For a given state, a year is classified as in a regional crisis if (i) any chronology surveyed in Table 1 marks it as a crisis start year or a minor crisis year, (ii) at least one bank failure occurs within one year of the crisis, and (iii) either deposits or wholesale liabilities decline within one year of the crisis. See Section F of the online appendix for variable definitions.

Table 3: States-in-crisis and U.S. Output Growth, 1870-2021

Dependent var.:	$100 \times \Delta \text{GDP}_t$			$100 \times \Delta \text{IP}_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbf{1}\{\text{BenchmarkCrisis}_{t-1}\}$	-5.210*		-4.105	-11.162***		-9.199***
	(2.737)		(2.660)	(3.482)		(3.418)
$\text{States-in-crisis}_{t-1}$		-1.256***	-1.092**		-2.129**	-1.697*
		(0.480)	(0.481)		(0.957)	(0.975)
AR(5)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	147	147	147	147	147	147

Notes: This table reports the results from a time series regression of the log change in real GDP (in columns 1-3) or industrial production (in columns 4-6) on a dummy for U.S. financial crises (`BenchmarkCrisis`) and the asset-weighted share of states experiencing a regional crisis (`States-in-crisis`) as of the previous year. $\mathbf{1}\{\text{BenchmarkCrisis}_{t-1}\}$ is an indicator for the benchmark crisis years. $\text{States-in-crisis}_{t-1}$ is the asset-weighted fraction of states experiencing a regional crisis in any given year, standardized to have a mean of 0 and standard deviation of 1. We classify an event as a "regional crisis" if the following criteria are met: (i) *any* existing chronology surveyed in Table 1 reports a financial crisis in the United States, (ii) there is a contraction either in state-level deposits or wholesale liabilities within one year of the crisis year, and (iii) there is at least one bank failure in a state within one year of crisis year. We control for 5 lags of US GDP growth rates. The standard errors reported in brackets are computed using 5 Newey-West lags. ***, **, * denote significance at the 1%, 5%, and 10% levels. We construct US-level real GDP by combining data from the BEA (1929 onward) and from Williamson (2025) for pre-1929 years. For industrial production, we combine data from Davis (2004) (1870–1915), Miron and Romer (1990) (1916–1919), and the Federal Reserve (1920–2021).

Figure 1: The Officer of the Comptroller of the Currency's (OCC) Annual Reports

MINNESOTA.

Resources.	JANUARY.	APRIL.	JULY.	OCTOBER.
	15 banks.	15 banks.	15 banks.	15 banks.
Loans and discounts	$2, 095, 713 77	$1, 993, 778 31	$2, 082, 646 26	$2, 080, 034 77
U. S. bonds dep'd to secure circulation	1, 682, 200 00	1, 682, 200 00	1, 682, 200 00	1, 682, 200 00
U. S. bonds dep'd to secure deposits	109, 550 00	100, 000 00	102, 250 00	100, 000 00
U. S. bonds and securities on hand	106, 900 00	110, 650 00	136, 250 00	90, 950 00
Other stocks, bonds, and mortgages	63, 257 48	67, 439 79	76, 725 21	65, 440 55
Due from national banks	241, 440 33	301, 547 26	231, 625 07	437, 946 07
Due from other banks and bankers	112, 476 12	67, 379 80	81, 180 32	83, 317 37
Real estate, furniture, &c	70, 565 59	73, 619 54	76, 688 81	84, 714 73
Current expenses	11, 010 02	22, 352 88	17, 618 37	42, 392 74
Premiums	22, 040 93	19, 888 26	18, 743 16	10, 048 76
Checks and other cash items	130, 260 27	72, 716 97	150, 789 76	144, 249 66
Bills of national banks	31, 065 00	21, 540 00	27, 393 00	81, 025 00
Bills of other banks	8, 229 00	4, 622 00	3, 399 00	1, 993 00
Specie	10, 446 71	13, 367 35	20, 868 02	6, 204 69
Legal tender notes and fract'l currency	285, 580 69	218, 160 72	293, 901 38	395, 348 26
Compound interest notes	328, 450 00	267, 530 00	292, 500 00	159, 650 00
Total	5, 309, 585 91	5, 036, 792 88	5, 294, 778 36	5, 465, 515 60

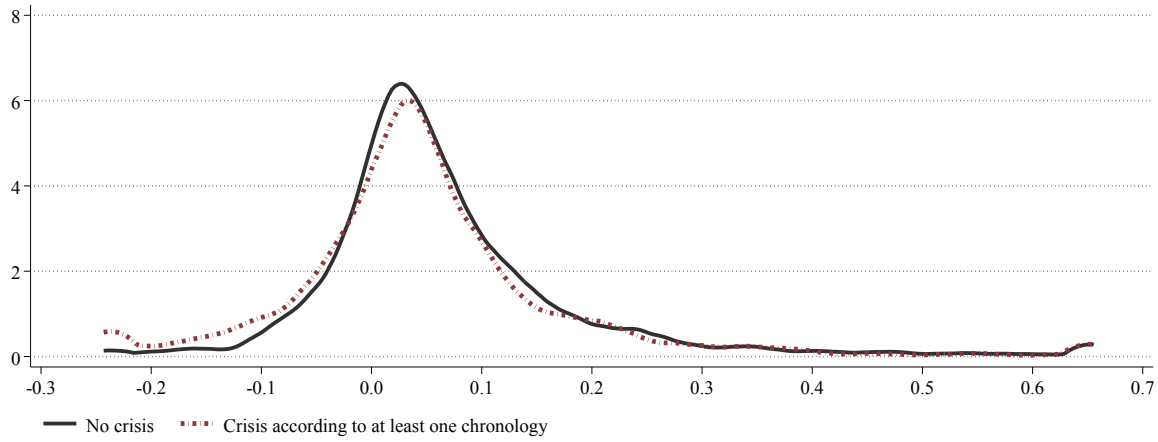
IOWA.

	45 banks.	44 banks.	45 banks.	45 banks.
Loans and discounts	$4, 704, 243 03	$5, 083, 156 28	$4, 915, 312 64	$5, 249, 256 22
U. S. bonds dep'd to secure circulation	3, 682, 150 00	3, 682, 150 00	3, 712, 150 00	3, 713, 150 00
U. S. bonds dep'd to secure deposits	583, 250 00	575, 150 00	504, 000 00	429, 000 00
U. S. bonds and securities on hand	306, 350 00	296, 250 00	388, 900 00	299, 600 00
Other stocks, bonds, and mortgages	131, 427 82	151, 143 69	146, 023 00	125, 811 71
Due from national banks	1, 102, 101 39	1, 070, 215 96	868, 189 25	1, 196, 505 23
Due from other banks and bankers	273, 729 72	234, 904 00	154, 385 35	145, 967 58
Real estate, furniture, &c	187, 185 55	206, 550 60	225, 254 68	246, 250 96
Current expenses	49, 387 07	73, 467 89	37, 852 46	86, 132 43
Premiums	21, 406 63	21, 605 99	17, 575 46	15, 961 66
Checks and other cash items	181, 190 92	137, 842 02	151, 279 23	152, 678 82
Bills of national banks	215, 936 00	201, 865 00	216, 636 00	253, 920 00
Bills of other banks	16, 983 00	9, 657 00	6, 239 00	6, 272 00
Specie	55, 542 98	47, 429 07	43, 364 02	29, 730 22
Legal tender notes and fract'l currency	1, 398, 452 66	1, 305, 581 77	1, 266, 545 69	1, 235, 122 99
Compound interest notes	676, 000 00	714, 550 00	639 950 00	335, 440 00
Total	13, 585, 336 17	13, 790, 839 27	13, 243, 656 78	13, 522, 739 82

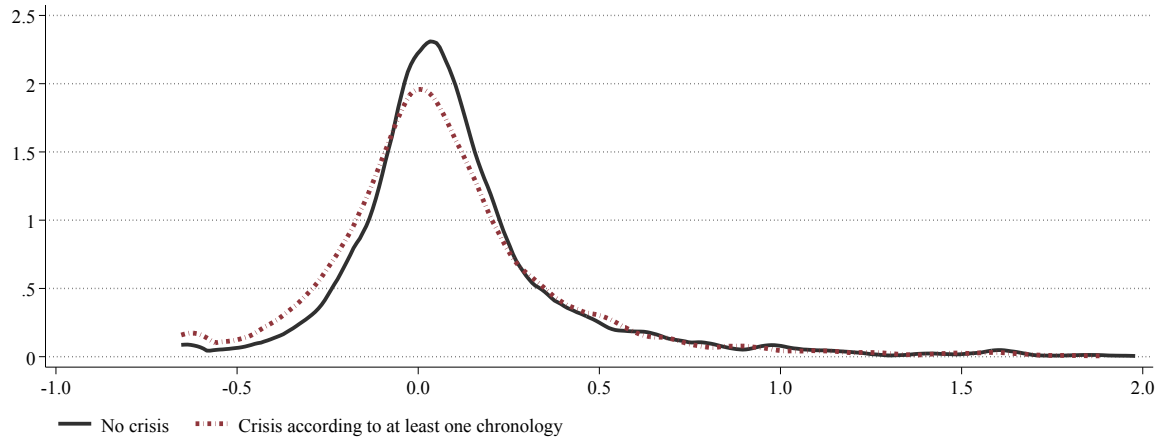
Notes: This figure provides an example of the raw source—the "Annual Report of the Comptroller of the Currency" as published by the United States' Office of the Comptroller of the Currency—from which we digitize state-level bank balance sheets for the period 1863 – 1960. A full list of OCC Annual Reports from 1863 – 1960 can be found on FRASER.

Figure 2: Distribution of Financial Distress Indicators during Financial Crises

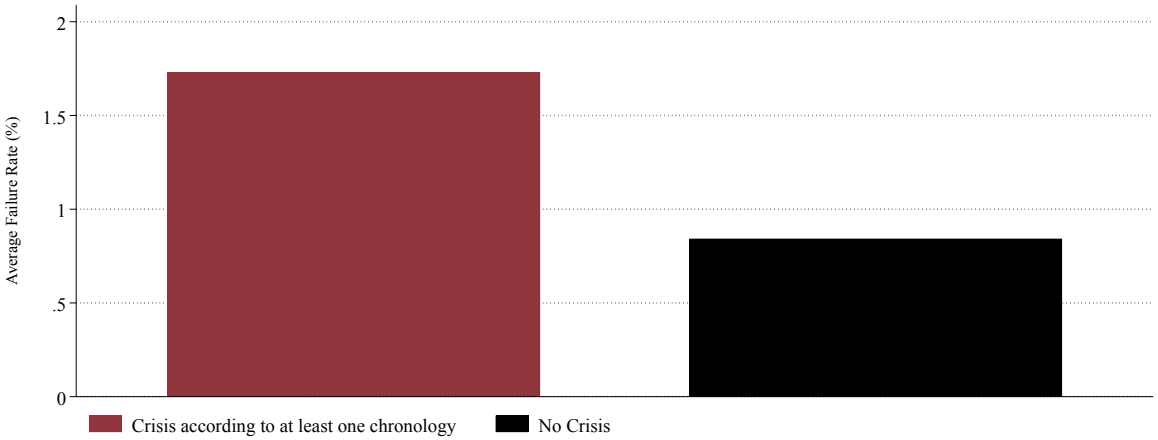
(a) Deposit Growth



(b) Wholesale Liability Growth



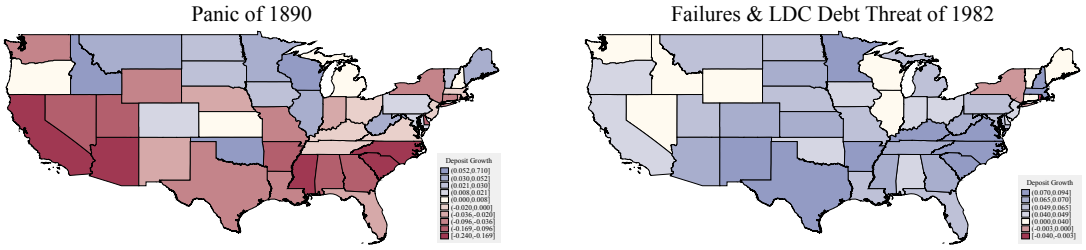
(c) Bank Failure Rate



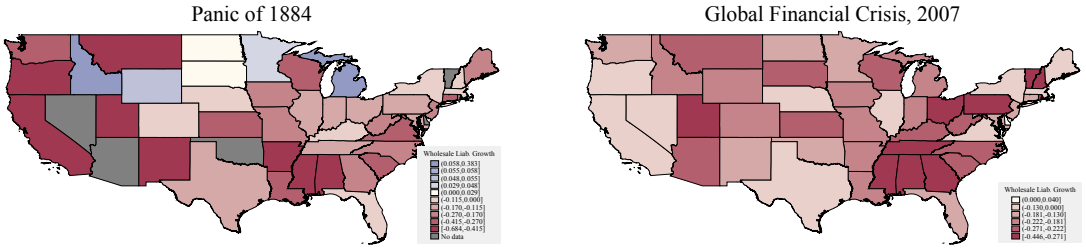
Notes: This figure presents density plots showing the distribution of deposit growth and wholesale liability growth, and a bar plot showing average bank failure rates, by periods of "No Crisis" (in black), and "Crisis according to at least one chronology" (in red). We refer the reader to Table 1 for more details on how we define crisis periods. Bank failure rates are reported in percentages. To account for outliers, bank failure rates are winsorized at the 99 percentile, while deposit growth and wholesale liability growth are truncated at 2.

Figure 3: Indicators of Financial Distress during Financial Crises

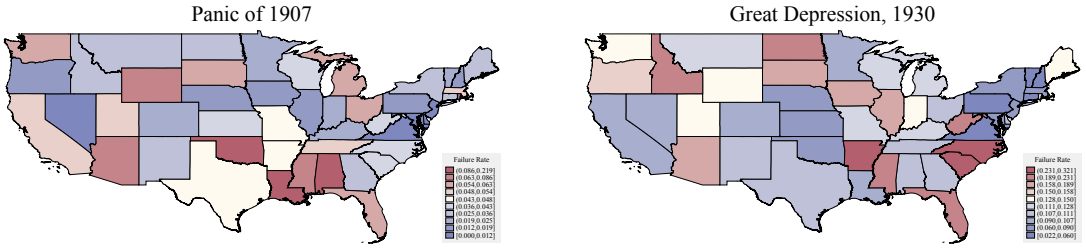
(a) Deposit Growth Rates



(b) Wholesale Liabilities Growth Rates



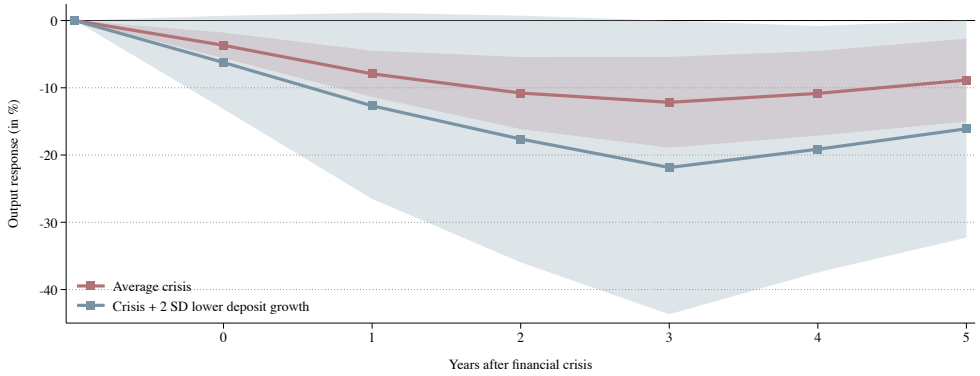
(c) Bank Failure Rates



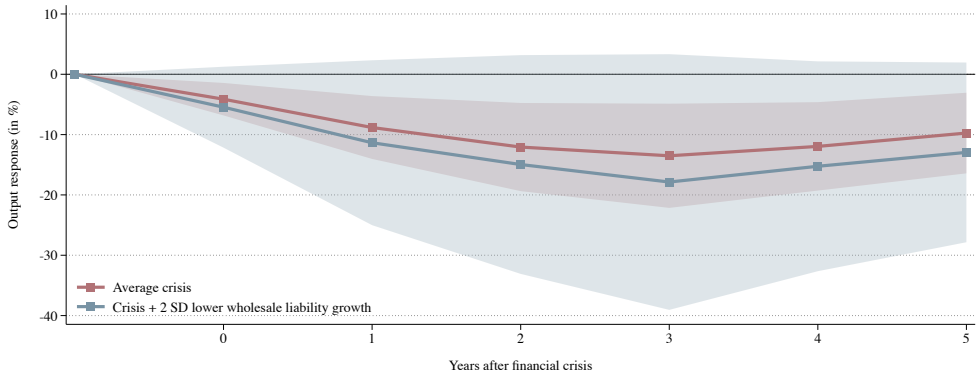
Notes: This figure plots three state-level indicators of financial distress - deposit growth rates, wholesale liabilities growth rates, and bank failure rates - across six significant crisis periods identified by our consensus chronology: the Banking Panic of 1890, the Banking Panic of 1884, the Trust-Company Banking Panic of 1907, the Banking Panic of 1930, the Failures & Less Developed Countries (LDC) Debt Threat of 1982 following Lopez-Salido and Nelson (2010), and the Financial Crisis of 2007. We refer the interested reader to Table E.1 for additional details on how each crisis is defined. For each crisis year, we plot the minimum growth rate of deposits and wholesale liabilities within 2 years of the crisis. Similarly, we plot the maximum failure rate within 2 years of the crisis. For each crisis period, for deposit and wholesale liabilities we assign colors by dividing positive growth rates into five quintiles (shaded in blue), and negative growth rates into five quintiles (shaded in red). We report ten deciles of failure rates, with those above the mean shaded in red, and those below the mean shaded in blue.

Figure 4: Financial Distress Indicators Predict Severity of Output Loss: 1870-2021

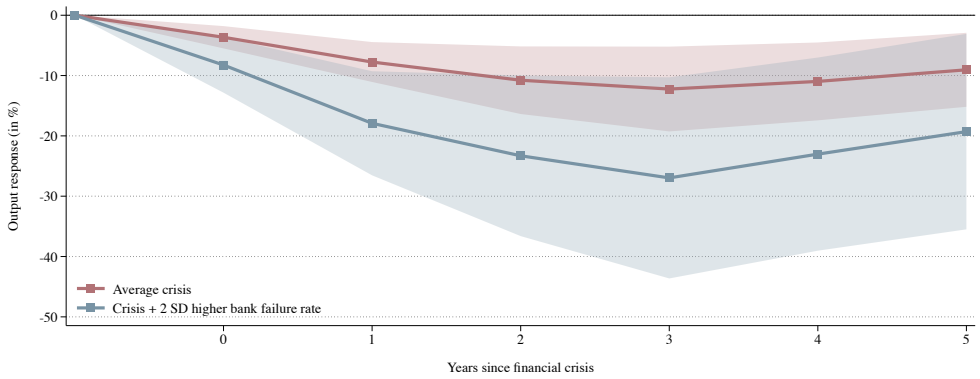
(a) Deposit Growth



(b) Wholesale Liabilities



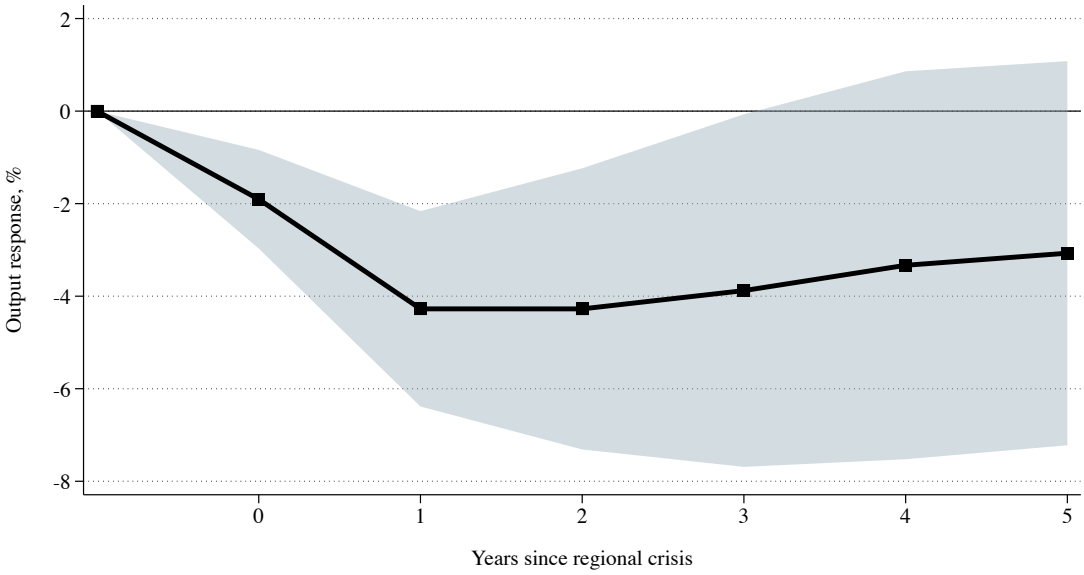
(c) Bank Failure Rate



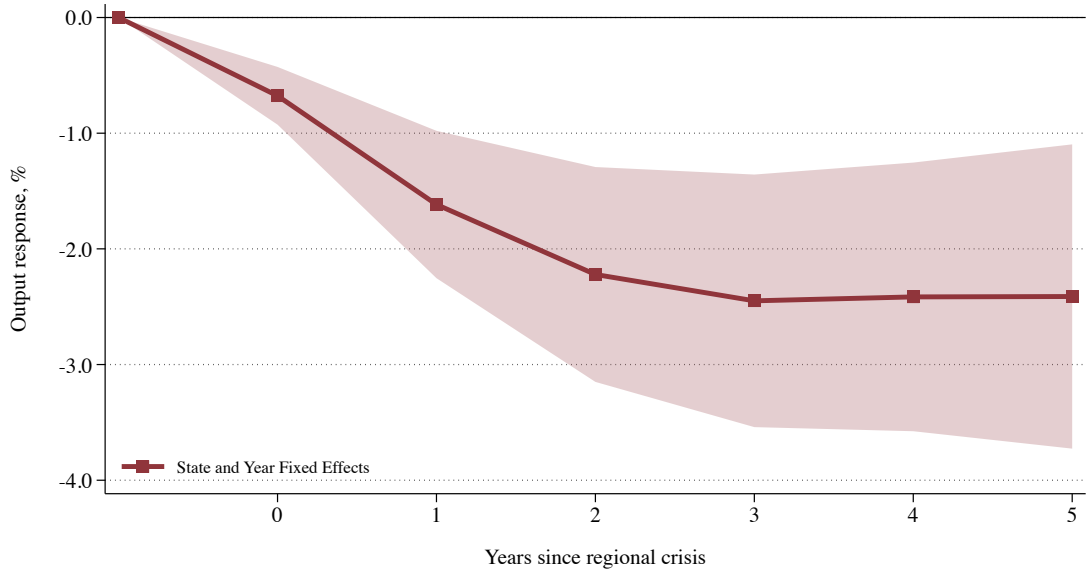
Notes: This figure presents the estimated response of our state-level economic activity index to a financial crisis as identified in our benchmark chronology, conditional on three indicators: the rate of deposit growth, wholesale liability growth, and bank failure rate respectively. We take the three-year moving average of each of these indicators. We plot the impulse response function estimated from equation (A.3), which extends our baseline specification to include each indicator and its interaction with the benchmark crisis dummy, and includes state fixed effects. The red markers represents the estimated coefficient $\beta_1^h, h \in [0,5]$, capturing the average output loss of a financial crisis at horizon h. The blue markers represents, for deposit growth and wholesale liability growth, the estimated coefficient $\beta_1^h - \beta_3^h * 2, h \in [0,5]$, where β_3^h captures how the relationship between the indicator and subsequent output changes during crises periods. Similarly, it represents the estimated coefficient $\beta_1^h + \beta_3^h * 2, h \in [0,5]$ for bank failure rates. The blue markers thus represent estimates of output losses when a state's banking sector experiences distress, as measured by low deposit or wholesale liability growth or alternatively high bank failure rates. The red and blue shaded areas correspond to the 90% confidence intervals based on standard errors clustered at the state and year level.

