The Costs of Financial Crises in the United States*

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Abstract

We study the incidence and costs of state and national financial crises in the United States. Using a newly-constructed state-level panel dataset on bank balance sheets and real economic activity covering the period 1863–2022, coupled with a new consensus chronology of U.S. financial crises, we establish the following facts: (i) U.S. financial crises are followed by persistent downturns in state-level economic activity, (ii) the output losses at the state level are similar to the aggregate output losses from a time series analysis over the period 1791–2022, (iii) output losses vary greatly across states, (iv) the extent of local deposit contractions is highly informative of the severity of state-level recessions after crises, (v) state-level deposit contractions can be used to construct a new chronology of *local* financial crises that closely matches existing narrative evidence, and (vi) a measure of "states-at-risk"–defined as the fraction of states experiencing a local crisis–predicts U.S. output over and above a U.S. crisis dummy, suggesting that more granular regional information is useful for understanding macro-financial linkages.

Keywords: financial 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. While an extensive literature documents the deep, protracted recessions associated with banking crises (Cerra and Saxena, 2008; Reinhart and Rogoff, 2009; Schularick and Taylor, 2012), we are not aware of a comprehensive study of these dynamics in the United States. This gap is particularly striking given that the U.S. has experienced financial turbulence with remarkable regularity since its founding–from 18th-century panics to the 2023 banking turmoil–making it a natural laboratory for studying crisis dynamics.[1]

Despite this rich history, two critical limitations have hindered a thorough assessment of U.S. financial crises. First, because crises are relatively rare events, a national time series analysis is likely to be statistically underpowered and may suffer from small sample bias. While the use of regional data could help overcome this limitation, the available sources of historical regional panel data suffer from limited coverage. State-level GDP statistics published by the Bureau of Economic Analysis, for example, only begin in 1963, and thus cover an insufficient time period for arriving at meaningful estimates. Second, there is considerable disagreement among economic historians about what constitutes a "crisis." These disagreements have resulted in divergent crisis chronologies, which makes it difficult to convincingly establish empirical patterns.

We address these challenges by assembling a new historical state-level macro-financial panel dataset covering the United States from 1863 to 2022. This dataset combines 65 time series on real economic outcomes with newly digitized historical banking sector balance sheets, creating an unprecedented view of regional financial and economic dynamics. These time series are constructed from 113 individual primary sources, and the details on how they are constructed and harmonized are documented in a 100+ page appendix. In addition to these state-level time series, we also construct U.S. time series on growth in real GDP and industrial production from 1791 to 2022 by combining modern data with existing historical series.

Complementing this data collection effort on real and banking sector outcomes, we develop a new "consensus" chronology of financial crises that spans the entire U.S. history. Instead of relying on a single narrative chronology, we rigorously survey 25 existing studies, describe their approach in detail, note the time period they cover, and classify the crisis episodes they identify based on their

[1] Throughout this paper, we use the terms "financial crises" and "banking crises" interchangeably. We provide a detailed comparison of what exactly different chroniclers mean by these terms in the data section.

type and assessed severity. This extensive exercise provides us with two key inputs for our empirical analysis: (i) a list of "consensus" years, for which most chronologies agree the U.S. experienced a financial crisis, and (ii) a list of years in which *any* chronology identifies a crisis. We show that most discrepancies in existing crisis lists are ultimately due to differences in the chroniclers' views on how severe or widespread a crisis was.

Equipped with these data, we establish six key findings about financial crises in the United States using (panel) local projections. First, U.S. financial crises are followed by persistent downturns in state-level economic activity, with output remaining approximately 10 percent below pre-crisis trends even five years after the crisis onset—a pattern consistent with international evidence (Cerra and Saxena, 2008; Reinhart and Rogoff, 2009; Schularick and Taylor, 2012), but not previously documented for the United States. Second, 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. We interpret this finding as evidence that general equilibrium factors–such as the occurrence of a nationwide panic, spillovers, or changes in monetary policy–slightly dampen the economic aftermath of crises.

Third, the state-level output losses we document display substantial heterogeneity across states, suggesting an important regional dimension to crisis transmission. These findings are consistent with existing work using regional variation in crisis exposure to study their consequences (e.g., Joe Peek and Eric S. Rosengren, 2000; Charles W. Calomiris and Joseph R. Mason, 2003; Adam B. Ashcraft, 2005; Huber, 2018). 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.

Fourth, we show that local deposit contractions during crises strongly predict the severity of subsequent economic contractions, highlighting a specific channel through which financial distress affects real economic activity. Consistent with the cross-country evidence in Jamilov et al. (2024), the extent of output losses following a financial crisis is highly predictable using the growth rate of the local banking sector's deposits, suggesting that bank runs may play an important role in crisis transmission to the macroeconomy.

Fifth, by combining our narrative chronology with objective measures of local financial distress–specifically, state-level deposit contractions–we develop a new chronology of *local* financial crises that aligns closely with existing narrative evidence while providing substantially greater coverage on the incidence of regional crises. The interaction of any chronology considering a year a U.S.-

wide crisis with a local deposit contraction thus gives us our baseline measure of whether a crisis occurs in a particular region. As we show, such "local" financial crises are also associated with deep output losses. Importantly, these estimates remain statistically significant but become substantially smaller when we include year fixed effects.

Sixth, 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-at-risk", defined as the fraction of the U.S. banking sector experiencing a local financial crisis at a given moment in time. In a time series analysis, states-at-risk predicts U.S.-wide economic downturns similarly or better relative to a traditional indicator variable for a financial crisis. This highlights that incorporating more granular information may be useful for monitoring macro-financial linkages, consistent with recent work by Correia, Luck and Verner (2024).

Our findings highlight the enduring economic costs of financial crises and demonstrate the importance of considering regional dimensions in crisis analysis. The substantial heterogeneity in outcomes across states suggests that national-level policies may be insufficient to address crisis consequences, pointing toward the potential value of regionally-targeted interventions. More broadly, our work illustrates how combining narrative and statistical approaches can enhance our understanding of financial crises, potentially offering new avenues for crisis prediction and mitigation.

Related literature. Our paper relates to several strands of the literature. First, we contribute to research on the economic costs of financial crises. Among others, work by Cerra and Saxena (2008), Reinhart and Rogoff (2009), and Schularick and Taylor (2012) shows that banking crises are typically associated with severe and prolonged recessions, and that these output losses tend to be permanent rather than temporary deviations from trend. Our work complements these cross-country analyses by providing the first comprehensive assessment of such patterns for the United States using both state-level and aggregate time series data jointly covering the entirety of U.S. history. More broadly, this literature relies on cross-country panel data, implicitly assuming homogeneous responses across vastly different economies, a common criticism of this type of work. Our approach overcomes this limitation by exploiting long time series with state-level variation in crises and real outcomes within a common federal economic system. Existing cross-country work also obscures the often localized nature of financial distress, and may as such underestimate the frequency and thus welfare implications of financial crises. Our historical state-level panel dataset

allows us to systematically analyze the regional dimension of crises.

Second, we contribute to the literature on historical financial crises in the United States. Gorton and Tallman (2019) provide a comprehensive historical account of banking panics in the United States but lack quantitative assessments of their heterogeneous impacts. Correia, Luck and Verner (2024) use long-run historical bank-level data to study bank failures. Kay Giesecke et al. (2014) study the link between corporate bond defaults, banking crises, and U.S. output using time series regressions over the period 1866 to 2010. Different from their work, we propose a new chronology of crisis since the founding of the United States, introduce several new historical state-level panel datasets, and use these inputs to provide a much more comprehensive assessment of financial crises.

Third, we engage with the literature on measuring financial stress and identifying crises. While there are many chronologies of U.S. financial crises–from the classic work of Milton Friedman and Anna Jacobson Schwartz (1963) to more recent contributions by Jalil (2015), Bordo and Haubrich (2017), and Baron, Verner and Xiong (2021)–substantial disagreements remain about which episodes constitute genuine 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 crisis episodes more reliably. A key contribution to this literature is our comparison of existing U.S. crisis chronologies and the construction of a "consensus" list that we believe is much more transparent and reliable than much of existing work. We survey the relevant literature in much greater detail below.

Fourth, we build on studies examining the regional effects of financial crises. Existing studies have used regional variation to estimate the link between U.S. crises and local output during the 1907 panic (Matthew Jaremski and David C. Wheelock, 2024), the 1920s (Rajan and Ramcharan, 2015; Matthew Jaremski and David C. Wheelock, 2020), the Great Depression (Charles W. Calomiris and Joseph R. Mason, 2003; Calomiris and Mason, 2003; Carlson and Mitchener, 2009; Jon Cohen, Kinda Hachem and Gary Richardson, 2021), and in the early 1990s (Joe Peek and Eric S. Rosengren, 2000; Adam B. Ashcraft, 2005). Eric Monnet, Angelo Riva and Stefano 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 exposure Commerzbank during the Global Financial Crisis of 2007-08 across German regions. The limitation of these studies is that they focus on a single episode, often 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 hundreds of years of data.

The paper proceeds as follows. Section 2 surveys existing U.S. financial crisis chronologies and introduces our consensus classification. Section 3 details our historical state-level macro-financial dataset. Section 4 examines the output losses associated with U.S. financial crises. Section 5 develops our methodology for identifying state-level crises using deposit growth rates. Section 6 analyzes how our states-at-risk measure relates to U.S.-wide economic performance.

2 U. S. Financial Crises – A New Consensus Chronology

The dating of financial crises has a long tradition in the United States. The divergent crisis dates across chronologies reflect both the complexity of defining what constitutes a crisis and the evolving methodologies employed to identify them. In this section, we survey the existing landscape of crisis chronologies, review the major methodological approaches taken in constructing them, explore the sources of disagreement among researchers, and develop a new consensus chronology.

2.1 Existing Chronologies

Table 1 plots 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 more recent work by Jamilov et al. (2024). While these chronologies differ widely in the time periods they cover, the time period covered by any one source extends from 1791 to 2022. 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 "—".

Early contributions to crisis chronology development include Juglar (1916) identification of cyclical patterns in economic activity and Sprague (1910) narrative accounts of major banking panics. These works established a foundation for subsequent research by documenting contemporaneous observations and 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 Milton Friedman and Anna Jacobson 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 (2012), 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 relatively parsimonious chronology that primarily captures major systemic events. Their framework has been widely adopted in cross-country studies but captures fewer U.S. crises than most 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 many other chronologies, such as Reinhart and Rogoff (2009) or Jordà, Schularick and Taylor (2017) interventions 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 Milton Friedman and Anna Jacobson 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).

More specialized approaches include Gorton (1988)'s focus on National Banking Era panics, Bordo, Wheelock et al. (1998)'s emphasis on monetary factors, and Lopez-Salido and Nelson (2010)'s attention to the dating of post-War financial crises.

Table 1 suggests substantial disagreement across chronologies. This heterogeneity poses substantial challenges for researchers attempting to identify patterns in the frequency and severity of crises, and assessing their potential economic impact. Events like the Panic of 1907 appear in nearly all chronologies, while others like the 1966 "credit crunch" appear in only a small subset. The 1837-1839 crisis episode exemplifies these disagreements, with some chronologies identifying a single extended crisis while others record discrete events in 1837 and 1839. More recent episodes, such as the Savings and Loan Crisis of the 1980s, demonstrate similar classification challenges, with disagreement about whether 1984, 1988, or both years represent distinct crisis events.

The disagreement in what constitutes a crisis also results in a strikingly different expected probability of a financial crisis, a key input in quantitative models with macro-financial linkages (see, e.g., Robatto, 2019; Gertler, Kiyotaki and Prestipino, 2019, 2020). The frequency of financial crises is also an important statistic because it can help judge the welfare implications of policies aimed at mitigating such crises. If they are rare, it may well be optimal to "let crises rip" from time to time rather than engaging in sub-optimal ex-ante interventions. If crises are not so rare after all, intervening early may be more clearly welfare-improving.

Figure 1 plots the implied crisis probability across several key chronologies. We focus on crisis lists covering a sufficient number of years to be meaningful. There are major differences in the expected crisis frequency even when comparing widely-used lists. According to Jordà, Schularick and Taylor (2017), the U.S. experiences the onset of a financial crisis around 8% of the time, slightly higher than Laeven and Valencia (2020)'s and slightly lower than Jalil (2015)'s estimates. The

probability implied by Reinhart and Rogoff (2009) is higher at around 12%, and Baron, Verner and Xiong (2021) imply an even higher probability. The clear outliers are the chronology by Kemmerer (1910) and Metrick and Schmelzing (2021), both of which suggest an unconditional crisis probability of around 30%. The former has been criticized by Jalil (2015) for being too generous in its definition of crises, and the latter focuses on regulatory interventions rather than crisis events, which may inflate the numbers. Importantly, when we consolidate across all chronologies, the implied frequency of any chronology suggesting a financial crisis in the United States is unsurprisingly the highest and thus higher than 30%, while our consensus estimate implies the lowest probability, around 5%.

2.2 Major and Minor Crises

There are several potential reasons for the substantial disagreement across chronologies outlined above. For one, researchers use different definitions of what constitutes a "crisis," 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 their definitions in considerable detail in Appendix **??**. Most crisis definitions focus squarely on banking sector disruptions of one kind or another. While they emphasize different aspects of such disruptions–such as bank runs, government interventions, or solvency issues–these differences overall appear too nuanced to explain the substantial heterogeneity in crisis classifications.

Our survey of existing work instead suggests that different crisis dates mainly arise because of the subjective assessment of how severe a particular crisis was. As a result, some chronologies include more minor or localized episodes of financial distress, while others only focus on events they consider systemic. Put differently, our interpretation of the results in Table 1 is that they reveal a clear distinction between such "major" crises–those with near-universal recognition across chronologies–and "minor" crises that appear in only a subset. In fact, the crisis lists of Bordo, Wheelock et al. (1998), Jalil (2015), and Kemmerer (1910) explicitly differentiate between "minor" and "major" crises.

The fundamental divide between narrative and quantitative approaches is significant. Narrative chronologies like those of Conant (1915) or Milton Friedman and Anna Jacobson Schwartz (1963) may include episodes based on contemporary accounts of financial distress even when quantitative indicators appear relatively mild. Conversely, more quantitative approaches may identify episodes that contemporaries did not recognize as distinct 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. 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 considered a crisis by Jalil (2015) and D/R (Davison and Ramirez, 2014), but not by chronologies such as Reinhart and Rogoff (2009), Baron, Verner and Xiong (2021), or Jordà, Schularick and Taylor (2017). Several years between the mid-1890s and 1907 also appear in the lists of Kemmerer (1910), DeLong and Summers (1986), Metrick and Schmelzing (2021), and Jalil (2015), but not in most others. Similarly, 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 JST (Jordà, Schularick and Taylor, 2017), RR (Reinhart and Rogoff, 2009), LV (Laeven and Valencia, 2020), or BVX (Baron, Verner and Xiong, 2021).

The Savings and Loan Crisis of the 1980s exemplifies the challenges of dating and classifying "minor" crises. While the episode's significance is widely acknowledged, chronologies vary substantially in whether they identify 1984, 1988, or both as discrete crisis years, with others treating the episode as a protracted period of financial stress rather than a distinct crisis. This variation stems from differences in whether researchers emphasize the point in time with the most pronounced failures, regulatory interventions, or market disruptions.

2.3 Towards A New Consensus Chronology

Given the substantial heterogeneity in existing financial crisis chronologies, we propose a "consensus" approach that integrates and synthesizes existing work. Rather than relying on any single chronology, with its inherent methodological limitations and potential biases, our consensus chronology identifies crises based on agreement across multiple independent sources.

Our baseline definition of a consensus crisis is one that appears in at least one-third of the chronologies surveyed that cover the relevant time period. This threshold represents a balance between being overly restrictive (which would exclude episodes recognized by significant subsets of researchers) and overly inclusive (which would fail to distinguish between major systemic events and more limited financial disturbances). By requiring substantial but not universal agreement, we acknowledge the inherent subjectivity in crisis identification while establishing a more objective basis for classification than any single approach can provide.

This methodology yields the consensus chronology presented in the "Consensus" column of Table 1. The resulting chronology identifies 14 distinct crisis episodes between 1790 and 2022: 1814, 1819, 1833, 1837, 1839, 1857, 1873, 1884, 1890, 1893, 1907, 1929, 1984, and 2007. Each of these episodes is recognized across chronologies employing diverse methodological approaches, from narrative accounts to quantitative indicators.

In our estimation, the first event that should be considered a financial crisis in U.S. history is 1814, when state banks suspended specie payments during the War of 1812. Apart from the difficulties the government faced in meetings its financial obligations, culminating in the outright default in 1814, the number of state banks had increased substantially between 1811 and 1815, and many of these banks issued paper money far exceeding their specie reserves, fueling speculative activities in land and other assets. This episode should set the stage for many other episodes over the following 200 years.

Figure 3 demonstrates the relationship between our consensus 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 consensus crises and economic contractions throughout U.S. history. Major episodes like the Panics of 1857, 1873, 1893, 1907, and 1929 align with pronounced output declines, confirming the economic significance of the identified consensus crises. The 2007-2008 Global Financial Crisis similarly corresponds to one of the most severe economic contractions of the post-World War II era.

The consensus approach successfully identifies crisis periods widely recognized for their economic impact. For instance, the Panic of 1873 preceded what contemporary observers called the "Great Depression" of the late 19th century, featuring a nearly 15% decline in industrial production. Similarly, the 1893 crisis was associated with a severe economic contraction, with unemployment exceeding 10%. The consensus chronology captures these major economic disruptions while excluding more ambiguous episodes that appear in only a small subset of existing chronologies.

While the consensus chronology provides a useful foundation for analyzing the frequency of U.S. financial crises, it has limitations for studying regional heterogeneity in crisis experiences. Many financial crises, particularly in the 19th and early 20th centuries, exhibited substantial geographic variation in their timing and severity. The consensus approach necessarily focuses on nation-wide crisis episodes, potentially obscuring an important regional dimension. We will revisit this issue in later sections by complementing our census of crisis chronologies with a statistical indicators on

state-level deposit contractions to identify local crises.

