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Author(s): Andrew J. Jalil

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A New History of Banking Panics in the United States, 1825–1929: Construction and Implications[†]

By ANDREW J. JALIL*

There are two major problems in identifying the output effects of banking panics of the pre–Great Depression era. First, it is not clear when panics occurred because prior panic series differ in their identification of panic episodes. Second, establishing the direction of causality is tricky. This paper addresses these two problems (i) by deriving a new panic series for the 1825–1929 period and (ii) by studying the output effects of major banking panics via vector autoregression (VAR) and narrative-based methods. The new series has important implications for the history of financial panics in the United States. (JEL E32, E44, G21, N11, N12, N21, N22)

The general absence of banking panics in the United States since the Great Depression means that there are few modern day equivalents to the banking crisis of 2008. Indeed, in the midst of the crisis, there was a growing sense that the developing recession might more closely resemble the downturns of the nineteenth and early twentieth centuries that accompanied banking crises than the recessions of the postwar period. As one prominent observer noted, “this may be your great-great-grandfather’s recession.”¹

This paper conducts a rigorous empirical test of the macroeconomic effects of the banking panics of the pre-Great Depression era. Specifically, there are two main problems in identifying the macroeconomic effects of financial panics of this period. First, it is not clear when panics occurred because prior panic series—lists of when panics occurred—differ in their identification of panic episodes. Second, establishing the direction of causality is inherently difficult: are panics causing downturns or are downturns causing panics? This paper addresses these two major problems. To address the first problem, this paper derives a new series on banking panics for the pre-Great Depression era. To address the second problem, this paper studies the output effects of major banking panics via vector autoregression (VAR) and narrative-based methods. In the process, this paper creates a detailed chronology of banking panics in the United States before 1929—one that has important

* Department of Economics, Occidental College, 1600 Campus Road, Los Angeles, CA 90041 (e-mail: jalil@oxy.edu). I am indebted to J. Bradford DeLong, Barry Eichengreen, Martha Olney, Christina Romer, David Romer, and James Wilcox for their continuous guidance, advice, and support. I thank numerous seminar participants and the referees for helpful comments and suggestions and the staff at the American Antiquarian Society for research assistance. I gratefully acknowledge financial support from the Economic History Association.

[†] Go to <http://dx.doi.org/10.1257/mac.20130265> to visit the article page for additional materials and author disclosure statement(s) or to comment in the online discussion forum.

¹ Krugman, Paul, “Who’ll Stop the Pain?,” *New York Times*, Feb 19, 2009.

implications for our understanding of the causes, effects, and frequency of financial panics throughout US history.

Section I begins by asking: when did the financial panics of the pre-Great Depression era occur? I show that—perhaps, somewhat surprisingly—answering this question is not a straightforward task. I document nine leading panic series and demonstrate that each of these series would arrive at a different answer to this question. Some series document panics occurring at a rate of roughly 1 per year, whereas other series identify recurring periods of 10 to 20 years without a panic. Why do these series differ so dramatically? By studying each of the panic series on a case-by-case basis, I find that methodological problems behind the development of earlier series are the likely source of these extreme variations. Specifically, I find two common problems. First, many series do not explicitly define a panic, making it unclear exactly what kind of financial disturbance is being recorded. Second, most series do not adopt a systematic rule to identify panics over a specified period, raising the possibility that some panic episodes might be omitted or that nonpanic episodes might be mistakenly classified as panics.

Due to the numerous contradictions across these series and in light of these methodological concerns, I derive a new series on banking panics for the 1825–1929 period—one that rectifies many of the problems of earlier series. To identify banking panics, I adopt a systematic rule to search through more than 100 years of contemporary financial and economic newspapers. Section I outlines the algorithm I use to identify banking panics from the historical news record and develops a consistent set of criteria for classifying banking panics according to degree.

Section II presents the results of the new series and its implications. The new series on banking panics identifies 7 major banking panics, as well as 20 nonmajor banking panics. The new series has several main initial findings. First, using my new series and the accounts of contemporary observers contained in the historical news record, I discover that earlier series presented flawed lists of when panics occurred. Some series combined panics with other developments in financial markets, others failed to distinguish among different types of financial panics, and a few series even went so far as to mistakenly identify foreign banking panics as domestic ones. Second, contrary to the accepted wisdom in the literature, I find that there is no evidence of a decline in the frequency of financial panics during the first 15 years of the existence of the Federal Reserve. Previous studies used the Kemmerer series—a series that the analysis in this paper shows to be severely flawed—to document the pre-1914 frequency of panics, leading to spurious conclusions regarding the historical frequency of panics. Third, major banking panics displayed a strong seasonality prior to 1914, suggesting that stringencies in the money market may have made the financial system more vulnerable to panics during particular seasons.

Equipped with the new panic series, Section IIIA presents the empirical tests I conduct to identify the real output effects of major banking panics. I present the basic vector autoregression. The findings from the basic VAR indicate that banking panics cause output declines. I then restrict the VAR using additional evidence from the narrative record to isolate those panics that the reports of contemporary observers suggest were the result of idiosyncratic disturbances, as opposed to declining output conditions. The impulse response functions with these additional restrictions

are similar to those from the basic VAR. They indicate that major banking panics have large effects on output. Methodologically, this approach is similar to the work of Ramey (2011); Ramey and Shapiro (1998); and Romer and Romer (1989, 2004, 2010) who use narrative evidence to identify the effects of fiscal and monetary policy.² Lastly, I estimate a three-variable VAR with monthly data on output and prices. The results indicate that banking panics have rapid, large, and strongly negative effects on both output and prices.

Armed with a reliable listing of when panics occurred, Section IIIB then investigates three related macroeconomic issues. First, I investigate whether banking panics were a significant source of output volatility prior to the founding of the Federal Reserve. I find that nearly half of all business cycle downturns between 1825 and 1914 contained major banking panics. According to the estimates I derive in Section IIIA, banking panics have large output effects. Thus, even if banking panics did not initiate all of these downturns, they amplified them. These findings suggest that banking panics were a substantial source of economic instability throughout much of US history and that major banking panics either caused or amplified nearly half of all business cycle downturns between 1825 and 1914.

Second, I examine how downturns with major banking panics differed from downturns without major banking panics. I find that in the post-Civil War era, downturns with major banking panics were slightly longer and substantially more severe than downturns without major banking panics on average. In addition, output recoveries for downturns with major banking panics were both substantially longer (two-to-three times the length of output recoveries for downturns without them) and slower.

Third, I analyze the behavior of output in the aftermath of major banking panics. Following three of the four major banking panics of the post-Jacksonian period, output did not rapidly revert back to its prepanic trend. Moreover, following two of these panics, trend output growth declined substantially. These results support the growing consensus in the literature that banking crises can have highly persistent and lingering effects on output. They also reveal that the sluggish output growth the US economy has experienced in the aftermath of the Great Recession is consistent with the historical record.

I. Development of a New Series on Banking Panics

This section derives a new series on banking panics. I discuss the motivation for constructing a new series. I then provide a definition of financial panic—one that distinguishes among different types of financial panics—and describe the methodology I use to compile the new series on banking panics. In particular, I develop a clearly defined rule to identify banking panics from 1825 to 1929.