Figure 5: Output Losses Following Local Financial Distress, 1870–2021

(a) State Fixed Effects Only

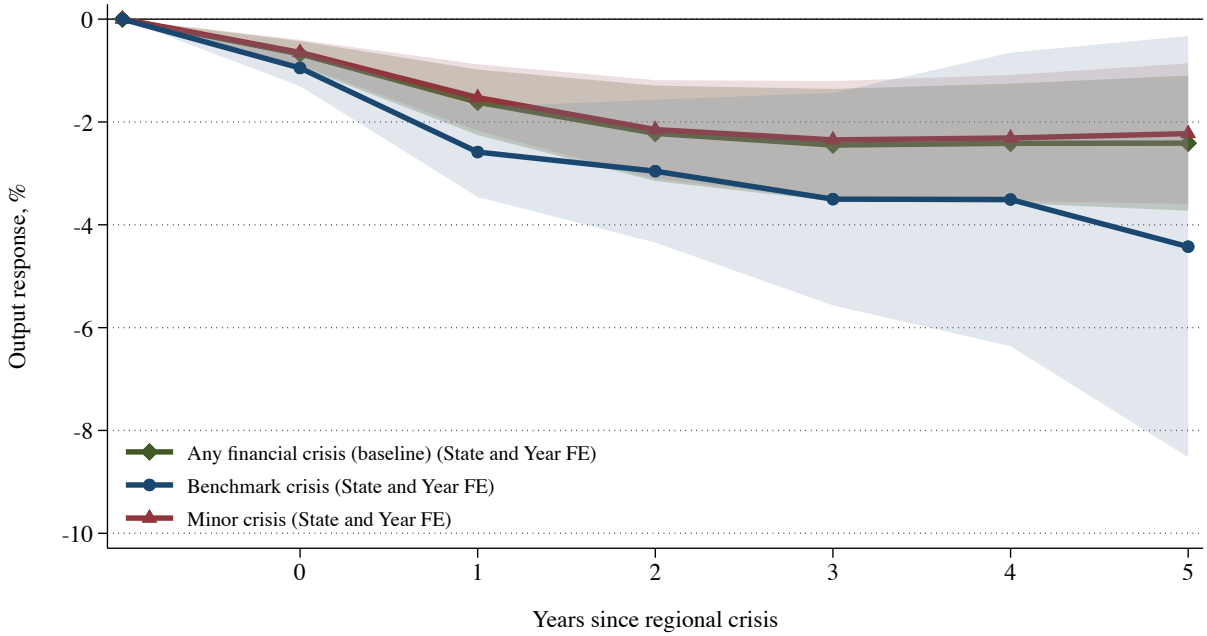


(b) With Year Fixed Effects



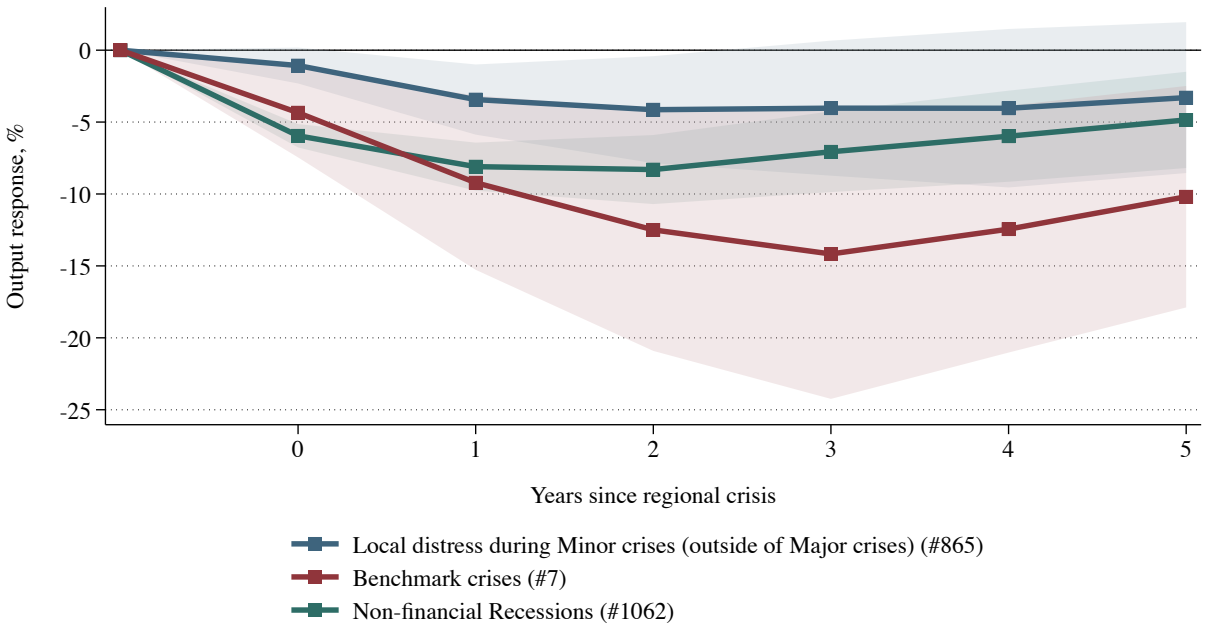
Notes: This figure presents the estimated response of our state-level economic activity index to a local financial distress identified in our state-level distress chronology. We plot the impulse response function estimated from equation (4.1), and report specifications including state fixed effects only in panel (a), and both year fixed effects and state fixed effects in panel (b) in red. The black markers represent the estimated coefficient $\beta^h, h \in [0, 5]$. With the inclusion of time fixed effects α_t^h, β^h captures the response of state-level output over the next h years to the start of a local financial distress, beyond the effect of common national shocks. The shaded regions correspond to the 90% confidence interval based on standard errors clustered by state and year.

Figure 6: Comparing Local Financial Distress During Major and Minor Crises



Notes: This figure presents the estimated response of the state-level economic activity index to three measures of local financial distress. Each measure requires there to be statistical evidence of a deposit or wholesale liability contraction in addition to at least one bank failure within one year of the crisis year. The differences arise from further requiring three variants of narrative evidence of a U.S.-wide crisis: (a) in our baseline definition, we require narrative evidence of a crisis from *any* chronology, (b) alternatively, we require there to be evidence of a major "benchmark" crisis on which there is broad agreement, and (c) we also consider a measure based on minor crises, defined as years appearing in at least one chronology that are not classified as a benchmark crisis. We plot the impulse response function estimated from equation (4.1), and include both state and year fixed effects. The black markers represents the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the total response of state-level output over the next h years to the start of local financial distress, relative to what would have been expected in the absence of a distress. The shaded region corresponds to the 90% confidence interval, based on standard errors clustered at the state and year level.

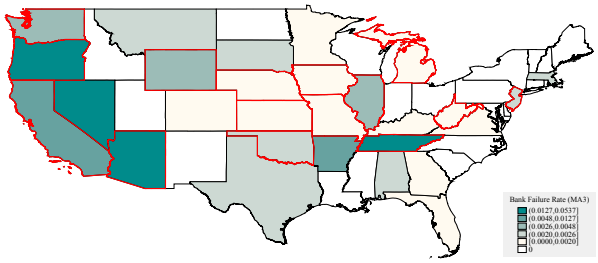
Figure 7: Comparing Local Financial Distress against Benchmark and Non-Financial Recessions



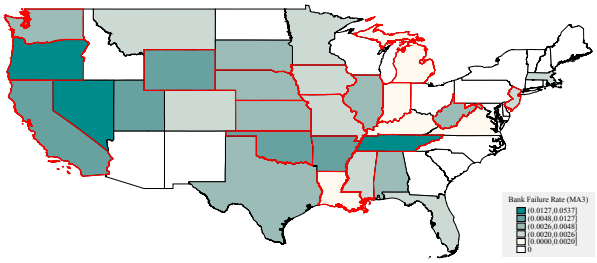
Notes: This figure presents the estimated response of the state-level economic activity index to three shocks: i) local financial distress which occur during Minor crises, ii) U.S.-wide Benchmark crises identified in our chronology, and iii) Non-Financial Recessions. Local financial distress which occur during Minor crises require there to be statistical evidence of a deposit or wholesale liability contraction in addition to at least one bank failure within one year of the crisis year, and for there to be narrative evidence of minor crises in that year. For ease of comparison with state-recession start years, we take the conservative approach of only keeping local financial 'start-years'. To do so, whenever we observe local financial distress which happens over consecutive years in the same state, we only keep the start year. Minor crises are defined as years appearing in at least one chronology that are not classified as a benchmark crisis. We define non-financial recessions in two steps. First, we identify state recessions using the Bry and Boschan (1971) algorithm following the procedure in Hoon et al. (2026). Next, we identify non-financial recessions as state recession start years which do not coincide with either local financial distress or a benchmark financial crisis. For each type of shock, we report in brackets the total number of such shocks within the span of our sample. We plot the impulse response function estimated from equation (4.1), and include both state and year fixed effects. The black markers represents the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the total response of state-level output over the next h years to the shock, relative to what would have been expected in the absence of a distress. The shaded region corresponds to the 90% confidence interval, based on standard errors clustered at the state and year level.

Figure 8: Crisis contagion after the Failures & LDC Debt Threat: 1982-1985

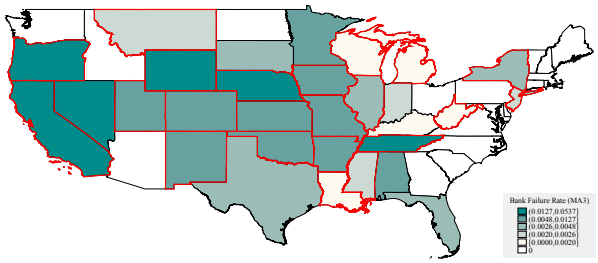
(a) 1982



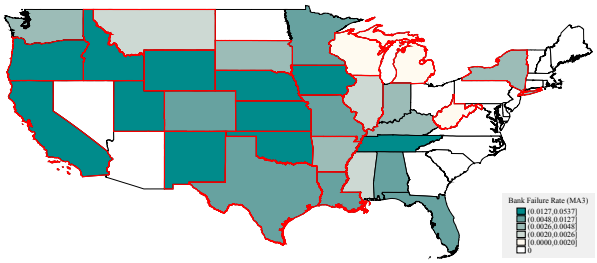
(b) 1983



(c) 1984



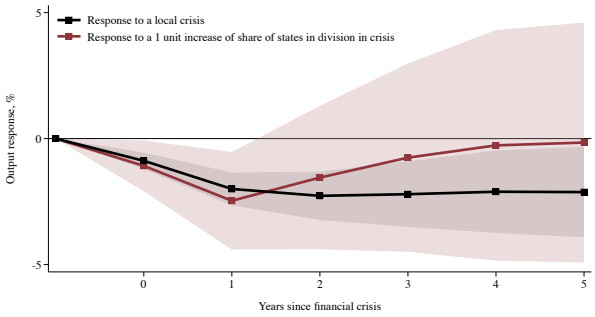
(d) 1985



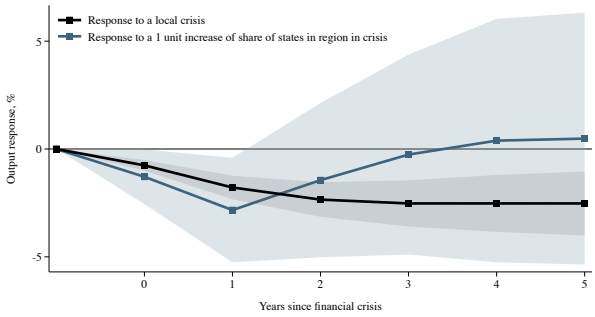
Notes: This figure plots the incidence of our local financial distress measure for four years after the onset of the Failures & Less Developed Countries (LDC) Debt Threat of 1982. We draw red borders around states which experience local financial distress within each year. We determine colors for each state based on the intensity of its bank failure rate, divided into five quantiles and a zero bin. For consistency with our definition of local crises, we report the 3-year moving average of the bank failure rate.

Figure 9: Output Losses Following Local Financial Distress Spillovers, 1870-2021

(a) Division

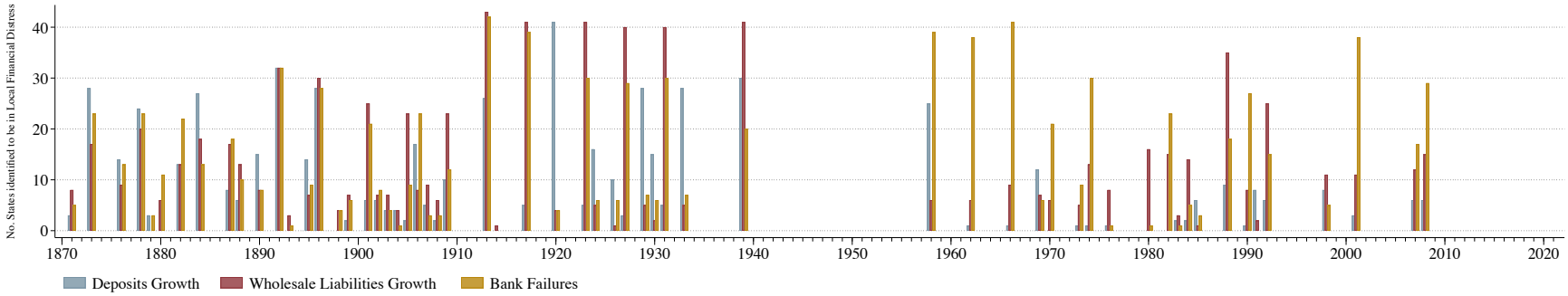


(b) Region



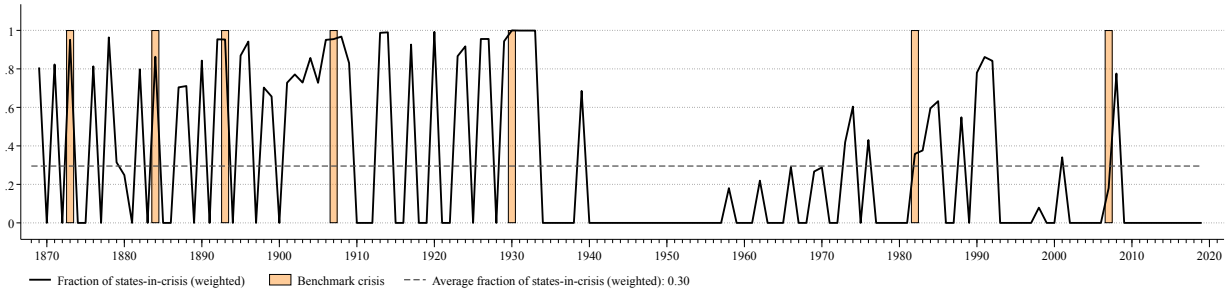
Notes: This figure presents the estimated response of our state-level economic activity index to local financial distress in the state itself, and local financial distress in surrounding states. We plot the impulse response function estimated from equation (4.2), and report specifications including both state fixed effects and a control for U.S.-wide systemtic crises. The black markers represent the estimated coefficient $\beta^h, h \in [0, 5]$, while the red (panel a) and blue (panel b) markers represent the estimated coefficient $\beta^{S,h}, h \in [0, 5]$. The shaded regions correspond to the 90% confidence interval based on standard errors clustered by state and year.

Figure 10: Number of Local Financial Distress Episodes by Distress Indicator, 1870-2021



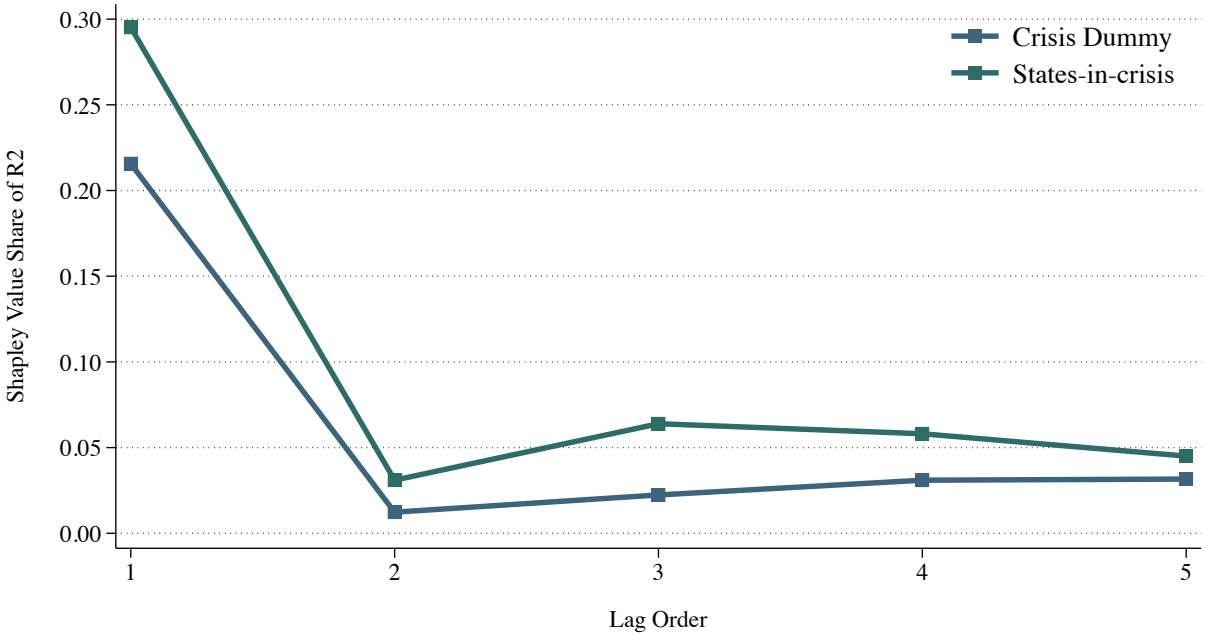
Notes: This figure presents the number of local financial distress episodes across three perturbations of the local financial distress variable, based only on deposit growth (leftmost, in blue), growth in wholesale liabilities (middle, in red), or bank failures (rightmost, in gold). Local financial distress is defined as state-year observations where (a) at least one chronology defines a year as a U.S.-wide crisis, and (b) there is evidence of a contraction in deposits, wholesale liabilities, or at least one bank failure (depending on the measure) within one year of the crisis. For each indicator and year, we plot the number of states experiencing a local financial distress episode as identified by the indicator in question.

Figure 11: Fraction of States Experiencing Local Financial Distress, 1870-2021



Notes: This figure presents the fraction of states whose banking sector experiences a crisis, which we term "states-at-risk". In this figure, we calculate this fraction by weighting states by the total assets of their banking sector, as $frac_states_at_risk_t = \sum_i \mathbf{1}_{i,t}^{Local\ crisis} \cdot a_{i,t} / \sum_i a_{i,t}$, where: $\mathbf{1}_{i,t}^{Local\ crisis}$ is an indicator variable that equals 1 if state i experiences local financial distress in year t, and 0 otherwise, and $a_{i,t}$ represents the total banking assets in state i at time t. Orange bars correspond to years for which a financial crisis is identified according to our benchmark chronology. We plot the average fraction of "states-at-risk" across years as a dotted line.

Figure 12: Share of variation in US Output accounted for by binary crisis indicator v.s. states-in-crisis



Notes: This figure presents relative Shapley Value shares which decompose R^2 from equation (5.4). We report the Shapley value share for our states-in-crisis measure and a binary crisis dummy, with the remainder accounted for by the five lags of GDP growth that we control for. In particular, we compute the Shapley value for each of the regressors i) our states-in-crisis measure, ii) a binary crisis dummy for benchmark crises, and iii) five lags of GDP growth. Next, we compute the fraction for each indicator j as $\frac{\text{Shapley Value}_j}{\sum_j \text{Shapley Value}_j}$. We consider lag orders from one to five years before the realization of GDP growth.

Online Appendix for

"The Costs of Financial Crises
in the United States"

Joseph Hoon Chang Liu Karsten Müller Jonathan Payne Zhongxi Zheng

A The Costs of U.S.-wide Financial Crises

In this section, we investigate the aftermath of U.S.-wide financial crises from 1870-2022. To do so, we construct a list of 'benchmark' systemic U.S. crises from our survey of chronologies. With this benchmark chronology in hand, we harness our long run macro-financial panel dataset to examine the response of state-level output after these systemic crises. We document three facts from our study:

First, U.S. financial crises are followed by downturns in state-level economic activity, based on our benchmark chronology. Output remains approximately 14 percent below pre-crisis trends three years after the start of a crisis and remains depressed even after five years. This pattern is consistent with international evidence (Cerra and Saxena, 2008; Reinhart and Rogoff, 2009; Schularick and Taylor, 2012), but has not previously been documented for the United States. The state-level output losses of economic activity following crises are slightly larger than the drop of nationwide U.S. real GDP and industrial production, based on a time series analysis covering the period from 1791 to 2022. This is consistent with general equilibrium factors—such as the occurrence of a nationwide panic, spillovers, or changes in monetary policy—slightly dampening the economic aftermath of crises.

Second, the output losses of U.S. financial crises display substantial heterogeneity across states, ranging from -34% to approximately -1%. These findings are consistent with existing work using regional variation in the exposure to individual crisis episodes to study their consequences (e.g., Peek and Rosengren, 2000; Calomiris and Mason, 2003*a*; Ashcraft, 2005; Huber, 2018), suggesting an important regional dimension to crisis transmission. Different from these existing studies, our analysis highlights persistent differences in the elasticity of output to crises across states using long-run panel data rather than a cross-sectional estimation based on a single crisis.

Third, we show that statistical markers of local banking sector issues strongly predict the severity of subsequent economic contractions. Based on our harmonized long-run dataset, we create three measures of such local issues: (a) growth in state-level deposits, (b) growth in wholesale liabilities, and (c) the rate of local bank failures. When interacted with a dummy for a U.S.-wide crisis from our benchmark list, we find substantially larger output losses when there is a state-level disruption to the banking sector's liquidity (proxied by liability-side disruptions) or solvency (proxied by failures). These findings are consistent with existing cross-country evidence suggesting that the aftermath of financial distress is partly predictable with the extent of bank equity declines

(Baron, Verner and Xiong, 2021), spike in credit spreads (Krishnamurthy and Muir, 2025), deposit contractions (Jamilov et al., 2024), or crisis intensity revealed by textual data (Romer and Romer, 2017; Chen et al., 2023; Ahir et al., 2023).

A.1 A Survey of U.S. Financial Crisis Episodes

In this section, we document descriptive statistics regarding the agreement and disagreement across our survey of chronologies, and document our construction of a "benchmark" chronology of widely accepted major crises.

Quantifying Crisis Probabilities

The heterogeneity in crisis definitions outlined above poses a challenge for researchers attempting to identify patterns in the frequency and severity of crises, and assessing their potential economic impact. In Figure B.1, we summarize the historical incidence of financial crises across these chronologies. We focus on crisis lists that span a sufficient number of years to be meaningful, excluding minor crises and years associated with ongoing crises. The figure shows considerable variation in the fraction of years classified as crises, even among widely-used sources. For instance, Jordà, Schularick and Taylor (2017) and Laeven and Valencia (2020) both report that crises occur in about 4% of years, whereas Jalil (2015) and Baron, Verner and Xiong (2021) imply higher incidences of roughly 6.1% and 6.7%, respectively. Reinhart and Rogoff (2009) reports an incidence of approximately 7.5%, nearly twice that in Jordà, Schularick and Taylor (2017) and Laeven and Valencia (2020). At the upper end, Kemmerer (1910) and Metrick and Schmelzing (2021) each imply crisis incidences of around 16%, reflecting their inclusion of major wars and Federal Reserve interventions as crisis episodes. We note that these comparisons are unconditional, since many chronologies span different time periods. Nonetheless, the broad ranking of crisis incidence remains unchanged when we restrict chronologies to a common sample window, where possible. For example, restricting to the period $1870 - 2014$, the incidence in Jordà, Schularick and Taylor (2017) remains at 4%, still about one-third lower than that of Baron, Verner and Xiong (2021), while the incidence in Metrick and Schmelzing (2021) rises slightly from 16% to about 17%.

Towards a Benchmark Chronology

In order to undertake our analysis, we construct a "benchmark" chronology of widely accepted major crises. We define a benchmark crisis as one that appears in at least one-half of the report-

ing chronologies in Table 1 and is identified as a start year of a major crisis based on financial sector disruptions rather than government interventions alone (which is the focus of Metrick and Schmelzing (2021)). Given the discrepancies of chronologies for the 1980s and early 1990s, we follow Lopez-Salido and Nelson (2010)'s persuasive account of this period and assign 1982 as a crisis year, which they argue was the beginning of commercial bank troubles. Since there is no clear agreement about the dating of the Savings and Loan Crisis, or whether it constituted a crisis at all, we do not assign another year in the 1980s or 1990s as a crisis.

This methodology yields the benchmark chronology presented in the first column of Table B.1, and identifies ten crisis start years between 1791 and 2023: 1837, 1857, 1873, 1884, 1893, 1907, 1930, 1982, 2007, and 2023. Each of these episodes is consistently recognized by a majority of widely used sources, including Reinhart and Rogoff (2009), Jalil (2015), Jordà, Schularick and Taylor (2017), and Baron, Verner and Xiong (2021). Further discussion of the benchmark chronology is provided in Section E.2 of the online appendix.

To understand how our benchmark list compares with the surveyed chronologies, Figure E.1 shows the fraction of years—including both crisis and non-crisis years—where each chronology's classification differs from the benchmark. Among the various crisis chronologies, the largest disagreements occur with Kemmerer (1910) and Metrick and Schmelzing (2021), consistent with the results observed in Figure B.1.

Finally, Figure B.2 demonstrates the relationship between our benchmark crisis episodes and U.S. economic performance measured by GDP growth. We take data on GDP from the Bureau of Economic Analysis from 1929 onwards, and use the estimates by Williamson (2025) before. The figure reveals a clear association between benchmark crises and economic contractions throughout U.S. history. Major episodes like the Panics of 1857, 1893, 1907, and 1930 align with pronounced output declines, suggesting the identified crises likely forecast significant downturns. The 2007-2008 Global Financial Crisis similarly corresponds to one of the most severe economic contractions of the post-World War II era.