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

This section introduces the backbone of our empirical analysis: a new state-level panel dataset covering economic and banking sector variables for the period from 1863 to 2024. Based on an extensive digitization and harmonization effort, these time series provide an unprecedented view into the history of macro-financial linkages in the United States.

3.1 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 activities. To meet this need, we digitized and harmonized state-level aggregates from the Officer of the Comptroller of the Currency's (OCC) Annual Reports for the period 1863–1960. Figure 2 displays a sample page from these reports, illustrating the granular state-level financial data available throughout this period.

These OCC reports offer an unparalleled view of the U.S. banking system's evolution in each state. Carlson, Correia and Luck (2022) and Correia, Luck and Verner (2024) use the same underlying raw data to construct a historical bank-level database that covers 1865–1904 and 1865–1941, respectively. Our approach differs fundamentally by focusing on state-level aggregates. This aggregation allows us to construct consistent time series that span regulatory changes, bank mergers, and changes in reporting standards that complicate a bank-level analysis over such an extended timeframe. Relative to this earlier work, our data further closes the gap between 1941 and 1960 in these studies.

Our dataset offers several advantages over existing sources such as the Federal Reserve's "All Bank Statistics" compilation (1959) and FDIC aggregates. First, we extend coverage back to 1863, the beginning of the National Banking Era, providing substantially greater historical depth than the FDIC series that begin in 1934. Second, going back to the primary source–the OCC reports–allows us to construct time series using consistent definitions of variables and banking institutions in the period before the "modern" Call Reports become available. Third, the OCC reports also contain additional information on bank failures that had not been previously constructed on the state-level.

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 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 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).

A clear limitation of the relying on the information published by the OCC is that it only covers national banks. The reason we rely on these data is that they are reported consistently over time. That said, financial institutions chartered under state rather than federal law–including state banks, trusts, or private banks–also played an important role in certain states starting in the early 20^{th} century. For example, White (1983) estimates that national banks had an asset-weighted market share upward of 80% in the 1870s, which decreased after the Civil War and stabilized at around 50% around 1900. On the other hand, state-chartered banks were regulated by local rather than federal banking regulators, and their reports are thus not easily accessible.

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 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. We address this limitation through a sub-sample analysis where we drop the historical OCC data and focus entirely on the modern period where we cover all commercial banks.

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.

From 1961 to 1980, we use state-level aggregates from the FDIC.[2] 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. This creates a challenge in the period starting in the 1970s, when the process of interstate branching deregulation 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, however, 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 has varied considerably across states (Rice and Strahan, 2010).

For our purposes, this creates the challenge that a bank's headquarter location is an increasingly poor proxy for its banking activities over time. In fact, the FDIC's historical statistics simply assign all bank activities to headquarter states, which results in erratic time series because it fails to capture the actual geographic distribution of bank assets after deregulation.

To address this challenge, we developed a methodology using the FDIC's Summary of Deposits (SOD) data, which provides branch-level information on bank deposits. While the publicly available version of these data only starts in 1994, we obtained a version beginning in 1981 through a FOIA request. Using these data, we directly construct time series on total bank deposits in a given state 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.

Finally, in order to avoid jumps due to series breaks, we splice together the modern data together with the historical OCC data: 1) From 1981 onwards, we report data from the Call Reports (after adjusting using SOD shares).[3] 2) From 1961 to 1980, we ratio-splice the Call Reports data with

[2] 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. In both cases, we digitize the data from "Summary Report, Assets and Liabilities of Member Banks", as published by the Board of Governors of the Federal Reserve System.

[3] 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: $\hat{y}_t^{dec} = \frac{\hat{y}_t^{jun} + \hat{y}_{t+1}^{jun}}{2}$.

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:

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

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

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

Coverage and comparison with existing sources We begin by comparing our newly-constructed time series aggregated to 48 contiguous U.S. states, for which there are several existing sources of historical data. Figure 12 plots our series together with the aggregated bank-level data constructed by Carlson, Correia and Luck (2022) (CCL2022, covering 1867-1904), 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 as provided by Carter et al. (2006) (HSUS, covering 1863-1960) and the Federal Deposit Insurance Corporation (FDIC, covering 1934-2022).[4] Overall, our data follow highly similar trends as these existing efforts but covers a much longer time period than any existing work.

The coverage varies somewhat across states and time, with more comprehensive data generally available for states with larger banking sectors and for more recent periods. 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 coverage across the full period, with core banking indicators available for over 95% of state-year observations after 1880. All in all, integrating multiple sources allows us to create a uniquely comprehensive view of the U.S. banking sector at the state level, spanning from the Civil War until today.

[4]Note that we provide a similar figure for selected states in Figure 14

3.2 A Historical State-Level Macroeconomic Dataset

State-level macroeconomic panel data since the Civil War 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. (2025). Based on an extensive digitization and harmonization effort, this dataset represents the most extensive historical state-level dataset on macroeconomic outcomes, covering all 48 contiguous U.S. states annually from 1863 to 2021. By combining 113 individual sources, 84 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. We provide a brief outline of these data here and refer the interested reader to Hoon et al. (2025) for additional details.

As detailed in Table 3, the dataset encompasses 65 distinct variables across nine categories: labor market (3 variables), real economic activity (32 variables), housing (2 variables), transportation (4 variables), government (9 variables), wealth (10 variables), and other miscellaneous indicators (5 variables). This comprehensive coverage allows for multidimensional analysis of state-level economic conditions throughout different historical periods, regulatory regimes, and crisis episodes.

The construction of this dataset required integrating information from diverse sources, including federal government publications, state-level records, historical compilations, and modern databases. For earlier periods (pre-1929), we relied 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 middle period (1929-1963), we incorporated Bureau of Economic Analysis (BEA) state personal income accounts, Federal Deposit Insurance Corporation (FDIC) banking statistics, and Bureau of Labor Statistics (BLS) employment records. The modern period (post-1963) draws primarily on standardized federal statistical series including BEA regional accounts, BLS state and metropolitan employment data, and Federal Reserve financial indicators.

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 is also often reported at mixed frequen-

cies, which required a careful implementation of temporal disaggregation methods that distribute changes between benchmark observations according to patterns observed in related high-frequency indicators.

The dataset's coverage varies across states and time periods, as illustrated in Figure 16 for Alabama. Variables with the most consistent long-term coverage include banking sector indicators (loans, deposits, assets), agricultural outputs, and transportation infrastructure. Manufacturing data become more comprehensive after 1899, when the Census of Manufactures adopted more standardized methodologies. Labor market indicators show the most significant gaps for pre-1939 periods, though we have constructed reasonable proxies using manufacturing employment and payroll information from censuses and state labor bureaus. Geographic coverage is most complete for northeastern and midwestern states, which typically have longer historical records and more developed statistical agencies during the 19th century. Western states generally enter the dataset later, coinciding with their admission to the Union and the development of state-level record-keeping institutions. Southern states present unique challenges due to Civil War disruptions and the economic restructuring that followed, requiring special attention to maintain consistency across the antebellum, Reconstruction, and post-Reconstruction periods.

A regional economic activity index To analyze the economic consequences of financial crises consistently across states and time periods, we need a reliable measure 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 develop a novel state-level economic activity index covering all 48 contiguous states from 1870 to 2022 in Hoon et al. (2025).

As shown in Table 4, our approach synthesizes multiple data sources with different time coverages to create a consistent long-run indicator. For the modern period, we incorporate established measures including the Bureau of Economic Analysis (BEA) state-level personal income (1929-2023) and state-level GDP (1963-2023). For earlier periods, we rely on the state-level economic indicators described in the previous section, drawing particularly on manufacturing output, agricultural production, retail sales, construction activity, and transportation metrics. To convert these diverse indicators into a single consistent measure of economic activity, we employ a mixed-frequency 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 frequencies and start dates. The approach assumes that a single latent factor–economic activity–drives the comovement of observable indicators, which we can estimate even as the specific available variables change over time.

Our implementation adapts the framework of Baumeister, Leiva-León and Sims (2024) to accommodate the historical nature of our data. We use a two-step estimation procedure. First, we estimate the factor loadings and dynamics using all available indicators for each state. Second, we anchor the resulting index to match the growth rate of state-level GDP during the period of overlap (1963-2022), ensuring our measure aligns with modern official statistics while extending much further back in time. Figure 17 validates our economic activity index by comparing it to established measures during periods of overlap. Figure 17a shows the relationship between our index and real GDP growth rates during 1963-2022, revealing a strong correlation (R^2 of 0.42) and a coefficient close to one (1.06), indicating our index closely tracks the official GDP measure. Figure 17b demonstrates an even stronger relationship with real personal income growth (R^2 of 0.63), confirming that our index captures meaningful variation in state-level economic conditions.

The resulting economic activity index provides several advantages over previously available measures. First, it offers consistent measurement across a much longer timeframe 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 source data. Third, the index's annual frequency allows us to precisely identify the timing of economic contractions following financial distress, even for distant historical periods.

This index represents a significant advance over existing historical collections of state-level economic data. Previous research has typically relied on decennial census data (with limited temporal resolution), focused on specific sectors like manufacturing or agriculture (missing broader economic dynamics), and covered only selected states or regions (preventing comprehensive cross-sectional analysis). By contrast, our index provides annual estimates for all 48 contiguous states across more than 150 years, enabling unprecedented analysis of regional economic patterns throughout U.S. history.

4 The 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 4.1 begins by estimate the state-level response of output to U.S.-wide financial crises. Section 4.2 compares these estimates with impulse responses from a time series analysis covering the period from 1791 to 2022. Section 4.3 shows that the local output response to financial crises vary widely across states.

4.1 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:

$$\Delta Y_{i,t+h} = \alpha_i^h + \beta^h \, 1_t^{\text{U.S. crisis}} + \sum_{k=1}^{5} \gamma^{k,h} \, \Delta X_{i,t-k} + \epsilon_{i,t}^h \quad \text{with} \quad h \in [0,5]. \tag{4.1}$$

where $\Delta Y_{i,t+h}$ represents the change in real economic activity in state i between periods t and $t+h$, measured by our state-level economic activity index. The term α_i^h captures state-specific fixed effects, accounting for time-invariant differences across states such as long-run growth rates. The indicator variable $1_t^{\text{U.S. crisis}}$ equals one when year t is identified as a financial crisis in our consensus chronology. The summation term $\sum_{k=1}^{5} \gamma^{k,h} \Delta X_{i,t-k}$ represents a set of control variables including five lags of state-level economic growth 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. By estimating this equation separately for each horizon h, we trace out the dynamic response of economic activity over time. We apply this econometric framework consistently throughout our analysis, adapting the basic specification to examine heterogeneity across states, investigate the role of local deposit contractions, and compare state-level to national output responses.

To address potential concerns about heteroskedasticity and serial correlation in the error terms, we employ double-clustered standard errors, which are robust to both cross-sectional dependence and serial correlation in the residuals. This approach recognizes the potential for common shocks affecting multiple states simultaneously and for persistence in the effects of financial crises beyond what is captured by our control variables. We also report heteroskedasticity-robust standard errors

based on the finding in Montiel Olea and Plagborg-Møller (2021) that including a sufficient number of dependent variable lags makes an adjustment of standard errors for serial correction unnecessary.

Figure 4 plots the impulse response function from estimating equation 4.1, which shows how state-level real economic activity evolves following U.S. financial crisis episodes from 1863 to 2022. The results reveal substantial and persistent output losses. In the first year after a crisis, state-level output falls by approximately 3 percent relative to its pre-crisis trend. This contraction deepens to roughly 10 percent by the third year and reaches a maximum depth of approximately 10.6 percent by the fourth year. Most strikingly, we find little evidence of reversal toward the pre-crisis trend even five years after the crisis onset. By the end of our forecast horizon, output remains about 9 percent below where it would have been in the absence of a crisis, suggesting that financial crises induce permanent shifts in output levels rather than temporary deviations from trend.

These findings align with the "scarring effects" hypothesis advanced by Cerra and Saxena (2008) in their cross-country study of financial crises. They are also consistent with the findings in Reinhart and Rogoff (2009) and Jordà, Schularick and Taylor (2017). However, our results are notable for documenting this pattern specifically for the United States across multiple crisis episodes spanning more than 150 years. The lack of recovery to pre-crisis trends challenges conventional business cycle models that would predict eventual mean reversion, suggesting instead that financial crises induce structural changes in the economy that permanently alter its growth trajectory.

4.2 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:

$$\Delta Y_{t+h} = \alpha^h + \beta^h \mathbf{1}_t^{\text{U.S. crisis}} + \sum_{k=1}^{5} \gamma^{k,h} \Delta X_{t-k} + \varepsilon_t^h \tag{4.2}$$

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

Given that financial crises are rare events, estimating equation 4.2 requires long-run time series on U.S. output. We construct such series for real GDP and industrial production by combining official statistics from the Bureau of Economic Analysis (BEA) with historical estimates by academics.

In particular, we use the BEA's data on real GDP from 1929 onwards, and use the estimates by Williamson (2025) starting in 1790. Combined with our new consensus chronology, these time series give us an unprecedented time span to study the output response to financial crises in the United States. Figure 5 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 output reaches approximately 9 percent three to four years after crisis onset, with little evidence of recovery within our five-year forecast horizon. The slightly muted contraction at the national level suggests the presence of general equilibrium mechanisms that dampen local shocks when they occur simultaneously across multiple regions. Put differently, they suggest that common factors affecting all states simultaneously play a significant role in crisis transmission.

4.3 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 investigate this question, we run time series regressions as in equation 4.2 separately for each state. This approach also not only allows for heterogeneous slopes but also for variation in the parameter estimates of the dependent variable lags, which may quell potential concerns about the pooled state-level estimates from equation 4.1.

Figure 6 presents these state-specific impulse responses to a U.S. financial crisis. We highlight the trajectories for three states–Maine, California, and Oklahoma–alongside the full distribution of state responses. Several findings stand out. Most importantly, *all* of the estimated responses are negative and persistent. While they vary in their severity, the output losses from U.S. financial crises are a universal feature across local economies. That said, the heterogeneity in magnitudes is striking: while some states experience output contractions exceeding 15 percent at their nadir, others face significantly milder recessions with losses of less than 6 percent. 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, tracking relatively close to the average response across states. On other hand, Maine exhibits less extreme output losses than most other states. Finally, Oklahoma tends to experience close to average initial contractions but shows severe output losses in later years.

This regional heterogeneity suggests that national-level analyses may obscure important dimensions of how financial crises affect the economy. The variation we document likely reflects differences

in industrial composition, banking system structure, fiscal capacity, and other state-specific characteristics that condition vulnerability to financial distress. In subsequent sections, we explore how specific financial factors–particularly deposit contractions and banking sector health–help explain this cross-state variation in the output response to crises.

Collectively, these findings suggest that U.S. financial crises produce deep and persistent economic contractions, with significant heterogeneity across regions. The lack of recovery to pre-crisis trends in virtually every state, even five years after crisis onset, suggests that financial disturbances generate permanent output losses rather than temporary disruptions.

5 Identifying Local Financial Crises

So far, our analysis has closely followed the existing literature in estimating the output response to *national* financial crises, albeit in the U.S. context. The striking heterogeneity in output losses across states, however, suggests that regional differences are critical for understanding how crises unfold. Section 5.1 documents substantial heterogeneity in local deposit growth rates across states and time, and shows they are highly predictive of the degree of state-level output losses following crises. Based on this insight, section 5.2 proposes a measure of local financial crises by combining our list of U.S. "candidate crises" with measures of state-level deposit contractions. Section 5.3 presents the resulting chronology of state-level financial crises and additional validation using narrative evidence. Finally, section 5.4 shows that the output losses of local crises are comparable to those of U.S. crises but considerably muted when controlling for time fixed effects.

5.1 Local Deposit Contractions and the Transmission of U.S. Crises

Having established that financial crises lead to substantial and persistent economic contractions, we next investigate how variations in local banking conditions relate to the severity of these downturns. In particular, we focus on the role of deposit contractions, motivated by the observation that many U.S. crisis episodes are accompanied by bank runs (see, e.g., Calomiris and Gorton, 1991; Wicker, 1996).

We begin by visualizing deposit growth rates during four significant crisis periods as identified by our consensus chronology: 1893, 1929, 1984, and 2007. Figure 7 shows the strikingly uneven geographical patterns of liability-side disturbances during these periods, revealing considerable heterogeneity in which states are particularly affected by an individual crisis, but also that which

states are affected differs across crisis episodes.

During the Panic of 1893, deposit growth rates contracted most in the South and West, with states like Washington, Montana, and New Mexico experiencing deposit contractions exceeding 40%. This pattern, shown in Figure 7a, largely reflects the crisis's origins in railroad failures and subsequent agricultural distress, which disproportionately affected regions dependent on these sectors. In contrast, Northeastern states generally experienced milder deposit contractions, with New York's decline limited to approximately 4% despite its central role in the financial system. This geographic pattern aligns with contemporary accounts emphasizing the regional nature of the 1893 crisis, which many Northeastern observers initially viewed as a primarily Western and Southern problem before contagion eventually affected eastern financial centers.

The Great Depression presents a different spatial pattern, as shown in Figure 7b. Banking distress during 1929-1930 was most severe in the Southeast and parts of the Midwest, with Florida, North Carolina, and Illinois experiencing deposit contractions exceeding 15%. This distribution reflects both structural weaknesses in regional banking systems and exposure to the agricultural price collapse that preceded the stock market crash. Notably, several western states maintained positive deposit growth during this initial crisis phase, highlighting the sequential nature of banking failures during the Great Depression.

The 1984 crisis, depicted in Figure 7c, shows a more localized pattern of financial distress centered on energy-producing states and regions with concentrated exposures to troubled sectors. Oklahoma and Oregon experienced significant deposit contractions, while several Midwestern states such as South Dakota faced banking stress due to agricultural loan problems. This episode illustrates how sector-specific shocks can generate geographically concentrated financial crises even within modern regulatory frameworks. The relatively mild deposit growth reductions in most Northeastern and Western states during this period underscore the limited contagion from these regional banking problems.