²In addition, other scholars who have recently used narrative evidence to empirically identify the effects of macroeconomic shocks include Richardson and Troost (2009); Carlson, Mitchener, and Richardson (2011); Hausman (2013); and Velde (2009). The early pioneers of the narrative approach are Friedman and Schwartz (1963).

TABLE 1—NINE PANIC SERIES, 1825–1929

Bordo-Wheelock banking panic 1825–1864	Thorp panic 1825–1864	Reinhart-Rogoff: Table A.3.1 banking crisis 1825–1864	Reinhart-Rogoff: Table A.4.1 banking crisis 1825–1864
<i>Panel A. 1825–1864</i>			
1825	1825	1825	Jan. 1825
1833	1833		
		1836	
1837	1837		1836–1838
1839	1839		
			March 1841
	1847		
1857	1857	1857	Aug. 1857 Dec. 1861 April 1864

(Continued)

A. Motivation

Scholars disagree on when financial panics occurred before the Great Depression. Table 1 presents nine different panic series from 1825–1929.³ A quick perusal of the table reveals that there is substantial disagreement across these series regarding the timing, incidence, and frequency of panics throughout US history.⁴

An understanding of when panics occurred is critical to studies on the real output effects and causes of panics.⁵ Why then do these panic series differ so dramatically? By analyzing the methodologies behind each of the nine panic series, I find that methodological problems behind the development of earlier series are the likely source of these extreme variations. Section A1 of the online Appendix to this paper describes the methodologies behind each of the nine panic series on a case-by-case basis. However, I find two common methodological problems. First, several series do not explicitly define a panic, making it unclear exactly what kind of financial

³As noted in Table 1, all of the series use the term panic, except for two, which use the term crisis.

⁴As an example, consider panel A in Table 1, which covers the period between 1825 and the end of the Civil War. The three series that span the 1825–1864 period—the Bordo-Wheelock, Thorp, and Reinhart-Rogoff series—identify 1825 and 1857 as either a US panic or crisis date. However, there is substantial disagreement regarding other episodes. The Bordo-Wheelock and Thorp series identify 1833 as a panic, while both versions of the Reinhart-Rogoff series omit 1833. The Bordo-Wheelock and Thorp series identify 1837 and 1839 as two distinct panics, while one version of the Reinhart-Rogoff series classifies 1836 as a banking crisis, whereas the other version identifies a crisis from 1836 to 1838. The Thorp series identifies 1847 as a panic, whereas the other series do not contain this episode. One version of the Reinhart-Rogoff series identifies December 1861 and April 1864 as banking crises, whereas the other series do not contain these episodes. Similar discrepancies, visible in panel B of Table 1, extend into the post Civil War period.

⁵For example, DeLong and Summers (1986) and Miron (1986) use different panic series to identify when panics occurred and as a result, arrive at contradictory conclusions regarding the output effects of financial panics of the predepression era. Using their panic series, DeLong and Summers (1986) compare the behavior of output surrounding panic periods with the behavior of output in nonpanic periods from 1890–1910. They conclude that no more than a small portion of the variance in output from 1890–1910 can be attributed to these panics and that as a consequence, panics did not have significant real output effects. However, Miron (1986) comes to a different conclusion using an alternate panic series—the Kemmerer series of major panics—for the 1890–1908 period—roughly the same period studied by DeLong and Summers. Miron notes that the average level of GNP growth almost doubles when panic years are excluded—a finding much more consistent with panics having real output effects.

TABLE 1—NINE PANIC SERIES, 1825–1929 (*Continued*)

Bordo-Wheelock banking panic 1865–1929	Thorp panic 1865–1925	Reinhart-Rogoff V1 banking crisis 1865–1929	Reinhart-Rogoff V2 banking crisis 1865–1929	Friedman-Schwartz banking panic 1867–1929
<i>Panel B. 1865–1929</i>				
1873	1873	1873	Sept. 1873	1873
1878 (financial distress)				
1884 (financial distress)		1884	May 1884	1884
1890 (financial distress)		1890	1890	1890
1893	1893			1893
			March 1907	
1907	1907	1907		1907
		1914	Jul. 1914	
1920s (financial distress)				
1929–1933		1929	1929–1933	
Gorton banking panic 1865–1914	Sprague crisis 1865–1910	Wicker banking panic 1865–1914	Kemmerer panic 1873–1908	DeLong-Summers panic 1890–1913
Sept. 1873	1873 (crisis)	Sept. 1873 (panic)	Sept. 1873 (major) April 1876 (minor) Nov. 1879 (minor) May–June 1880 (minor) March–April 1882 (minor) May 1884 (major)	
June 1884	1884 (panic)	May 1884 (incipient panic)	June 1887 (minor) March–April 1888 (minor) Nov. 1890 (major)	1890:4
Nov. 1890	1890 (financial stringency)	Nov. 1890 (incipient panic)	Feb. 1893 (minor) May–Aug. 1893 (major)	1893:2 and 1893:3
May 1893	1893 (crisis)	Jun.–Aug. 1893 (panic)	Sept.–Dec. 1895 (minor)	
Oct. 1896			June–July 1896 (minor) Dec. 1896 (minor) March 1898 (minor)	1896:1 1896:3
			Sept. 1899 (minor) Dec. 1899 (major) May 1901 (major) July 1901 (minor) Sept. 1901 (minor) Sept.–Nov. 1902 (minor) March–Aug. 1903 (major) Dec. 1904 (minor) April 1905 (minor)	1898:2 1899:4 1901:2
Oct. 1907	1907 (crisis)	Oct. 1907 (panic)	April–May 1906 (minor) Dec. 1906 (minor) March 1907 (minor) Oct. 1907 (major) Sept. 1908 (minor)	1903:2 1905:4 1907:4
Aug. 1914				1909:4

Notes: The series come from the following studies: (i) Bordo and Wheelock (1988), (ii) Thorp (1926), (iii) Reinhart and Rogoff (2009), (iv) Friedman and Schwartz (1963), (v) Gorton (1988), (vi) Sprague (1910), (vii) Wicker (2000), (viii) Kemmerer (1910), and (ix) DeLong and Summers (1986). Reinhart and Rogoff (2009) provide two versions of their series. They list one version in table A.3.1 and another version in table A.4.1. The two versions occasionally contradict one another. As a consequence, Table 1 reports both versions.

disturbance is being recorded. Second, most series do not adopt a systematic rule to identify panics, raising the possibility that some important panic episodes might be omitted or that nonpanic episodes might be mistakenly classified as panics.