A.2 The Heterogeneous Output Losses of U.S. Financial Crises

Equipped with our macro-financial panel dataset, this section provides new estimates of the output losses of financial crises in the United States. Section A.2.1 begins by estimating the state-level response of output to U.S.-wide financial crises. Section A.2.2 compares these estimates with impulse responses from a time series analysis covering the period from 1791 to 2022. Section

A.2.3 shows that the local output response to financial crises varies widely across states. Section A.2.4 shows that the extent of a local output decline during crises is predictable with measures of state-level banking conditions.

Estimating the Local Output Responses to U.S. Financial Crises

To estimate the dynamic relation between financial crises and economic activity, we run variations of local projections (Jordà, 2005), adapted for a panel setting. Our baseline specification is:

$$\Delta Y_{i,t+h} = \alpha_i^h + \beta^h \, \mathbf{1}_t^{\text{U.S. crisis}} + \sum_{k=1}^{5} \gamma^{k,h} \left(X_{i,t-k} - X_{i,t-k-1} \right) + \epsilon_{i,t}^h \quad \text{with} \quad h \in [0,5]. \tag{A.1}$$

where $\Delta Y_{i,t+h}$ represents the change in real economic activity in state i between periods $t-1$ and $t+h$, measured by the natural logarithm of the state-level economic activity index from Hoon et al. (2026). α_i^h captures state fixed effects, accounting for time-invariant differences across states such as long-run growth rates. The indicator variable $\mathbf{1}_t^{\text{U.S. crisis}}$ equals one when year t is identified as a financial crisis in our benchmark chronology. The summation term $\sum_{k=1}^{5} \gamma^{k,h}(X_{i,t-k} - X_{i,t-k-1})$ represents a set of control variables, where the baseline specification only includes five lags of changes in state-level economic activity to account for pre-crisis economic conditions. Finally, $\epsilon_{i,t}^h$ is the error term.

The key parameter of interest, β^h, measures the average elasticity of output over the next h years to the start of a financial crisis, relative to what would have been expected in the absence of a crisis. Together with the estimates of β^h, we report their 90% confidence intervals constructed using standard errors clustered by state and year. By estimating this equation separately for each horizon h, we trace out the differential dynamic response of economic activity over time.

Figure B.3 plots the impulse response function from estimating equation (A.1), which shows how state-level real economic activity evolves following U.S. financial crisis episodes from 1863 to 2022. The results reveal substantial output losses. In the year of a crisis, state-level output falls by approximately 4 percent relative to its pre-crisis trend. This contraction reaches its maximum depth of approximately 14 percent by the third year. Five years after a crisis, there are some signs of a recovery, but output remains depressed at around 10 percent lower than the pre-crisis trend.

These findings broadly align with existing estimates from cross-country studies. For example,

Cerra and Saxena (2008), Reinhart and Rogoff (2009), and Jordà, Schularick and Taylor (2017) document similar patterns of deep and protracted recessions following financial crises. However, our results are notable for documenting this pattern specifically for the United States across multiple crisis episodes spanning more than 150 years using state-level data.

Robustness Figure B.6 presents a series of robustness checks on result shown in Figure B.3. These include: (1) employing alternative crisis definitions, (2) analyzing subsamples, (3) estimating weighted regressions, and (4) incorporating additional control variables, including lagged term premium, U.S. GDP growth, the interaction between the state "business cycle beta", from a regression of changes in state economic activity on changes in U.S. GDP, and U.S. GDP growth, and the central bank policy rate. The results remain broadly consistent with the baseline findings, except that crisis indicators referring to less severe episodes are associated with smaller output losses.

In addition to examining the response of local output—measured by the economic activity index constructed in Hoon et al. (2026)—we also analyze the behavior of a broader set of state-level indicators following a nationwide financial crisis, as shown in Figure B.7. Applying the same estimation framework as in Figure B.3, we find significantly positive responses of the unemployment rate, state net debt, and the number of business failures. There is also a notable decline in agricultural and manufacturing output, two sectors that constitute substantial portions of economic activity across most periods in our sample. Finally, there is a decline in the economic sentiment index from Van Binsbergen et al. (2024). These results suggest a broad-based economic downturn in the aftermath of financial crises.

Comparison with Time Series Estimates, 1791–2022

To compare these state-level findings with national patterns, we estimate a time series specification for aggregate U.S. output:

$$\Delta Y_{t+h} = \alpha^h + \beta^h \mathbf{1}_t^{\text{U.S. crisis}} + \sum_{k=1}^{5} \gamma^{k,h}(X_{i,t-k} - X_{i,t-k-1}) + \varepsilon_t^h \tag{A.2}$$

where $\Delta Y_{i,t+h}$ represents the change in output (measured by GDP or industrial production) between $t-1$ and $t+h$, $\mathbf{1}_t^{\text{U.S. crisis}}$ is the same indicator variable for a financial crisis in year t as identified by our benchmark chronology, $\sum_{k=1}^{5} \gamma^{k,h}(X_{i,t-k} - X_{i,t-k-1})$ a set of lags of the dependent variable, and ϵ_t^h the error term.

Given that financial crises are rare events, estimating equation (A.2) requires long-run time

series on U.S. output. We obtain such series for real GDP and industrial production by combining the official statistics from the Bureau of Economic Analysis (BEA) and Federal Reserve with historical estimates by Miron and Romer (1990), Davis (2004), and Williamson (2025).[5] Combined with our new benchmark chronology, these time series give us an unprecedented time span to study the output response to financial crises in the United States. Figure B.4 presents the national-level results, also revealing large output losses in the aggregate time series, similar to the state-level panel. The maximum decline in GDP reaches approximately 10 percent four years after a crisis, with limited evidence of a recovery within our five-year forecast horizon. Notably, the magnitude of contraction is very similar to our output-weighted estimates in panel c) of Figure B.6. The response of industrial production is similar, reaching approximately 17 percent three to four years after crisis onset.

Heterogeneous Impulse Responses Across States

Beyond the average state-level responses documented above, we find substantial heterogeneity in how states respond to financial crises. To showcase this result, we run time series regressions as in equation (A.2) separately for each state. This approach allows for heterogeneous slopes, which may also address potential concerns about the pooled state-level estimates from equation (A.1).

Figure B.5 presents the state-specific impulse responses to a U.S. financial crisis and also compares them with the U.S. time series estimate for GDP. We highlight the trajectories for three states—Maine, California, and North Dakota—alongside the full distribution of state responses. Several findings stand out. Most importantly, *all* of the estimated responses are negative and suggest relatively limited evidence of a recovery even three or four years after a crisis. That said, the heterogeneity in magnitudes is striking: while some states experience output contractions by nearly 34 percent at their nadir, others face significantly milder recessions with losses of less than 5 percent that revert back to trend after five years. The timing of maximum impact also varies considerably, with some states experiencing their worst outcomes in the second year after crisis onset while others see continued deterioration throughout the five-year horizon.

Among the examples we highlight, California represents an intermediate case that is relatively close to the average response across states. Maine exhibits smaller output losses than most other states. Finally, North Dakota tends to experience a contraction close to the average initially but then shows severe output losses in later years. This regional heterogeneity suggests that national-

[5] We combine estimates on industrial production from the Federal Reserve (1920 – 2022), Miron and Romer (1990) (1916 – 1919) and Davis (2004) (1790 – 1915).

level analyses may obscure important dimensions of how financial crises unfold. In subsequent sections, we explore how specific financial factors—particularly contractions in bank liabilities and bank failures—help explain this cross-state variation in the output response to crises.

Local Banking Conditions and the Transmission of U.S. Crises

Having established that U.S. financial crises are linked to substantial contractions in (state-level) output, we next investigate how variations in local banking conditions relate to the severity of these downturns. In particular, we focus on contractions in deposits or wholesale liabilities and the incidence of bank failures, motivated by the observation that financial crises are often defined based on these events (see, e.g., Calomiris and Gorton, 1991; Wicker, 1996).

To begin, we investigate how these measures of local banking conditions differ in years we classify as U.S. "benchmark" crises relative to other periods. Figure 2 visualizes the distribution of state-level deposit growth, wholesale liability growth, and the number of bank failures during U.S.-wide crises and other times. As one may expect, crises are associated with a leftward shift in the distribution of growth of bank liabilities and deposit growth, and an increase in the rate of bank failures.

Importantly, there is considerable regional variation underlying these results. Figure 3 uses several case studies to show the uneven geographical patterns of liability-side disturbances and failures during crises. Importantly, there is not only clear regional heterogeneity in which states see banking sector distress, but we also see changes in which states are affected from episode to episode.

The 1982 commercial bank failures and "LDC debt threat" (Lopez-Salido and Nelson, 2010), depicted in the upper right panel of Figure 3, shows a highly localized pattern of deposit contractions, with New York banks being particularly affected. The middle right panel of Figure 3 visualizes the widespread contractions of wholesale liabilities during the 2007-2008 Global Financial Crisis. While nearly all states experienced reduced wholesale liability growth, there was still substantial geographical variation. Some states, such as Virginia and Maine, maintained relatively stable wholesale liability growth while several southern states saw particularly large contractions. The bottom panel highlights the vast heterogeneity in bank failure rates during the Panic of 1907 and the Great Depression. In fact, many areas particularly hit by the 1907 crisis were *not* as badly affected by the Depression. This showcases that banking sector distress do not only vary geographically, but that which states are affected also changes over time.

To understand the role of local financial factors more systematically, we extend our baseline specification by including an interaction term for the U.S. benchmark crisis indicator with the 3-year moving average of state-level deposit growth, wholesale liability growth, or the rate of bank failures:

$$\begin{aligned}\Delta Y_{i,t+h} = \alpha_i^h + \beta_1^h \mathbf{1}_t^{\text{U.S. crisis}} + \beta_2^h \Delta\text{Local banking conditions}_{i,t} \\ + \beta_3^h \mathbf{1}_t^{\text{U.S. crisis}} \times \Delta\text{Local banking conditions}_{i,t} \\ + \sum_{k=1}^{5} \gamma^{k,h}(X_{i,t-k} - X_{i,t-k-1}) + \varepsilon_{i,t}^h\end{aligned} \tag{A.3}$$

where ΔLocal banking conditions$_{i,t}$ refers to the three-year moving average between years $t-1$, t, and $t+1$ in state i for either (a) the percent change in (nominal) bank deposits, (b) the percent change in wholesale liabilities, or (c) the rate of local bank failures (defined as bank failures over the number of banks in the previous year). We use this smoothing to capture episodes in which states experience banking sector distress not necessarily in the exact year of a "benchmark" crisis, but rather in the year before or after. In this specification, β_1^h captures the average output loss of a financial crisis at horizon h, β_2^h measures the relationship between state-level banking sector problems and subsequent output during normal times, and β_3^h—our primary coefficient of interest—identifies how this relationship changes during crisis periods. When plotting these estimates, we invert the sign for β_3^h for deposit and wholesale liability growth, based on the hypothesis that heightened banking sector issues (lower liability-side growth, higher bank failures) should signal lower output growth going forward.

Figure 4a presents the results from this analysis, comparing the trajectory of state-level output following U.S. financial crises depending on deposit growth rates. The red line shows the response of real economic activity following an average crisis, while the blue line illustrates the response when deposit or wholesale liability growth is two standard deviations *below* the mean or bank failure rates two standard deviations above the mean—representing a severe local banking disruption.

States experiencing severe local banking distress based on deposit growth or failures face substantially deeper output losses during crises. By the third year after the start of the crisis, a two standard deviation larger contraction in deposits predicts a close to 21% cumulative drop in economic activity, albeit with considerably wider confidence intervals, a large magnitude relative to an output loss of around 12% without such a liability-side contraction. For a two standard deviation increase in bank failures, we find even larger output losses of close to 26%. For a two standard

deviation in wholesale liabilities, we find a qualitatively similar pattern but around 4% more severe contractions at the nadir relative to the average crisis. Taken together, these results suggest that the most severe recessions following financial crises are those coinciding with statistically detectable local banking sector problems.

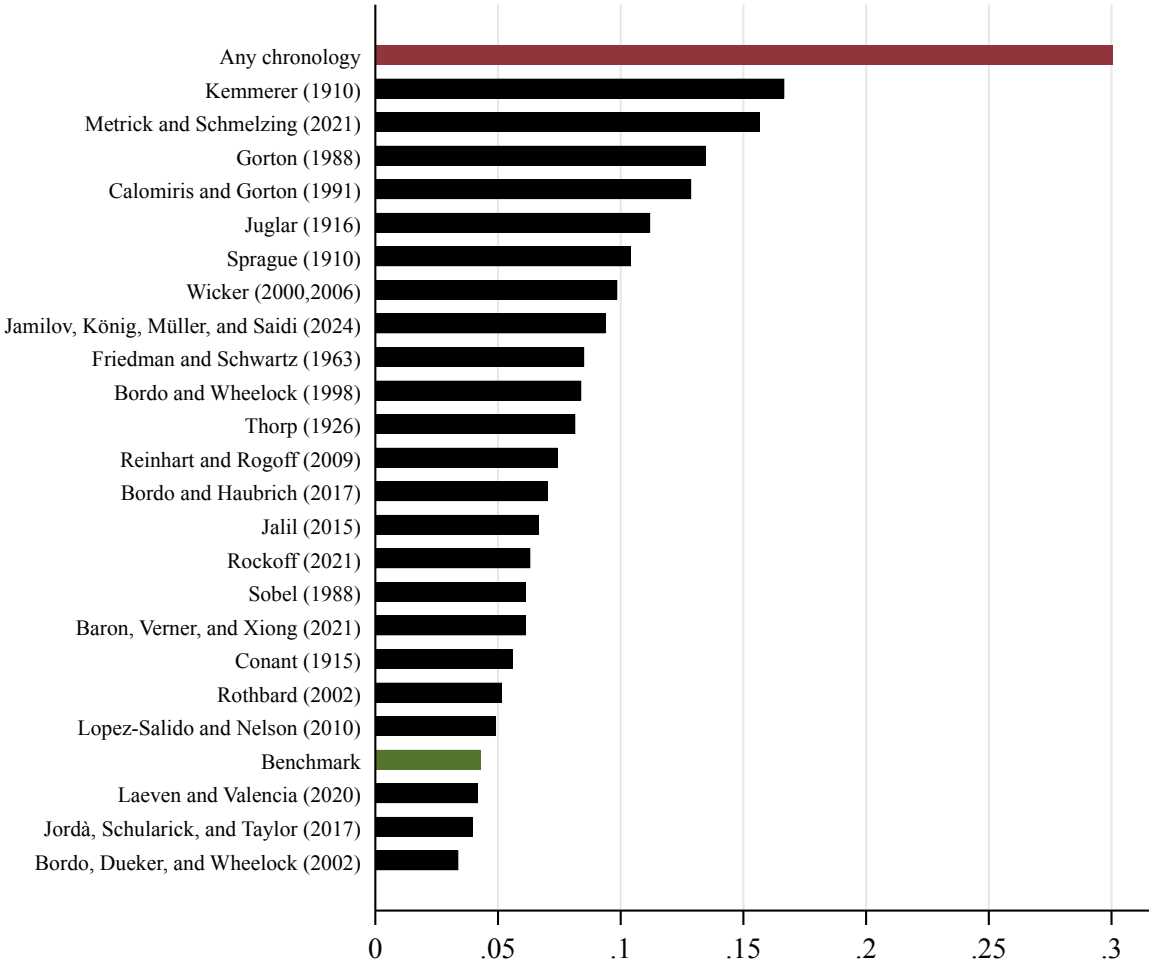
B Tables & Figures for U.S.-wide Financial Crises Results

Table B.1: Chronologies of Crisis Years Based on Alternative Indicators, 1791–2023

Year	Benchmark	Minor crisis	Govt. intervention	Year	Benchmark	Minor crisis	Govt. intervention
1791			Yes	1907	Yes		
1792			Yes	1908		Yes	
1809		Yes		1909			Yes
1819		Yes		1917			Yes
1825		Yes		1920			Yes
1829			Yes	1926		Yes	
1833		Yes	Yes	1927		Yes	
1837	Yes			1929		Yes	
1841		Yes		1930	Yes		
1842		Yes		1939			Yes
1851		Yes		1958			Yes
1854		Yes		1966			Yes
1857	Yes			1969			Yes
1860		Yes		1970			Yes
1861		Yes	Yes	1974			Yes
1871			Yes	1976			Yes
1873	Yes			1980			Yes
1884	Yes	Yes		1982	Yes		
1890		Yes		1998			Yes
1893	Yes			2001			Yes
1896		Yes		2007	Yes		
1905		Yes	Yes	2023	Yes		

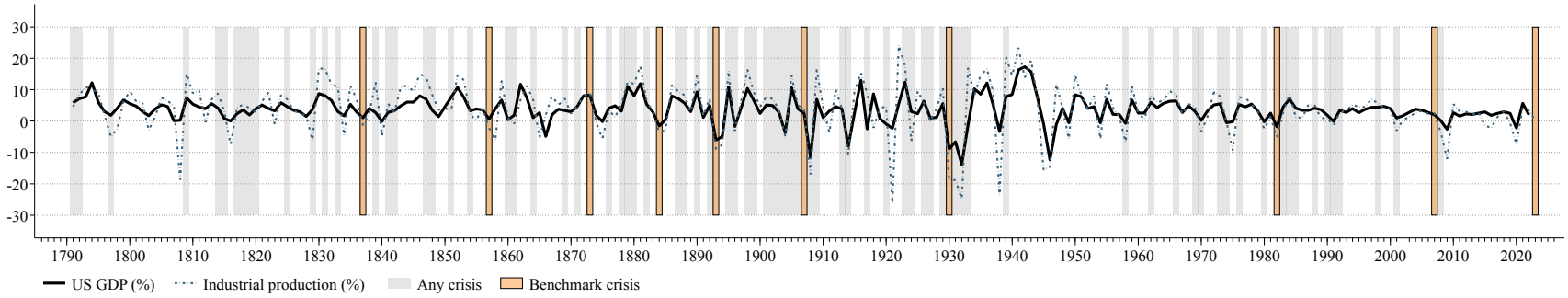
Notes: This table presents three crisis year indicators for the United States: a benchmark indicator of crisis start years (excluding minor crises), an indicator of minor crisis years, and an indicator of *candidate* crisis start years based on government intervention episodes from Metrick and Schmelzing (2021). For the benchmark, we designate a year as the start of a crisis if it appears in at least one-half of the reporting chronologies in Table 1, and is identified as a start year of a major crisis based on financial sector outcomes rather than government interventions. In addition, we select 1982 as the start year of the Savings and Loan Crisis of the 1980s (rather than 1984 or 1988) since no chronology classifies this year as part of an ongoing crisis episode. For the minor crisis indicator, we classify a year as a minor crisis year if at least half of the chronologies reporting minor crises (i.e., B/W, D/R, J, K, and W) identify a minor crisis episode in that year.

Figure B.1: Fraction of Years Classified as Crisis Years by Chronology



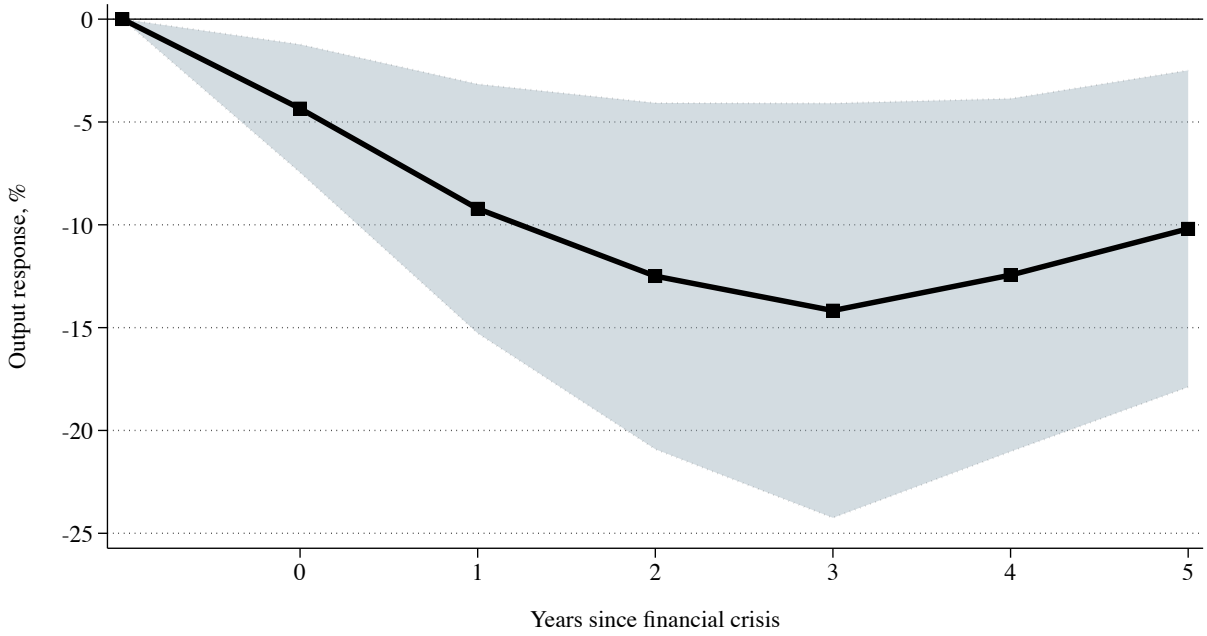
Notes: This figure shows the fraction of years classified as crisis years in the chronologies listed in Table 1, excluding Davison and Ramirez (2014) and DeLong and Summers (1986). Each bar is computed as the number of years classified as crises (excluding minor crises and years associated with ongoing crises) divided by the total number of years covered by that chronology. The bars labeled "Any chronology" and "Benchmark" are based on the full period from 1791 to 2023. "Any chronology" refers to the share of years classified as crises by at least one chronology, whereas the "Benchmark" chronology corresponds to our baseline crisis indicator introduced in Table B.1.

Figure B.2: U.S. Financial Crises and Output Growth, 1791-2023



Notes: This figure plots two indicators of national economic activity, U.S. GDP and industrial production, both in growth rates and from 1791 to 2022. We label years where any chronology indicates a financial crisis in gray, and years where a "benchmark crisis" occurs in orange. We collect data on U.S. real GDP from the BEA from $1929-2022$, and from Williamson (2025) from $1791-1928$. The data on industrial production series is constructed by combining the data from Davis (2004) (1791–1915), Miron and Romer (1990) (1916–1919), and the Federal Reserve (1920–2022).

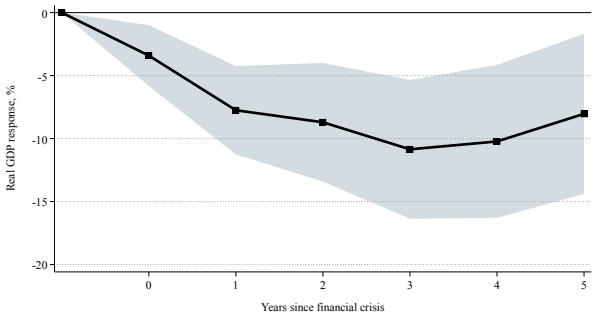
Figure B.3: State-Level Output Losses Following U.S. Financial Crises, 1870-2021



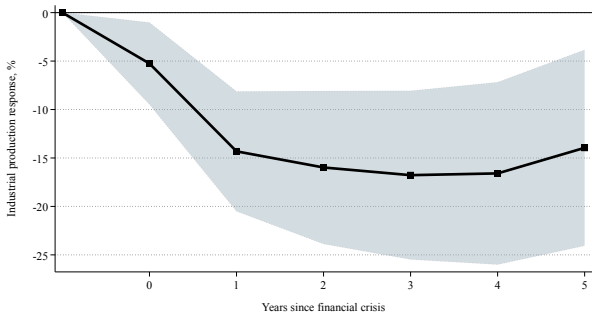
Notes: This figure presents the estimated response of the state-level economic activity index to financial crises identified in our benchmark chronology. We plot the impulse response function estimated from equation (A.1), which is in line with Jordà (2005) adapted for a panel setting, and includes state fixed effects. The black markers represents the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the average response of state-level output over the next h years to the start of a financial crisis, relative to what would have been expected in the absence of it. The shaded region correspond to the 90% confidence interval, with standard errors clustered at the state and year level.