Figure 7d shows more prevalent deposit growth patterns during the 2007-2008 Global Financial Crisis, revealing a heterogeneous distribution of banking stress, with states such as New Hampshire, Vermont and Maine experiencing the most severe contractions. Several Midwestern states maintained relatively stable deposit growth, benefiting from more conservative lending practices and less extreme housing price appreciation during the preceding boom.

To understand the role of local financial factors more systematically, we extend our baseline specification by including an interaction term for the U.S. crisis indicator with the 3-year moving

average of state-level deposit growth:

$$\begin{aligned}\Delta Y_{i,t+h} = \alpha_i^h + \beta_1^h \mathbf{1}_t^{\text{U.S. crisis}} + \beta_2^h \Delta\text{Deposits}_{i,t} \\ + \beta_3^h \mathbf{1}_t^{\text{U.S. crisis}} \times \Delta\text{Deposits}_{i,t} + \sum_{k=1}^{5} \gamma^{k,h} \Delta X_{i,t-k} + \varepsilon_{i,t}^h\end{aligned} \tag{5.3}$$

where $\Delta\text{Deposits}_{i,t}$ is the moving average of the percent change in (nominal) bank deposits in state i between years $t-1$, t, and $t+1$. We use this smoothing to capture episodes in which state-level deposits contract not in the exact year of a "consensus" 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 deposit growth and subsequent output during normal times, and β_3^h–our primary coefficient of interest–identifies how this relationship changes during crisis periods. A positive and significant β_3^h would indicate that stronger deposit growth (or less severe contractions) during crises predicts better economic outcomes in subsequent years.

Figure 8 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 growth is two standard deviations *below* the mean–representing a severe local banking disruption. The difference between these trajectories reveals the substantial role of deposit contractions in determining crisis severity.

States experiencing severe deposit contractions (two standard deviations below average) during financial crises face substantially deeper and more persistent output losses. By the fifth year after the start of the crisis, such a negative deposit growth rate is associated with a cumulative drop in economic activity of around 20%, a large magnitude relative to an output loss of around 10% without such a liability-side contraction. Put differently, the most severe recessions following financial crises are those coinciding with large drops in deposits.

These findings highlight the importance of banking sector stability in determining the real economic costs of financial crises. The amplifying role of deposit contractions can be understood through several complementary mechanisms. First, deposit outflows directly reduce banks' loanable funds, forcing them to contract credit supply through the bank lending channel (Bernanke and Blinder, 1988). Second, deposit contractions may signal broader financial system stress that raises external finance premiums through the financial accelerator mechanism (Bernanke, Gertler and Gilchrist, 1999). Third, severe deposit outflows may trigger liquidity hoarding by banks, exac-

erbating credit rationing even for creditworthy borrowers (Caballero and Simsek, 2013).

5.2 Identifying Local Crises Using Deposit Contractions

Building on our finding that deposit contractions strongly predict the severity of economic downturns following financial crises, we develop a new methodology for identifying *localized* financial crises throughout U.S. history. This approach combines the strengths of narrative chronologies with objective statistical indicators, allowing us to capture variation in crisis exposure across states and time periods. 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 approach for identifying local crises is based on two complementary criteria. First, we consider the timing of national financial crises as identified by existing chronologies. Rather than relying exclusively on our consensus chronology, we include *any* year identified as a crisis by at least one of the major chronologies reviewed in Section 2. This method builds on the insight, discussed in section 2.2, that the discrepancies across crisis lists are best understood as disagreements about the severity of a given crisis, and whether it only affects a certain region or the financial system as a whole.

Second, we require evidence of substantial financial distress at the state level, measured by a contraction in local deposits within one year of the national crisis date. Specifically, we classify a state-year as experiencing a local financial crisis if any U.S. crisis chronology indicates a crisis *and* there is a decline in deposits in absolute terms within ∓ 1 year around the crisis year. This criterion ensures that we identify only episodes where local banking systems experienced genuine stress, as opposed to states that remained largely insulated from broader financial disturbances.

By combining narrative and statistical elements, our approach addresses key limitations of traditional crisis chronologies. National-level chronologies necessarily obscure regional heterogeneity, treating financial crises as uniform shocks affecting all areas simultaneously. Our state-level identification allows for substantial geographic variation in crisis timing, intensity, and duration, reflecting the reality that financial systems often experience distinct regional stresses even during nationwide episodes.

This approach also sidesteps the 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 in-

tensity across regions. By anchoring our identification to an objective statistical marker–deposit contractions–we focus on episodes with demonstrable local financial disruption regardless of the level of disagreement in U.S. crisis chronologies.

Deposit contractions provide a particularly valuable indicator of financial distress for our state-level analysis because they offer a continuous, objectively measurable variable that captures both the intensity of financial stress and its geographic variation. Unlike binary crisis indicators, deposit growth rates quantify the severity of financial disruptions, allowing us to distinguish between mild financial stress and acute banking crises. Furthermore, deposit data are available at the state level throughout our sample period, providing us with a consistent measurement of local financial conditions across both historical and modern crisis episodes.

5.3 A New Chronology of Local Crises

The state-level crisis chronology spans the entire 1870-2022 period across multiple regulatory regimes, from the National Banking Era through the establishment of the Federal Reserve System and into the modern period of financial deregulation. This historical depth allows us to examine how the regional incidence and economic impact of financial crises have evolved across different institutional environments. By constructing this granular picture of financial crisis incidence throughout U.S. history, we establish a foundation for analyzing the economic costs of financial distress with greater precision than is possible using national-level data alone.

Our new chronology of local financial crisis provides us with unprecedented detail. As a starting point, Table 5 plots an excerpt of our new chronology of local financial crises for selected states, along with the minimum deposit growth rate (in %) within one year of the crisis.

There are considerable differences in crisis frequency and severity. California's experience is notable for both frequent and intense banking sector distress, with particularly severe deposit contractions during 1876 (-44.4%), 1884 (-21.6%), 1888 (-19.1%), 1892 (-27.5%), and 1931 (-18.6%). This pattern reflects California's historically volatile economic structure, with boom-bust cycles in sectors including mining, agriculture, and real estate generating recurrent financial instability.

Massachusetts exhibits considerably more moderate deposit contractions but experiences financial crises with remarkable regularity throughout the 19th and early 20th centuries. The state's position as a major financial center exposed it to numerous crisis episodes, though its more diversified banking system may have helped in avoiding the extreme deposit contractions seen in other regions.

New York's crisis pattern reflects its central role in the U.S. financial system, with significant but typically not extreme deposit contractions during major national crises. The state experienced notable banking stress during 1876 (-22.9%), and otherwise relatively less severe episodes. This pattern suggests that New York's status as a financial center created vulnerability to systemic disturbances while its institutional depth and policy support may have moderated the worst outcomes.

Texas shows a distinctive crisis chronology heavily influenced by commodity cycles, with significant banking distress during both agricultural crises (1920, -21.0%) and energy sector disruptions (1988, -5.4%). The state's exposure to sector-specific shocks generated financial instability even during periods of relative national stability, highlighting how regional economic structures shape vulnerability to financial crises.

Wisconsin's experience illustrates the severe impact of agricultural downturns on rural banking systems, with extreme deposit contractions during the post-Civil War depression (-12.0% in 1873), Panic of 1896 (-15.3%) and 1931 (-22.7%). The state's crisis chronology reflects its transition from an agricultural to a more diversified economy, with banking sector vulnerability gradually declining through the 20th century.

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

5.4 The Output Losses of Local and U.S. Crises

Having established a new chronology of local financial crises based on state-level deposit contractions, we now estimate the economic costs of these episodes. We adapt our local projections framework to analyze how state-level economic activity responds to local financial distress using the following specification:

$$\Delta Y_{i,t+h} = \alpha_i^h + \beta^h \mathbf{1}_{it}^{Local\ crisis} + \sum_{k=1} \gamma^{k,h} \Delta X_{i,t-k} + \varepsilon_{i,t}^h \tag{5.4}$$

where $Y_{i,t+h}$ continues to index changes in future state-level output, and $\mathbf{1}_{it}^{Local\ crisis}$ is now an

indicator for a *local* (rather than a U.S.-wide) crisis. We continue to report both heteroskedasticity-robust and double-clustered standard errors.

Different from equation 4.1, the specification in equation 5.4 also allows us to include year fixed effects α_t^h, because the crisis variable now varies by state and year. In our baseline model, however, we would like to compare the path of future output in response to a local crisis with that of a U.S. crisis, and we thus do not include year fixed effects. By comparing these estimates with those from a specification with time fixed effects, we can gauge to what extent local crises can be explained by general equilibrium factors, for example a drop in aggregate demand due to several states experiencing crises at the same time.

Figure 9 presents the results from estimating equation 5.4. Local crises are followed by substantial and persistent output losses. State-level economic activity declines by approximately 3 percent in the first year after crisis onset, with the contraction deepening to roughly 6 percent by the third year. As with U.S.-wide crises, we find little evidence of recovery toward pre-crisis trends within our five-year forecast horizon. By the end of the period, output remains approximately 5 percent below where it would have been absent the crisis, suggesting that even localized financial distress can generate permanent shifts in economic trajectories.

These output losses are somewhat smaller than those estimated for U.S.-wide crises in Figure 4, which showed peak contractions of approximately 10 percent. This difference likely reflects the more limited scope of local crises, which by definition affect specific regions rather than the entire national economy. Nevertheless, the substantial magnitude of these local crisis effects underscores that banking sector distress need not be nationwide to impose significant economic costs on affected regions.

Figure 10 presents the results from a specification that includes time fixed effects, which abstracts from common shocks such as other states experiencing a crisis at the same time. Note that this specification may be "over-controlling" in that sense that it abstracts from waves of local crises, given that it forces a comparison at the exact same point in time. These estimates reveal more modest but still economically and statistically significant output losses, with economic activity declining by approximately 1.5 percent relative to other states within the same year. This contraction persists for at least five years after crisis onset, with no evidence of relative recovery over our forecast horizon.

The substantial difference between results with and without time fixed effects highlights the importance of crisis clustering in future economic outcomes. Many local financial crises occur

simultaneously across multiple states during periods of broader financial stress, as we will discuss in section 6. 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 additional effect of local crises beyond what would be expected from national conditions alone at the cost of discarding potentially useful variation in the clustered incidence of crises.

This distinction has important implications for understanding crisis transmission mechanisms. The results suggest that while national macroeconomic factors explain a substantial portion of the economic contraction during crisis periods, local financial conditions have independent predictive power for regional outcomes. States experiencing banking sector distress perform significantly worse than other states facing the same national economic environment.

While it is not a perfect test, this result also goes some way in quantifying the causal effect of financial crises beyond other factors. Different from the existing literature, the results in Figure Figure 10 only exploit within-country variation in (local) crises at the same point in time. As such, they hold constant confounding factors such as changes in monetary policy and (federal) government spending, which could bias the magnitudes in cross-country studies on the output losses of crises. These results also highlight the importance of considering the regional dimension when analyzing financial crises and the potential policy responses.

6 States-At-Risk and U.S.-Wide Recessions

The analysis above shows that U.S.-wide 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 Section 6.1 and studying its predictive properties for U.S. business cycles in section Section 6.2.

6.1 A Continuous Measure of U.S. Financial Distress

The binary classification of financial crises in traditional chronologies–where periods are categorized as either crisis or non-crisis states–obscures important variation in the intensity and geographic scope of financial distress. Recent cross-country studies have increasingly developed continuous measures of financial stress that capture gradations of severity based on narrative coding (Romer and Romer, 2017), credit spreads (Krishnamurthy and Muir, 2017), bank equity declines (Baron,

Verner and Xiong, 2021), deposit contractions (Jamilov et al., 2024), or natural language processing (Chen et al., 2023; Ahir et al., 2023).[5]

Based on our measure of local financial crises, we propose a new continuous measure to capture the level of U.S. banking sector distress: the fraction of states whose banking sector experiences a crisis, which we call "states-at-risk." This measure quantifies the fraction of the banking system experiencing a local crisis. As a baseline, we calculate this fraction by using the total assets of a state's banking sector as weight, but we also consider versions based on deposits or without weights for robustness.

Our states-at-risk measure differs from existing financial stress indices such as the OFR Financial Stress Index or the St. Louis Fed Financial Stress Index in several important dimensions. First, while these indices typically aggregate multiple financial market indicators (including credit spreads, volatility measures, and liquidity metrics), our approach focuses specifically on stress in the banking system as measured by the overlap of narrative crisis periods and local deposit contractions. This narrower focus allows for clearer identification of banking crises as distinct from other forms of financial market disturbance. Second, our measure provides a unique geographic dimension by capturing the spatial distribution of financial distress across states, rather than relying solely on national aggregates. Third, our historical coverage from 1863 to 2022 substantially exceeds that of modern financial stress indices, which typically begin in the late 20th century.

Figure 11 plots our measure of states-at-risk, i.e. the fraction of U.S. banking sector assets affected by a local crisis, between 1870 and 2022. Several patterns stand out. First, the measure successfully identifies all major consensus crises, with pronounced spikes during episodes like 1873, 1893, 1907, and 1929. During these periods, a substantial majority of states–often exceeding 60%–experienced simultaneous banking stress, 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 crises in the late 1880s or mid-1920s impacted a more limited subset of states, suggesting more regionally concentrated disturbances that did not fully propagate across the national banking system.

Third, the states-at-risk measure identifies periods of significant regional financial distress that

[5]These studies build on a longer tradition of work that includes Bordo et al. (2001) and many others. See Bordo and Meissner (2016), Frydman and Xu (2023), and Amir Sufi and Alan M. Taylor (2022) for recent surveys on historical financial crises.

do not appear in most national crisis chronologies. For example, the figure shows substantial banking sector stress during the late 1870s, the early 1920s, the late 1960s, and the late 1980s rarely classified as national financial crises but characterized by significant regional banking problems. These episodes include the agricultural banking stress of the 1920s, which severely affected farming regions while leaving financial centers relatively unscathed, and the Savings and Loan and energy-lending crises of the 1980s, which created severe banking problems in specific regions without generating nationwide panic.

The continuous nature of our states-at-risk 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 2007-2008 Global Financial Crisis, with an increasing fraction of states experiencing banking stress in 2007 before the failure of Lehman Brothers 2008.

6.2 States-at-Risk and Future GDP Growth

Having established the states-at-risk measure as a continuous indicator of financial distress, we now examine its relationship with subsequent U.S. economic performance. We are particularly interested in whether this measure has predictive power over and above existing binary crisis indicators.

Table 6 presents the results from a set of time series regressions relating national GDP growth to both our consensus crisis indicator and the states-at-risk measure. Column 1 confirms the strong negative relationship between consensus financial crises and subsequent economic activity. The coefficient of -5.95 indicates that, on average, GDP growth is nearly 6 percentage points lower in the year following a consensus crisis compared to non-crisis periods. This large and statistically significant effect aligns with our earlier findings on the substantial output costs of financial crises.

Column 2 examines the predictive power of our states-at-risk measure, which represents the asset-weighted fraction of states experiencing local financial crises in a given year. The coefficient of -1.58 indicates that when all states experience banking sector stress (states-at-risk = 1), subsequent GDP growth is approximately 1.6 percentage points lower than when no states face financial distress. This effect 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 consensus crisis indicator and the states-at-risk measure simultaneously. While both coefficients decrease somewhat in magnitude, they remain economically meaningful and statistically significant. The consensus crisis indicator retains a large coefficient (-4.98), indicating that nationally recognized crises predict substantially lower growth even after controlling for the geographic distribution of banking stress. However, the states-at-risk measure also maintains independent predictive power (-1.25), suggesting that the spatial extent of financial distress provides additional information beyond the simple presence or absence of a consensus crisis.

These findings have several important implications. First, they validate our state-level approach to measuring financial distress, demonstrating that aggregating local banking conditions provides meaningful insight into national economic prospects. The predictive power of the states-at-risk measure confirms that the geographic breadth of financial distress matters for macroeconomic outcomes, not just the binary occurrence of a crisis.

Second, the results highlight the value of continuous measures of financial stress compared to traditional binary classifications. The states-at-risk measure captures variations in crisis intensity that binary indicators miss, allowing for more nuanced understanding of how different episodes of financial distress affect the broader economy. This continuous approach may help explain why some financial disruptions lead to severe recessions while others result in more modest slowdowns.

Third, the independent predictive power of both variables suggests that financial crises operate through multiple channels. The additional predictability of the consensus crisis indicator beyond the states-at-risk measure may capture nationwide financial market disruptions or monetary policy constraints that are not fully reflected in state-level banking conditions. Conversely, the independent predictive power of the states-at-risk measure highlights how regional banking problems can aggregate to affect national outcomes even in the absence of widely recognized systemic crises.

These findings suggest potential applications for economic forecasting and policy implementation. From a forecasting perspective, monitoring the geographic distribution of banking sector stress could provide an early warning signal of a broader economic slowdowns, potentially before traditional crisis indicators signal systemic problems. The continuous nature of the states-at-risk measure allows for detection of building financial pressures that might not yet qualify as full-blown crises but nevertheless pose risks to economic growth.

7 Conclusion

This paper provides the first comprehensive assessment 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 analysis yields the following takeaways. Existing chronologies of U.S. financial crises disagree considerably, prompting the need for a consensus list of crisis events we introduce here. Based on this new chronology, we show that financial crises are followed by substantial and persistent output losses at the state level, with economic activity remaining approximately 10 percent below pre-crisis trends five years after. This pattern, consistent across multiple crisis episodes spanning more than a century, suggests that financial crises induce permanent shifts in output trajectories rather than temporary deviations from trend.

Importantly, the severity of local output losses is highly predictable by the extent of deposit contractions, highlighting a key role for bank runs in understanding U.S. financial crisis events. By combining our census of narrative chronologies with statistical indicators of deposit contractions, we develop a new methodology for identifying financial crises at the state level. This approach identifies episodes of significant regional financial distress that do not appear in conventional national chronologies, resulting in a state-level chronology with unprecedented detail on the geographic distribution of financial instability throughout U.S. history. As we show, heterogeneity in local crises experiences also contains valuable information about subsequent national economic performance, highlighting how regional banking problems can aggregate to affect national outcomes.