As an illustrative example, consider the Kemmerer series. Kemmerer (1910) identified financial panics by reading the *Commercial and Financial Chronicle*, the leading economic newspaper of the late nineteenth and early twentieth century, from 1873 to 1908. He found 8 major and 21 minor panics. However, he provided almost no explanation for his methodology. He did not provide a clearly defined criterion for selecting major and minor panic episodes, nor did he provide a definition of panic. For the major panics, he chose periods that were “financial disturbances”⁶ without explaining what that term encompassed, and for minor panics, he did not provide any rationale for his selection process. Moreover, when describing his panics, Kemmerer wrote, “the word panic has been used here to cover several financial disturbances for which many would not use so strong a word, i.e., the disturbances of 1884, 1890, 1899, and 1901.”⁷ Furthermore, in a footnote, Kemmerer provided a cautionary message regarding the methodology he used to identify his minor panics, noting that such a list was created after “a rather hasty perusal of the [*Commercial and Financial*] *Chronicle*” and that “this list is probably not complete, and there may be room for doubt as to the inclusion of some of the dates mentioned.”⁸ Thus, the Kemmerer series neither explicitly defines a panic nor adopts a systematic rule to identify panics. Similar concerns—documented in the online Appendix—pertain to other panic series.

The numerous contradictions across these series, alongside these methodological concerns, motivate the case for constructing a new panic series. Moreover, the development of a new, consistent panic series is more than an important exercise in taxonomy; it will serve as a crucial tool for analyzing the causes, effects, and frequency of panics throughout US history.

B. Definition of Financial Panic

A financial panic occurs when fear prompts a widespread run by private agents in financial markets, i.e., a run to convert deposits into currency (a banking panic), sell stocks in equity markets (a stock market panic), or dispose of currency in foreign exchange markets (a currency panic). My definition of financial panic distinguishes among these three different types of financial panics: banking, stock market, and currency panics. A banking panic occurs when there is an increase in the demand for currency relative to deposits that sparks bank runs and bank suspensions. A stock market panic occurs when there is a rush to liquidate stocks in equity markets, resulting in sharp declines in stock prices. A currency panic occurs when agents sell currency in foreign exchange markets out of fears of devaluation. In developing a new panic series, however, I restrict attention to one type of financial panic: banking

⁶Source: Kemmerer (1910, 223).

⁷Source: Kemmerer (1910, 223).

⁸Source: Kemmerer (1910, 223).

panics. I leave the development of a series on stock market or currency panics for later work.⁹

The definition that I employ for a banking panic builds on the classic Diamond-Dybvig (1983) framework. In the Diamond-Dybvig formulation, banks play an explicit crucial role in an economy: banks permit investors to maintain liquid, short-term assets, while channeling those funds to finance illiquid, long-term projects. In their model, a panic arises when fear of bank failures induces depositors to run to convert deposits into currency.¹⁰

C. Identifying Banking Panics

Quantitative sources are not sufficient to identify banking panics. Consistent data series on bank suspensions and failures are not readily available throughout much of the nineteenth century. Beginning in 1865, a consistent series on national bank failures—provided by the Comptroller of the Currency—exists. However, the Comptroller's series is available at a yearly frequency, making it difficult to determine whether bank failures were clustered together—as would be the case in a banking panic—or whether they were spread out over the course of a year. Furthermore, even if one were to overlook this shortcoming, the Comptroller's series on national bank failures omits state banks, private banks, and trust companies, making the series unrepresentative of the overall banking system.¹¹ Lastly, data on bank failures or suspensions, by itself, does not reveal whether there was a panic by depositors since a cluster of bank suspensions or failures can occur without runs by depositors.

To overcome these limitations, I employ other sources to identify banking panics: financial and economic newspapers from the nineteenth and early twentieth centuries. The press of that era devoted substantial resources to covering banking panics. Incidents of bank runs, suspensions, and failures were regularly reported in contemporary newspapers, regardless of place of origin. Indeed, disturbances occurring in the less-populated regions of the interior as well as those occurring in more populated urban centers received significant attention by the press. Consequently, contemporary newspapers contain a detailed record of when and where banking panics occurred.

Therefore, to identify banking panics, I utilize contemporary newspapers. In particular, I use three newspapers: the *Niles Weekly Register*, the *Merchants' Magazine and Commercial Review*, and the *Commercial and Financial Chronicle*. These three newspapers were among the leading economic and financial newspapers of their day.

⁹In a classic essay, Schwartz (1987) describes financial crises as either real or pseudo. According to Schwartz, real financial crises develop when the banking system experiences a crisis. By contrast, Schwartz describes all other financial disturbances—e.g., declines in asset prices of equity stocks, depreciation of a national currency—as pseudo crises. My decision to focus on banking panics and to distinguish among different types of financial panics is motivated, in part, by her work.

¹⁰Specifically, the susceptibility to runs occurs because there are multiple equilibria with varying degrees of confidence. For other models of financial panics, see Jacklin and Bhattacharya (1988); Morris and Shin (1998, 2001); and Lucas and Stokey (2011).

¹¹Grossman (1993) reports that the Comptroller of the Currency provides a series on both national and state bank failures. Due to regular inspections and uniform reporting rules, the comptroller provides consistent and detailed information on national banks. However, the same level of consistency in reporting did not apply to state banks.

Most importantly, they provided detailed coverage of developments in the banking sector, with special attention placed to reporting incidents of bank runs, suspensions, and failures. I use the *Niles Weekly Register* for the period 1825 to 1849, the *Merchants' Magazine and Commercial Review* for the period 1842 to 1869, and the *Commercial and Financial Chronicle* for the period 1865 to 1929.¹² These newspapers were printed on a regular basis and were bound in volumes for preservation.¹³

The bound volumes of all three newspapers contain index pages. The index pages provide detailed lists of specific information found in each volume, arranged alphabetically. Each item listed in the index is matched to its respective page number, permitting readers to quickly identify its precise location in the volume. Of particular importance, the index pages provide information regarding banking panics. Reports of bank runs, suspensions, and failures, along with general entries for banking panics and financial crises are listed in the index pages.¹⁴

Since the index pages of these newspapers provide comprehensive lists of economic, financial, and banking news, a careful scanning of these pages locates banking panics reported in the *Niles Weekly Register*, the *Merchants' Magazine and Commercial Review*, and the *Commercial and Financial Chronicle*. Therefore, to identify banking panics, I read the index pages of these newspapers—from 1825 to 1929—for key terms that are likely to signal a banking panic. In particular, I search for any of the following terms: bank failure, bank suspension, bank run, bank closure, bank crisis, bank panic, bank disturbance, crash, crisis, financial crisis, financial disturbance, financial revulsion, panic, revulsion, run, suspension, suspension of payments, and suspension of specie payments.¹⁵ When I find one of these terms in an index page, I read the referenced article to see if any bank runs, suspensions, or failures occurred.¹⁶

Since a banking panic occurs when there is a loss of depositor confidence that sparks runs on financial institutions and bank suspensions, I identify banking panics

¹²The *Merchants' Magazine and Commercial Review* was first published in July 1839, but it did not contain the "Monthly Commercial Chronicle" section—the key section that covered contemporaneous economic news—until April 1842. During its early years, from July 1839 until March 1842, The *Merchants' Magazine and Commercial Review* devoted little coverage to current news.

¹³The *Niles Weekly Register* and the *Commercial and Financial Chronicle* were published on a weekly basis, and the *Merchants' Magazine and Commercial Review* on a monthly basis. Editions of the *Niles Weekly Register* and the *Merchants' Magazine and Commercial Review* were bound in six-month volumes. Editions of the *Commercial and Financial Chronicle* were bound in six-month volumes from 1865 to 1916 and three-month volumes from 1917 to 1929.