Figure B.4: Output Losses of U.S. Financial Crises: Aggregate Time Series Evidence, 1791–2021

(a) Real GDP Response

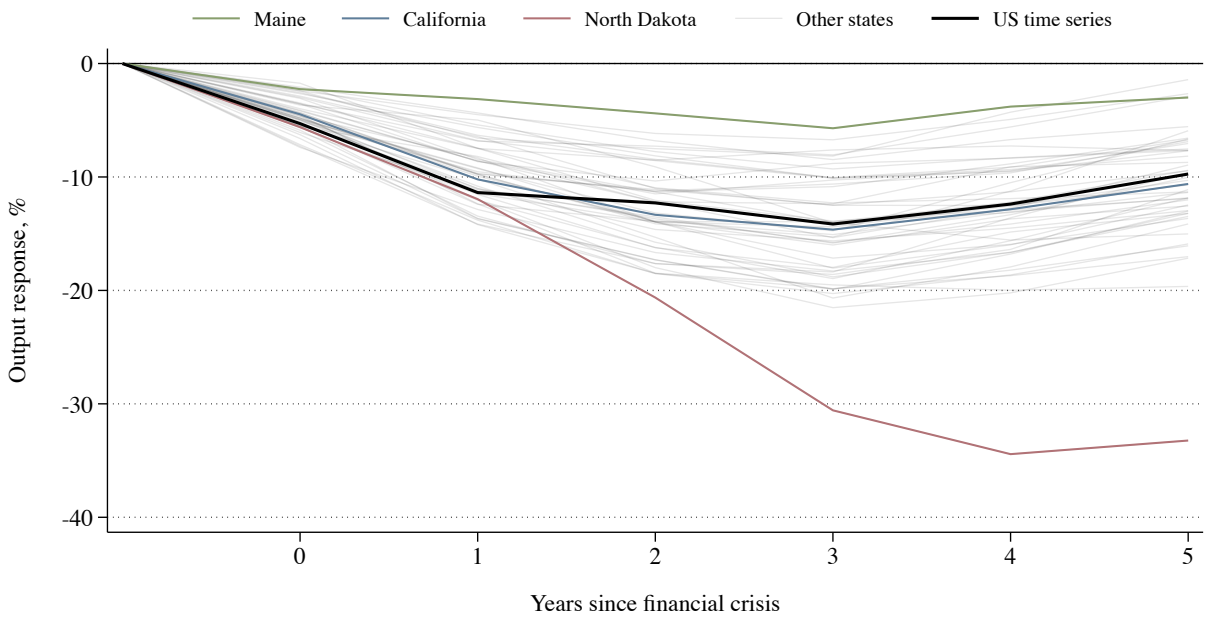


(b) Industrial Production Response



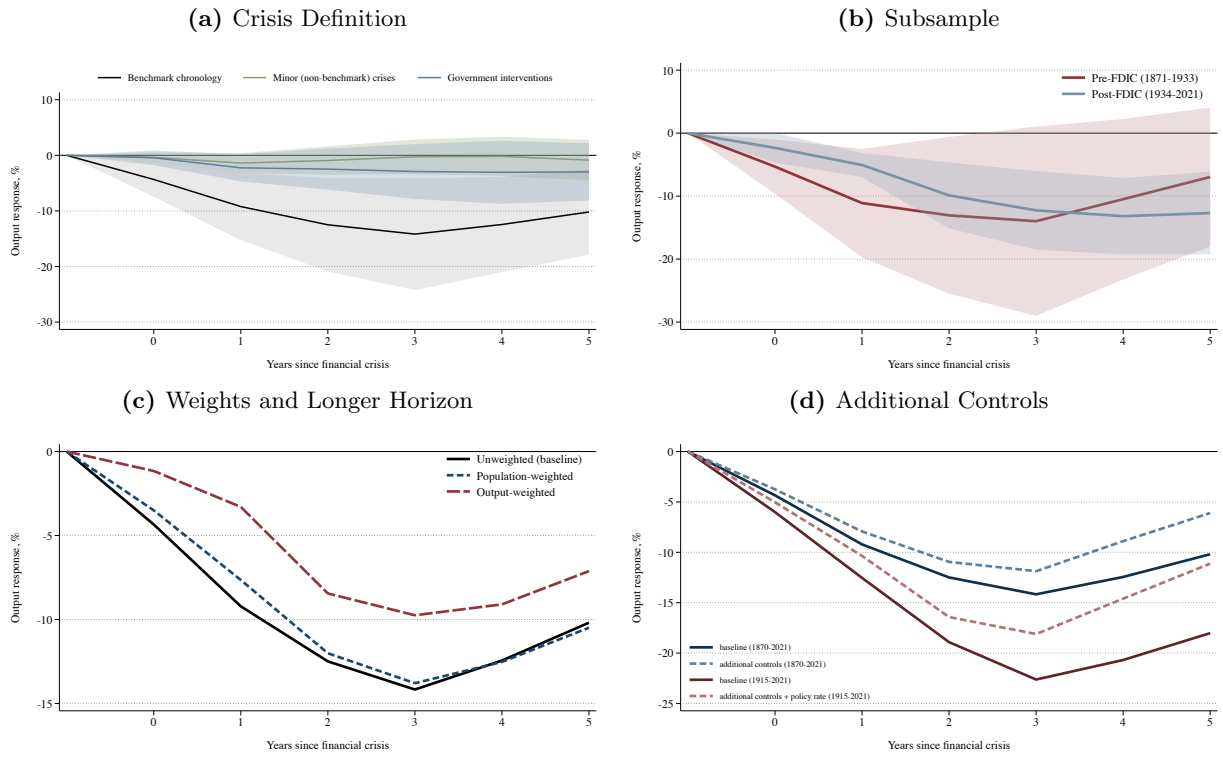
Notes: This figure presents the estimated response of aggregate output to financial crises identified in our benchmark chronology in panel (a), and of aggregate industrial production in panel (b). We plot the impulse response function based on the sequence of β^h coefficients from equation (A.2). The black markers represent the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the average response of the respective indicator over the next h years to the start of a financial crisis, relative to what would have been expected in the absence of it. The shaded region corresponds to the 90% confidence interval based on Newey-West standard errors. U.S. real GDP data is taken from the BEA ($1929 - 2021$) and from Williamson (2025) ($1791 - 1928$). Industrial production is taken from the Federal Reserve ($1920 - 2021$), Miron and Romer (1990) ($1916 - 1919$) and Davis (2004) ($1791 - 1915$).

Figure B.5: Heterogeneous Output Responses Across States: 1870-2021



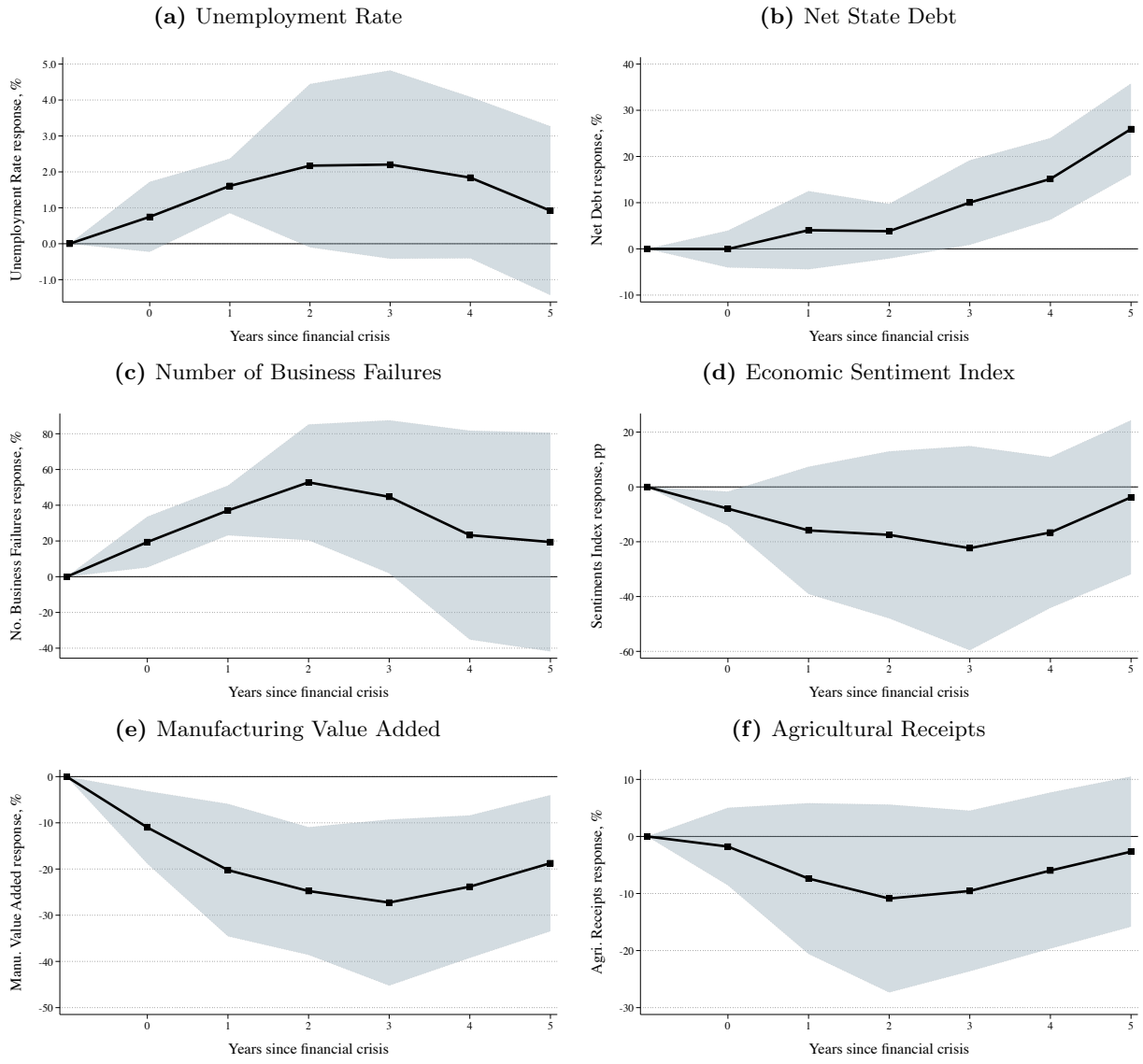
Notes: This figure presents the estimated response of the state-level economic activity index to a financial crisis as identified in our benchmark chronology. We plot the impulse response functions from a time series version of equation (A.1), where we estimate a separate regression for each state similar to equation (A.2). Each line plots the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the average responses of state-level and national output over the next h years to the start of a financial crisis, relative to what would have been expected in the absence of it. We highlight the estimated coefficients of Maine, California, North Dakota and the U.S. time series estimate from Figure B.4. Each estimation uses data for the same sample period 1870–2021.

Figure B.6: U.S. Crises and Local Output – Robustness



Notes: These figures present the estimated responses of the state-level economic activity index to financial crises identified in our benchmark chronology in (b)–(d) and alternative crisis definitions in (a). The specifications follow that in Figure B.3, except that: in (a), we use different crisis definitions; in (b), we examine the results by subsamples of pre- and post-FDIC periods; in (c), we present results of regressions weighted by population and state-level output; and in (d), we add additional control variables. We augment our baseline specification with two sets of controls: i) from 1870-2021 (in light blue), we control for lags of the term premium, U.S. GDP growth, and the interaction between U.S. GDP growth and state "business cycle beta". We calculate the latter by running a regression for each state of state economic index growth on U.S. GDP growth, and recovering the coefficient on U.S. GDP growth. We source the term premium from Müller et al. (2025) and U.S. GDP from Williamson (2025). ii) from 1928-2021, in addition to the controls from i) we additionally control for the central bank policy rate. We source this rate from $1928M4$ to $2021M12$ as the Federal Funds Effective Rate, with $1954M7$ to $2021M12$ retrieved directly from FRED and $1928M4$ to $1954M6$ from Anbil et al. (2021). As detailed in Anbil et al. (2021), the two series draw from the same source data and can therefore be reliably linked in $1954M7$. From $1915M1$ to $1928M3$, we source it as the discount rate of the New York Federal Reserve Bank. Finally, we take annual averages to compile the full policy rate series from 1915 to 2021.

Figure B.7: Changes of Other State-Level Variables Following U.S. Financial Crises, 1863-2022



Notes: These figures present the estimated responses of other state-level economic indicators—including the unemployment rate, state net debt, number of business failures, economic sentiments, manufacturing sector value added and agriculture sector gross receipts—to financial crises identified in our benchmark chronology. The data for each dependent variable is sourced from Hoon et al. (2026), of note, we report seasonally-adjusted fitted claims-based unemployment rates from Fieldhouse et al. (2024) and the economic sentiment index from Van Binsbergen et al. (2024). We plot the impulse responses estimated from equation (A.1), which is in line with Jordà (2005) adapted for a panel setting, and includes state fixed effects. The black markers represents the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the average response of state-level output over the next h years to the start of a financial crisis, relative to what would have been expected in the absence of it. The shaded regions correspond to the 90% confidence intervals, based on standard errors clustered at the state and year level.

C Additional Empirical Results for Local Financial Distress

Frequency of Distress Indicators Our baseline classification of local financial distress requires that three indicators are satisfied: i) any U.S. crisis chronology indicates a crisis in a given year, ii) there is at least one bank failure within one year of the crisis, and iii) either deposits or wholesale liabilities decline in absolute terms within one year of the crisis. In order to understand the "composition" of local financial distress, we plot in Figure C.8 a venn diagram detailing the frequency of state-years that each of these indicators signal financial distress, as well as the count within each intersection where more than one indicator is satisfied.

Alternative Classification of Distress We consider alternative classifications of local financial distress and list the details in Table C.2 for four states: California, Florida, New York and Texas. We also compare these distress episodes with narrative-based evidence from Davison and Ramirez (2014), Jalil (2015), and Metrick and Schmelzing (2021) in Table C.3. In particular, we plot all states and years for which we were able to find narrative evidence of a "local crisis" in any one of these chronologies. We find that our method detects local financial distress using at least one of our measures for all of these, with the exception of Ohio in 1985. This validation highlights the consistency of our distress classifications with narrative accounts when such evidence is available.

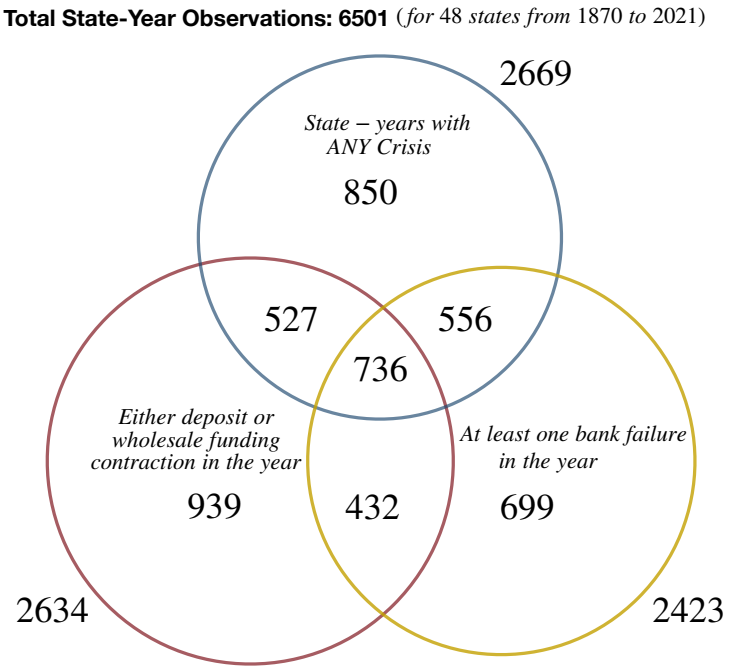
Alternative Specifications We provide an array of alternative specifications for the result shown in figure 5a, including: (a) examining the results accounting for changes in the source of crises during the pre- and post-FDIC periods, either going from retail deposits to wholesale liabilities, or going from runs (wholesale liabilities or deposits) to solvency issues (bank failures only) by constructing combined indicators, (b) including other lending institutions from our dataset in constructing deposit and wholesale liability contractions, including state banks, private banks, trust loan corporations, and savings banks in the historical sample, as well as savings institutions in the modern sample, (c) running weighted regressions, (d) identifying financial distress in a purely statistical manner with deposit contractions, wholesale liability contractions, and increases in bank failures respectively without taking into account narrative evidence, and (e) adding additional control variables, including lagged term premium, U.S. GDP growth, the interaction between the state "business cycle beta", from a regression of changes in state economic activity on changes in U.S. GDP, and U.S. GDP growth, and the central bank policy rate.

Overall, the robustness tests show largely consistent results with our baseline estimates. Panel

(d) shows that, when we completely ignore narrative evidence of crises, only deposit contractions robustly predict output losses, highlighting the usefulness of narrative indicators in detecting crises.

Standard Errors In our main exercises, we report standard errors clustered by state and year. In Figure C.11, we re-run our baseline regression in Figure 5a using heteroskedasticity-robust standard errors, standard errors clustered by state, and Driscoll-Kraay standard errors. As expected, the confidence intervals vary, but still reject the null hypothesis of zero output losses.

Figure C.8: Frequency of Distress, 1870-2021



Notes: This figure presents the number of state-year observations which fall into three categories: i) the number of state-years which are identified as a crisis year by at least one surveyed chronology in Table 1 (in blue), ii) the number of state-years for which there is a decline in either deposits or wholesale liabilities within the given year and state (in red), and iii) the number of state-years for which there is at least one bank failure in the given year and state (in yellow). We report the total count for each category outside the circle, and the count for each intersection within the circles. We include only state-years for which we observe deposits, wholesale funding, and bank failures, and limit the figure to the post-1870 estimation sample, for a total of 6501 observations.

Table C.2: Alternative Classifications of Local Financial Distress for Selected States, 1871–2021

					Distress classification								Distress classification		
State	Year	Deposits	Liabilities	Failures	Baseline	Broad	Narrow	State	Year	Deposits	Liabilities	Failures	Baseline	Broad	Narrow
California	1876	-24.0	-68.4	0	No	Yes	No	New York (ct.)	1873	-14.1	-8.5	9	Yes	Yes	Yes
	1878	-4.4	-40.1	2	Yes	Yes	Yes		1876	-22.9	-5.7	4	Yes	Yes	Yes
	1879	-4.4	-32.7	2	Yes	Yes	Yes		1878	-1.7	-3.6	5	Yes	Yes	Yes
	1880	25.9	-32.7	2	Yes	Yes	No		1879	11.8	0.4	5	No	Yes	No
	1882	4.9	-42.8	1	Yes	Yes	No		1880	3.5	4.9	4	No	Yes	No
	1884	-21.6	-50.8	1	Yes	Yes	Yes		1882	-15.3	-0.9	6	Yes	Yes	Yes
	1887	-19.1	2.6	3	Yes	Yes	No		1884	-13.3	-11.3	6	Yes	Yes	Yes
	1888	-19.1	-20.6	3	Yes	Yes	Yes		1887	-5.9	-2.9	5	Yes	Yes	Yes
	1890	-6.4	-20.6	2	Yes	Yes	Yes		1888	-2.1	1.7	7	Yes	Yes	No
	1892	-24.0	-12.0	2	Yes	Yes	Yes		1890	-3.6	-6.1	7	Yes	Yes	Yes
	1893	-24.0	-12.0	2	Yes	Yes	Yes		1892	-4.3	3.9	4	Yes	Yes	No
	1895	-3.3	-0.5	2	Yes	Yes	Yes		1893	-4.3	3.9	2	Yes	Yes	No
	1896	-3.3	-0.5	2	Yes	Yes	Yes		1895	-4.6	-10.6	10	Yes	Yes	Yes
	1899	4.9	-12.4	0	No	Yes	No		1896	-4.6	-10.6	10	Yes	Yes	Yes
	1901	4.9	-12.4	0	No	Yes	No		1898	-15.4	-13.4	5	Yes	Yes	Yes
	1903	2.1	19.5	2	No	Yes	No		1899	-15.4	-13.4	5	Yes	Yes	Yes
	1904	2.1	19.5	2	No	Yes	No		1901	2.6	-1.8	8	Yes	Yes	No
	1905	2.1	19.5	2	No	Yes	No		1902	-11.3	-1.8	8	Yes	Yes	Yes
	1906	-15.3	-37.5	6	Yes	Yes	Yes		1903	-11.3	-1.8	5	Yes	Yes	Yes
	1907	-15.3	-37.5	6	Yes	Yes	Yes		1904	-11.3	-15.3	11	Yes	Yes	Yes
	1908	-15.3	-37.5	6	Yes	Yes	Yes		1905	-3.1	-15.3	11	Yes	Yes	Yes
	1909	9.6	24.0	3	No	Yes	No		1906	-3.1	-15.3	11	Yes	Yes	Yes
	1913	5.3	-22.7	4	Yes	Yes	No		1907	-1.3	-12.7	5	Yes	Yes	Yes
	1914	5.3	-22.7	4	Yes	Yes	No		1908	-4.7	-16.7	5	Yes	Yes	Yes
	1917	7.8	-4.2	7	Yes	Yes	No		1909	-4.7	-16.7	5	Yes	Yes	Yes
	1920	-9.6	-22.7	13	Yes	Yes	Yes		1913	-4.4	-5.1	5	Yes	Yes	Yes
	1923	-5.9	-5.5	34	Yes	Yes	Yes		1914	-4.4	-5.1	7	Yes	Yes	Yes
	1924	-5.9	-5.5	24	Yes	Yes	Yes		1917	2.7	-9.1	12	Yes	Yes	No
	1926	1.7	2.3	39	No	Yes	No		1920	-13.6	-17.7	8	Yes	Yes	Yes
	1927	1.7	2.3	39	No	Yes	No		1923	-14.1	-9.9	9	Yes	Yes	Yes
	1929	0.2	0.5	24	No	Yes	No		1924	-14.1	-9.9	6	Yes	Yes	Yes
	1930	0.2	-21.9	18	Yes	Yes	No		1926	2.3	-5.6	15	Yes	Yes	No
	1931	-16.8	-35.5	19	Yes	Yes	Yes		1927	0.9	-2.2	15	Yes	Yes	No
	1932	-16.8	-35.5	19	Yes	Yes	Yes		1929	-8.8	-32.6	15	Yes	Yes	Yes
	1933	-16.8	-35.5	21	Yes	Yes	Yes		1930	-11.6	-32.6	34	Yes	Yes	Yes
	1939	2.7	6.7	3	No	Yes	No		1931	-24.0	-35.9	35	Yes	Yes	Yes
	1958	3.7	-3.6	0	No	Yes	No		1932	-24.0	-35.9	35	Yes	Yes	Yes
	1962	6.8	-68.4	0	No	Yes	No		1933	-24.0	-35.9	36	Yes	Yes	Yes
	1966	5.0	-32.3	1	Yes	Yes	No		1939	-0.8	15.9	8	Yes	Yes	No
	1969	-4.2	-8.9	0	No	Yes	No		1958	2.0	-4.3	0	No	Yes	No
	1970	-4.2	-8.9	0	No	Yes	No		1962	2.8	-55.2	0	No	Yes	No
	1973	10.6	-14.3	1	Yes	Yes	No		1966	5.2	-57.8	0	No	Yes	No
	1974	7.7	-14.3	1	Yes	Yes	No		1969	-2.2	-5.6	0	No	Yes	No
	1976	4.2	6.8	1	No	Yes	No		1970	-2.2	-5.6	0	No	Yes	No
	1982	6.6	-10.9	5	Yes	Yes	No		1973	8.3	-1.4	1	Yes	Yes	No
	1983	4.1	-10.9	6	Yes	Yes	No		1974	-4.7	-13.0	1	Yes	Yes	Yes
	1984	4.1	-10.9	7	Yes	Yes	No		1976	-4.7	-13.0	1	Yes	Yes	Yes
	1985	2.5	-8.6	8	Yes	Yes	No		1983	-0.3	-1.0	0	No	Yes	No
	1988	2.1	-5.4	8	Yes	Yes	No		1984	-0.3	-1.0	2	Yes	Yes	Yes
	1990	1.3	-16.6	4	Yes	Yes	No		1985	-0.3	-1.0	2	Yes	Yes	Yes
	1991	-1.4	-22.1	12	Yes	Yes	Yes		1988	-0.7	-4.7	3	Yes	Yes	Yes
	1992	-2.4	-22.1	20	Yes	Yes	Yes		1990	-0.7	-4.7	3	Yes	Yes	Yes
	1998	6.8	-1.5	1	Yes	Yes	No		1991	-1.1	-2.2	2	Yes	Yes	Yes
	2001	8.1	-13.6	1	Yes	Yes	No		1992	-1.5	2.4	2	Yes	Yes	No
	2007	7.1	14.2	2	No	Yes	No		1998	2.7	2.6	1	No	Yes	No
	2008	9.3	-6.1	16	Yes	Yes	No		2001	5.5	-7.6	0	No	Yes	No
New York	1869	-15.5	-6.8	5	Yes	Yes	Yes		2007	-4.0	-6.1	0	No	Yes	No
	1871	-9.6	-3.0	6	Yes	Yes	Yes		2008	-4.0	-10.7	1	Yes	Yes	Yes

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Table C.2: Alternative Classifications of Local Financial Distress for Selected States, 1871–2021 (*continued*)