Our work demonstrates the value of disaggregated, long-run historical analysis for understanding financial crises. By examining regional patterns across multiple crisis episodes spanning different regulatory regimes and monetary systems, we identify persistent relationships that transcend the specifics of any particular historical period. This approach reveals the enduring features of financial crisis dynamics.

Future research could extend this regional perspective in several promising directions. Further investigation of the specific mechanisms through which banking sector stress affects regional economies would enhance our understanding of crisis transmission channels. Analysis of how different regulatory frameworks and policy interventions affect the geographic distribution of crisis impacts could yield valuable insights for policy design. Finally, extending this regional approach

to other countries would allow for exploration of how different national institutional structures influence the spatial dynamics of financial crises.

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

Year	Consensus	J/S/T	M/S	R/R	L/V	B/V/X	G	F/S	B/W	J	T	SP	W	KE	L/N	B/H	C	D/S	R	D/R	B/D/W	SO	CJ
1791	—		Yes								—						—				—		—
1792	—		Yes								—						—				—	Yes	—
1797	—		—								—						—				Yes	—	—
1814	Yes		Yes	Yes			Yes				—						—				—	—	Yes
1817	—		—	Yes			O				—						—				—	—	—
1818	—		—	O			—				—						—				—	—	Yes
1819	Yes		Yes	O			Yes				—						—		Yes		Yes	—	—
1820	—		O	—			—				—						—		—		—	—	—
1825	—		—	Yes			—		Yes	—	Yes						—		—		—	—	Yes
1826	—		—	—			—		—	—	—						—		—		—	—	O
1829	—		Yes	—			—		—	—	—						—		—		—	—	—
1833	Yes		Yes	—			—		Yes	Yes	Yes						—		—		—	—	—
1834	—		O	—			—		—	O	—						—		—		—	—	—
1836	—		—	—			—		—	—	—						—		—		—	—	Yes
1837	Yes		Yes	Yes			Yes		Yes	Yes	Yes						Yes		Yes		Yes	Yes	O
1838	—		—	O			—		—	—	—						—		—		—	—	O
1839	Yes		Yes	—			Yes		Yes	Yes	Yes						—		Yes		—	—	O
1840	—		O	—			O		—	—	—						—		—		—	—	—
1841	—		O	Yes			O		—	Yes*	—						—		—		—	—	—
1842	—		O	—			O		—	Yes*	—						—		—		—	—	—
1847	—		—	—			—		—	—	Yes						—		—		—	—	—
1848	—		—	—			—		—	—	—						—		—		—	—	Yes
1851	—		—	—			—		—	Yes*	—						—		—		—	—	—
1854	—		—	—			—		—	Yes*	—						—		Yes		—	—	—
1857	Yes		Yes	Yes			Yes		Yes	Yes	Yes						Yes		Yes		Yes	Yes	Yes
1860	—		—	—			—		—	Yes*	—						—		—		—	—	—
1861	—		Yes	Yes			Yes		—	Yes*	—						—		—		—	—	—
1864	—		—	Yes			—		—	—	—						—		—		—	—	Yes
1871	—	—	Yes	—		—	—		—	—	—		—				—		—		—	—	—
1873	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			—		Yes		—	Yes	Yes
1876	—	—	—	—		—	—	—	—	—	—	—	—	Yes*			—		—		—	—	—
1878	—	—	—	—		—	—	—	Yes*	—	—	—	—	—			—		—		Yes	—	—
1879	—	—	—	—		—	—	—	—	—	—	—	—	Yes*			—		—		—	—	—
1880	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—		—		—	—	—
1882	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—		—		—	—	—
1884	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		—	—	
1892	—	—	—	—		—	—	—	—	—	—	—	—	—		Yes	—	—	—		—	—	
1893	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		O	Yes	Yes	Yes		—	Yes	
1895	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—	—	—		—	—	
1896	—	—	—	—		—	Yes	—	—	Yes*	—	—	—	Yes*		—	—	Yes	—		—	—	
1898	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—	Yes	—		—	—	
1899	—	—	—	—		—	—	—	—	Yes*	—	—	—	Yes		—	—	Yes	—		—	—	
1901	—	—	—	—		—	—	—	—	Yes*	—	—	—	Yes		—	—	Yes	—		—	Yes	
1902	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—	—	—		—	—	
1903	—	—	—	—		—	—	—	—	Yes*	—	—	—	Yes		—	—	Yes	—		—	—	
1904	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—	—	—		—	—	
1905	—	—	Yes	—		—	—	—	—	Yes*	—	—	—	Yes*		—	—	Yes	—		—	—	
1906	—	—	—	—		—	—	—	—	—	—	—	—	Yes*		—	—	—	—		—	—	
1907	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes*	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		—	Yes	
1908	—	—	—	—		—	—	—	—	Yes*	—		—	Yes*		—	—	—	—		—	—	
1909	—	—	Yes	—		—	—	—	—	—	—		—			—	—	Yes	—		—	—	

Continued on next page

Table 1: A Chronology of Start Year of Financial Crises in the United States, 1791–2023

Year	Consensus	J/S/T	M/S	R/R	L/V	B/V/X	G	F/S	B/W	J	T	SP	W	KE	L/N	B/H	C	D/S	R	D/R	B/D/W	SO	CJ
1914	—	—	Yes	Yes		—	Yes	—	—	—	—		—			Yes	—		—		—	Yes	
1917	—	—	Yes	—		—		—	—	—	—					—			—		—	—	
1920	—	—	Yes	—		—		—	Yes*	Yes*	—					—			—		—	—	
1921	—	—	O	—				—	—	—	—					—			—		—	—	
1923	—	—	—	—		—		—	—	—	—					—			—	Yes	—	—	
1924	—	—	—	—		—		—	—	—	—					—			—	Yes	—	—	
1926	—	—	—	—		—		—	—	Yes*						—			—	Yes	—	—	
1927	—	—	—	—		—		—	—	Yes*						—			—	Yes	—	—	
1929	Yes	—	Yes	Yes		—		Yes	Yes*	Yes*						—			—	Yes	—	Yes	
1930	O	Yes	—	O		Yes										Yes			Yes		—	—	
1931	—	O	—	O		—										O			—		Yes	—	
1932	—	—	O	O		—										O			—		O	—	
1933	—	—	—	O		—										O			—		—	—	
1966	—	—	Yes	—		—									—	—			—		—	—	
1969	—	—	Yes	—		—									—	—			—		—	—	
1970	—	—	Yes	—	—	—									—	—			—		—	—	
1973	—	—	—	—	—	—									Yes	Yes			—		—	—	
1974	—	—	Yes	—	—	—									O	O			—		—	—	
1975	—	—	—	—	—	—									O	O			—		—	—	
1976	—	—	Yes	—	—	—									—	—			—		—	—	
1980	—	—	Yes	—	—	—									—	—			—		—	—	
1982	—	—	Yes	—	—	—									Yes	Yes			—		—	—	
1983	—	—	—	—	—	—									O	O			—		—	—	
1984	Yes	Yes	Yes	Yes	—	Yes									O	O			—		—	—	
1985	—	—	O	O	—	—									—	—			—		—	—	
1988	—	—	—	O	Yes	—									Yes	Yes			—		—	—	
1990	—	—	O	O	—	Yes									O	O			—		—		
1991	—	—	O	O	—	—									O	O			—		—		
1998	—	—	Yes	—	—	—									—	—			—				
2001	—	—	Yes	—	—	—									—	—			—				
2007	Yes	Yes	Yes	Yes	Yes	Yes									Yes	Yes			—				
2008	—	—	—	O	—	—									—	—			Yes				
2009	—	—	—	O	—	—									—	—			—				
2010	—	—	—	O	—	—									—	—			—				

Notes: This table reports an overview of existing financial crisis chronologies for the United States. For each chronology, we mark years identified as the beginning of a crisis by a "Yes", years associated with an ongoing crisis as "O", years that are part of the study but without crisis years as "—", and years that are identified as a minor crisis as "Yes*".

Sources: **J/S/T**: Jordá, Schularick, and Taylor (2017); **M/S**: Metrick and Schmelzing (2024); **R/R**: Reinhart and Rogoff (2009); **L/V**: Laeven and Valencia (2020); **B/V/X**: Baron, Verner, and Xiong (2021); **G**: Gorton (1988); **F/S**: Friedman and Schwartz (1963); **B/W**: Bordo and Wheelock (1988); **J**: Jalil (2015); **T**: Thorp (1924); **SP**: Sprague (1910); **W**: Wicker (2000); **KE**: Kemmerer (1910); **L/N**: Lopez-Salido and Nelson (2010); **B/H**: Bordo and Haubrich (2017); **C**: Conant (1915); **D/S**: DeLong and Summers (1986); **R**: Rockoff (2021); **D/R**: Davison and Ramirez (2014); **B/D/W**: Bordo, Dueker, and Wheelock (2000); **SO**: Sobel (1988); **CJ**: Juglar (1916); **RB**: Rothbard (2002); Jamilov, König, Müller, and Saidi (2025).

Table 2: Comparison with Existing Datasets

	No. States	Bank Coverage	
		National	Commercial
A. State-Level Data			
This paper	50	1863–1960	1961–2024
FDIC	50	—	1934–2024
All Bank Statistics †	18	—	1896–1955
	50	1896–1955	—
B. Bank-Level Data			
Carlson, Correia and Luck (2022)	50	1867–1904	—
Correia, Luck and Verner (2024)	50	1865–1941	1959–2023
C. National-Level Data			
Carter et al. (2006)	—	1863–1998	1834–1980

Notes: This table compares our state-level Bank Balance Sheet dataset with other Bank Balance Sheet datasets. We report the Coverage of each dataset for National and Commercial Banks, along with the number of states reported. † - All Bank Statistics (1959), a publication by the Federal Reserve, is digitized in Flood (1998) and Cao and Richardson (2022).

Table 3: State-Level Variables of Economic Activity

Categories	**# of Variables**	**Examples**
Labor Market	3	non-farm employment, manufacturing payroll
Real Activity	32	agricultural receipts, manufacturing value added, mining value, exports value
Housing	2	house sales price index, rent price index
Transportation	4	railroad mileage, motor vehicle registration
Government	9	federal govt revenue, state general revenue, state general expenditure, state debt
Wealth	10	personal income, value of farm land, bank balance sheet items, # of bankruptcies
Others	5	# of patents, news-based sentiment index, newspaper circulation
Total	**65**	

Notes: This table summarizes the 65 variables reported in Hoon et al. (2025), grouping them into eight broad categories. We also provide examples of the variables within each category. For more details, please refer to our companion paper (Hoon et al., 2025).

Table 4: Data Sources for State-Level Economic Activity

Source (Variable)	**Start**	**End**	**Frequency**
Panel A: Examples of Digitized Sources: 84 in total			
Statistical Abstract (Value of Imports of Merchandise, # Business Failures, Various)	1860	2018	Annual
Census Compendium (Non-farm Employment, Crop Receipts, Various)	1870	2021	Decennial
Livestock on Farms (Sheep Value)	1869	1935	Annual
Biennial Report of the Territorial Treasurer to the Governor of the Territory of Arizona (State Govt. Rev.)	1886	1911	Annual
Panel B: Examples of Existing Sources: 29 in total			
BEA (Personal Income)	1929	2021	Annual
BEA (GDP)	1963	2021	Annual
USDA (Crop Receipts)	1924	2021	Annual
Van Binsbergen et al. (2024) (Sentiments)	1850	2019	Annual

Notes: This table provides examples of the sources we use to construct the Hoon et al. (2025) dataset, along with the period and frequency covered by the sources. We provide examples of newly digitized Sources in Panel A, and of existing sources in Panel B. Note that we digitize data from the Census Compendium from 1870–1930, and use existing Census data after. For more details, please refer to our companion paper (Hoon et al., 2025).

Table 5: Local Financial Crisis Chronology for Selected States

Year	California	**Year**	Massachusetts	**Year**	New York	**Year**	Texas	**Year**	Wisconsin
1876	−44.4	**1873**	−6.6	**1871**	−9.6	**1871**	−3.3	**1873**	−12.0
1884	−21.6	**1878**	−2.8	**1876**	−22.9	**1876**	−3.5	**1878**	−4.6
1888	−19.1	**1884**	−7.3	**1882**	−15.3	**1884**	−5.5	**1884**	−13.6
1892	−27.5	**1890**	−0.2	**1887**	−5.9	**1890**	−3.7	**1892**	−8.8
1896	−3.3	**1895**	−4.3	**1892**	−4.3	**1895**	−9.2	**1896**	−15.3
1906	−15.3	**1899**	−5.5	**1896**	−4.6	**1906**	−16.6	**1906**	−1.9
1920	−9.6	**1903**	−4.8	**1902**	−11.3	**1914**	−11.3	**1920**	−8.5
1924	−6.0	**1907**	−6.0	**1906**	−3.1	**1920**	−21.0	**1931**	−22.7
1931	−18.6	**1914**	−2.8	**1920**	−13.6	**1929**	−4.7		
1969	−4.2	**1920**	−5.6	**1924**	−14.1	**1988**	−5.4		
1991	−1.4	**1926**	−1.4	**1929**	−5.5				
		1930	−2.5	**1937**	−0.8				
		1937	−1.7	**1969**	−2.2				
		1969	−5.7	**1974**	−4.7				
		1976	−1.1	**1984**	−0.3				
		1988	−0.2	**1988**	−0.7				
		2001	−1.8	**2007**	−4.0				

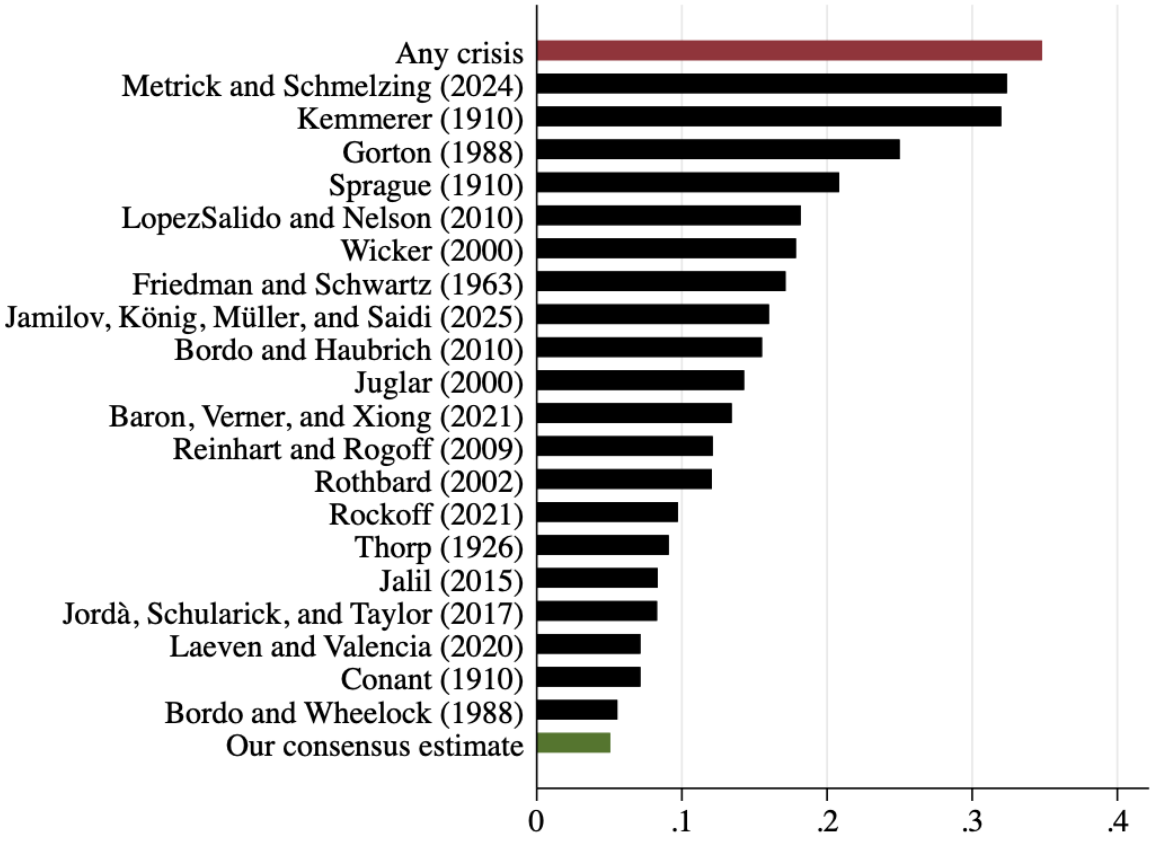
Notes: This table provides examples of deposit contractions associated with financial crises identified within our local crisis chronology. We classify an event as a "local crisis" if two criteria are met: (i) *any* existing chronology surveyed in Table 1 reports a financial crisis in the United States, and (ii) there is a contraction in state-level deposits within a ∓ 1 year horizon around a U.S.-wide crisis, based on our newly constructed time series. We report the minimum deposit growth rates (in %) within one year of any crisis to gauge the severity of local financial distress.

Table 6: States-at-Risk and U.S. GDP Growth

	Dependent Var: $100 \times \Delta \text{GDP}_t$		
	(1)	(2)	(3)
$\mathbf{1}\{\text{ConsensusCrisis}_{t-1}\}$	-5.95^{***}		-4.98^{**}
	(2.16)		(2.27)
$\text{States-at-risk}_{t-1}$		-1.58^{***}	-1.25^{**}
		(0.58)	(0.56)
Controls	Yes	Yes	Yes
Observations	145	145	145

Notes: This table reports the results from a time series regression of the log change in real GDP on a dummy for U.S. financial crises (ConsensusCrisis) and the asset-weighted share of states experiencing a local crisis (States-at-risk) as of the previous year. $\mathbf{1}\{\text{ConsensusCrisis}_{t-1}\}$ is an indicator function for the consensus crisis years. $\text{States-at-risk}_{t-1}$ represents the asset-weighted fraction of states experiencing a local crisis in any given year. We classify an event as a "local crisis" if two criteria are met: (i) *any* existing chronology surveyed in Table 1 reports a financial crisis in the United States, and (ii) there is a contraction in state-level deposits within a ∓ 1 year horizon around a U.S.-wide crisis, based on our newly constructed time series. 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 0.01, 0.05, and 0.1 levels. We construct US-level real GDP from 1790 to 2022 by combining data from the BEA (from 1929 onwards) and Williamson (2025) (1790–1928).