¹⁴The index pages are consistent over the 1825 to 1929 period in that they report incidents of bank runs, suspensions, and failures. However, the structure of these index pages changed somewhat over time and across different newspapers. For example, the *Merchants' Magazine and Commercial Review* split its listing of articles into an index page and a contents page. Even though it is not officially labeled an index page, the contents page serves in that capacity and consequently, I treat it as such. Also, the *Commercial and Financial Chronicle* split its index into several different categories that varied across years.

¹⁵In compiling this list, I chose words that describe key features of banking panics—failure, suspension, run, crisis, panic, disturbance, crash. One of the terms—revulsion—was widely used in the nineteenth century to denote financial panics even though it has fallen out of use today. Moreover, in scanning the index pages for key terms, I take into consideration the possibility of a rearrangement of words. For example, suspension of payments could be listed as "payments, suspension of" and suspension of specie payments could be listed as "specie payments, suspension of."

¹⁶To facilitate the process, the index pages of all three newspapers are alphabetical. The contents page of the *Merchants' Magazine and Commercial Review* is chronological, and as a consequence, I read every entry. One of the index pages contained in the *Commercial and Financial Chronicle*—the Current Events and Discussion Page—is alphabetical, but occasionally it listed banking panics under region; therefore, I read every entry.

in these newspaper articles by the occurrence of a cluster of bank suspensions and runs.¹⁷ The presence of both runs and suspensions is a necessary criterion. A wave of bank suspensions without runs would not be classified as a banking panic because a key feature of a banking panic is a rush by depositors to convert deposits into currency. Similarly, runs on institutions that did not produce bank suspensions would not be classified as a banking panic.¹⁸

Moreover, to separate isolated bank runs and suspensions from banking panics, which are more generalized disturbances that extend beyond the confines of individual bank-specific problems, I identify banking panics by a cluster of bank suspensions and runs. To avoid any ambiguity, I define a cluster as three or more banks. In addition, for a bank run or suspension to be treated as part of a cluster, the report containing the bank run or suspension must contain a reference to other bank runs or suspensions or there must be reports of a general panic. This avoids classifying scattered, unconnected bank runs and suspensions as a cluster. Lastly, to partition banking panics, I implement the following rule: a panic ends if there are no reports of any bank runs or suspensions for one full calendar month.

D. Scaling Banking Panics

To reflect varying degrees, I classify each banking panic as major or nonmajor. A banking panic is classified as major if it meets two conditions: (i) it spans more than one geographic unit, and (ii) it appears on the front page of the newspaper. All other banking panics are classified as nonmajor. I define a geographic unit as a state and its bordering states. For example, bank runs and suspensions that occur in Ohio, Indiana, and Illinois would be contained in one geographic unit, whereas bank runs and suspensions that occur in Ohio, Indiana, Illinois, and Pennsylvania would not be contained in one geographic unit.

Scaling banking panics according to geographic extent serves two useful purposes. First, it separates more localized disturbances from more widespread disturbances. A banking panic that occurs in one part of the country, but does not spread to other regions would seem to be a more minor disturbance than a banking panic that involves a generalized loss of depositor confidence throughout many parts of the nation. Separating more localized disturbances from more widespread disturbances clarifies the degree of the panic. Second, geographic extent is measurable and hence, not susceptible to personal discretion. Given the lack of bank-specific data throughout the 1800s, geographic extent provides a measurable criterion for classifying panics according to degree.

¹⁷In searching through the historical news record, I adopt a very inclusive framework for what constitutes a bank. For example, I include commercial banks (national banks, incorporated state banks, loan and trust companies, stock savings banks, and unincorporated or private banks) and mutual savings banks. If the newspaper reports indicate that a financial institution was the subject of a run, then I treat that institution as a bank. Since many different types of banking institutions existed in the nineteenth and early twentieth centuries, it is crucial that I adopt a very inclusive framework for what constitutes a bank.

¹⁸The newspapers do not need to use the word “run” if the action is described in other terms. For example, “heavy withdrawals” or “a depletion of reserves by depositors”—alternative ways of describing a sharp increased demand for currency by depositors—would be considered runs.

However, scaling banking panics according to geographic extent is not a flawless measure of degree. It is entirely plausible that a banking panic could have spanned more than one geographic unit, but have remained a minor disturbance. Consider for example, a banking panic that spanned more than one geographic unit, but that remained confined to a few states with small banking sectors. While such a disturbance might have seriously affected the local economies of those states, a panic of that nature might have been a minor disturbance from the perspective of the overall banking system. To overcome this potential problem, I require that all major banking panics be reported on the front page of the newspaper—the *Niles Weekly Register* for 1825–1849, the *Merchants' Magazine and Commercial Review* for 1842–1879, and the *Commercial and Financial Chronicle* for 1865–1929—to ensure that only the most serious episodes of banking distress are classified as major banking panics.¹⁹

II. The New Panic Series and Its Implications

This section describes the new series on banking panics and presents its implications. I begin by documenting the incidence of banking panics between 1825 and 1929. I then assess the reliability of earlier series by comparing them to my new series and by reading contemporary news reports surrounding every panic episode on all nine series. Next, equipped with my new series, I examine the movements in equity prices and commercial paper rates during banking panics, the historical frequency of banking panics, the seasonality of banking panics prior to 1914, and the relationship between banking panics and economic downturns.

A. Results

Table 2 presents the new banking panic series. The new series identifies 7 major banking panics and 20 nonmajor banking panics between 1825 and 1929. The major banking panics were nationwide in scope, whereas the nonmajor banking panics were, in general, much more localized disturbances.²⁰ Moreover, while all of the major banking panic episodes from the new series are noted in at least one

¹⁹By front page, I refer to the first page of the newspaper, with the exception of index or contents pages. If the first page of the newspaper is an index or contents page, then I treat the first page following the index or contents page as the front page. One concern with using the front page of the newspaper is that a panic may be more likely to appear on the front page, and thus, may be more likely to be classified as major in periods when more than one newspaper was in operation (1842–1849 and 1865–1879). However, as I document in Section IIA, the classification does not depend on which news source is used in these overlapping periods.

²⁰The Table in Section A2 of the online Appendix provides a detailed breakdown of the geographic reach of each of the panics. Because I provide detailed information on the geographic extent of each of these panics, a more continuous ranking (beyond the simple major versus nonmajor classification adopted by this paper) could be generated. For example, it would be relatively straightforward to divide the number of states afflicted during a panic by the number of states in existence (since the number of states increased dramatically between 1825 and 1929) as a means of ranking panics along a more continuous scale. This methodology would still rank the seven major panics as among the most severe disturbances (since they were nationwide), whereas the other panics—the nonmajor panics—were more localized disturbances and thus, would be ranked as less severe. The only two exceptions are the nonmajor panics of November 1860 and December 1861, which involved generalized suspensions of specie payments during the Civil War, and thus, reflected a different set of circumstances from the other nonmajor panics of this period.