					Distress classification								Distress classification		
State	Year	Deposits	Liabilities	Failures	Baseline	Broad	Narrow	State	Year	Deposits	Liabilities	Failures	Baseline	Broad	Narrow
Florida	1876	-24.0	239.4	0	No	Yes	No	Texas (ct.)	1878	-0.3	3.3	1	Yes	Yes	No
	1878	-24.0	-68.4	0	No	Yes	No		1879	-0.3	3.3	1	Yes	Yes	No
	1879	10.1	-68.4	0	No	Yes	No		1880	11.4	3.3	1	No	Yes	No
	1880	25.4	-68.4	0	No	Yes	No		1884	-5.5	-13.3	1	Yes	Yes	Yes
	1884	11.1	-9.8	0	No	Yes	No		1887	10.6	14.8	2	No	Yes	No
	1887	2.3	-33.0	1	Yes	Yes	No		1888	10.6	14.8	1	No	Yes	No
	1888	2.3	-33.0	1	Yes	Yes	No		1890	-3.7	-4.9	6	Yes	Yes	Yes
	1890	-3.0	-24.5	1	Yes	Yes	Yes		1892	-17.3	-24.9	14	Yes	Yes	Yes
	1892	-19.9	-38.2	3	Yes	Yes	Yes		1893	-17.3	-24.9	14	Yes	Yes	Yes
	1893	-19.9	-38.2	3	Yes	Yes	Yes		1895	-9.2	-17.2	9	Yes	Yes	Yes
	1895	-18.9	-20.3	2	Yes	Yes	Yes		1896	-9.2	-17.2	9	Yes	Yes	Yes
	1896	-18.9	-20.3	2	Yes	Yes	Yes		1898	12.1	-2.8	9	Yes	Yes	No
	1898	6.6	-9.1	2	Yes	Yes	No		1899	12.1	-2.8	9	Yes	Yes	No
	1899	10.9	-9.1	0	No	Yes	No		1901	0.3	-19.4	4	Yes	Yes	No
	1902	4.2	4.1	1	No	Yes	No		1902	0.3	-19.4	8	Yes	Yes	No
	1903	4.2	4.1	1	No	Yes	No		1903	0.3	-2.6	8	Yes	Yes	No
	1904	20.0	23.4	1	No	Yes	No		1904	12.7	31.8	18	No	Yes	No
	1906	-6.1	-4.5	2	Yes	Yes	Yes		1905	16.2	31.8	18	No	Yes	No
	1907	-6.1	-4.5	2	Yes	Yes	Yes		1906	-16.6	-52.6	18	Yes	Yes	Yes
	1908	-6.1	-4.5	2	Yes	Yes	Yes		1907	-16.6	-52.6	14	Yes	Yes	Yes
	1909	2.2	5.4	1	No	Yes	No		1908	-16.6	-52.6	19	Yes	Yes	Yes
	1913	4.4	-11.9	1	Yes	Yes	No		1909	-11.7	-32.0	19	Yes	Yes	Yes
	1914	4.4	-11.9	1	Yes	Yes	No		1913	-11.3	-24.2	16	Yes	Yes	Yes
	1917	15.6	-12.4	3	Yes	Yes	No		1914	-11.3	-24.2	12	Yes	Yes	Yes
	1920	-7.6	-25.6	2	Yes	Yes	Yes		1917	-8.3	-47.4	10	Yes	Yes	Yes
	1923	11.4	17.1	5	No	Yes	No		1920	-21.0	-53.3	24	Yes	Yes	Yes
	1924	11.4	17.1	5	No	Yes	No		1923	6.6	-5.9	11	Yes	Yes	No
	1926	-18.7	-25.1	3	Yes	Yes	Yes		1924	6.6	-5.9	10	Yes	Yes	No
	1927	-18.7	-25.1	5	Yes	Yes	Yes		1926	2.2	-7.7	24	Yes	Yes	No
	1929	-12.0	-24.1	14	Yes	Yes	Yes		1927	2.2	-7.7	24	Yes	Yes	No
	1930	-12.0	-24.1	14	Yes	Yes	Yes		1929	-4.9	-19.5	40	Yes	Yes	Yes
	1931	-11.3	-37.1	7	Yes	Yes	Yes		1930	-10.5	-19.5	65	Yes	Yes	Yes
	1932	-11.3	-37.1	6	Yes	Yes	Yes		1931	-18.2	-33.5	65	Yes	Yes	Yes
	1933	-8.9	-37.1	3	Yes	Yes	Yes		1932	-18.2	-33.5	65	Yes	Yes	Yes
	1939	-5.5	3.9	1	Yes	Yes	No		1933	-18.2	-33.5	43	Yes	Yes	Yes
	1958	3.2	-6.1	0	No	Yes	No		1939	3.4	3.6	5	No	Yes	No
	1962	5.5	-20.1	0	No	Yes	No		1958	-0.9	-9.0	1	Yes	Yes	Yes
	1966	8.0	-54.6	1	Yes	Yes	No		1962	4.4	-68.4	1	Yes	Yes	No
	1969	6.8	3.0	1	No	Yes	No		1966	4.9	-54.3	3	Yes	Yes	No
	1974	3.3	-21.7	0	No	Yes	No		1969	1.2	23.2	5	No	Yes	No
	1976	3.3	-21.7	0	No	Yes	No		1970	1.2	23.2	5	No	Yes	No
	1980	6.5	14.5	1	No	Yes	No		1973	10.3	-19.9	1	Yes	Yes	No
	1982	6.5	7.6	1	No	Yes	No		1974	10.3	-19.9	2	Yes	Yes	No
	1983	12.6	7.6	2	No	Yes	No		1976	11.2	11.2	4	No	Yes	No
	1984	12.6	7.6	2	No	Yes	No		1980	14.3	17.2	1	No	Yes	No
	1985	9.2	12.7	3	No	Yes	No		1982	11.1	11.4	7	No	Yes	No
	1988	8.5	6.5	5	No	Yes	No		1983	9.4	10.4	7	No	Yes	No
	1990	4.6	-7.3	10	Yes	Yes	No		1984	5.7	1.4	12	No	Yes	No
	1991	1.5	-15.0	10	Yes	Yes	No		1985	0.4	-4.2	26	Yes	Yes	No
	1992	1.5	-15.0	10	Yes	Yes	No		1988	-5.4	-20.4	175	Yes	Yes	Yes
	1998	4.3	19.5	1	No	Yes	No		1990	-0.6	-20.4	134	Yes	Yes	Yes
	2001	4.3	-20.5	2	Yes	Yes	No		1991	2.2	-19.4	103	Yes	Yes	No
	2007	4.7	-3.4	2	Yes	Yes	No		1992	0.1	-19.4	31	Yes	Yes	No
	2008	4.7	-18.1	10	Yes	Yes	No		1998	2.9	7.6	1	No	Yes	No
Texas	1869	-20.4	14.7	0	No	Yes	No		2001	9.1	11.9	1	No	Yes	No
	1871	-3.3	-45.7	0	No	Yes	No		2007	1.3	7.1	1	No	Yes	No
	1873	-4.5	-68.4	0	No	Yes	No		2008	1.3	-10.9	4	Yes	Yes	No
	1876	-3.5	-62.9	0	No	Yes	No								

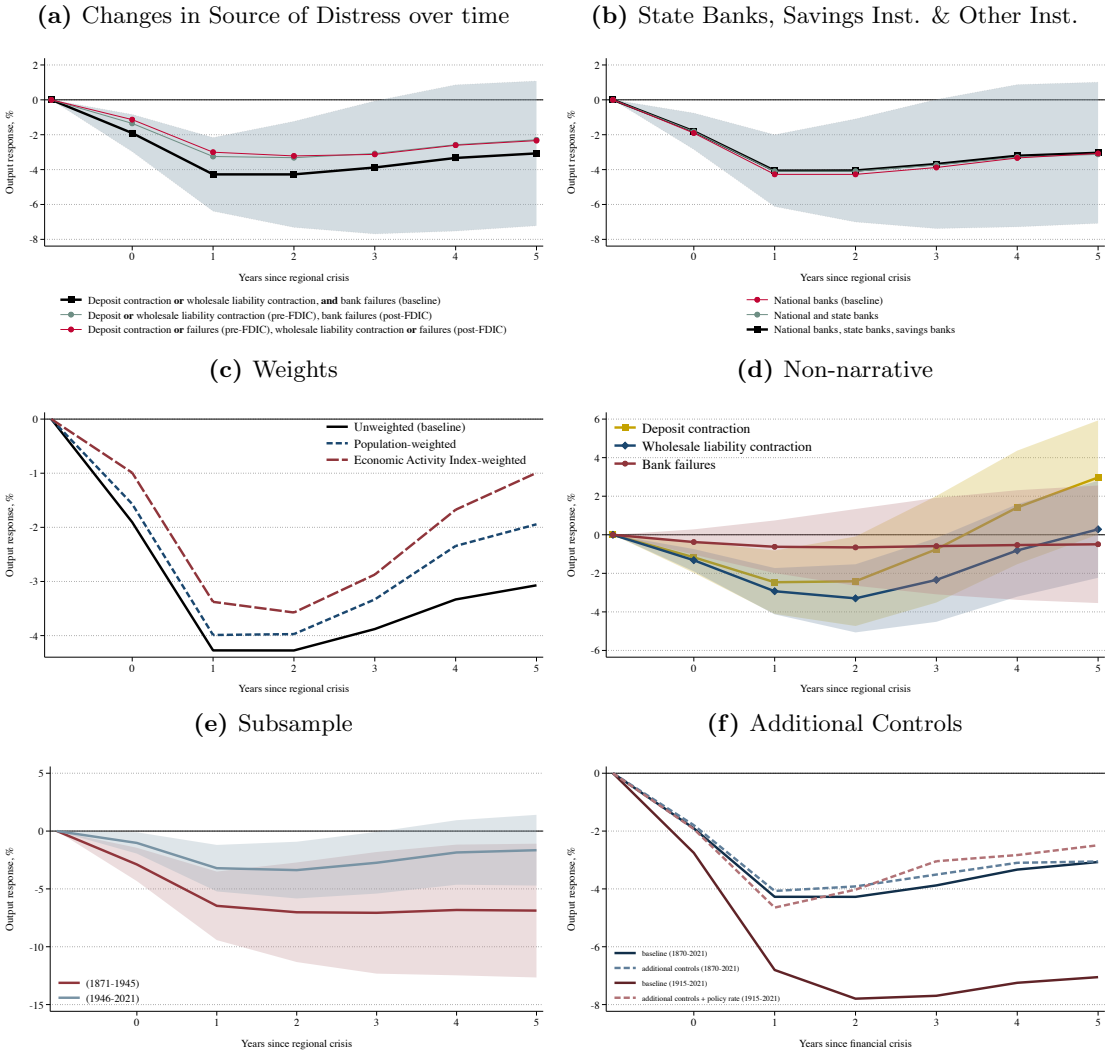
Notes: This table reports episodes of financial distress for selected states under three classifications. The "baseline" classification follows the criteria described in Table 2, defining a distress year as one that meets all of the following: (i) it is identified as a crisis year by at least one surveyed chronology in Table 1, (ii) there is at least one bank failure, and (iii) there is a decline in either deposits or wholesale liabilities within one year of the crisis. The "broad" classification is more lenient: a year is considered distressed if it meets criterion (i) and has either a bank failure, a decline in deposits, or a decline in wholesale liabilities within one year of the crisis. The "narrow" classification is more restrictive: a year qualifies as distressed if it meets criterion (i), involves at least one bank failure, and shows declines in both deposits and wholesale liabilities within one year of the crisis.

Table C.3: Validation of Local Financial Distress Using Narrative Evidence

		Narrative evidence			Distress classification		
State	Year	Jalil	Davison-Ramirez	Metrick-Schmelzing	Baseline	Broad	Narrow
Alabama	1929	No	Yes	No	Yes	Yes	Yes
Florida	1926	Yes	Yes	No	Yes	Yes	Yes
	1927	Yes	Yes	No	Yes	Yes	Yes
	1929	Yes	Yes	Yes	Yes	Yes	Yes
Georgia	1926	Yes	Yes	No	Yes	Yes	No
Iowa	1926	No	Yes	No	Yes	Yes	Yes
Illinois	1896	Yes	No	No	Yes	Yes	Yes
	1905	Yes	No	Yes	Yes	No	No
	1929	No	Yes	No	Yes	Yes	Yes
	1932	No	No	Yes	Yes	Yes	Yes
Indiana	1929	No	Yes	No	Yes	Yes	No
Kansas	1927	No	Yes	No	Yes	Yes	No
Massachusetts	1899	Yes	No	No	Yes	Yes	Yes
	1920	Yes	No	No	Yes	Yes	Yes
	1991	No	No	Yes	Yes	Yes	Yes
Maryland	1903	Yes	No	No	Yes	No	No
Minnesota	1896	Yes	No	No	Yes	Yes	Yes
	1923	No	Yes	No	Yes	Yes	No
Missouri	1926	No	Yes	No	Yes	Yes	No
North Dakota	1920	Yes	No	Yes	Yes	Yes	Yes
Nebraska	1984	No	No	Yes	Yes	Yes	No
New Jersey	1884	Yes	No	No	Yes	Yes	Yes
New Mexico	1924	No	Yes	No	Yes	Yes	Yes
New York	1871	No	No	Yes	Yes	Yes	Yes
	1873	Yes	No	No	Yes	Yes	Yes
	1884	Yes	No	No	Yes	Yes	Yes
	1890	Yes	No	No	Yes	Yes	Yes
	1899	Yes	No	No	Yes	Yes	Yes
	1901	Yes	No	No	Yes	Yes	No
	1907	Yes	No	Yes	Yes	Yes	Yes
	1908	Yes	No	No	Yes	Yes	Yes
Ohio	1985	No	No	Yes	No	No	No
Oklahoma	1909	No	No	Yes	Yes	Yes	Yes
Pennsylvania	1873	Yes	No	No	Yes	Yes	Yes
	1884	Yes	No	No	Yes	Yes	Yes
	1903	Yes	No	No	Yes	No	No
Rhode Island	1990	No	No	Yes	Yes	No	No
South Dakota	1924	No	Yes	No	Yes	Yes	Yes
	1926	No	Yes	No	Yes	Yes	Yes
Wisconsin	1896	Yes	No	No	Yes	Yes	Yes

Notes: This table compares our identified episodes of local financial distress with narrative-based evidence from Jalil (2015), Davison and Ramirez (2014), and Metrick and Schmelzing (2021). For each state-year observation, we report whether there is an episode of local financial distress and whether the narrative sources classify it as a localized crisis. Under the "baseline" classification, a year is considered financially distressed if it (i) is marked as a crisis start year or a minor crisis year by any chronology in Table 1, (ii) involves at least one bank failure, and (iii) exhibits a decline in either deposits or wholesale liabilities within a year of the crisis. The "broad" classification is more lenient, requiring criterion (i) and the presence of either a bank failure within a year of the crisis, a decline in deposits, or a decline in wholesale liabilities within a year of the crisis. The "narrow" classification is more restrictive, requiring criterion (i), at least one bank failure, and simultaneous declines in both deposits and wholesale liabilities within a year of the crisis.

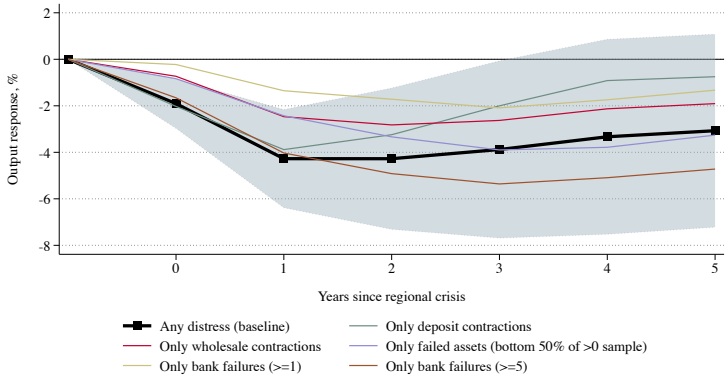
Figure C.9: Regional crises and Output Losses – Robustness



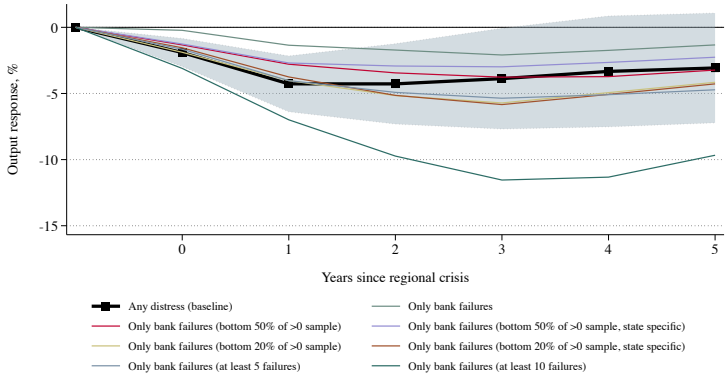
Notes: These figures present the estimated responses of the state-level economic activity index to financial crises identified in our regional crisis chronology, against alternative specifications. The specifications follow that in Figure 5a, except that: in (a), we examine the results accounting for changes in the source of crises during the pre- and post-FDIC periods—from retail deposits to wholesale liabilities, and from runs (wholesale liabilities or deposits) to solvency issues (bank failures only); in (b), we include other institution types present in our dataset in constructing deposit and wholesale liability contractions—pre-1961: State Banks, Private Banks, Trust Loan Corporations, and Savings Banks, and post-1980: Savings Institutions—taking the minimum contraction or maximum failure rate across institutions in each year; in (c), we present results of regressions with versions of the economic index weighted by population and the state-level economic activity index; in (d) we identify financial distress in a purely statistical manner, using deposit contractions, wholesale liability contractions, and increases in bank failures, respectively, but ignoring narrative evidence; in (d), we examine the results by subsamples of pre-1945 and post-1945 periods; and in (e), we add additional control variables. We augment our baseline specification with two sets of controls: i) from 1870-2021 (in light blue), we control for lags of the term premium, U.S. GDP growth, and the interaction between U.S. GDP growth and state "business cycle beta". We calculate the latter by running a regression for each state of state economic index growth on U.S. GDP growth, and recovering the coefficient on U.S. GDP growth. We source the term premium from Müller et al. (2025) and U.S. GDP from Williamson (2025). ii) from 1928-2021, in addition to the controls from i) we additionally control for the central bank policy rate. We source this rate from $1928M4$ to $2021M12$ as the Federal Funds Effective Rate, with $1954M7$ to $2021M12$ retrieved directly from FRED and $1928M4$ to $1954M6$ from Anbil et al. (2021). As detailed in Anbil et al. (2021), the two series draw from the same source data and can therefore be reliably linked in $1954M7$. From $1915M1$ to $1928M3$, we source it as the discount rate of the New York Federal Reserve Bank. Finally, we take annual averages to compile the full policy rate series from 1915 to 2021.

Figure C.10: Regional Crises and Output Losses – Single Distress Indicators Robustness

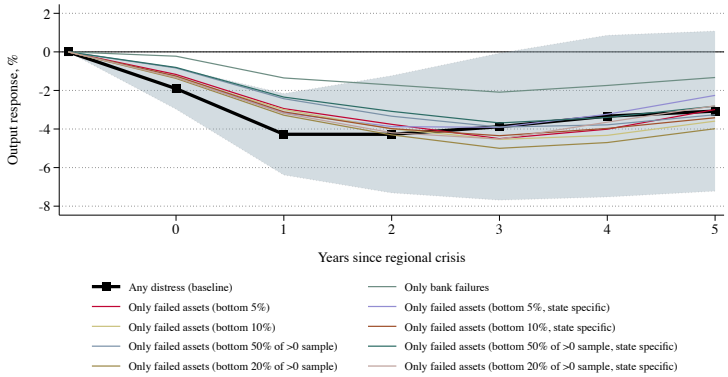
(a) Single Distress Indicator



(b) Bank Failures

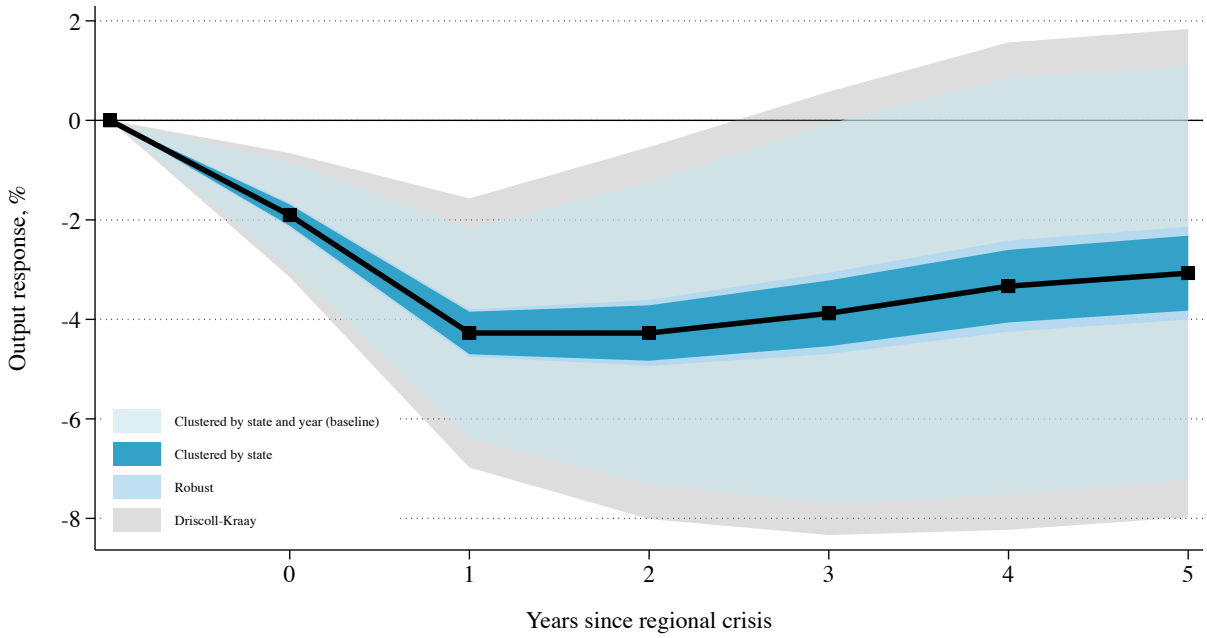


(c) Failed Assets



Notes: These figures present the estimated responses of the state-level economic activity index to financial crises identified in our local financial distress chronology, against alternative specifications which use a single distress indicator. The specifications follow that in Figure 5a, except that: in (a), we examine the results classifying regional crises as one which any U.S. crisis chronology indicates a crisis in a given year, and a single distress indicator is satisfied - deposit contractions, wholesale liability contractions, at least one bank failure, at least five bank failures, and an expansion in failed assets which is within the worst 50% of the > 0 sample. In (b), we explore restricting our bank failure distress indicator to various percentiles, within the full > 0 sample and a state specific > 0 sample. Finally, in (c) we explore restricting our failed assets indicator to various percentiles, within the full sample, the > 0 sample and a state specific > 0 sample.

Figure C.11: Local Financial Distress and Output Losses – Alternative Standard Errors

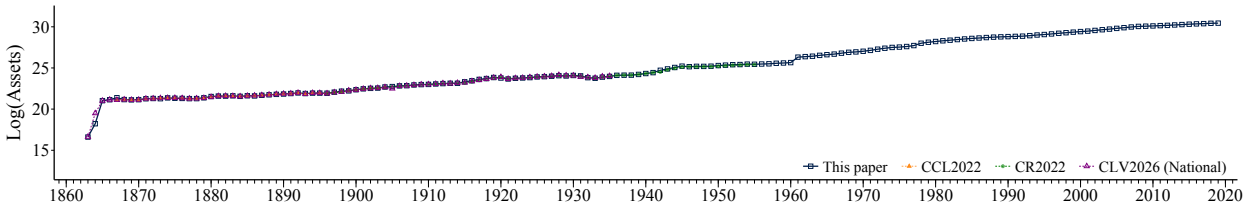


Notes: This figure presents the estimated responses of the state-level economic activity index to financial crises identified in our local financial distress chronology, using alternative standard errors. The specification follows that in Figure 5a. We consider standard errors clustered by state and year, heteroskedasticity-robust standard errors, standard errors clustered by state, and Driscoll-Kraay standard errors.