Figure 1: Probability of Financial Crisis by Chronology



Notes: This figure plots the implied crisis probability across several key chronologies, along with the probability implied by our "consensus chronology" (bottom row, in green). Note that the time coverage varies across chronologies. The implied crisis probability is defined as the number of years identified as a crisis by the chronology divided by the total number of years that the chronology covers.

Figure 2: The Officer of the Comptroller of the Currency's (OCC) Annual Reports

MINNESOTA.

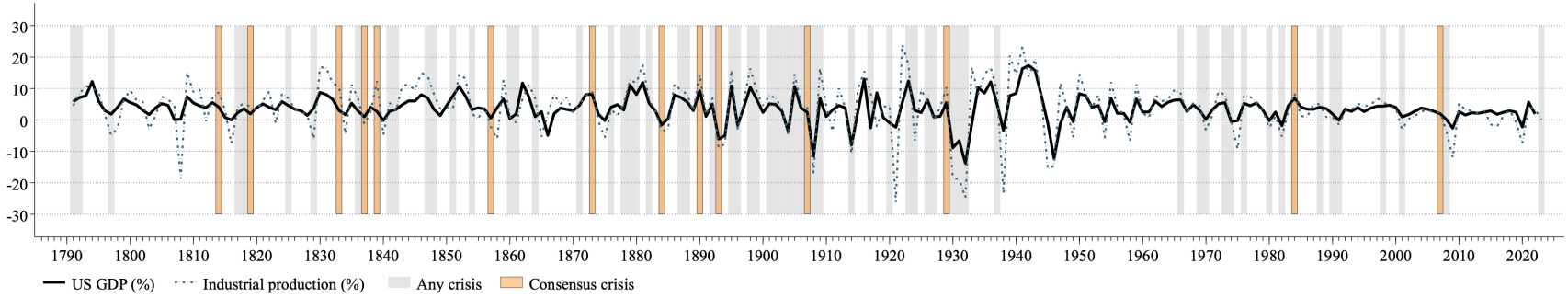
Resources.	JANUARY.	APRIL.	JULY.	OCTOBER.
	15 banks.	15 banks.	15 banks.	15 banks.
Loans and discounts	$2,095,713 77	$1,993,778 31	$2,082,646 26	$2,080,034 77
U. S. bonds dep'd to secure circulation	1,682,200 00	1,682,200 00	1,682,200 00	1,682,200 00
U. S. bonds dep'd to secure deposits	109,550 00	100,000 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	112,576 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	31,665 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 62	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	5,026,792 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	1,196,565 23
Due from other banks and bankers	273,729 72	224,904 00	154,385 35	145,967 58
Real estate, furniture, &c	187,185 55	206,550 60	225,254 68	246,210 96
Current expenses	49,387 07	73,467 89	37,852 46	86,132 43
Premiums	21,406 63	21,005 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	216,656 00	255,920 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 06	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

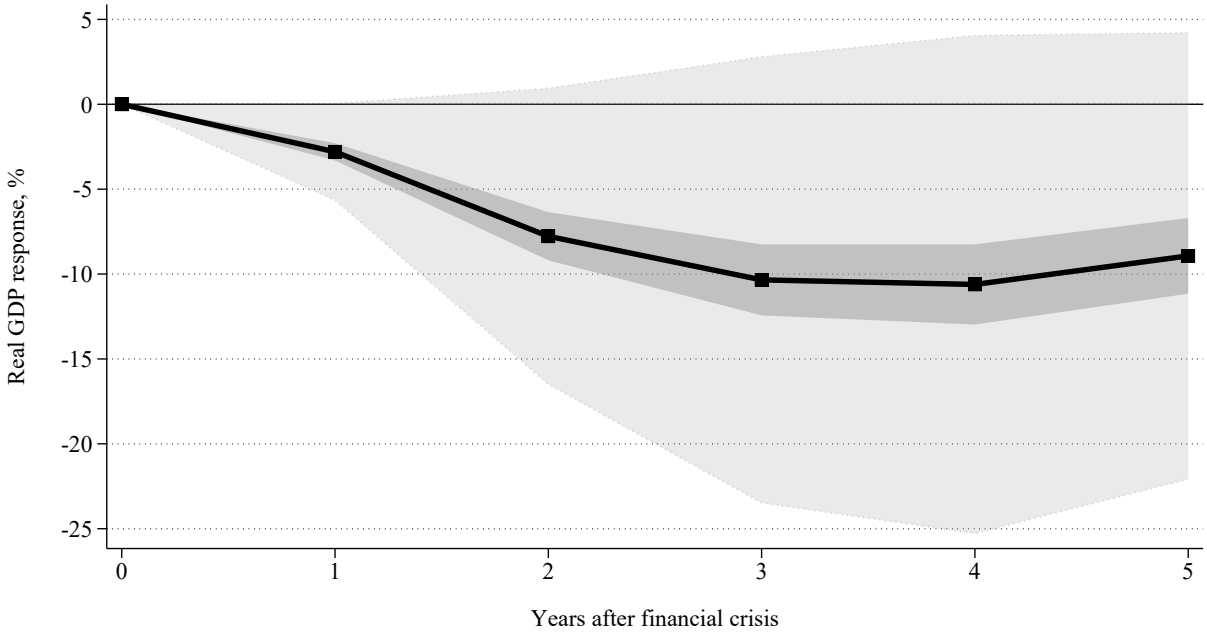
Notes: This figure provides an example of the raw source – the 'Annual Report of the Comptroller of the Currency' as published by the United States, Office of the Comptroller of the Currency – from which we digitize state-level bank balance sheets for the period 1863–1960. A full list of OCC Annual Reports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

Figure 3: U.S. Financial Crises and Output Growth, 1790-2022



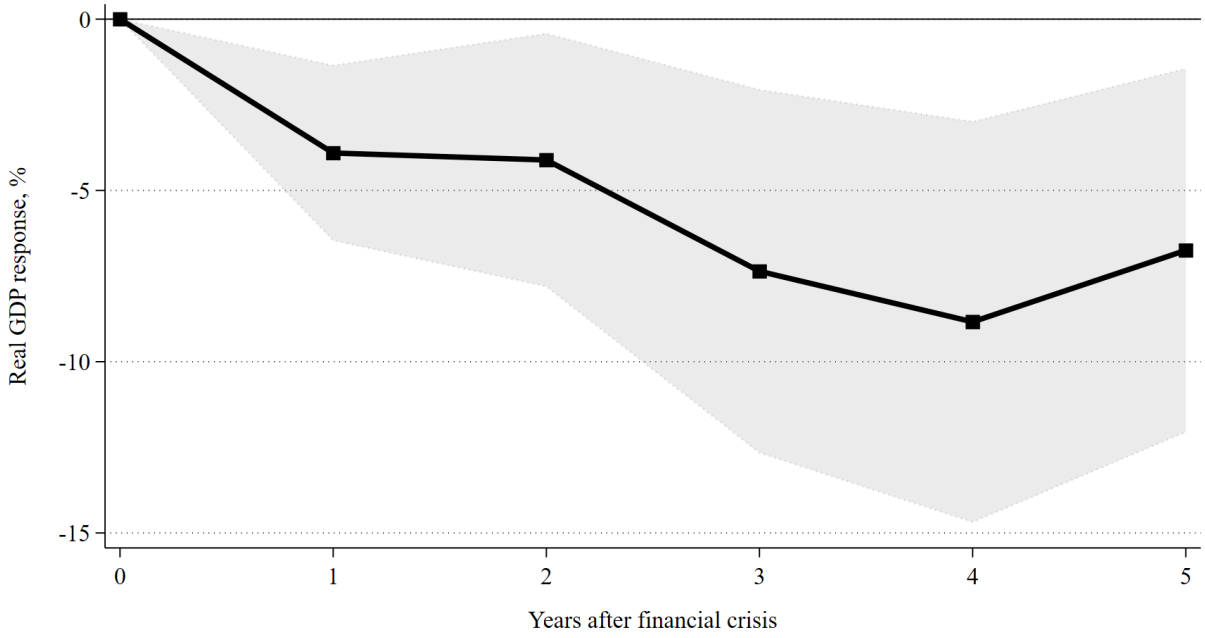
Notes: This figure plots two indicators of national economic activity, U.S. GDP and industrial production, both in growth rates and from 1790 to 2022. We label years where any chronology indicates a financial crisis in gray, and years where a "consensus crisis" occurs in orange. We collect data on U.S. real GDP from the BEA from 1929–2022, and from Williamson (2025) from 1790–1928. The data on industrial production series is constructed by combining the data from Davis (2004) (1871–1915), Miron and Romer (1990) (1916–1919), and the Federal Reserve (1920–2019).

Figure 4: State-Level Output Losses Following U.S. Financial Crises, 1863-2022



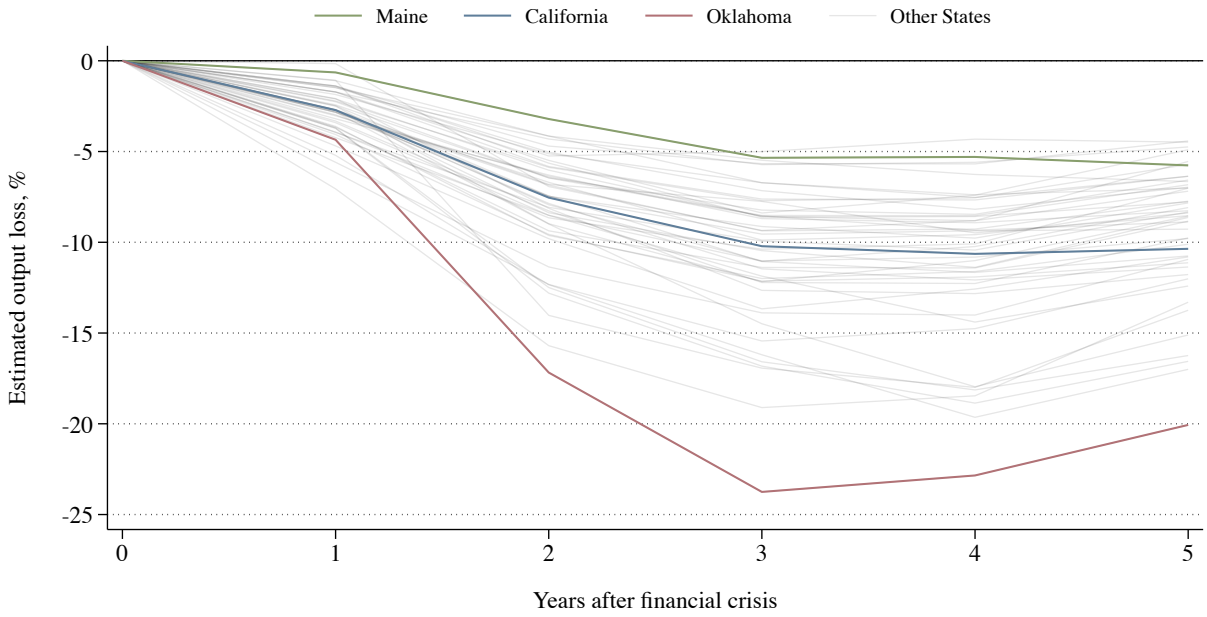
Notes: This figure presents the estimated response of our state-level economic activity index to financial crises identified in our consensus chronology. We plot the impulse response function estimated from Equation (4.1), which is in line with Jordà (2005) adapted for a panel setting, and includes state 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 a crisis. The shaded regions correspond to the 95% confidence interval. The light gray shaded region accounts for heteroskedasticity-robust standard errors clustered at the state and year levels, while the dark gray shaded region accounts for heteroskedasticity-robust standard errors.

Figure 5: Output Losses of U.S. Financial Crises: Aggregate Time Series Evidence, 1790-2022



Notes: This figure presents the estimated response of aggregate U.S. to financial crises identified in our consensus chronology. We plot the impulse response function estimated from Equation (4.2). The black markers represents the estimated coefficient $\beta^h, h \in [0, 5]$, capturing the average response of aggregate U.S. 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. The shaded region corresponds to the 95% confidence interval, accounting for heteroskedasticity-robust standard errors. We construct US-level real GDP from 1790 to 2022 in the following manner: First, we collect US-level nominal GDP data from BEA from 1929 onwards, and from Williamson (2025) starting in 1790. Second, we apply GDP deflators collected from FRED from 1929 onwards, and from Williamson (2025) starting in 1790.

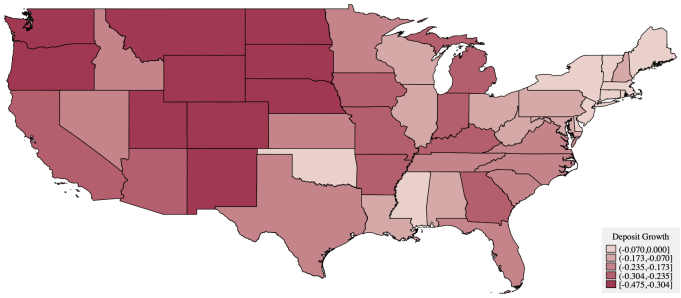
Figure 6: Heterogeneous Output Responses Across States



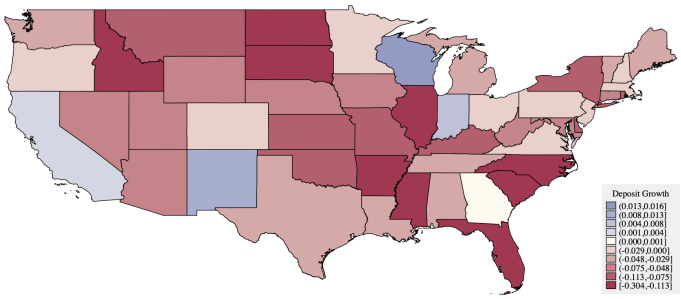
Notes: This figure presents the estimated response of our state-level economic activity index to a financial crises as identified in our consensus chronology. We plot the impulse response functions from a time series version of Equation (4.1), where we estimate a separate regression for each state similar to Equation (4.2). 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 a crisis. We highlight the estimated coefficients of Maine, California, and Oklahoma in color.