TABLE 2—NEW SERIES ON BANKING PANICS, 1825–1929

Major banking panic	Nonmajor banking panic
Nov. 1833–Apr. 1834	
Mar.–May 1837	
Oct. 1839	Jan.–April 1841 (Pennsylvania, Delaware, Maryland, North Carolina, Virginia, Illinois)
	March 1842 (Pennsylvania)
	May–June 1842 (New Orleans)
	Oct. 1851 (New York, New Jersey, Maryland)
	Sept. 1854–Feb. 1855 (Ohio, Indiana, Michigan, Wisconsin, Iowa, Missouri, New York, California)
Aug.–Oct. 1857	Nov. 1860 (suspension of specie payments by banks in the South)
	Dec. 1861 (generalized suspension of specie payments)
Sep. 1873	
	May 1884 (New York City, Pennsylvania, New Jersey)
	Nov. 1890 (New York City)
May–Aug. 1893	
	Dec. 1896 (Illinois, Minnesota, Wisconsin)
	Dec. 1899 (Boston and New York City)
	June–July 1901 (New York: Buffalo and New York City)
	Oct. 1903 (Pennsylvania, Maryland)
	Dec. 1905 (Chicago)
Oct.–Nov. 1907	
	Jan. 1908 (New York City)
	Aug.–Sept. 1920 (Boston)
	Nov. 1920–Feb. 1921 (North Dakota)
	July 1926 (Florida, Georgia)
	March 1927 (Florida)
	Jul.–Aug. 1929 (Florida)

earlier series, 13 of the 20 nonmajor banking panics are not listed in any of the earlier series.²¹

Descriptions of each of these banking panics—with citations to the contemporary news articles reporting them—are contained in the companion online Appendix to this paper. Section A2 of the online Appendix provides the complete documentation of the historical news sources reporting the panics in the new series. Section A5 provides a narrative description of each of the nonmajor banking panics, and Sections A6 and A7 provide a narrative description of each of the major banking panics. Due to space constraints, I include the detailed narrative information in the online Appendix. However, I encourage interested readers to read the companion online Appendix for a detailed exposition of each panic.²²

²¹ Because I am using three different newspapers over the 1825 to 1929 period, a useful check to make sure that the reporting is consistent across newspapers is to see if different newspapers in overlapping periods—periods in which more than one newspaper was in operation—identify the same banking panics. There are two overlapping periods: (i) April 1842 to 1849 (*Niles Weekly Register* and *Merchants' Magazine*) and (ii) 1865 to 1869 (*Merchants' Magazine* and *Commercial and Financial Chronicle*). In the two overlapping periods, I arrive at the same results, regardless of which newspaper I use. Between April 1842 and 1849, both the *Niles Weekly Register* and the *Merchants' Magazine* identify just one banking panic: the banking panic in New Orleans in 1842. Between 1865 and 1869, the *Merchants' Magazine* and the *Chronicle* do not identify any banking panics.

²² This paper develops a consistent methodology to identify banking panics in the century before the Great Depression. In the process, I discover many localized banking panics not contained in any of the earlier series. Yet, I cannot make the claim that this methodology identifies every localized banking panic between 1825 and 1929. Though the financial and economic press devoted substantial resources to reporting incidents of bank runs, suspensions, and failures throughout the country, including in the less-populated regions of the interior, it may

TABLE 3—COMPARISON OF EARLIER SERIES WITH NEW SERIES

Bordo-Wheelock 1825–1864	Thorp 1825–1864	Reinhart-Rogoff: A.3.1 1825–1864	Reinhart-Rogoff: A.4.1 1825–1864	New series (major) 1825–1864	New series (minor) 1825–1864
<i>Panel A. 1825–1864</i>					
1825	1825	1825	Jan. 1825		
1833	1833			Nov. 1833–Apr. 1834	
		1836			
1837	1837		1836–1838	Mar.–May 1837	
1839	1839			Oct. 1839	
			March 1841		Jan.–April 1841 Mar. 1842 May–June 1842
	1847				October 1851 Sept. 1854–Apr. 1855
1857	1857	1857	Aug. 1857	Aug.–Oct. 1857	Nov. 1860 Dec. 1861
			Dec. 1861 April 1864		

(Continued)

B. Inconsistencies in Earlier Series

A comparison of my new series with earlier series reveals major inconsistencies in some of the earlier series. Some series combined panics with other developments in financial markets. Others failed to distinguish among different types of financial panics. A few series even went so far as to incorrectly identify foreign banking panics as domestic ones.

To demonstrate this, consider Table 3, which presents the new series on banking panics alongside the nine earlier series for the period 1825–1929. This is a particularly useful comparison since five of the panic series—Bordo-Wheelock, Reinhart-Rogoff, Friedman-Schwartz, Gorton, and Wicker—explicitly refer to themselves as series on banking panics or banking crises. Entries with strikes are panic episodes noted in one of the earlier panic series that are not included in the new series on banking panics. These episodes do not contain banking panics. To verify this, I read the contemporary news reports surrounding each of these episodes. I consider a few of these episodes below as illustrative examples (1825, 1847, and Kemmerer’s panics), but reserve a full blow-by-blow description of additional episodes for interested readers in the online Appendix (see Section A3).

1825 and 1847.—In both 1825 and 1847, a banking panic occurred in England—not in the United States. The Bordo-Wheelock, Thorp, and Reinhart-Rogoff series list 1825 as either a US panic or crisis date and the Thorp series lists 1847 as a US

indeed be possible that some local panics did not make it into the national news sources that I examine. The methodology adopted in this paper—of examining contemporaneous historical news sources to identify clusters of bank runs, suspensions, and failures—could be extended in future research to a range of local news sources, as a means of determining whether other localized banking panics occurred throughout this period. For example, a recent study by Davison and Ramirez (2014), modeled in this spirit, finds additional localized banking panics in the 1920s using an extensive set of nine newspapers from 1921–1929. This suggests that increasing the number of news sources may locate additional banking panics. Future research, examining a larger array of news sources, may very well be helpful in identifying additional local banking panics for the 1825–1929 period.

panic date. While serious banking panics did occur, they were confined to England in both cases. The reporting of the *Niles Weekly Register* in 1825 contains only a few reports of isolated bank failures in the United States and the reporting of the *Merchants' Magazine and Commercial Review* in 1847 does not contain any accounts of bank runs, suspensions, or failures in the United States. There was no generalized panic in the United States in either year.

Twenty-One Kemmerer Panics.—More than two-thirds of Kemmerer's panic episodes do not contain banking panics. Eight of the 29 Kemmerer panic episodes contain banking panics—September 1873, May 1884, November 1890, May–August 1893, December 1896, December 1899, July 1901, and October 1907—whereas the remaining 21 do not contain banking panics. To verify this, I read the *Commercial and Financial Chronicle*—Kemmerer's source in identifying panics—during all of Kemmerer's panic episodes. Since no banking panics occurred, why did Kemmerer classify these 21 episodes as panics? A reading of the *Chronicle* provides a hint: many of Kemmerer's episodes coincided with reports of instability in the stock market. This raises the possibility that Kemmerer combined banking panics with stock market disturbances in one series or that Kemmerer's panic series was intended to serve as a series on stock market panics, with these eight banking panic episodes simply coinciding with stock market panics. However, because Kemmerer never clearly explained what kind of financial disturbance he included as a panic, it is unclear which of these two interpretations most accurately applies to his series. Moreover, even if Kemmerer had intended his series as a series on stock market panics, it is unlikely that he constructed it in a consistent way. Kemmerer relied on the reporting of the *Chronicle*—rather than on stock market indices or other quantitative evidence—to identify his episodes. Deciphering the magnitude of declines in stock prices or the magnitude of instability in stock markets from the qualitative reporting of the *Chronicle* is likely to be highly unreliable. This might, in part, explain the cautionary messages—outlined in Section IA—that Kemmerer provided regarding the accuracy of his series.