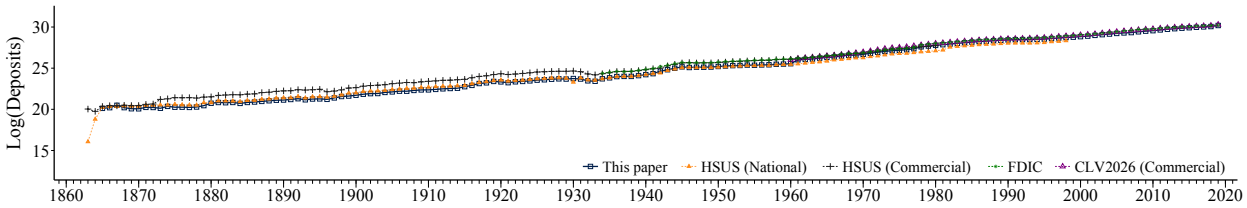
D Validation of the Banking Data

Figure D.1: Comparison with other Sources of Banking Data (1863-2019)

(a) Bank Assets – This Paper vs. Cao and Richardson (2022, `CR2022`), Carlson, Correia, and Luck (2022, `CCL2022`) and Correia, Luck and Verner (2026, `CLV2026`)

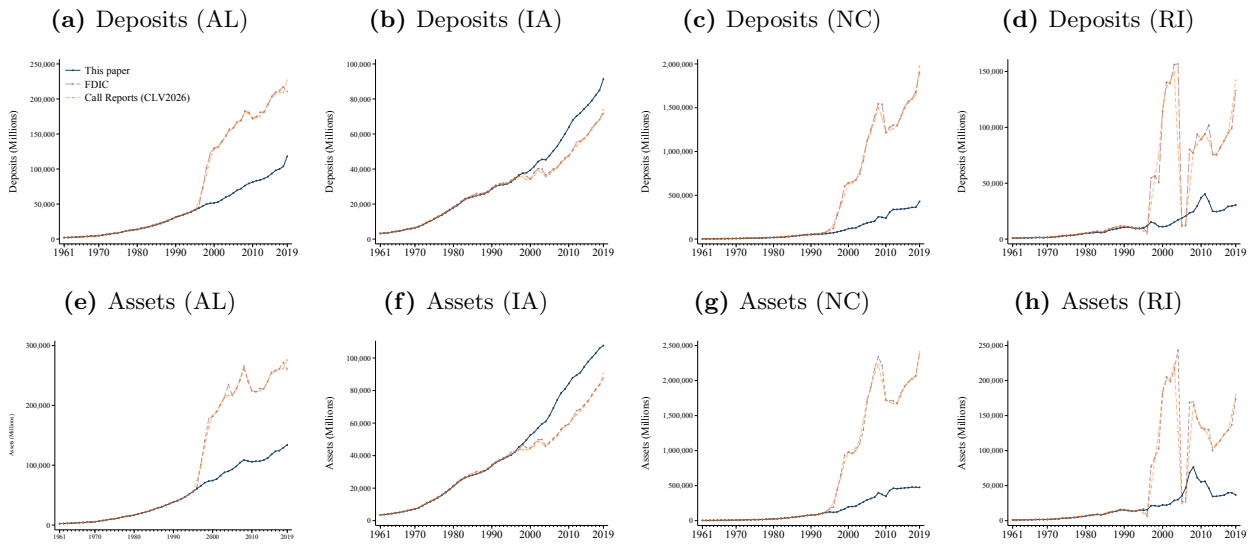


(b) Bank Deposits - This Paper vs. HSUS, FDIC and Correia, Luck and Verner (2026, `CLV2026`)



Notes: This figure compares our bank balance sheet dataset ("This paper", $1863-2019$) aggregated to the U.S.-level, with other datasets using deposits as an example. In the first panel, we compare against the datasets reported in "All Bank Statistics" (1959) as digitized by Cao and Richardson (2022) (CR2022, $1896-1955$), Carlson, Correia and Luck (2022) (CCL2022, $1867-1904$) and Correia, Luck and Verner (2026) (CLV2026, 1863-1935) for which we report coverage as kindly made available in their replication package. In the second panel, we compare our dataset against the datasets reported in Carter et al. (2006) (HSUS, $1863-1960$), in FDIC (FDIC, $1961-2019$) and Correia, Luck and Verner (2026) (CLV2026, 1960-2019). HSUS (National) and CLV2026 (National) stand for the data on nationally-chartered banks reported in HSUS and Correia, Luck and Verner (2026) respectively, while HSUS (Commercial) and CLV2026 (Commercial) refer to data on commercial banks.

Figure D.2: State-level Comparison with other Sources of Banking Data (1961-2019)



Notes: This figure compares our bank balance sheet dataset ("This paper"), with other datasets for the modern period, at the state-level and from 1960-2019. We use Deposits (in the top row) and Assets (in the bottom row) as examples, and plot data for Alabama (AL), Iowa (IA), North Carolina (NC) and Rhode Island (RI). We compare our data in blue against the datasets reported in FDIC (in red), and from the Call Report data as reported in Correia, Luck and Verner (2026). Following the FDIC approach, we aggregate the latter data up to the state-level by taking a sum across all banks which report a particular state as their headquarter state.

E Towards a Benchmark Chronology of U.S. Financial Crises

E.1 Existing definitions of financial crises

The existing literature has defined financial crises in various ways. To make progress towards a benchmark chronology we can use in our analysis, we thus begin by outlining the definitions used in the existing literature to the extent we can identify them. In the process, we also indicate the time period they cover.

Early contributions to the development of crisis chronologies include Juglar (1916)'s identification of cyclical patterns in economic activity and Sprague (1910)'s narrative accounts of major banking panics. These works established a foundation for subsequent research by documenting the commentary of contemporaneous observers and the institutional responses to various kinds of financial distress. Kemmerer (1910) expanded this approach by systematically cataloging banking system disruptions, while Thorp (1926) often discussed financial crises as part of his "Business Annals."

The pioneering methodological approach still shaping most of the work on crisis chronology construction today was introduced by Friedman and Schwartz (1963). Their key insight was to

combine a quantitative analysis of monetary aggregates with narrative evidence to identify major banking panics. Their approach focused on episodes characterized by widespread bank failures, deposit contractions, and central bank interventions, all of which are still widely used to identify crises today.

Recent work has applied this methodological approach to date financial crisis episodes for many countries, often covering more than a century. Bordo et al. (2001) introduced an important database of crisis dates covering 120 years, coded using a narrative approach. Reinhart and Rogoff (2009) also employ a primarily narrative approach, identifying crises based on historical accounts. Their chronology is notable for its breadth, covering events from the late 18th century through the early 21st century, and has also been drawn on in work surveying historical financial crises (Frydman and Xu, 2023). The Laeven and Valencia (2020) database, originally introduced as Laeven and Valencia (2013), represents an influential international approach that also provides details on several U.S. crisis episodes. They employ a definition focused on significant banking system distress and substantial policy interventions, resulting in a chronology that primarily captures major systemic events. Their framework has been widely adopted in cross-country studies but captures fewer U.S. crises than some alternative chronologies. Schularick and Taylor (2012) and the expanded Jordà, Schularick and Taylor (2017) database classify crises using a narrative approach in 18 advanced economies, including a detailed discussion of U.S. crises.

Work by Baron, Verner and Xiong (2021) represents a further methodological innovation by focusing specifically on bank equity declines as a source of quantitative evidence on banking sector distress. By combining crashes in bank equity returns with narrative evidence, their approach identifies several episodes not identified by other researchers, particularly in the post-World War II era, partly because systemic financial distress may not always manifest as traditional bank runs. Jamilov et al. (2024) adopt a similar hybrid approach between statistical and narrative evidence but focus entirely on the incidence of bank runs, which they classify into "systemic" and "non-systemic" episodes depending on whether they are accompanied by measurable contractions in banking sector deposits. Their chronology starts in 1800 and thus has a similar coverage to that by Reinhart and Rogoff (2009) despite its narrower conceptual focus on runs rather than other sources of financial stress.

Metrick and Schmelzing (2021) take a different approach by focusing entirely on identifying crisis *interventions* rather than judging whether an event constitutes a systemic crisis event. We include their work here because many other chronologies, such as Reinhart and Rogoff (2009) or

Jordà, Schularick and Taylor (2017), explicitly use government and central bank interventions as one indication of a crisis occurring. Importantly, using interventions to date potential crises is also useful because they may contain information about relatively isolated instances of financial stresses that do not result in system-wide meltdowns.

Since Friedman and Schwartz (1963)'s pioneering work, there have also been important advances in the literature that focuses on dating of U.S. crises specifically rather than taking a cross-country comparative approach. Jalil (2015) offers a significant contribution by drawing on many primary contemporary sources in his dating of historical crisis episodes between 1825 and 1929. This methodology yields a chronology that suggests contemporary accounts often provide more detailed information about the severity and geographic spread of crises than ex-post accounts, and leads Jalil (2015) to reject the classification of certain years as crises, particularly those highlighted by Kemmerer (1910).

Additional work includes Gorton (1988)'s focus on National Banking Era panics, Bordo, Dueker and Wheelock (2002)'s estimated long-run quantitative index of financial conditions, and Lopez-Salido and Nelson (2010)'s attention to the dating of post-War financial crises.

Table E.1 provides an overview of selected chronologies. Chronologies such as Reinhart and Rogoff (2009) or Laeven and Valencia (2020) squarely focus on the incidence of banking crises. Other work, such as Bordo, Dueker and Wheelock (2002), provides a more general history of business cycle fluctuations, from which we extract the timing of various banking crisis events.

Table E.1: Existing Chronologies and Their Definitions

Source	Abbr.	Indicator type	Time coverage	Definition
Baron et al. (2021)	B/V/X	Banking crisis dummy (start-year only)	1870–2016	"Our conceptual definition of a banking crisis is an episode in which the banking sector's ability to intermediate funds is severely impaired. Because equity holders are the first to suffer losses from a banking crisis that damages banks' intermediation capacity, we assume that conceptually, a large bank equity decline is necessary for a banking crisis." (p. 52)
Bordo et al. (2002)	B/D/W	Index of fin. conditions with five categories: 1. severe distress, 2. moderate distress, 3. normal, 4. moderate expansion, 5. euphoria.	1790–1997	The authors construct an annual index of financial conditions, classifying each year from 1790 to 1997 into one of five categories: 1. *severe distress*, 2. *moderate distress*, 3. *normal*, 4. *moderate expansion*, 5. *euphoria*. The index is based on narrative sources prior to 1870 and on four quantitative indicators for 1870–1997: business failure rates, the real interest rate, the interest rate quality spread, and banking conditions. These series are aggregated to construct the index separately for the subperiods 1870–1933 and 1934–1997, as follows: 1. For each series, compute the differences between annual observations and the series median for the subperiod, then divide it by the subperiod standard deviation. 2. Within each subperiod, sum the standardized differences across the four series for each year. Classify a year as *euphoria* (*severe distress*) if the summed standardized difference exceeds 1.5 (−1.5) standard deviations from the overall mean. Classify it as *moderate expansion* (*moderate distress*) if the summed difference is within ±0.75 and ±1.5 standard deviations, and as *normal* if the summed difference falls between −0.75 and 0.75 standard deviations. (p. 526) In Table 1, a year is labeled "Yes" if it is classified as a *severe distress* episode.
Bordo and Haubrich (2017)	B/H	Financial crisis dummy	1880–2007	The authors apply the banking crisis definition of Eichengreen and Bordo (2002) for the years prior to WWII, and additionally include 1914, a year in which the bond markets closed. The definition of Eichengreen and Bordo is outlined as follows: "For an episode to qualify as a banking crisis, we must observe either bank runs, widespread bank failures and the suspension of convertibility of deposits into currency such that the latter circulates at a premium relative to deposits (a banking panic), or significant banking sector problems (including but not limited to bank failures) resulting in the erosion of most or all of banking system collateral that are resolved by a fiscally underwritten bank restructuring." (Eichengreen and Bordo, 2002, pp. 15–16) For the post-WWII years, the authors apply the chronology of Lopez-Salido and Nelson (2010), and additionally include 2007. (Bordo and Haubrich, 2017, p. 533)
Bordo and Wheelock (1998)	B/W	Financial crisis dummy	1790–1929	"We define a financial crisis as a banking panic, which is an event characterized by widespread depositor runs on banks, leading to a decline in the deposit/currency ratio and possibly many bank failures." (p. 44)
Calomiris and Gorton (1991)	C/G	Banking panic dummy	1814–1914	"We define a banking panic as follows: A *banking panic* occurs when bank debt holders at all or many banks in the banking system suddenly demand that banks convert their debt claims into cash (at par) to such an extent that the banks suspend convertibility of their debt into cash or, in the case of the United States, act collectively to avoid suspension of convertibility by issuing clearing-house loan certificates." (p. 112)

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Table E.1: Existing Chronologies and Their Definitions (*cont'd*)

Source	Abbr.	Indicator type	Time coverage	Definition
Conant (1915)	C	Financial crisis dummy	1791–1915	The banking crises the author describes display evidence of either i) bank failures or suspensions, ii) bank runs, or iii) disruption of payments (specie payments, payment of checks in currency, etc.).
Davison and Ramirez (2014)	D/R	Local banking panic dummy	1921–1929	The authors define local banking panics based on the presence of "clusters" of bank suspensions which experience bank runs and reopenings. The authors focus their analysis on "clusters that have a minimum of four suspensions, with the specified period of time being 30 days and the specified geographical area being 10 miles" (p. 165). They additionally require there be "contemporary newspaper reports of runs" (p. 165) and "at least one bank reopening within a year" (p. 171).
DeLong and Summers (1986)	DL/S	Financial crisis dummy	1890–1913	The authors define as a panic as a "time in which either there is a (month-to-month) jump of one percentage point in the commercial paper rate or banks cease paying out deposits at par" (p. 689).
Friedman and Schwartz (1963)	F/S	Financial crisis dummy (start-year only)	1867–1960	The episodes the authors describe display evidence of "recurrent banking difficulties ... [produced by] bank failures, runs on banks, and widespread fears of further failures." (p. 8)
Gorton (1988)	G	Banking panic dummy (start-year only)	1863–1914	The author defines banking panics as episodes "when depositors demand such a large-scale transformation of deposits into currency that, at the contracted for exchange rate (of a currency dollar for a deposit dollar), the banking system can only respond by suspending convertibility of deposits into currency, issuing clearinghouse loan certificates, or both." (p. 222-223) He distinguishes banking panics, defined as "the situation in which depositors at all banks want to withdraw currency" from bank runs, which are defined as the "situation in which depositors at a single bank seek to exchange their deposits for currency". (p. 223)
Jalil (2015)	J	Banking panic dummy	1825–1929	The author defines a banking panic as an event that "occurs when there is an increase in the demand for currency relative to deposits that sparks bank runs and bank suspensions." (p. 300) In particular, banking panics are defined as "a cluster of bank suspensions and runs." (p. 303)
Jamilov, König, Müller and Saidi (2024)	JKMS	Bank run dummy (start-year only)	1800–2023	The authors define a bank run following Diamond and Dybvig (1983) as a situation where "depositors rush to withdraw their deposits because they expect the bank to fail", and consider as a bank to be "any type of deposit-taking institution.". (p. 7) They define systemic bank runs as bank runs which are "accompanied by a contraction in aggregate deposits." (p. 12)
Juglar (1916)	Ju	Financial crisis dummy	1791–1915	The author defines a Crisis or Panic "as a stoppage of the rise of prices ... always accompanied by a reactionary movement in prices", and "due to overtrading, which causes general business to need more than the available capital, thus producing general lack of credit." (p. 3) He classifies panics in the United States as i) Panics of Circulation, ii) Panics of Credit, iii) Panics of Capital and iv) (Panics due to) General Tariff Changes. (p. 3-4)

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Table E.1: Existing Chronologies and Their Definitions (*cont'd*)

Source	Abbr.	Indicator type	Time coverage	Definition
Jordà et al. (2017)	J/S/T	Banking crisis dummy (start-year only)	1870–2020	"An episode of banking distress is coded as a systemic banking crisis if it is characterized by major bank failures, banking panics, substantial losses in the banking sector, significant recapitalization, and/or significant government intervention. Importantly, this definition excludes the failures or losses of individual/small banks without systemic implications from being coded as a crisis episodes." (p. 1 of the documentation file)
Laeven and Valencia (2020)	L/V	Banking crisis dummy (start-year only)	1970–2020	"We define a banking crisis as an event that meets two conditions: 1. Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations). 2. Significant banking policy intervention measures in response to significant losses in the banking system." (p. 309)
Lopez-Salido and Nelson (2010)	LS/N	Financial crisis dummy	1946–2006	The authors focus on financial crises that are bank-centered, which they define as episodes involving "the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions)". (p. 6)
Reinhart and Rogoff (2009)	R/R	Banking crisis dummy (start-year only)	1800–2016	"We mark a banking crisis by two types of events: 1. Bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions and 2. if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions." (p. 10)
Rockoff (2021)	Ro	Financial panic dummy (start-year only)	1819–2008	The author defines financial panics as "an abnormal state of financial markets in which almost everyone is trying to protect themselves by turning their assets into cash." (p. 8) He emphasizes the role of failures or near-failures in triggering panics, and focuses on the 12 most severe peacetime financial panics in the United States.

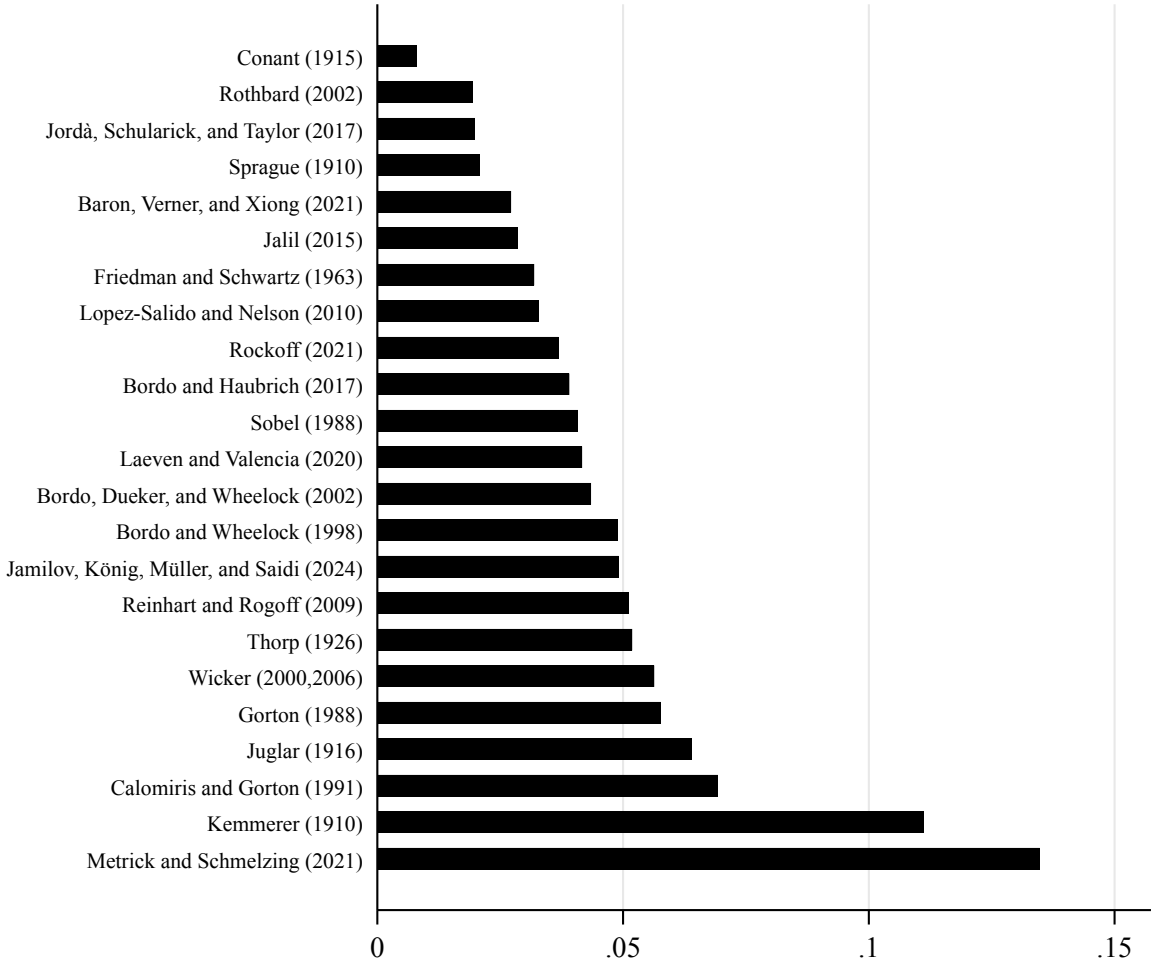
E.2 Identifying Benchmark Crises

Given the plethora of crisis definitions, we need to decide which of the identified events we should count as a crisis on which there appears to be broad consensus, which we refer to as "benchmark crises." Our goal is not to come up with a new, subjective list of events, but rather condense what the literature already agrees on.

Based on this motivation, we classify a benchmark financial crisis event as one where *the majority of the existing chronologies identify a crisis*. This definition means we effectively crowd-source the incidence of crises based on an equal weighting of chronologies as our baseline measure. Based on this dating scheme, we identify benchmark crises with broad agreement for the years 1837, 1857, 1873, 1884, 1893, 1907, 1930, and 2007. We add 2023 which only appears in a recent paper by Jamilov et al. (2024), but since our estimation sample ends in 2022, this does not affect our results.

The only remaining issue is how to deal with the widely differing timing of the crises identified in the 1980s. Lopez-Salido and Nelson (2010) provide a detailed discussion of the commercial bank failures of the early 1980s at the heel of the Least Developed Country crisis and the subsequent Savings and Loan Crisis, which they treat as distinct events. They argue persuasively that these troubles should be dated as starting in 1982 with the uptick in bank failure rates. Since there is no clear agreement about the dating of the Savings and Loan Crisis, or whether it constituted a crisis at all, we do not assign another year in the 1980s or 1990s as a crisis.

Figure E.1: Fraction of Years with Classification Disagreement Between Chronologies and the Benchmark



Notes: This figure shows the fraction of years in which each crisis chronology disagrees with the benchmark chronology, for the chronologies shown in Figure B.1. For each chronology, we compute the share of all years — both crisis years (excluding minor crises and years associated with ongoing crises) and non-crisis years — that are classified differently from the benchmark. The benchmark chronology corresponds to our baseline crisis indicator introduced in Table B.1.

F A State-Level Banking Dataset, 1863–2024

F.1 A New State-Level Dataset on Bank Balance Sheets and Failures

The backbone of our paper is a new historical dataset on local banking activity from $1863 - 2024$, as captured by balance sheets and the incidence of failures. For the purpose of this paper, we focus on eight key variables: [1] Total Assets; [2] Total Deposits; [3] Total Loans; [4] Total Real Estate Loans; [5] Total Liabilities; [6] Total Capital; [8] No. of Bank Failures; and [9] Total Assets of Failed Banks.

The United States went through a massive change in regulatory and policy regimes over the period we are studying. After the Civil War, the U.S. banking system was made up of separately-regulated national and state banks, with an important role for unit banks (consisting of a single branch). There was no central bank, although clearing houses at times functioned as lenders of last resort during crises. After the founding of the Federal Reserve, the U.S. entered the period of more active monetary policy that was, however, still restrained by the gold standard. Following the Second World War, regulations such as the separation of investment and commercial banking enshrined in the Glass-Steagall Act constrained the banking sector. Starting in the 1980s, the lifting of intrastate and interstate branching restrictions allowed for greater consolidation and diversification of banks, and these liberalizations culminated in a wider loosening of regulatory constraints before the 2007-08 financial crisis. Over the past 15 years, in turn, the Dodd-Frank Act and additional capital requirements on systematically important institutions have added new constraints.

These changes in the regulatory environment pose a few challenges for the construction of consistent long-run time series on banks. In our analysis, we thus focus exclusively on *growth rates* of balance sheet variables (e.g., the year-on-year growth rate of deposits). The advantage of focusing on growth rates is that they are less susceptible to biases compared to estimates of the *level* of a variable (e.g., the outstanding amount of deposits in a state).

Our basic strategy for constructing long-run estimates of state-level banking activity is as follows. First, we digitize state-level aggregates of bank balance sheets from the Officer of the Comptroller of the Currency (OCC)'s Annual Reports for the years from 1863 to 1960. Within the OCC Reports, National Banks are by far the most widely reported institutions even when other institution types are not. Accordingly, we also complement them with information on state banks from the "All Bank Statistics" (1959) as digitized by Cao and Richardson (2022) (also see White,

1983). We provide a detailed discussion of the role of National and State banks in the next section.

Second, for the post-1960 period, we draw on data from the Federal Deposit Insurance Corporation (FDIC) and the Federal Financial Institutions Examination Council (FFIEC)'s Consolidated Reports of Condition and Income, better known as "Call Reports".[6] Using these data to construct growth rates of bank balance sheets is non-trivial because of the liberalization of branching restrictions across states. As a result of these liberalizations, it is impossible to capture the extent of local banking sector activity from bank balance sheets, because all numbers are reported based on each bank's headquarter state rather than the bank's local exposure. We propose a method to get around this issue using the geographical distribution of bank deposits from the FDIC's Summary of Deposits (including a historical extension we obtained through a FOIA request). The section dedicated to these issues also discusses various additional definitional challenges when trying to capture local deposits.

The two sections below outline our process in constructing consistent long time series in more detail.

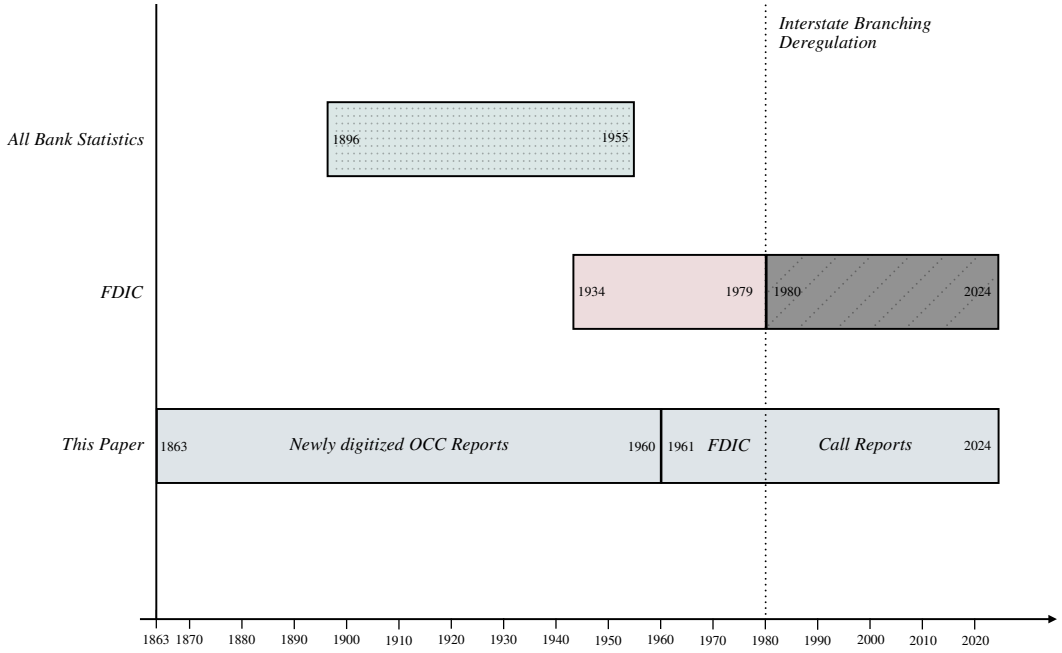
[6] We source data from FDIC from 1961-1980, and directly from the "Call Reports" from 1981 onwards. An exception is for the series "Bank Liabilities", which from 1961-1965 we source from the "Call Reports" as kindly shared by Correia, Luck and Verner (2026). For this period, the FDIC reported Liabilities only encompass Deposits, and are exactly equal to the Deposit series reported.