Figure 7: Local Deposit Growth Rates During Financial Crises

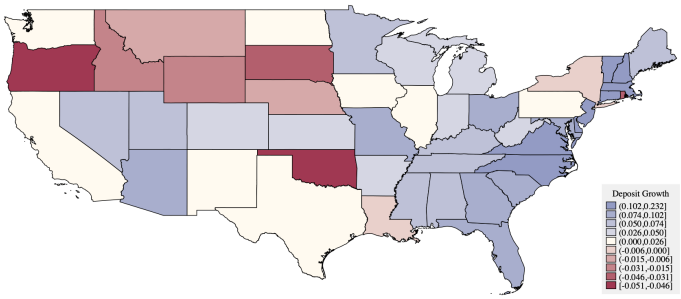
(a) Panic of 1893



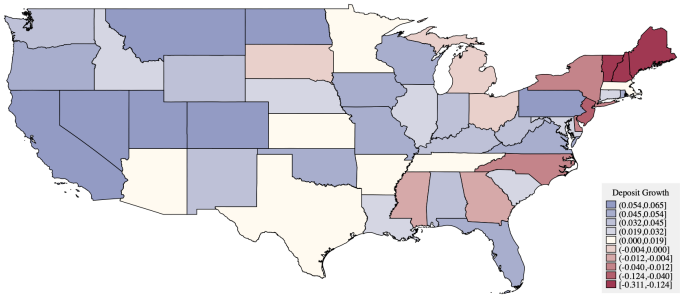
(b) Great Depression



(c) Bank Failures in 1984

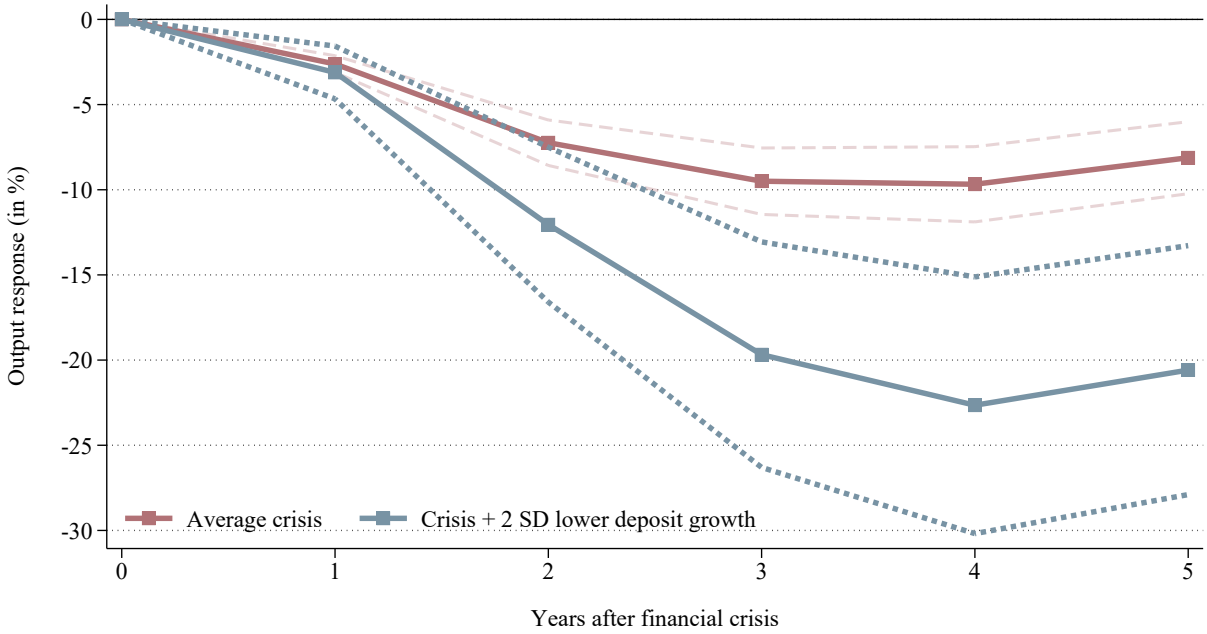


(d) Global Financial Crisis of 2007



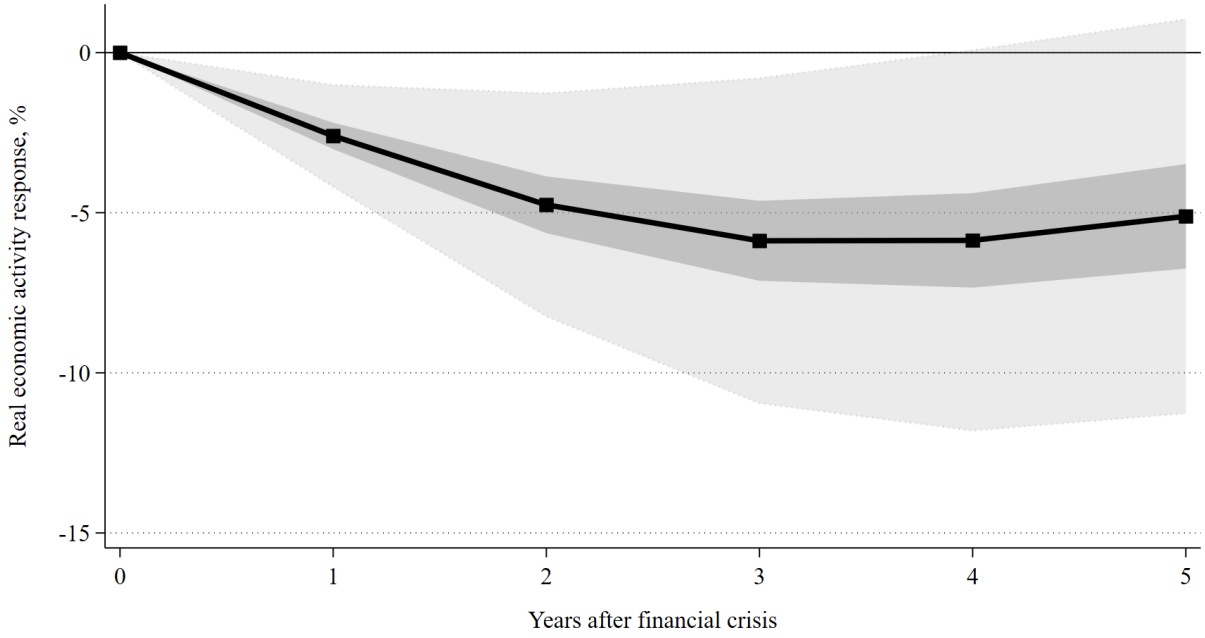
Notes: This figure plots state-level deposit growth rates across four significant crisis periods identified by our consensus chronology: the Panic of 1893, The Great Depression (dated 1929), the 1984 bank failures, and the Global Financial Crisis (dated 2007). For each crisis year, we keep the minimum cumulative growth rate within 2 years of the crisis. For each crisis period, we assign colors by dividing positive deposit growth rates into five quantiles, and negative deposit growth rates into five quantiles.

Figure 8: Deposit Growth Predicts Severity of Output Loss



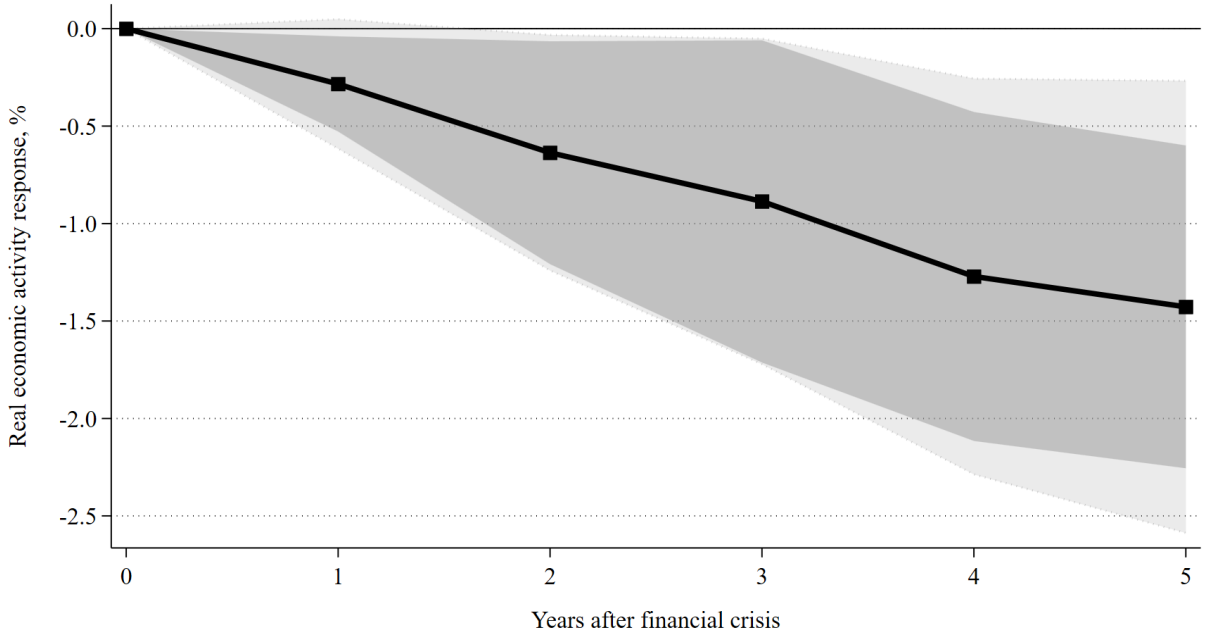
Notes: This figure presents the estimated response of our state-level economic activity index to a financial crises as identified in our consensus chronology, conditional on the rate of deposit growth. We plot the impulse response function estimated from Equation (5.3), which extends our baseline specification to include deposit growth and its interaction with the consensus crisis indicator, 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 the estimated coefficient $\beta_1^h - \beta_3^h * 2, h \in [0, 5]$, where β_3^h captures how the relationship between deposit growth and subsequent output changes during crises periods. Thus, $\beta_1^h - \beta_3^h * 2$ reflects the average output loss of a financial crisis when deposit growth is two standard deviations below the crisis period mean, at each horizon h. The dashed and dotted lines correspond to the 95% confidence interval of the β_1^h and $\beta_1^h - \beta_3^h * 2$ estimates, respectively, based on heteroskedasticity-robust standard errors.

Figure 9: Output Losses Following Local Financial Crises



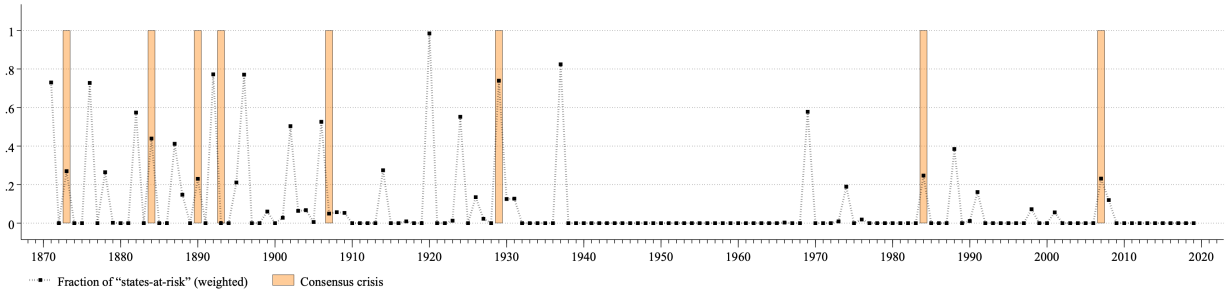
Notes: This figure presents the estimated response of our state-level economic activity index to a local financial crises as identified in our state-level crisis chronology. We plot the impulse response function estimated from Equation (5.4), which includes state fixed effects. The black markers represents 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 a local financial crisis, relative to what would have been expected in the absence of a crisis. The shaded regions correspond to the 95% confidence interval. The light gray shaded region accounts for heteroskedasticity-robust standard errors clustered at the state and year levels, while the dark gray shaded region accounts for heteroskedasticity-robust standard errors.

Figure 10: Output Losses of Local Crises with Time Fixed Effects



Notes: This figure presents the estimated response of our state-level economic activity index to a local financial crises identified in our state-level crisis chronology. We plot the impulse response function estimated from **??**, which includes both year fixed effects and state fixed effects. The black markers represents 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 crisis, beyond the effect of common national shocks. The shaded regions correspond to the 95% confidence interval. The light gray shaded region accounts for heteroskedasticity-robust standard errors clustered at the state and year levels, while the dark gray shaded region accounts for heteroskedasticity-robust standard errors.

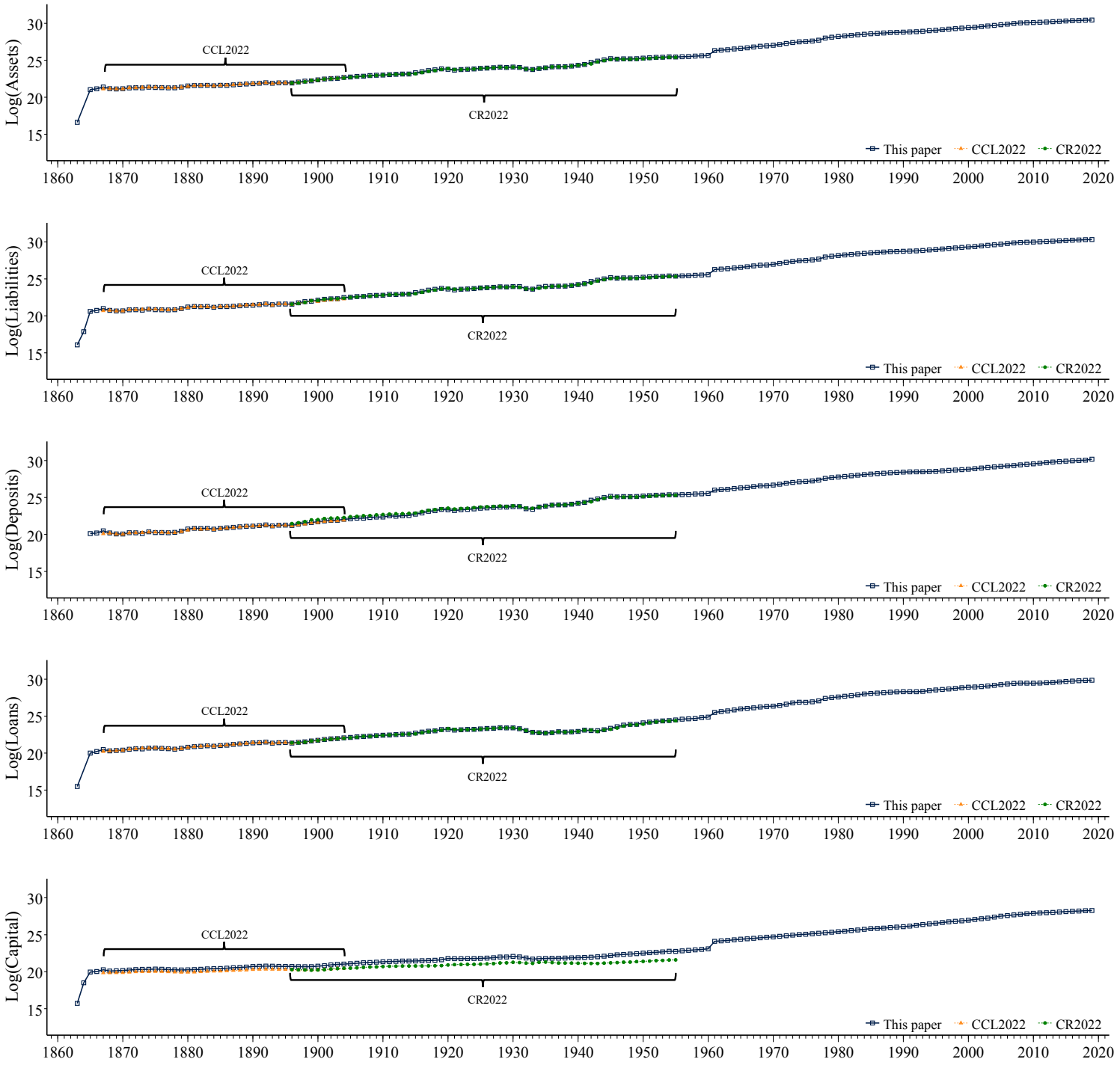
Figure 11: Fraction of States Experiencing a Local Crisis, 1870-2022



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

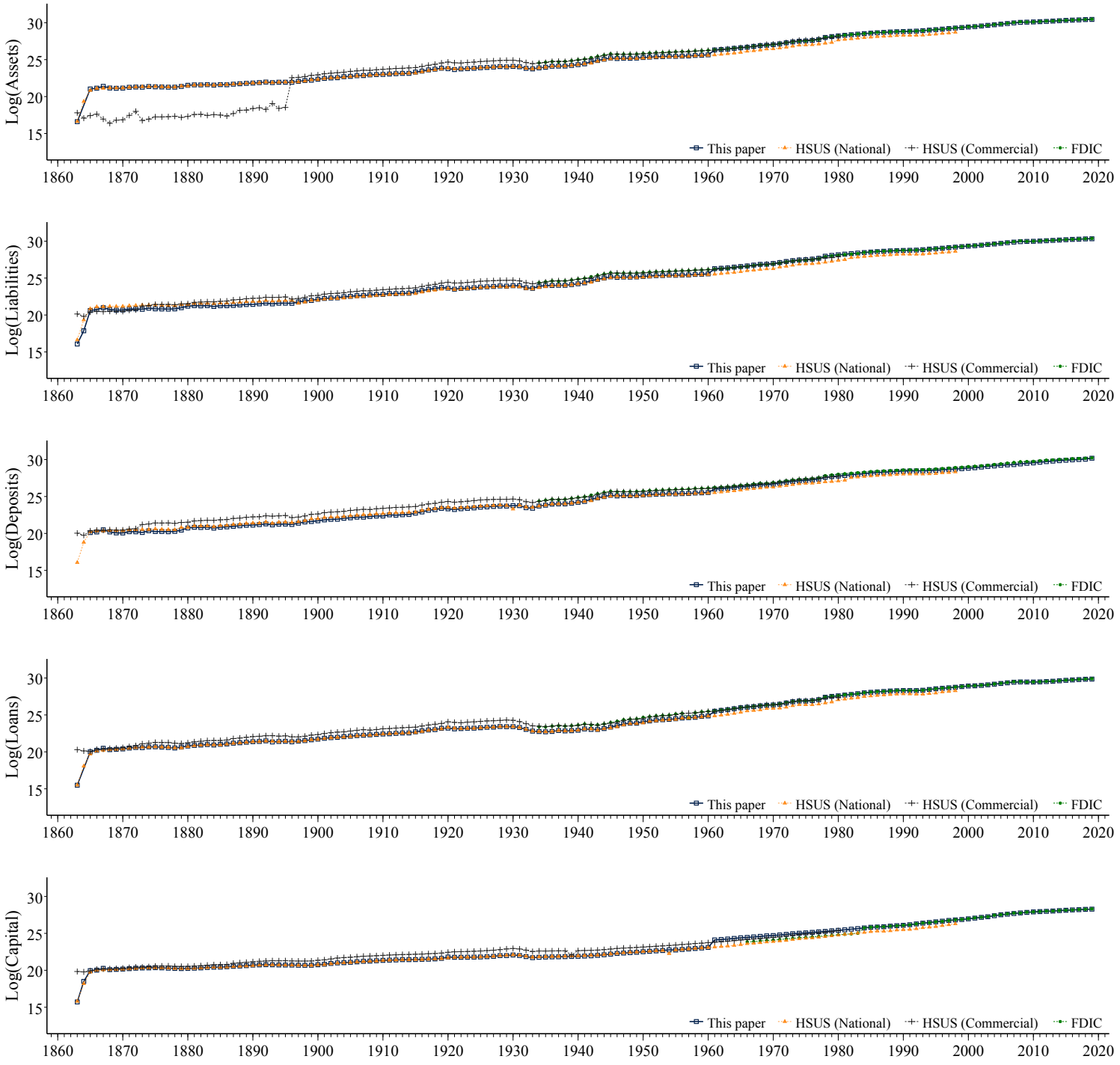
8 Additional Exhibits

Figure 12: Validation against Bank Data from CR2022 and CCL2022 (1863-2019)



Notes: This figure validates our Bank Balance Sheet dataset ('This paper', 1863–2019) aggregated to the US-level, against the datasets reported in "All Bank Statistics" (1959) as digitized by Cao and Richardson (2022) (CR2022, 1896–1955), and Carlson, Correia and Luck (2022) (CCL2022, 1867–1904). We define bank liabilities to exclude capital, and report capital separately as the sum of capital stock, surplus, and undivided profits.