C. Relationship with the Stock Market and Commercial Paper Rates

Equipped with this new series, I am able to examine the movements in stock prices and in the commercial paper rate during banking panics. To do this, I use two series: the Cowles Commission and Standard and Poor's Corporation Stock Index, available beginning in 1871, and a commercial paper rate series, available beginning in 1857.²³ Stock prices decline dramatically during each of the major banking panics since 1871. The stock index declines by 15.7 percent during the Panic of 1873, 22.9 percent during the Panic of 1893, and 15.9 percent during the Panic of 1907. In addition, the commercial paper rate increases during each of the major banking panics, though the magnitude varies dramatically. The commercial paper

²³Source: NBER macrohistory series m11025a (US Index of All Common Stock Prices, Cowles Commission, and Standard and Poor's Corporation) and m13002 (US Commercial Paper Rates). Both series are available at a monthly frequency.

TABLE 4—FREQUENCY OF BANKING PANICS

	Pre-Fed (1825–1914)	Post-Fed (1914–1929)
Major	One every 12.9 years (median number years separating panics = 16)	No major banking panics between 1914 and 1929 (next one occurs in 1930, 16 years after 1914)
Nonmajor	One every 6 years	One every 3.5 years

rate increases by 15.5 percentage points during the Panic of 1857, 9.44 percentage points during the Panic of 1873, 4.85 percentage points during the Panic of 1893, and 1.02 percentage points during the Panic of 1907.²⁴ For the nonmajor banking panics, however, there is no clear systematic relationship with declines in the stock market or increases in the commercial paper rate. The stock index declines in seven nonmajor banking panics and increases in the remaining six. Moreover, for most of the nonmajor banking panics, the change in the commercial paper is small, below 1 percentage point. (See Section A4 of the online Appendix for the movements in stock prices and the commercial paper rate surrounding each banking panic.)

D. Frequency of Banking Panics

Table 4 presents the frequency of banking panics implied by the new series. Frequencies are calculated by dividing number of years by number of panics. To differentiate the pre-Federal Reserve era from the post-Federal Reserve era, I calculate pre-1914 and 1914 to 1929 frequencies.

Before 1914, major banking panics occurred at a rate of 1 every 12.9 years and nonmajor banking panics occurred at a rate of 1 every 6 years. It should be noted, however, that the occurrence of three major banking panics during the 1830s increases the rate of major banking panics—by contrast, the median number of years separating major banking panics is 16. Between 1914 and 1929, nonmajor banking panics occurred at a rate of 1 every 3.5 years. No major banking panics occurred between 1914 and 1929.

These findings differ in substantive ways from the orthodox view in the literature. The conventional wisdom on the historical frequency of panics is that the frequency of panics was high before 1914 and that the frequency dramatically decreased between 1914 and 1929—that is, during the first 15 years of the existence of the Federal Reserve. However, these claims originate with Miron (1986), who used the Kemmerer series to document the incidence of panics prior to 1914. Between 1890 and 1908, Kemmerer identified 6 major panics, leading Miron to conclude that before the founding of the Fed, the probability of having a major panic in a given year was 0.316, and that major panics occurred at a rate of roughly 1 every 3 years. If minor panics are included, then the rate—according to Miron—increases to more than one panic per year.²⁵ By contrast, Miron then claims that between 1915 and

²⁴ These calculations reflect the change from July to October 1857, August to October 1873, April to August 1893, and September to November 1907.

²⁵ Miron writes, “If only major panics are included, the frequency was slightly more than one every three years. Including minor panics raises the frequency to more than one per year” (Miron 1986, 131).

1929, the banking system did not experience any financial panics.²⁶ Using the pre-1914 frequency of major panics derived from the Kemmerer series, Miron calculates that the probability of going 14 years—from 1915 to 1929—without a major panic was 0.005. On the basis of this evidence, Miron concludes that the Federal Reserve's policies of furnishing an elastic currency—one that could expand during seasons of high money demand and contract during seasons of low money demand—strengthened the nation's banking system to ward off panics, resulting in a dramatic reduction in the frequency of panics between 1914 and 1929. This claim has subsequently been picked up by others and is now widely circulated in the literature.²⁷

However, Miron's claims hinge on an unreliable panic series, the Kemmerer series. According to my new series on banking panics, it was not uncommon for 15 consecutive years to elapse without a major panic. Eighteen years separated the major banking panics of 1839 and 1857, 16 years separated the major banking panics of 1857 and 1873, 20 years separated the major banking panics of 1873 and 1893, and 14 years separated the major banking panics of 1893 and 1907. Moreover, the median number of years separating major banking panics between 1825 and 1914 was 16. Therefore, the absence of a major panic for 15 consecutive years—from 1914 to 1929—provides no support for the claim that the frequency of panics decreased during the first 15 years of the existence of the Federal Reserve.²⁸ Prior to 1914, recurring periods of 14 to 20 years without a major banking panic were the norm.

E. Seasonality of Major Banking Panics

An additional result of the new series is the seasonality of major banking panics. Consider Table 5, which documents the seasonality of banking panics before the founding of the Federal Reserve. There is a strong tendency for major banking panics of this era to break out during the fall or spring. Six of the 7 major banking panics—or 86 percent—began in a fall or spring month. Four broke out during the fall—the Panic of 1833 (November), the Panic of 1839 (October), the Panic of 1873 (September), and the Panic of 1907 (October)—and two broke out during the spring—the Panic of 1837 (March) and the Panic of 1893 (May). The sole exception—the Panic of 1857—began during the last week of August, but became more intense during the fall months of September and October. Thus, there is strong evidence that major banking panics were more likely to occur during particular seasons: six of the seven major banking panics began during the spring or fall. These findings lend credence to the view that before the founding of the Fed, seasonal stringencies

²⁶“Between 1915 and 1933, the banking system experienced financial panics only during the subperiod 1929–33” (Miron 1986, 131).

²⁷For example, Meltzer (2003, 9), in his *History of the Federal Reserve*, writes “In the 1920s, the Federal Reserve received credit for improving economic performance ... Although the economy continued to experience relatively large cyclical fluctuations and many banks failed, old style financial panics did not return in the three recessions from 1920 through 1927.” Bordo (1989, 40) also notes that, “financial panics in the United States before 1914 generally occurred at seasonal peaks in nominal interest rates ... After 1914, however, the Fed extended reserve bank credit to accommodate seasonal credit demands, thereby considerably reducing the amplitude of the seasonal interest rate cycle and preventing any panics from occurring between 1914 and 1929.”

²⁸The next major banking panic—the first one of the Great Depression—occurred in 1930, sixteen years after the founding of the Fed.