Table F.2: Description of Variables

Variable	Code	Period	Frequency	Sample	Main Sources
Bank Assets ($)	BNKASST	1863–2024	Annual	All States	OCC/FDIC/SOD/Call Reports
Bank Capital ($)	BNKCAP	1863–2024	Annual	All States	OCC/FDIC/SOD/Call Reports
Bank Loans ($)	BNKLOAN	1863–2024	Annual	All States	OCC/FDIC/SOD/Call Reports
Bank Real Estate Loans ($)	BNKRELOAN	1886–1909 1911–2010	Annual	All States	OCC/FDIC/SOD/Call Reports
Bank Liabilities ($)	BNKLIAB	1863–2024	Annual	All States	OCC/FDIC/SOD/Call Reports
Bank Deposits ($)	BNKDEP	1863–2024	Annual	All States	OCC/FDIC/SOD/Call Reports

Notes: The first column reports the variable names. The second column provides the corresponding code labels used in our data sets. The third, fourth, and fifth columns outline the period, frequency, and sample coverages, respectively. Links to main sources are provided in the last column.

Figure F.2: Comparison of state-level bank balance sheet datasets: 1863-2024



Notes: This table compares our state-level banking sector dataset with existing work, in particular, the All Bank Statistics (1959), a publication by the Federal Reserve, as digitized in Flood (1998) and Cao and Richardson (2022), and the FDIC data as collected from Bank Find Suite as of January 2025. We report the coverage of each dataset, indicating the start and end years within each bar. We indicate two potential challenges facing historical bank balance sheet state-level data: first, the transparency of construction of balance sheet items in the All Bank Statistics (dotted), and second, the interstate branching deregulation beginning in 1980 (shaded gray). An in-depth discussion regarding the consequences of interstate branching deregulation on state-level aggregates can be found in Appendix F.3.

F.2 Historical Data for 1863–1960

We collect data on both aggregates and sub-items in the Bank Balance sheets from the Officer of the Comptroller of the Currency's (OCC) Annual Reports from 1863−1960. In most years, these reports contain by far the most data on National Banks, although they at times also report information on various State Banks, Private Banks, Trust Loan Companies, Savings Banks, Stock Savings Banks and Mutual Savings Banks. This group of institutions encompasses our baseline definition of Commercial Banks in the modern era (`RSSD9048` == 200 within the FFIEC Call Reports), which includes National Banks, State Banks, depository Trust Companies and Private Banks but excludes non-deposit Trust Companies, Savings Banks and Savings and Loan Institutions, the latter two of which we also collect data on and use in our robustness exercise.[7] However, the reported values on state-chartered banks are inconsistently available and often appear extremely volatile. For example, as detailed in OCC Annual Report 1874 (pg. XXIV-XXV): in accordance with the act of Congress approved 16 February 1873, the Comptroller of the Currency "was able to obtain the necessary information from the State authorities of the condition of the savings banks in only eight States, and of the State banks in no more than nine." In particular, "the official returns of [the State Banks within] the several States are made to their legislatures ... and are not published or received at this Office until [his] report for the current year has been presented." We illustrate the relative availability of balance sheet data pertaining to each institution type in Table F.3. We observe that National Banks are not only (1) consistently reported across states and years within the historical OCC data, yielding an average of 95% non-missing observations across variables[8], but also (2) by far the best reported in comparison to other institution types. As a result, our baseline balance sheet measures focus on National Banks, for which we can create consistent measures over time.

It is worth noting that an existing compilation called "All Bank Statistics" (1959)–digitized by Flood (1998) and Cao and Richardson (2022)–already constructed state-level bank balance sheet aggregates for the period 1896 to 1955. This important contribution, however, suffers from two limitations that necessitate building a new dataset from scratch. First, the construction of individual bank balance sheet items across years of the OCC Annual Report, which is the main source of the "All Bank Statistics", is not straightforward. Unfortunately, the "All Bank Statistics" are not

[7] Credit card companies with commercial bank charters are also included within `RSSD9048` == 200. We note that this group of institutions also encompasses the modern definition of Commercial banks by the FDIC, which differs slightly in that it excludes Private Banks (as of 1947). For more details, see FDIC BankFindSuite Commercial Banks Help.

[8] This is with the notable exception of real estate loans, which National Banks were prohibited to make until 1913, and only gradually permitted after.

Table F.3: Coverage of Historical State-Level Bank Balance Sheet Data: 1863–1960

				Asset Subcategories			Liability Subcategories	
		Institution type	Assets	Loans	Real estate loans	Liabilities	Deposits	Capital
All states + D.C.	No. of observations	National banks	4,671	4,671	2,159	4,698	4,656	4,698
		State banks	3,652	3,650	2,579	3,651	3,650	3,651
		Private banks	1,319	1,319	1,131	1,319	1,318	1263
		Savings banks	143	143	153	143	143	9
		Stock savings banks	765	744	577	744	744	741
		Mutual savings banks	1,145	1,145	1,060	1,145	1,145	70
		Trust loan companies	1,271	1,257	919	1,257	1,241	1,257
	Pctg. non-missing	National banks	93%	93%	43%	94%	93%	94%
		State banks	73%	73%	52%	73%	73%	73%
		Private banks	26%	26%	23%	26%	26%	25%
		Savings banks	3%	3%	3%	3%	3%	0%
		Stock savings banks	15%	15%	12%	15%	15%	15%
		Mutual savings banks	23%	23%	21%	23%	23%	1%
		Trust loan companies	25%	25%	18%	25%	25%	25%

Notes: This table reports the number of non-missing state-level observations (rows 1–7) and the corresponding percentages relative to the full state-year sample (rows 8–14) across major institution types in our dataset, covering the period from 1863 to 1960. Asset subcategories include total loans and real estate loans, and liability subcategories include deposits and capital.

transparent in their variable definitions over time, which raises questions about the consistency of the state-level time series. To compile consistent series, we thus take a bottom-up approach and create mapping tables for each year of the OCC reports that assign each reported balance sheet item to a harmonized variable definition. Second, the data does not cover the periods before 1896 or $1955-1960$ (when the modern Call Reports begin), which means these intermediate years would have to be spliced using some external dataset subject to its own classifications and challenges (such as the FDIC's compilation of state aggregates).

Construction of OCC Balance Sheet data Harmonizing the OCC balance sheets involves several challenges. The categories of reported balance sheet items change over time, which required us to develop a custom mapping scheme to standardize them in a way that is consistent with their modern (post-1960) equivalents where possible. For example, we created consistent series for loans, securities, cash, assets, deposits, and capital by carefully aggregating subcategories that sometimes changed terminology or reporting conventions. We detail the underlying structure by which we aggregate the data in Table F.4. There are three components in the data: Totals, Principal Items and Subitems. Totals are comprised of Principal Items and Principal Items are comprised of

Subitems.[9] We manually assign each balance sheet item as published in the OCC reports to the corresponding Subitem.

We construct the balance sheet variables Loans, Securities, Cash, Deposits and Capital according to the following procedure: First, we report the Totals whenever available. When unavailable, we instead construct the Totals as the sum of Principal Items. Whenever a Principal Item is unavailable, we construct it as the sum of Subitems. For example, Real Estate Loans is a Principle Item. Accordingly, we report the Principal Item directly whenever available, and construct it from Subitems otherwise. Finally, we follow a similar procedure for Total Assets and Liabilities–reporting the Totals whenever available, and otherwise constructing Total Assets as the sum of Loans, Securities, Cash and Other Assets, and Total Liabilities as the sum of Deposits, Bond Liabilities and Other Liabilities.[10]

We also adjusted for changes in reporting frequency and retained only the last observations reported in a given year despite variations in the underlying schedule (quarterly, semi-annual, or annual). In the digitized raw data, we have $40,307$ "monthly" observations. Of these, 32% ($13,186$) are years with only one month available, and the remaining 68% have more than one month available. 66% of observations have 4 months or more per year. We aggregate to a yearly level by keeping only the latest available observation in a given year. In doing so, we "lose" 55% of the raw observations but have consistent year-end (or close to year-end) values.

[9] Principal Items are always listed at the beginning of the balance sheet within the OCC Reports.

[10] We note that Capital is listed as a component of Liabilities within the OCC Reports. However, we report Total Liabilities with Capital excluded, and construct Capital including Surplus and Undivided Profits for consistency with the FDIC's definition.

Table F.4: OCC Balance Sheet Assets: Totals, Principals and Subitems

Totals	Principal (FDIC Code if applicable)	Subitems	Examples of Items subsumed by Subitems in OCC Report
ASSETS			
Loans			
Total Loans and Leases (Net)	Real Estate Loans (LNRE)	Real Estate Loans (s)	Secured by farm land, Secured by other properties
Total Loans and Leases (Net)	Other Loans (NEW11_1)	All Other Loans (s)	Loans not classified
Total Loans and Leases (Net)	Bank Loans (LNDEP)	Bank Loans (s)	Loans to domestic commercial and foreign banks
Total Loans and Leases (Net)	Secured Loans, excluding Real Estate (LNCON)	Agricultural Loans	Loans to farmers
Total Loans and Leases (Net)		Commercial & Industrial Loans	Commercial and industrial loans (including open market paper)
Total Loans and Leases (Net)		Loans on securities	Loans to brokers and dealers in securities
Total Loans and Leases (Net)		Commercial Papers	Open market paper
Total Loans and Leases (Net)		Consumer Credit	Consumer loans to individuals, Demand loans
Securities			
Total Securities	U.S. Treasury Securities (SCUST)	U.S. Treasury Securities (s)	Home Owners Loan Corporation guar. by U.S. Government
Total Securities	Equity Securities (SCEQ)	Equity Securities (s)	Bank stocks, Stock of domestic corporations
Total Securities	State, county, and municipal bonds (SCMUNI)	State, county, and municipal bonds (s)	State, municipal, and other bonds and stocks
Total Securities	Railroad Bonds and Stocks	Railroad Bonds and Stocks (s)	Railroad bonds, Railroad stocks
Total Securities	Other Securities	Other Securities (s)	Other bonds, notes, warrants, etc.
Total Securities	Other Bonds and Securities	Foreign Securities	Foreign government bonds and other foreign securities
Total Securities		Bonds of oth. public service corporations	Bonds of Federal land banks
Cash			
Total Cash	Cash on hand	Cash on hand (s)	Gold Coin, Fractional Currency, Gold Certificates
Total Cash	Cash items		
Total Cash	Other Cash		
Other Assets			
	Bank Premises Owned (ORE)		
	Other Real Estate Owned (ORE)		

Notes: This table describes the structure of our OCC bank balance sheet dataset for Asset Items. There are 3 components in the data: Totals, Principal Items and Subitems. Totals are comprised of Principal Items and Principal Items are comprised of Subitems. We provide examples of the balance sheet items coded under each respective Subitem, as reported in the respective OCC reports. "(s)" is used to identify Subitems in cases where they share a common name with a Principal Item. Whenever applicable, we report the FDIC Variable Code which is consistently defined with the Principal Item.

Table F.5: OCC Balance Sheet Liabilities & Capital: Totals, Principals and Subitems

Totals	Principal (FDIC Code if applicable)		Subitems	Examples of Items subsumed by Subitems in OCC Report
LIABILITIES				
Deposits				
Total Deposits	Indiv. Dep. (NEW15_2)	Dem. Dep.	Dem. Dep. - Other Banks (s)	Deposits of banks in foreign countries
Total Deposits	Indiv. Dep. (NEW15_2)	Dem. Dep.	Dem. Dep. - Indiv., Partners. and Corp. (s)	Demand certificates of deposit
Total Deposits	Indiv. Dep. (NEW15_2)	Dem. Dep.	Dem. Dep - States and Pol. Subdiv. Securities (s)	Deposits of states and political subdivisions
Total Deposits	Indiv. Dep. (NEW15_2)	Dem. Dep.	Dem. Dep. - U.S. Government (s)	U.S. Government demand deposits
Total Deposits	Indiv. Dep. (NEW15_2)	Time Dep.	Time Dep. - Other Banks (s)	Time Deposits of banks in United States
Total Deposits	Indiv. Dep. (NEW15_2)	Time Dep.	Time Dep. - Indiv., Partners. and Corp. (s)	Time deposits, open accounts, Christmas savings, etc.
Total Deposits	Indiv. Dep. (NEW15_2)	Time Dep.	Time Dep - States and Pol. Subdiv. Securities (s)	Public funds of states, counties, school districts, etc. (time)
Total Deposits	Indiv. Dep. (NEW15_2)	Time Dep.	Time Dep. - U.S. Government (s)	U.S. Government time deposits
Total Deposits	Indiv. Dep. (NEW15_2)		Unclassified Dep. - Indiv., Partners. and Corp.	Deposits not classified
Total Deposits	Dep. - U.S. Govt (NEW15_3)			
Total Deposits	Other Dep.			
Total Deposits	Liabilities to other Banks			
Bond Liabilities				
Total Bond Financing	Bond Financing			
Other Liabilities				
Liabilities to other Banks				
Demand Notes and Other Liabilities				
Other Liabilities				
CAPITAL				
Capital				
Total Capital			Preferred Stock	Preferred Stock
Total Capital			Other Capital	Capital notes and debentures
Total Capital			Common Stock	Common Stock
Total Capital			Common Stock (Book Value)	Book value
Total Capital	Surplus			
Total Capital	Undivided Profit			

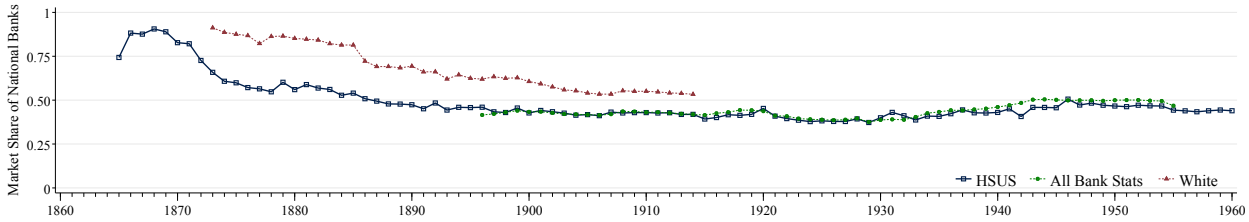
Notes: This table describes the structure of our OCC bank balance sheet dataset for Liability and Capital Items. There are 3 components in the data: Totals, Principal Items and Subitems. Totals are comprised of Principal Items and Principal Items are comprised of Subitems. We provide examples of the balance sheet items coded under each respective Subitem, as reported in the respective OCC reports. "(s)" is used to identify Subitems in cases where they share a common name with a Principal Item. Whenever applicable, we report the FDIC Variable Code which is consistently defined with the Principal Item. Note that Total Deposits comprise Total Individual Deposits (split up into time and demand), U.S. Government Deposits, Liabilities to other Banks and Other Deposits. Finally, we note that "Individual Deposits" category is only reported up till 1928, after which it is reported split up into Time and Demand Deposits.

National Banks and Other Institutions In our setting, the key concern with relying on national bank data is that it might have implications for how we are measuring local banking distress. Historically, national banks were typically not allowed to lend against real estate collateral (see, e.g., Barnett, 1911; Hammond, 1957; White, 1983; Jaremski and Wheelock, 2020). The rationale behind these regulations was that real estate-related lending was considered particularly risky, consistent with recent empirical evidence documenting a link between real estate collateral and financial crises (Jordà, Schularick and Taylor, 2015; Ivashina et al., 2024). While Keehn and Smiley (1977) provides some evidence that national banks attempted to circumvent these regulations, it still raises the question of whether the balance sheets of national banks can plausibly proxy for whether a state's banking system is experiencing distress.

To get a first idea of the potential importance of these issues, Figure F.3 plots the market share of national banks, defined as the total banking assets of national banks relative to those of all banks. We construct these estimates of national banks' market share by drawing on several data sources, including Carter et al. (2006), the "All Bank Statistics" (1959), and White (1983). Beginning with the advent of the National Banking Era in 1865, we observe that national banks capture the lion's share of the banking market, with a market share of around 75%, which hovers around or above 50% from 1886-1960.

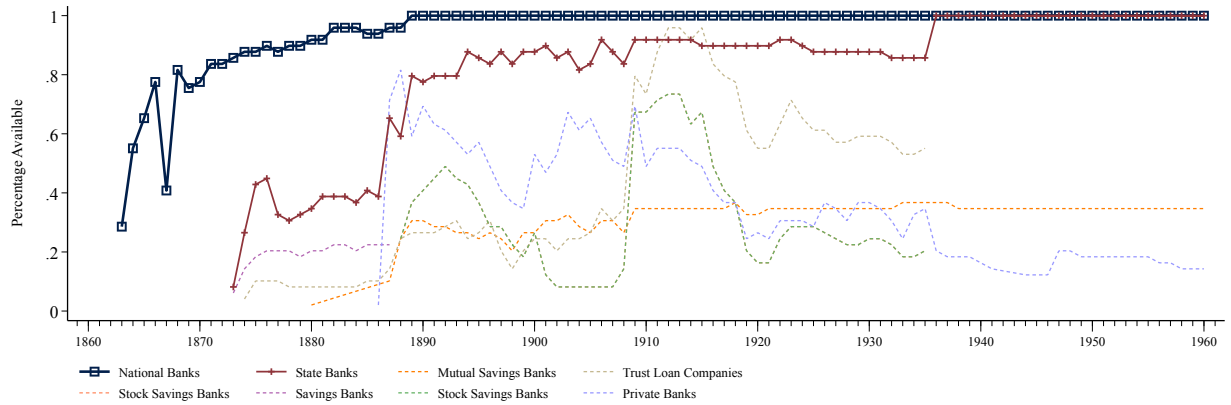
We more directly test whether changes in national bank's balance sheets can serve as a reasonable proxy for developments in the overall banking sector by assessing the correlation of nationally- and state-chartered deposit growth rates. Figure F.5 plots a binscatter suggesting a close positive relation. Our takeaway is thus that, while omitting an important part of the U.S. banking sector in the pre-World War II era in particular, nationally-chartered banks' balance sheet can serve as an acceptable starting point for assessing local banking sector distress. This is consistent with White (1983)'s observation that the failure rates of nationally and state-chartered banks in 1930 showed a cross-state correlation of 0.885, also suggesting substantive co-movement.

Figure F.3: Market Share of National Banks, 1865 – 1960



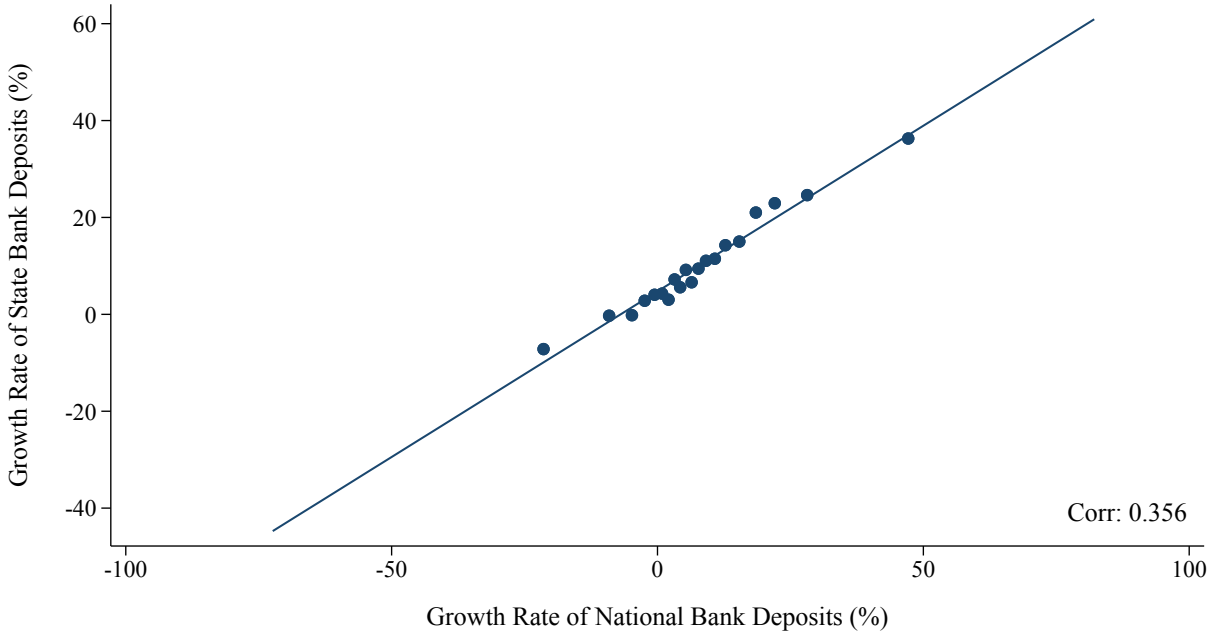
Notes: This figure plots the U.S.-wide market share of national banks, defined as the total assets of national banks divided by those of all banks from 1865 – 1960. Data are compiled from Carter et al. (2006) (HSUS, 1865 – 1960), "All Bank Statistics" (1959) as digitized by Flood (1998) and Cao and Richardson (2022) (All Bank Stats, 1896 – 1955), and White (1983) (White, 1873-1914). Before aggregating the "All Bank Statistics" (1959) to the US-level, we first limit our sample to the 48 contiguous states plus AK and HI. The data include national banks, all commercial banks (state-chartered commercial banks, mutual savings banks), and unincorporated or private banks. White (1983) reports the total assets of nationally and state-chartered banks (from 1873 onwards), and of private banks and trust companies (from 1886 onwards). From the HSUS dataset, we collect data on national bank assets from `Cj204` (1865 – 1896) and `Cj213` (1897 – 1960). HSUS reports data on the total assets of "all reporting banks" from 1834 – 1895 from the OCC Annual Report 1931 in series `Cj252`. In order to construct a consistent series, we digitize data on the total assets of all reporting banks from the corresponding OCC reports from 1896 – 1960. In particular, we digitize data in 1896 – 1931 from OCC Report 1931, and 1932 – 1936 from OCC Report 1936, both of which are reported as of June. Next, we digitize data for 1936 – 1944 from OCC Report 1944, and 1945 – 1960 from OCC Report 1960, both of which are reported as of December. To account for changes in the reporting month, we adjust the pre-1936 data by taking a simple average of the corresponding years: $assets_t^{dec*} = (assets_t^{june} + assets_{t+1}^{june})/2$.

Figure F.4: Coverage of Historical State-Level Bank Balance Sheet Liabilities by Bank and Institution Type: 1863 – 1960



Notes: This figure illustrates the availability of our State-Level Bank Balance Sheet Data, using Total Liabilities as an example. For each year, we plot the percentages available relative to the full state sample, across each major institution type reported within the OCC reports. We highlight the two most frequently reported institution types, National Banks (in blue) and State Banks (in red).

Figure F.5: Correlation between National and State Bank Deposit Growth Rates: 1863 – 1960



Notes: This figure presents a binscatter plot of the deposit growth rate of nationally and state-chartered banks (in %). The number of bins is chosen using the rule-of-thumb bin selector of Cattaneo et al. (2024). Additionally, we report the simple correlation between national and state bank deposit growth rates. To account for outliers, we truncate each sample at the 99th percentile. We note that the correlation is robust to truncating samples at the 95th and 90th percentiles. These specifications yield correlations of 0.409 and 0.423 respectively.

F.3 Modern Data for 1960–2024

Estimating balance sheet values after branching deregulation Historically, U.S. banks were effectively banned from building branch networks across state borders, leading to the proliferation of "unit banks" with a single branch. The resulting lack of opportunity to diversify and reduce the effect of regional shocks is often cited as a major contributor to the frequency of banking crises before World War II (see, among others, White, 1983; Bordo, 1985; Bordo and Redish, 1996; Calomiris, 2009).

In fact, it was not until the beginning of the 1900s that within-state prohibitions on branching began to be relaxed: in 1909, nine states allowed branch banking statewide, while four others allowed limited branching, typically confined within the bank's home-office city (White, 1983). The early to mid 20$^{\text{th}}$ century came with a rapid expansion in intrastate branch banking–initially a privilege available only to State Banks. National Banks gained similar rights only after the

McFadden Act of 1927, and even then, only within states that explicitly permitted branch banking. Since our study is conducted entirely at the state-level, our results are not affected by the changes in intrastate banking regulation.