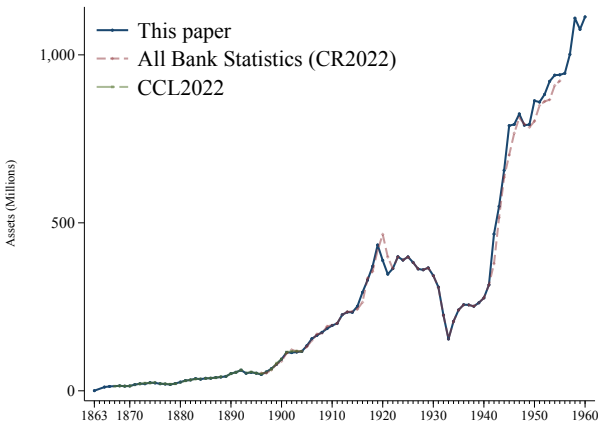
Figure 13: Validation against Bank Data from HSUS and FDIC (1863-2019)



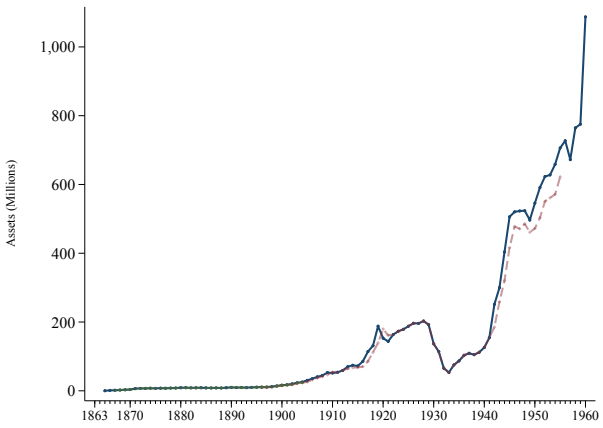
Notes: This figure validates our Bank Balance Sheet dataset ('This paper', 1863–2019) aggregated to the US-level, against the datasets reported in Carter et al. (2006) (HSUS, 1863–1960) and in FDIC (FDIC, 1961–2019). We define bank liabilities to exclude capital, and report capital separately as the sum of capital stock, surplus, and undivided profits. HSUS (National) abbreviates for national bank data reported in HSUS, while HSUS (Commercial) abbreviates for commercial bank data.

Figure 14: Bank Data Validation for Selected States (1863-1960)

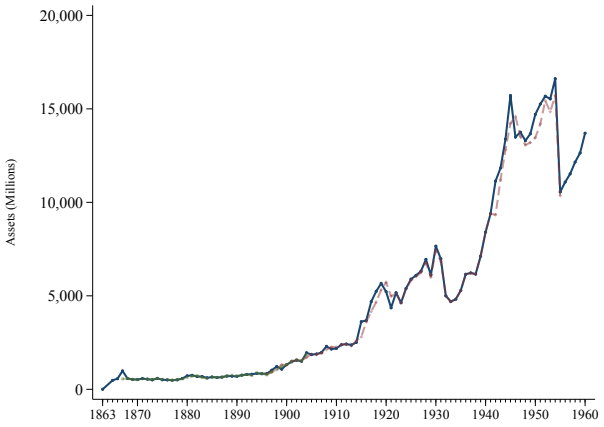
(a) Bank Assets (IA)



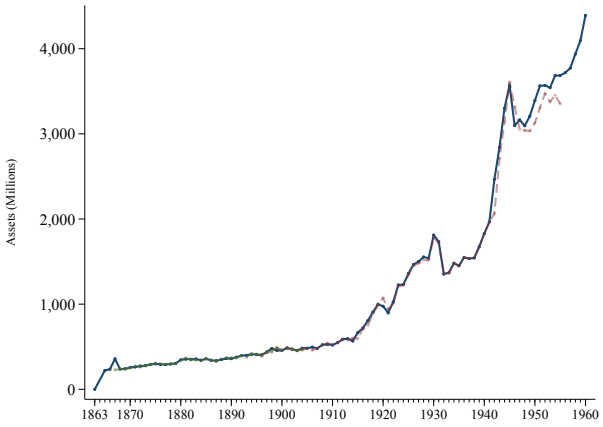
(b) Bank Assets (NC)

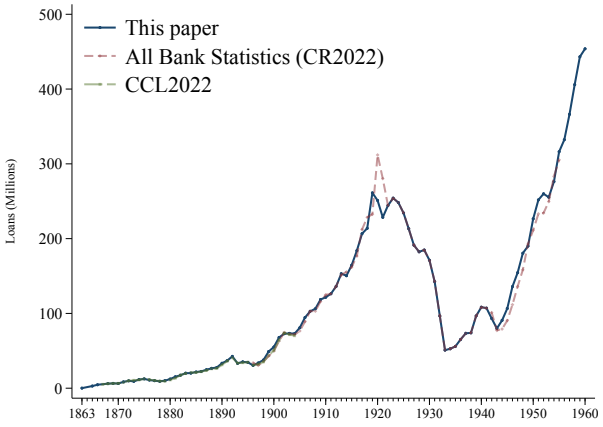


(c) Bank Assets (NY)

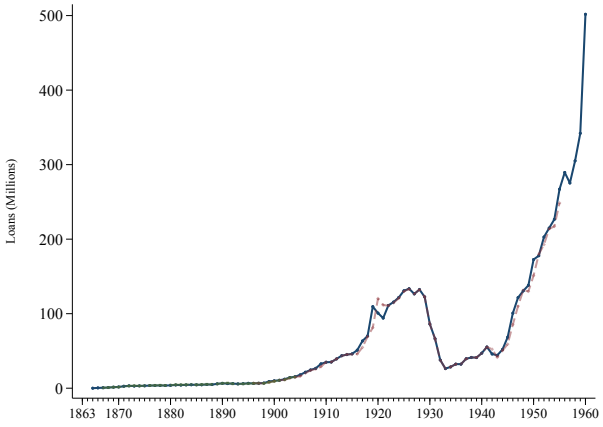


(d) Bank Assets (MA)

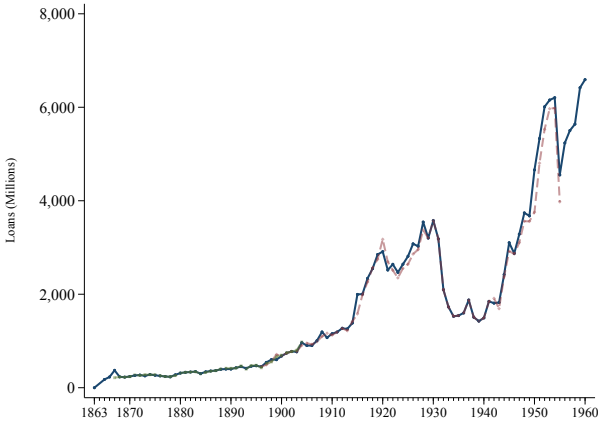




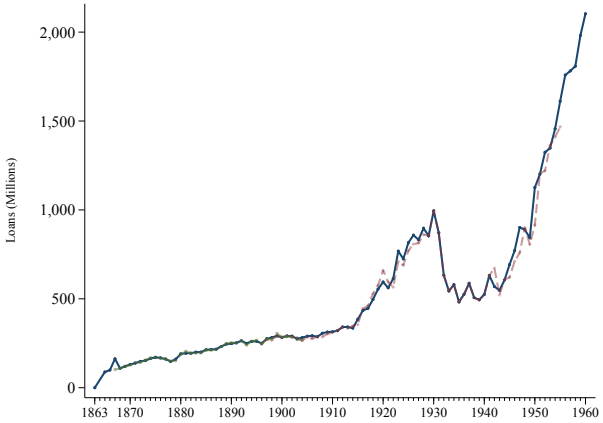
(e) Bank Loans (IA)



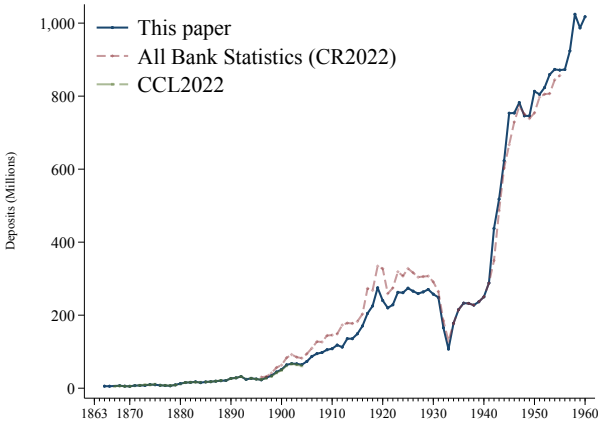
(f) Bank Loans (NC)



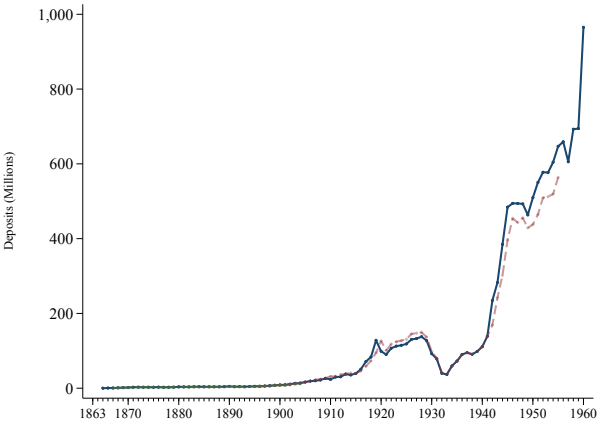
(g) Bank Loans (NY)



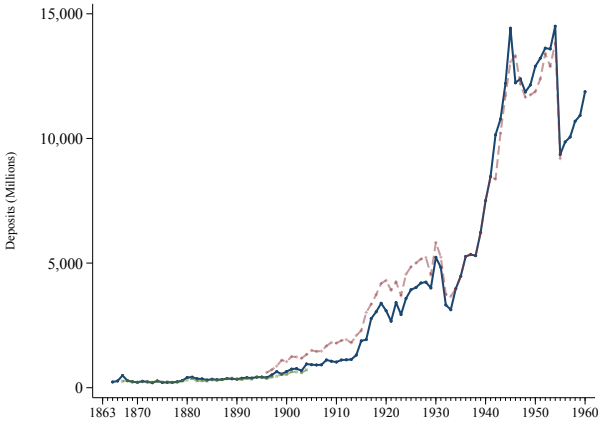
(h) Bank Loans (MA)



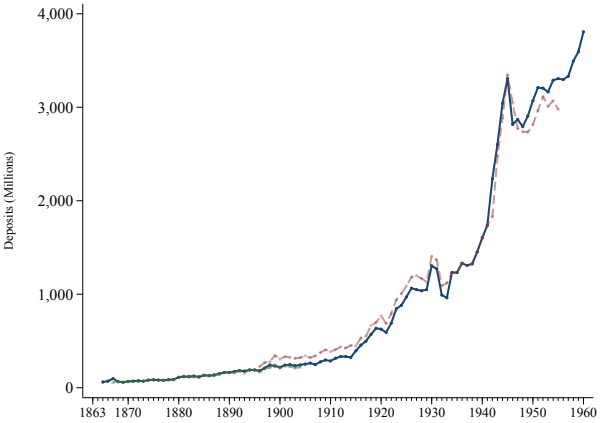
(i) Bank Deposits (IA)



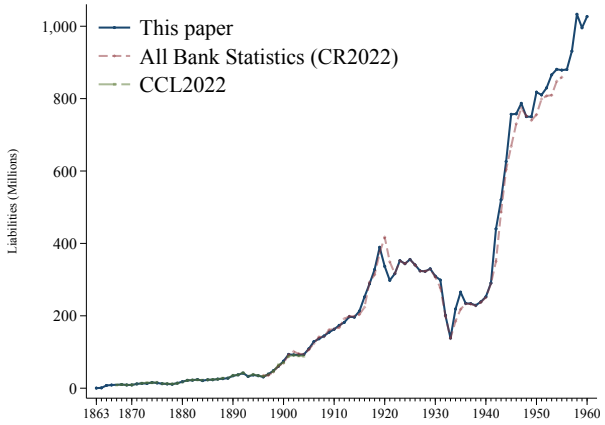
(j) Bank Deposits (NC)



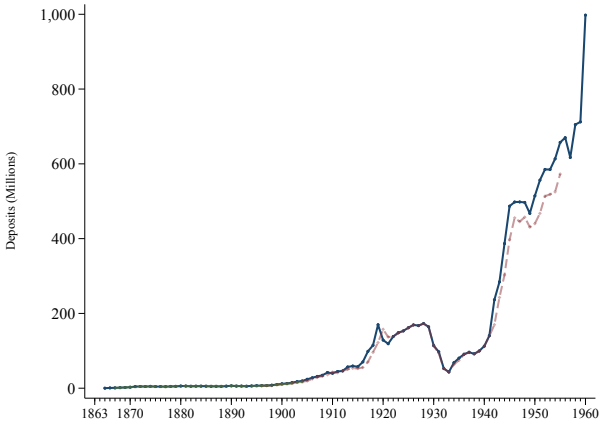
(k) Bank Deposits (NY)



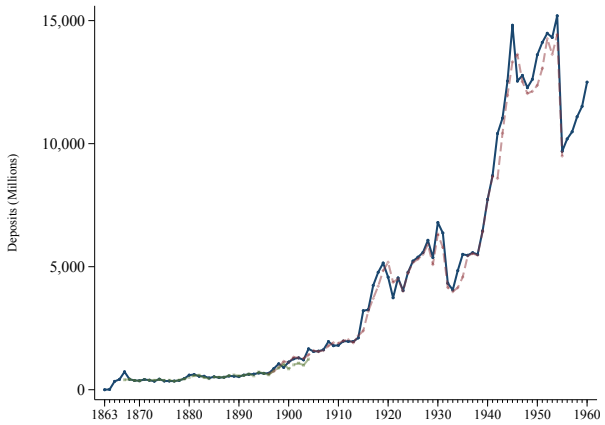
(l) Bank Deposits (MA)



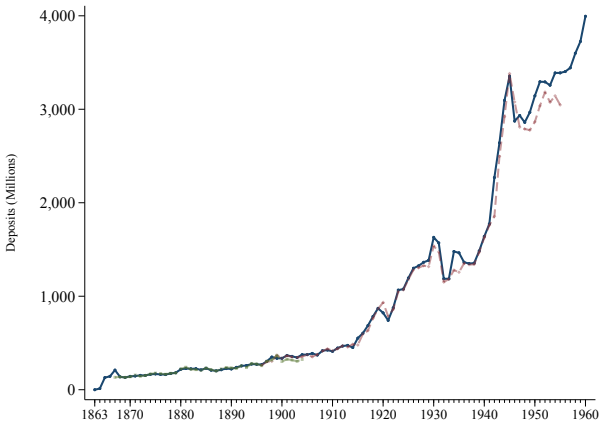
(m) Bank Liabilities (IA)



(n) Bank Liabilities (NC)



(o) Bank Liabilities (NY)

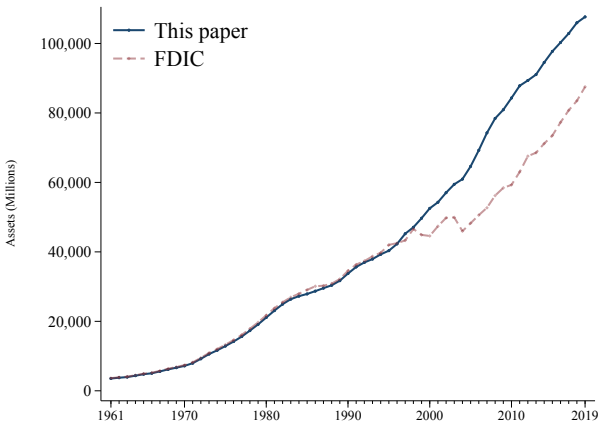


(p) Bank Liabilities (MA)

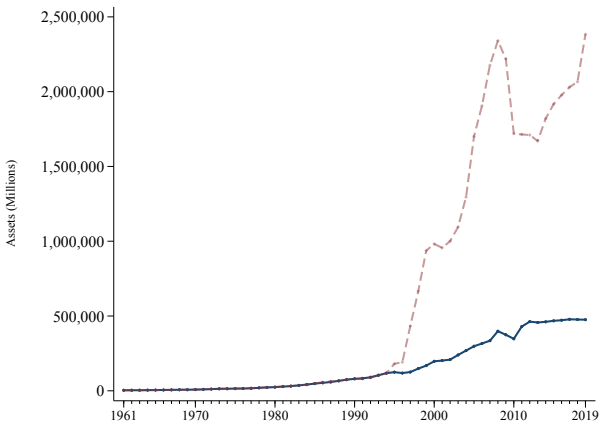
Notes: This figure validates our Bank Balance Sheet dataset ('This paper', 1863–1960) for selected states, against the datasets reported in "All Bank Statistics" (1959) as digitized by Cao and Richardson (2022) (CR2022, 1896–1955) and Carlson, Correia and Luck (2022) (CCL2022, 1867–1904). Consistent across all four sources, we limit our sample to National Banks. Consistent with our dataset, we define Total Liabilities to exclude Capital, and report Capital separately as the sum of Capital Stock, Surplus, and Undivided profits.