TABLE 5—SEASONALITY OF BANKING PANICS

	Major	Nonmajor
<i>Distribution of panics by starting months</i>		
Spring		
March	1	1
April	1	0
May	0	2
Summer		
June	0	1
July	0	0
August	1	0
Fall		
September	1	1
October	2	2
November	1	2
Winter		
December	0	4
January	0	2
February	0	0
Percentage spring and fall	85.7	53.3
Percentage summer and winter	14.3	46.7

Note: The table records panics, according to the month of outbreak.

in the money market made financial panics more likely to occur during particular seasons. By extension, they also suggest that policies designed to eliminate seasonal stringencies in the money market—such as the establishment of an elastic currency after the founding of the Fed—might have had a stabilizing influence on the nation's banking system.²⁹ In this sense, these findings support the broad conclusions of Miron (1986), who argued that financial panics of the pre-Federal Reserve era were more likely to have occurred during particular seasons.³⁰

F. Correlation with Downturns

A final trend that merits attention is the strong correlation between major banking panics and downturns. Table 6 presents the behavior of the Davis Index of Industrial Production surrounding every major banking panic between 1825 and 1914. The

²⁹ Nonmajor banking panics were not more likely to occur during the fall or spring: 53 percent broke out during the fall or spring, whereas 47 percent broke out during the summer or winter. This absence of a seasonal effect for nonmajor banking panics is noteworthy. To be sure, some of the nonmajor panics in the new series (e.g., Dec. 1899, Dec. 1905, Jan. 1908) occurred in nonagricultural areas, which may partially explain this finding. Nonetheless, one potential explanation is that if shocks occur randomly throughout the year, localized panics may occur anytime, but the likelihood that a localized panic will develop into a full-scale panic may be heightened during seasons when the banking system as a whole is under greater monetary strain (i.e., during the fall or spring). This may explain the observed difference in seasonality between major and nonmajor panics. Future research is needed to identify whether this is the case.

³⁰ Even though it was noted in the previous subsection that there is no evidence of a decline in the frequency of panics during the first 15 years of the existence of the Federal Reserve, the policies of the Federal Reserve—such as the establishment of an elastic currency—still might have helped strengthen the nation's banking system to ward off panics. The true counterfactual—the incidence of panics from 1914 to 1929 without the Federal Reserve's policies—is unobservable. However, the general tendency of major banking panics to occur during those seasons characterized by stringent monetary conditions before 1914 suggests that the establishment of an elastic currency following the founding of the Federal Reserve might have helped stabilize the country's banking system.

TABLE 6—MAJOR PANICS AND DOWNTURNS

Panic	Percent change in Davis Index from peak to trough
1833	−4.5 percent from 1833 to 1834
1837	−1.4 percent from 1837 to 1838
1839	−4.7 percent from 1839 to 1840
1857	−8.0 percent from 1856 to 1858
1873	−6.0 percent from 1873 to 1875
1893	−15.3 percent from 1892 to 1894
1907	−15.6 percent from 1907 to 1909

Source: The Davis Index of Industrial Production comes from Davis (2004).

Davis Index is the only consistent output series that spans the entire pre-WWI US economy. Davis (2004) used 43 quantity-based annual series in the mining and manufacturing sectors to compile his index. According to Davis, these series “indirectly represent close to 90 percent of the value added produced by the US industrial sector during the nineteenth century.”³¹ Consequently, it serves as a reliable measure of real economic activity. Its chief limitation is that it is available at only a yearly frequency.

Table 6 shows that the Davis index declines surrounding each panic episode. The table displays the percentage change in output from peak to trough. The correlation between major banking panics and downturns is clear.

However, the existence of a correlation between panics and downturns does not prove that panics have real output effects since panics might be consequences—rather than causes—of downturns. Mitchell (1941) and Fels (1959) provide the main articulation of this hypothesis. They argue that major recessions cause banking panics. During downturns, business failures and declining fundamentals cause depositors to become alarmed that banks will suspend or fail. This precipitates a run to convert deposits into currency, thereby generating a panic. Under this specification, it would be misleading to attribute output declines to panics since panics would be products of downturns rather than causes. Therefore, to identify the output effects of panics, stronger evidence is required.

III. The Macroeconomic Effects of Banking Panics

Equipped with the new panic series, this section empirically examines the macroeconomic effects of the major banking panics of the pre-Great Depression era. The main problem in identifying the output effects of panics is the possibility that panics might be consequences—rather than causes—of downturns. To overcome this problem, Section IIIA studies the output effects of major banking panics via VAR/narrative-based methods. Part 1 presents the baseline VAR estimated using annual data. Part 2 then restricts the VAR using additional evidence from the narrative record to isolate those panics that the reports of contemporary observers suggest were the result of idiosyncratic disturbances, as opposed to declining output conditions. Part 3

³¹Davis (2004, 1179).

presents a VAR estimated using monthly data on output and prices. Section IIIB then investigates three related macroeconomic issues.

A. A VAR-Based Approach

1. The Basic VAR.—To identify the output effects of major banking panics, I estimate a basic VAR. VARs are frequently used in the literature to estimate the effects of policy and other macroeconomic events. VARs possess the benefit of controlling for the prior behavior of all variables in the system.

The basic VAR that I estimate has two variables: a panic dummy series that equals one in the year in which a major banking panic breaks out and the change in log output. The panic dummy includes all seven major banking panics identified in my series from 1825–1929. Output is measured using the Davis Index of Industrial Production. The sample period is 1825 to 1915, the final year of the Davis Index of Industrial Production.³²

Figure 1 presents the results from the VAR. It shows the impulse response functions of the panic dummy and output to shocks of one unit in the panic dummy and 1 percentage point in output growth, along with one-standard error bands.³³ Panels A and D show that both output growth and the panic dummy exhibit few dynamics in response to shocks in their own series: in both cases, shocks lead to small and irregular movements in the two respective series.

Panel C shows that the movements in the panic dummy in response to an output shock are insignificant. After a 1 percentage point innovation to output growth, the panic dummy increases by an insignificant 0.42 units one year after the shock (t -stat = 0.83), returning in years 2 and 3 to roughly zero. The p -value for the test of the null hypothesis that output does not Granger-cause the panic dummy series is 0.79, suggesting that the panics are unrelated to past movements in output.

The main result of the VAR is in panel B. It presents the behavior of output following a unit shock in the panic dummy variable. The results indicate that banking panics have large and strongly significant effects on output. The estimated maximum effect is a decline of 9.9 percent in the year following the panic (t -stat = -4.18).³⁴

³²I limit my test of the real output effects of banking panics to major banking panics. I exclude nonmajor banking panics due to data limitations. The existing historical series on real economic activity are available at a national level, making an assessment of the effect of major banking panics on aggregate output feasible. By contrast, an assessment of the real effects of nonmajor banking panics, which tend to be more localized disturbances, would require regional data on output. Unfortunately, such data are unavailable throughout most of US history. This does not mean that localized banking panics did not have significant real effects for the US economy. However, any evidence of the output effects of localized panics would likely be muddled in national statistics on output, making a statistical analysis of the real effects of localized panics very noisy. As a consequence, I confine my test to major banking panics.