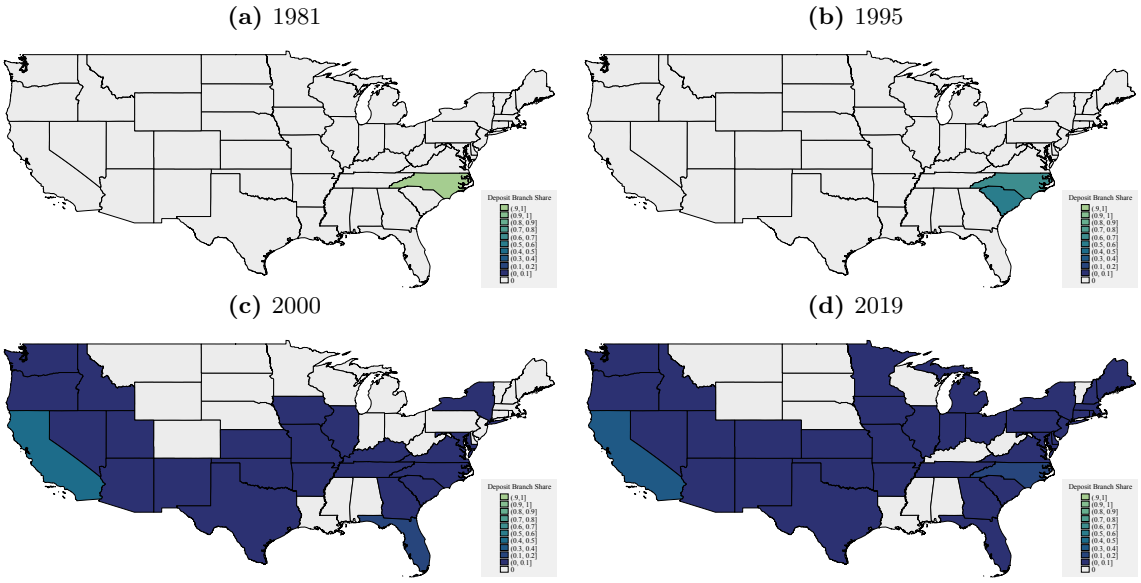
Importantly, the McFadden Act continued to prohibit nationwide interstate banking. This remained the status quo up till the early 1980s, whereupon some states began to allow limited interstate banking in regional or reciprocal arrangements. Following the Savings and Loans crisis of the 1980s, a watershed reform came with the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) of 1994, signed into law by President Clinton on September 29.[11] This act eliminated most of the restrictions on interstate banking, allowing for the establishment of new branches across state lines. We illustrate the consequences of interstate branching deregulation in Figure F.6 by tracking the deposit shares of Bank of America (BOA) across different states over time. Before the IBBEA of 1994, the deposits of BOA were entirely concentrated in their headquarter state of North Carolina. Shortly after the act, we observe a spreading out of deposit shares as BOA began to open branches in South Carolina as early as 1995, and continued to do so across the rest of the U.S. through the 2000s.

Given that our study aims to understand the impact of local financial distress, it is imperative that we are able to measure bank's activity in a given state for, instead of relying on a measure which allocates all resources of a bank to its headquarter state. This is especially important for deposits, which we use as part of our baseline measure of local distress. Fortunately, the Summary of Deposits (SOD), an annual survey of branch office deposits as of June 30 for all FDIC-insured institutions, reports deposits at the branch-level. The publicly available version begins in 1991, but we were able to obtain additional data for the $1981-91$ period through a FOIA request. This combined version of the SOD thus spans from 1981-present, which exactly coincides with the period of nationwide interstate branching deregulation. Accordingly, we report the Summary of Deposits data on Deposits of all branches geographically located in a particular state, aggregated up to the state-level, from 1981 onward.

Taking advantage of the SOD data, we also adjust our other balance sheet variables to obtain estimates of the localized values within in each state using the following procedure: First, we construct shares at the bank-id-level of the amount of deposits reported by each bank within each state. For bank b, branches r, state s and year t, this corresponds to:

[11] States had up till June 1 1997 to decide whether to opt-out of the new branching provisions. Montana and Texas chose to opt-out, but eventually adopted interstate banking–Montana in 2002 and Texas in 1999.

Figure F.6: Bank of America Deposit Shares across States



Notes: This figure plots state-level deposit shares of the Bank of America (RSS-ID 480228) across four years: 1981, 1995, 2000 and 2019. Using the underlying annual branch-level data from the Summary of Deposits, we construct state-level shares as the ratio of, for a particular state i and year t, $\frac{\text{Total Deposits of Bank of America Branches in state } i \text{ and year } t}{\text{Total Deposits of Bank of America Branches in all states and year } t}$. We select these four years to depict the changes in interstate banking before and after the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994.

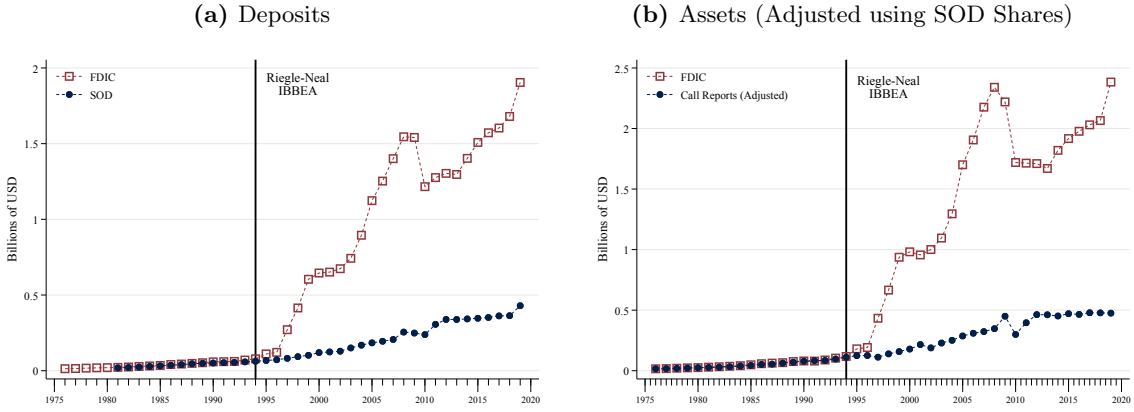
$$share_{b,s,t} = \frac{\sum_{r \in \text{ branches of bank } b \text{ in state } s} deposits_{r,t}}{\sum_{s} \sum_{r \in \text{ branches of bank } b \text{ in state } s} deposits_{r,t}} \tag{F.4}$$

Next, we apply these shares to the bank-id-level Call Reports data on each balance sheet item. For example, we compute, $adjusted_assets_{b,s,t} = call_report_assets_{b,t} \times share_{b,s,t}$.[12] Finally, we aggregate back to the state-level by taking a simple summation across adjusted assets of all banks with branches within a given state. We apply this adjustment procedure to the balance sheet items Assets, Capital, Loans, Real Estate Loans, and Liabilities, from 1981 to 2021.

Using North Carolina as an example, we provide an illustration of our adjustment method in Figure F.7. Figure F.7a depicts the raw deposits data reported in the SOD, aggregated to the state level, and the deposits data as reported in FDIC's BankFindSuite. We observe that the Deposits series from SOD and FDIC almost perfectly overlap up until the establishment of IBBEA in 1994 and the relaxation on interstate branching, after which the series begin to diverge significantly. This coincides with the spreading out of deposits across states of Bank of America from 1995

[12] Note that while the headquarter state is reported within the Call Reports data, we do not use this in the adjustment, only the bank-id number. Instead, we geolocate each bank's branches using the SOD data. Consequently, $call_report_assets_{b,t}$ is not indexed by s.

Figure F.7: Adjustment for Changes of Interstate Banking using SOD Deposit Shares for North Carolina



Notes: Figure (a) plots Total Deposits from the Summary of Deposits (SOD) in blue, and from the Federal Deposit Insurance Corporation (FDIC) in red. The SOD data is aggregated up to the state-level from the bank-level. The FDIC data is collected from BankFindSuite. Figure (b) plots Total Assets, with our adjusted figures from the Call Reports in blue, and from the FDIC in red. As detailed in the main text, in order to account for changes in interstate branching regulation, we adjust the Call Reports data from 1981 onwards using state-level Deposit Shares constructed from the SOD. Finally, we indicate a significant change in interstate branching regulation with a vertical line: the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994.

onward. Figure F.7b depicts our adjusted assets figures against the assets data as reported in FDIC's BankFindSuite. Similar to deposits, we observe a much lower level in the adjusted series compared to the FDIC data which assigns the assets of each bank to their headquarter state. These adjusted series serve as a proxy for localized financial activity, and provide the foundation for our analysis of local financial distress after the relaxation of interstate banking laws.

A note on modern deposit contractions Before the advent of deposit insurance, "traditional" bank runs–where depositors line up in front of banks in a panicked rush to withdraw their funds– were a common occurrence during periods of financial stress (e.g. Frydman, Hilt and Zhou, 2015). While connections between (major) institutions were important for the transmission of crises during certain periods, banks still predominantly relied on deposits as their funding source. With the rise of wholesale funding markets, the nature of runs also changed. While traditional bank runs still occurred during crises after the founding of the FDIC (see, e.g., Jamilov et al., 2024), runs by other bank creditors became increasingly important.

To accommodate this reality, our data comprise both deposit and wholesale liabilities. These allow us to proxy for the incidence of runs of different types, affecting either deposit or wholesale funding markets. We construct our wholesale liability series in the following manner: We begin by collating a series for interbank liabilities - from $1863 - 1960$, we collect "Liabilities to other

Banks" or the wholesale deposits due to other banks from the OCC Reports.[13] From 1966-2021 we collect federal funds purchased and securities sold under agreement to repurchase - 1966-1975 from the FDIC BankFindSuite API (`FREPP`) and 1976 – 2021 from the Call Reports (`RCFD2800` up to 2000 and `RCONB993`+`RCFDB995` from 2001 onward). Accordingly, we construct wholesale liabilities from 1863 – 1960 as interbank liabilities. For the modern period post-1960, we follow Acharya and Mora (2015) to define wholesale liabilities as, whenever available, the sum of interbank liabilities (as defined above), large time deposits (`RCON2604`), deposits booked in foreign offices (`RCFN2200`), subordinated debt and debentures (`RCFD3200` post-1976 and FDIC's `SUBND` from 1966-1975) and other borrowed money (`RCON2850` + `RCON2910` from 1960-1969, `RCFD2850` + `RCFD2910` from 1969-1993, `RCFD2332` + `RCFD2333` + `RCFD2910` from 1994-1996, `RCFD2332` + `RCFDA547` + `RCFDA548` from 1997-2009, and `RCFD3190` from 2001 onward). We source "other borrowed money" from the Call Report dataset kindly made public by Correia, Luck and Verner (2026), and obtain the other variables either directly from the Call Reports (from 1976 onwards), or from FDIC BankFindSuite. Given that the primary objects of our study pertain to year-on-year growth rates, we include each subcomponent whenever available and ratio-splice following the procedure outlined in Appendix F.5: from 1994-2019, as the sum of all five categories, from 1984-1993 as the sum of gross federal funds purchased, repos, large time deposits, deposits booked in foreign offices, subordinated debt and debentures (spliced on overlap year 1994), from 1976-1983 as the sum of gross federal funds purchased, repos, large time deposits and subordinated debt and debentures (spliced on overlap year 1984), and from 1870-1975 as the sum of "Liabilities to Other Banks" and subordinated debt and debentures (spliced on overlap year 1976).

F.4 A Note on Bank Failures

We gather data on [1] the number of bank failures, and [2] the total assets of failed banks, and [3] the total number of active banks from 1863 – 2021. From 1863-1941, we focus on National Banks and define a failed bank as one for which either a receiver is appointed by the OCC, or one that undergoes voluntary liquidation. From 1942-2021, we focus on all commercial banks and follow the FDIC in defining a failed bank as one which involves the closing of a bank by regulators, for which the FDIC becomes the bank's receiver, or one which involves open bank assistance.[14] We note that

[13] Note that this is reported in the OCC Reports as "Due from Banks" from 1863 – 1935, and from 1936 – 1960 the sum of Demand deposits and Time deposits of other banks.

[14] A potential concern is that within main dataset of bank balance sheet items, we focus on National Banks from 1863-1960 and all commercial banks from 1961-2021. However, we note that our chronology of financial crises does not identify any crises between 1940-1957, and therefore our results are robust to this.

our results are robust to excluding open bank assistance from the post-1942 definition. We define the date of bank failure by the closing date: for the case of receivership, this corresponds to the date for which a receiver is appointed.

From 1863-1904, data on the number of bank failures and total assets of failed banks are collected from Carlson, Correia and Luck (2022). From 1905-1916, data on the number of bank failures is collected from the list of significant bank events compiled by Van Belkum (1968), and revised within Huntoon (2025). For this period, we collect data on the total assets of failed banks from the "Pollock dataset", as kindly made available by Andrew Pollock and Huntoon (2025). This is a bank-level yearly dataset, compiled from Comptroller of the Currency Annual Reports, Bankers Magazine, and various bank directories. We merge the failed banks by Charter ID, and extract the latest total assets within one year of the closing date. From 1917-1941, we digitize state-level data on both the the number of bank failures and the total assets of failed banks directly from the Comptroller of the Currency Annual Reports. From 1942-2021, we collect data on both the the number of bank failures and the total assets of failed banks from the FDIC's "Bank Failures and Assistance" data, as of December 2024.

Given that our definition of failed banks for the historical period includes both receivership and voluntary liquidation, a potential concern when constructing the total number of bank failures in each year is banks which first undergo voluntary liquidation, and then later have receivers appointed for the purpose of completing unfinished liquidation. Thankfully, the OCC reports the number and failed assets of such cases as footnotes within its yearly reports. We illustrate with an example of the relevant table within the OCC 1928 report in Figure F.8. In order to avoid double counting, we digitize the data within these footnotes and in the baseline, we exclude these banks. However, we note that our results are robust to not excluding these banks.[15]

Having collected data on the number of bank failures and the total assets of failed banks, we construct the fraction of failed banks in year t and state s as $\frac{num_bank_failures_{s,t}}{num_banks_{s,t-1}}$, and similarly the fraction of failed assets as $\frac{failed_assets_{s,t}}{total_assets_{s,t-1}}$. From 1863-1941, we digitize the total number of national banks from the OCC reports themselves.[16] From 1942-2021, we collect the total number of commercial banks insured by FDIC directly from FDIC Bank Find Suite. We use the total

[15] While the failed assets of such banks is typically reported alongside the number, there are few cases where only the failed capital is reported. There are 21 such observations with missing failed assets in our sample of 94 such bank-year observations. In the baseline we impute the predicted values of failed assets, from a linear regression of bank-average failed assets on bank-average failed capital within the subsample of such banks. However, our results are robust to simply excluding cases where failed assets are not reported.

[16] We collect the total number of national banks from the Pollock dataset for one year, 1922.

assets collected within our bank balance sheet dataset, of national banks from 1863-1941, and of all commercial banks from 1942-1980 (from FDIC) and 1981-2021 (from Call Reports).

Figure F.8: Failed Banks and Failed Assets: OCC 1928 Report

TABLE NO. 18.—*National banks, by States and geographical divisions, organized, failed, and reported in voluntary liquidation during the year ended October 31, 1928*

States	Organized		Failed			Voluntary liquidations		
	Number	Authorized capital	Number	Capital	Assets	Number	Capital	Gross assets
Maine						2	$500,000	$8,880,168
New Hampshire	1	$50,000						
Massachusetts	4	325,000				3	1,650,000	17,439,151
Rhode Island			1	$100,000	$1,407,654	1	150,000	494,572
Connecticut	1	25,000						
Total New England States	6	400,000	1	100,000	1,407,654	6	2,300,000	26,813,891
New York	16	12,450,000				10	8,700,000	119,702,891
New Jersey	6	600,000				2	400,000	3,049,855
Pennsylvania	13	2,410,000				13	3,825,000	70,689,218
Delaware						1	75,000	505,511
Maryland	1	100,000				1	800,000	5,593,450
Total Eastern States	36	15,560,000				27	13,800,000	199,540,925
Virginia						1	50,000	532,293
West Virginia	1	100,000	2	75,000	927,828	1	50,000	328,297
North Carolina	1	150,000	1	100,000	1,071,673			
South Carolina			4	175,000	1,012,127	2	275,000	3,170,891
Georgia	3	225,000	2	400,000	3,365,073	2	200,000	957,549
Florida	3	700,000	2	200,000	1,155,064	3	400,000	5,768,810
Alabama	1	200,000						
Mississippi	1	125,000						
Louisiana	2	125,000				1	50,000	277,291
Texas	8	315,000	3	230,000	2,356,668	14	720,000	4,239,122
Arkansas	2	75,000				2	100,000	724,641
Kentucky	1	100,000				1	350,000	5,675,743
Tennessee						3	600,000	7,119,062
Total Southern States	23	2,115,000	14	1,180,000	9,888,433	30	2,795,000	28,793,699
Ohio	4	185,000	1	85,000	960,911	11	1,210,000	22,981,880
Indiana	1	200,000	2	50,000	[1] 431,690	4	340,000	2,892,682
Illinois	8	2,325,000	5	275,000	2,717,337	4	925,000	8,528,377
Michigan	1	50,000						
Wisconsin	3	400,000				1	25,000	191,550
Minnesota	3	225,000	3	75,000	[2] 456,373	7	336,000	2,300,879
Iowa	2	175,000	10	700,000	5,891,199	6	415,000	6,242,350
Missouri	2	350,000	1	125,000	773,737	2	65,000	373,300
Total Middle Western States	24	3,910,000	22	1,310,000	11,231,247	35	3,316,000	43,511,018
North Dakota	1	25,000	5	275,000	2,475,276	3	175,000	1,697,122
South Dakota	2	75,000	2	100,000	764,570	1	25,000	675,631
Nebraska	9	275,000	3	105,000	[3] 647,409	2	[4] 325,000	4,161,562
Kansas			5	300,000	1,790,626	3	250,000	1,557,505
Montana						3	75,000	491,119
Wyoming						4	250,000	5,124,547
Oklahoma			5	185,000	1,650,884	10	400,000	2,393,110
Total Western States	12	375,000	20	965,000	7,328,765	26	1,500,000	16,100,596
Washington	4	2,725,000				1	100,000	1,129,763
Oregon	1	50,000	1	200,000	2,695,604	2	90,000	349,086
California	7	1,025,000	1	300,000	[5] 1,104,477	24	3,050,000	38,282,715
Idaho			1	50,000	194,503	4	330,000	5,292,124
Utah			1	30,000	[4] 39,399			
Arizona						1	100,000	2,625,920
Total Pacific States	12	3,800,000	4	580,000	4,033,983	32	3,670,000	47,679,608
Total United States	113	26,160,000	61	4,135,000	33,890,082	156	27,381,000	362,439,737

[1] Includes 1 bank with capital of $25,000 and assets of $104,790 restored to solvency.
[2] Includes 1 bank with capital of $25,000 previously reported in voluntary liquidation.
[3] Includes 1 bank with capital of $40,000 and assets aggregating $105,716 previously reported in voluntary liquidation.
[4] Includes 1 bank that never opened for business.
[5] Was in voluntary liquidation.

Notes: This figure provides an example of the state-level data on bank failures within the OCC reports. We note that the "Failed" column here pertains to banks with receivers appointed, while the "Voluntary liquidation" column pertains to banks that undergo voluntary liquidation. We emphasize two footnotes which we digitize which pertain to failed banks with receivers appointed which were previously reported in voluntary liquidation: In blue, an example of the number of such banks and failed assets and failed capital reported. In red, an example of the number of such banks and failed capital reported, but failed assets not reported.

F.5 Combining Time Series

To splice together the time series from different sources, we use the following process. First, from 1981 onwards, we report data from the Call Reports (after adjusting using SOD shares).[17] Second, from 1961 to 1980, we ratio-splice the Call Reports data with the FDIC data in the following manner. For state i and year t, let the older series, in this case the FDIC data, be $y_{i,t}^{old}$ and the newer series, in this case the Call Reports, by $y_{i,t}^{new}$. The two series share the overlap year $\bar{t}$, in this case 1981. The break-adjusted series for the older source is then:

$$\hat{y}_{i,t}^{old} = y_{i,t}^{old} \times \theta_{i,\bar{t}}$$

where $\theta_{i,\bar{t}}$ is the splicing ratio calculated on the overlap year $\bar{t} : \theta_{i,\bar{t}} = \frac{y_{i,\bar{t}}^{new}}{y_{i,\bar{t}}^{old}}$

Third, and finally, from 1863 to 1960, we ratio-splice the Call Reports data with the OCC reports data using the overlapping year $\bar{t} = 1960$.

The resulting dataset has the following advantages over alternative approaches. It retains a consistent definition of banks and variables over the $1863 - 1960$ period based on our newly-digitized OCC dataset. From 1961 onwards, it is constructed directly from bank-level data, with the important adjustments due to the role of interstate branching as discussed above. The intermediate period is filled using the comprehensive data from the FDIC, which has the highest consistency with the bank-level Call Reports, given that the state-level aggregates are based on banks' reporting to the FDIC as well. Conceptually, we thus really only draw on a single ultimate source of "ground truth" for the state-level time series: the Call Reports as collected and aggregated first by the OCC, then the FDIC, and ultimately the FFIEC.

G State-Level Macroeconomic Data

To measure state-level economic conditions, we draw on the dataset and measures constructed in Hoon et al. (2026). We provide a high-level overview of these time series here and refer the interested reader to that paper for additional details.

The key innovation of the data from Hoon et al. (2026) is to construct harmonized, annual,

[17] Note that the SOD data is reported in June, and within the Call Reports, 98.4% of bank-year observations are reported in June. However, we are primarily interested in calendar years for consistency with our index of economic activity. Accordingly, we adjust for each series by taking the average of second quarter observations in adjacent years: $\hat{y}_t^{dec} = \frac{\hat{y}_t^{jun} + \hat{y}_{t+1}^{jun}}{2}$.

state-level indicators of economic activity going back to the Civil War. Much of the data was newly digitized based on specialized publications and painstakingly combined using a variety of inputs. The result is the first annual long-run sub-national dataset for the United States.

What necessitates going through this process instead of simply using existing measures? Perhaps surprisingly, most macroeconomic time series are only available on the state-level since the 1960s (e.g., GDP) or even more recent decades. The only existing long-run state-level data on agricultural production and personal income–starting in the 1910s and 1920s, respectively–paint an incomplete picture of local economies. To improve on this paucity of knowledge about regional economic fluctuations, Hoon et al. (2026) collect a grand total of 62 time series capturing various aspects of economic activity, including variables on the labor market, real activity, housing, transportation, government, income and wealth, and other miscellaneous indicators.

The construction of this dataset requires integrating information from diverse sources, including federal government publications, state-level records, historical archives, and modern databases. For earlier periods (pre-1929), we rely heavily on the Census of Manufactures, Census of Agriculture, and Statistical Abstracts of the United States, supplemented by state-level publications such as agriculture department reports and labor bureau statistics. For the intermediate period (1929-1963), we incorporate Bureau of Economic Analysis (BEA) state personal income accounts and Bureau of Labor Statistics (BLS) employment records. The modern period (post-1963) draws primarily on standardized federal statistical series including BEA regional accounts, as well as BLS state and metropolitan employment data.

A key contribution in constructing this dataset is to propose harmonized, consistent time series by carefully recategorizing historical classifications to align with modern standards where possible. For example, manufacturing output measures shifted from "value of product" in early censuses to "value added" in later periods, requiring reconciliation through overlapping observations and adjusting for intermediate input shares. The raw data are also often reported at mixed frequencies, which requires implementation of temporal disaggregation methods that distribute changes between benchmark observations according to patterns observed in related high-frequency indicators.

To analyze the economic consequences of financial crises consistently across states and time periods, we need reliable measures of local economic activity spanning our entire sample period. However, comprehensive state-level GDP data are only available from the Bureau of Economic Analysis starting in 1963, creating a substantial data gap for earlier periods. To address this limitation, we use the index of state-level economic activity covering all 48 contiguous states from

1870 to 2021 developed in Hoon et al. (2026). In particular, they estimate a dynamic factor model in the tradition of Stock and Watson (1989) and Stock and Watson (2016). This methodology extracts common movement across multiple economic indicators while allowing for variables with different start dates and missing observations.

The resulting economic activity index provides several advantages over previously available measures. First, it offers consistent measurement across a much longer span of time than official statistics, allowing us to analyze state-level economic dynamics during historical crisis episodes like the Panics of 1873, 1893, and 1907. Second, it maintains methodological consistency across states and time periods, facilitating direct comparisons that would be complicated by changing definitions or coverage in the underlying data. Third, the index's annual frequency allows us to precisely identify the timing of local economic contractions, even for distant historical periods. Previous research has typically relied on decennial census data (with limited temporal resolution), focused on specific sectors like manufacturing or agriculture (missing other dimensions of economic activity), and covered only selected states or regions (and thus limited cross-sectional variation).