Figure 15: Bank Data Validation for Selected States (1961-2019)

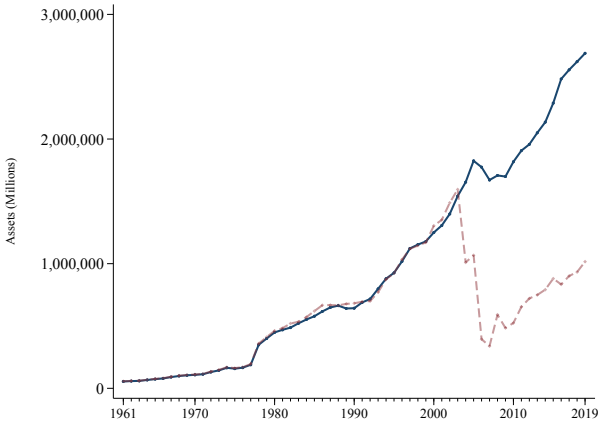
(a) Bank Assets (IA)



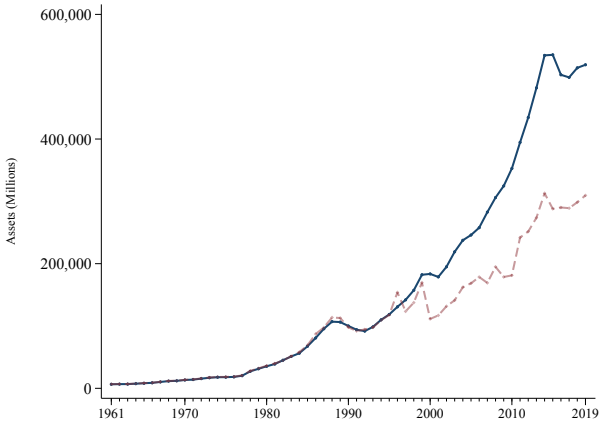
(b) Bank Assets (NC)

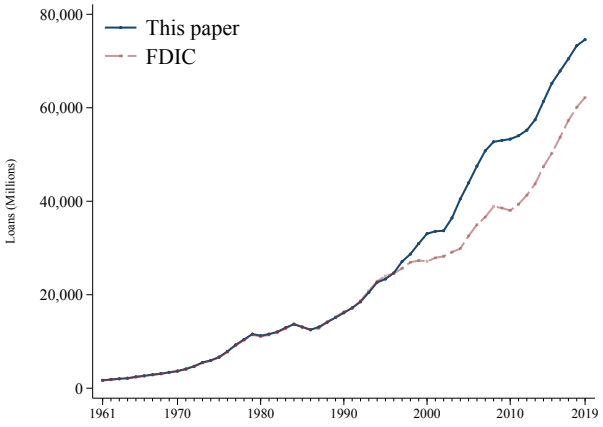


(c) Bank Assets (NY)

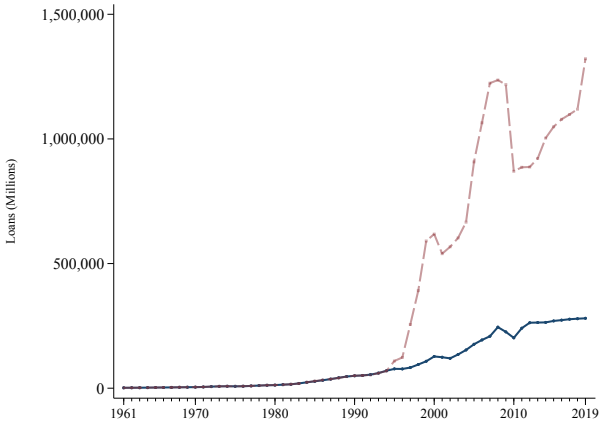


(d) Bank Assets (MA)

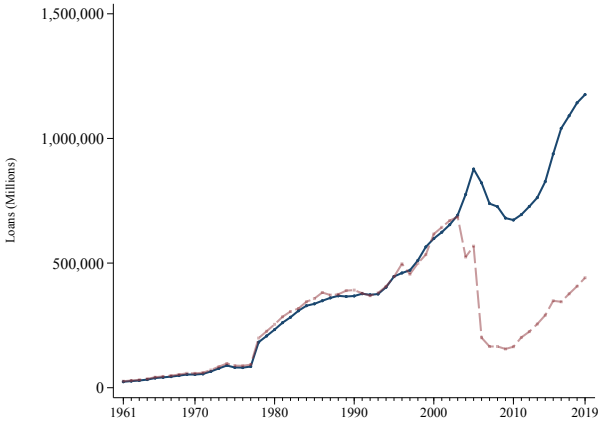




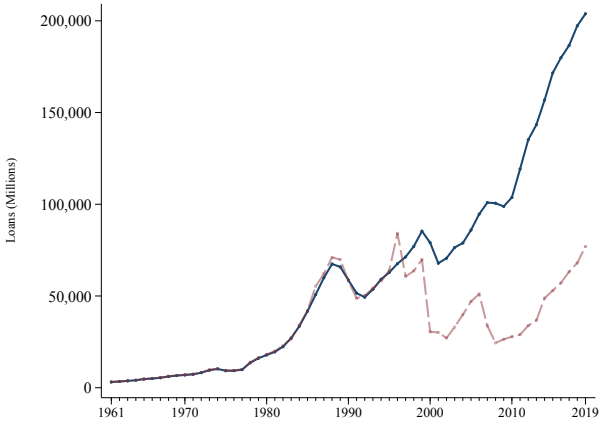
(e) Bank Loans (IA)



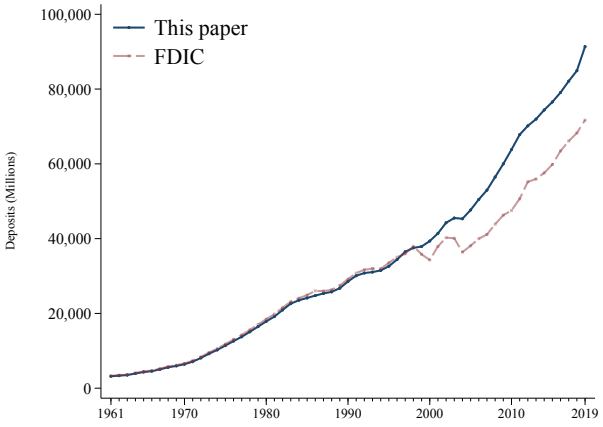
(f) Bank Loans (NC)



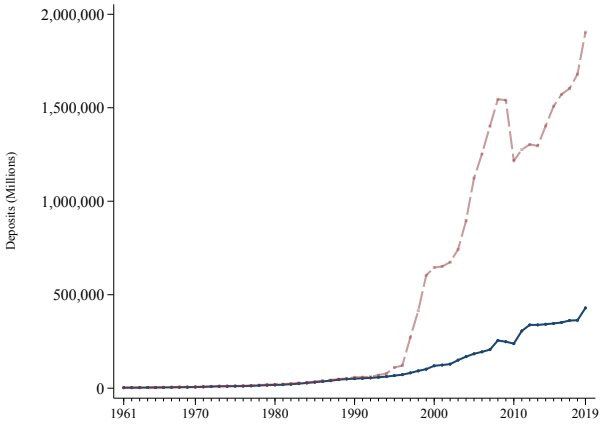
(g) Bank Loans (NY)



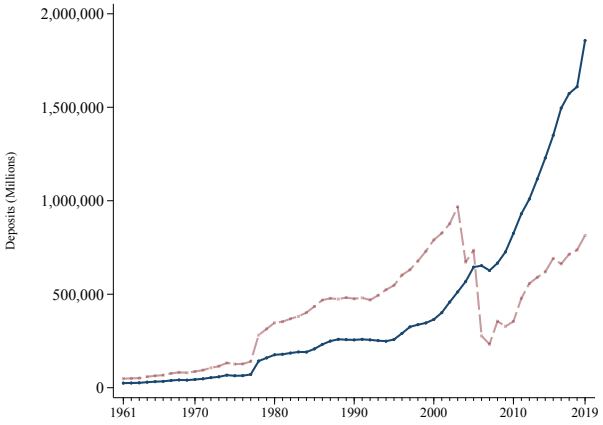
(h) Bank Loans (MA)



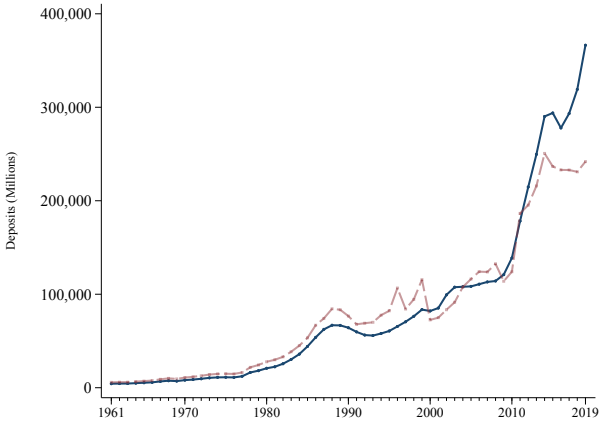
(i) Bank Deposits (IA)



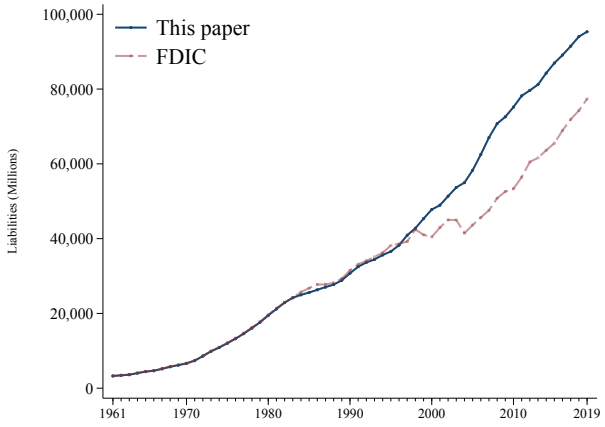
(j) Bank Deposits (NC)



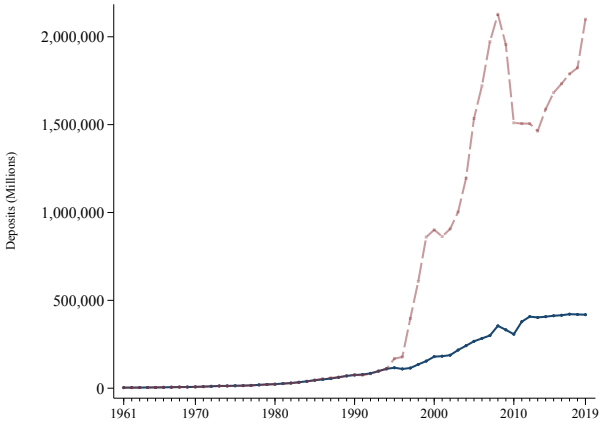
(k) Bank Deposits (NY)



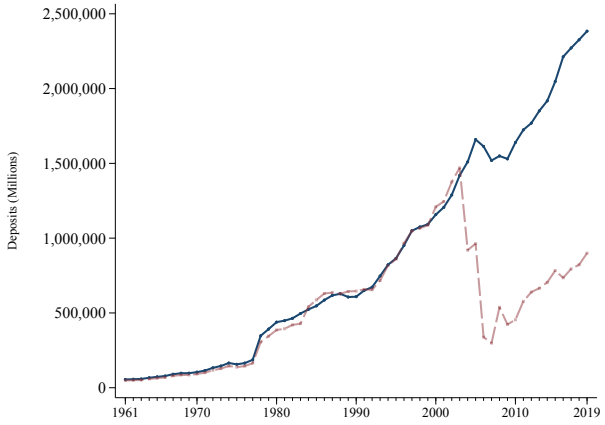
(l) Bank Deposits (MA)



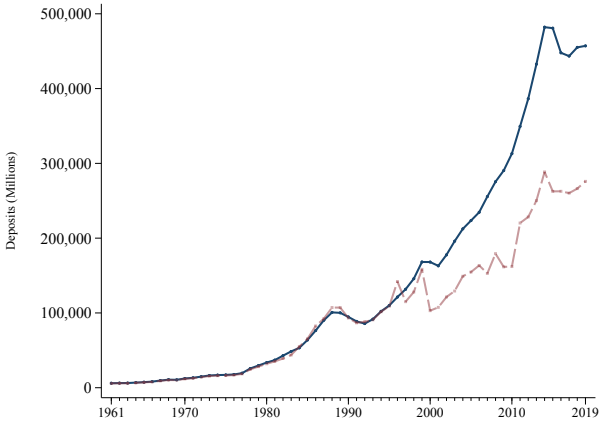
(m) Bank Liabilities (IA)



(n) Bank Liabilities (NC)



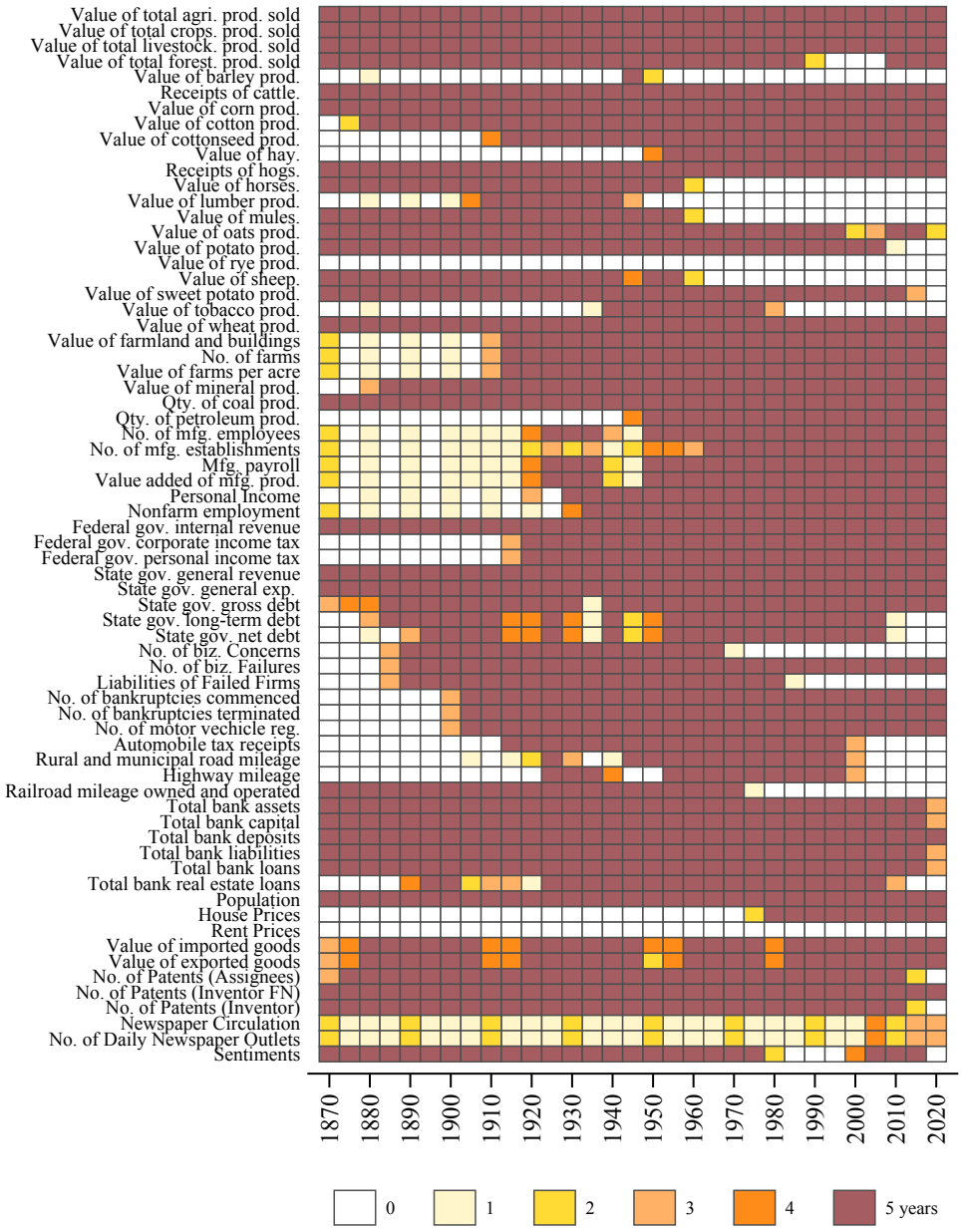
(o) Bank Liabilities (NY)



(p) Bank Liabilities (MA)

Notes: This figure validates our Bank Balance Sheet dataset ('This paper', 1961–2019) for selected states, against the dataset reported by the FDIC (FDIC, 1961–2019). Consistent across all three sources, we limit our sample to Commercial Banks. Consistent with our dataset, we define Total Liabilities to exclude Capital, and report Capital separately as the sum of Capital Stock, Surplus, and Undivided profits. As noted in the main text, our Bank Balance Sheet dataset differs from the FDIC data in that, post-1980 after banks were allowed to operate branches outside of their headquarter state, we use the SOD data to distribution multi-state bank's activities across the states where it operates. This is in contrast to the FDIC data which assigns all bank activities to the bank's headquarter state. This plot illustrates the benefits of this approach: For example, in North Carolina where Bank of America is headquartered, we observe that the FDIC reported data far exceeds that which is allocated to the state using deposit shares.

Figure 16: Availability of Historical State-Level Data – Alabama Example

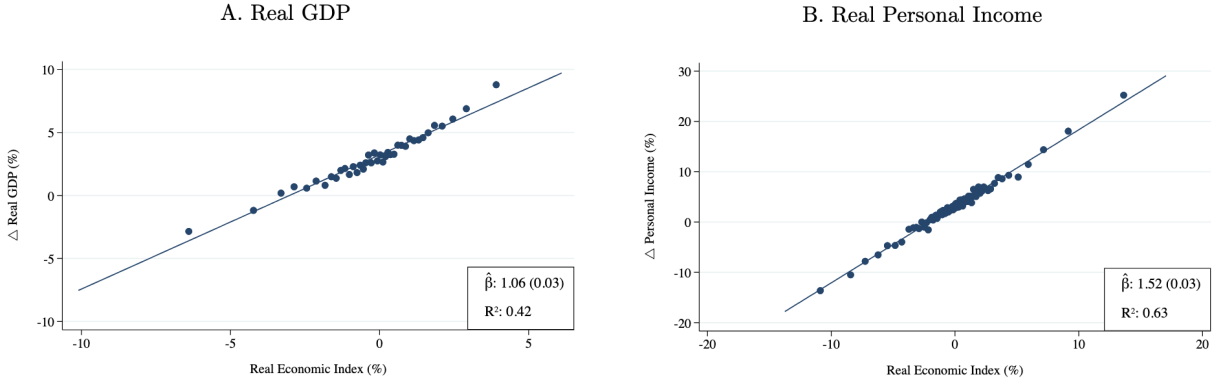


Notes: This figure visualizes the availability of each variable within our Hoon et al. (2025) dataset for Alabama, from 1870 to 2020. Each box represents a 5-year interval, with colors indicating the number of years for which data are available within that interval. The colors correspond to the following availability: 0, 1, 2, 3, 4, and 5 for data available in 1, 2, 3, 4, and 5 years within the interval, respectively. For more details, please refer to our companion paper Hoon et al. (2025).

Figure 17: Validation of State-Level Economic Activity Index

(a) Real GDP

(b) Real Personal Income



Notes: This figure presents binscatter plots of the estimated economic activity indices against alternative measures of state-level economic conditions. The number of bins is chosen using the rule-of-thumb bin selector of Cattaneo et al. (2024). Annual growth rates of state-level GDP (1964–2019) and personal income (1929–2019) are calculated as log differences. GDP and personal income data are from the BEA. For more details, please refer to our companion paper Hoon et al. (2025).