³³The standard error bands represent Monte Carlo standard error bands, based on 2,000 draws.

³⁴The basic two-variable VAR presented in the paper treats the two equations symmetrically and only includes lagged variables on the right-hand side. Allowing for contemporaneous effects of the panic series on output (by ordering the panic series first in a standard Choleski Decomposition) or for contemporaneous effects of output on the panic series (by ordering output first), does not alter the key finding that shocks to the panic dummy are associated with strongly significant effects on output, but not vice versa. Thus, the findings are robust to alternative specifications of the VAR. Moreover, the specific VAR that I report includes three lags, though the results are not sensitive to the number of lags.

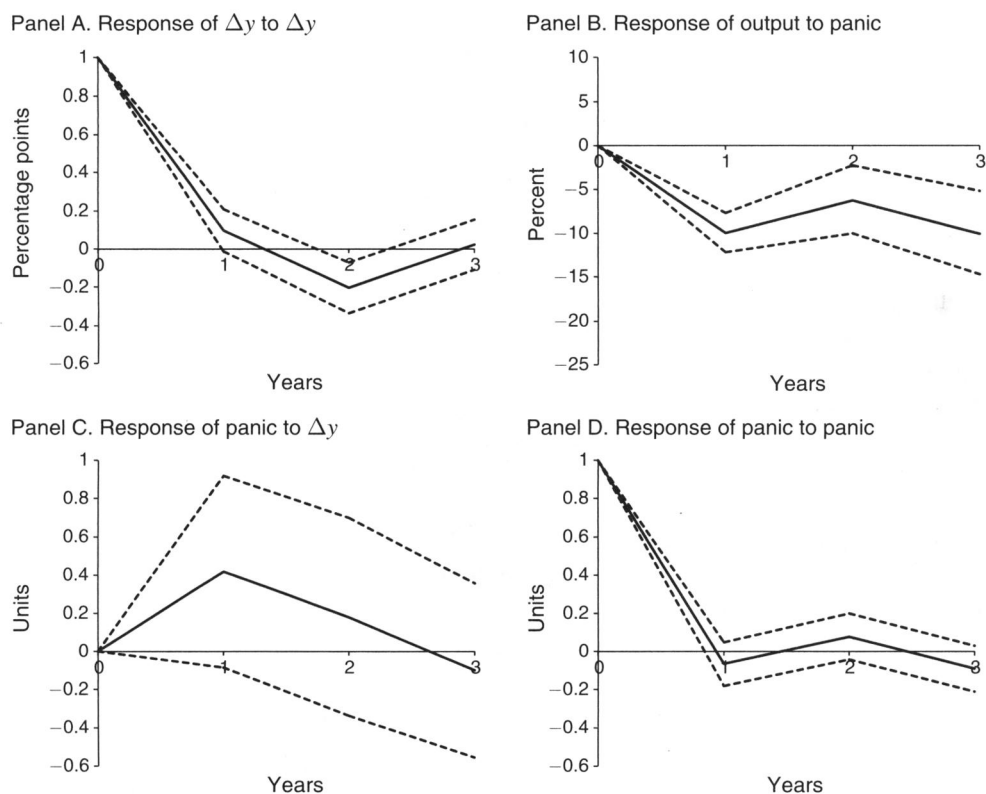


FIGURE 1. RESULTS OF THE BASIC VAR

Notes: The figure displays the impulse response functions of output and the panic dummy to shocks of 1 percentage point in output growth and one unit in the panic dummy. The dashed lines are one standard error Monte Carlo bands.

2. *Further Restrictions on the VAR: Narrative Evidence.*—The results from the basic VAR indicate that banking panics cause output declines. While the purely statistical results from the basic VAR are strong, evidence from the narrative record can be used to further address identification issues. Of particular relevance, financial and economic newspapers from the 1825 to 1929 period contain detailed commentaries by economic observers. In many instances, the economic press identify the events that precipitated a panic among depositors, making it easier to determine whether the panic was caused by a downturn or by some other disturbance. Moreover, the economic press also provide descriptions of economic conditions on the eve of the outbreak of the panic. According to the Mitchell and Fels framework, major recessions cause panics because depositors become alarmed by declining fundamentals. Accordingly, newspaper reports should reflect these deteriorating economic conditions and serve as a signal to depositors that fundamentals are declining or expected to decline.

Therefore, to obtain additional information on the causes of panics, I read the newspaper records surrounding every major banking panic between 1825 and 1929 to identify those panics that the reports of contemporary observers suggest were the

result of idiosyncratic disturbances, as opposed to declining output conditions. I then use these episodes to empirically identify the output effects of panics by imposing restrictions on the VAR.

Methodologically, this test is similar in approach to the work of Romer and Romer (1989, 2004) to identify the effects of monetary policy, Romer and Romer (2010) to identify the effects of changes in taxes, and Ramey and Shapiro (1998) and Ramey (2011) to identify the effects of changes in government spending. Moreover, similar to Ramey and Shapiro (1998) and Ramey (2011), the narrative sources that I use are contemporary financial and economic news reports. In particular, I employ the following newspapers: *Niles Weekly Register* (1825–1849), the *New York Commercial Advertiser* (1825–1857), the *Merchants' Magazine and Commercial Review* (1839–1869) and the *Commercial and Financial Chronicle* (1865–1914). These periodicals were among the leading economic and financial newspapers of their day.

Thus, I read the newspaper records surrounding major banking panics to accomplish two goals: (i) to identify the perceived causes of panics and (ii) to identify the perceived state of the economy when the panic broke out. I classify panics along a two-dimensional scale. On the first dimension, I classify panics according to reported causes. On the second dimension, I classify panics according to the reported state of the economy when the panic broke out. The scale ranges from 1 to 3 along both dimensions. Figure 2 presents a visual representation of this scale.

On the first dimension of the scale, if the newspaper records identify an event unrelated to output fluctuations as the primary cause of the panic, then I assign the panic a 3; if the newspaper records identify output fluctuations as the primary cause of the panic, then I assign the panic a 1. Examples of events that might precipitate a panic but that are likely to be unrelated to domestic output fluctuations include a political decision that causes a change in market expectations regarding the stability of the banking sector, the failure of a mismanaged bank and a subsequent contagion of fear generated in the aftermath of such a failure, or a panic abroad that triggers financial instability at home. If the newspaper records identify any of these events as the primary cause of the panic, then I assign the panic a 3. By contrast, a panic caused by depositor anxiety that a major recession will cause banks to fail or suspend would be a prime example of a panic that would receive a 1. On the second dimension, if the newspaper records characterize economic conditions as “prosperous” on the eve of the outbreak of panic, then I assign the panic a 3; if the newspaper records characterize the state of the economy as in “depression” or “in recession” on the eve of the outbreak of panic, then I assign the panic a 1. Moreover, on both dimensions, there is an intermediate category 2, which is reserved for ambiguous situations in which the newspaper records are not definitive in assigning causes or in characterizing the state of the economy. If the newspaper records identify both a downturn as well as other events that are unrelated to output fluctuations as primary causes of the panic, then the panic is assigned a 2 on the first dimension. If the newspaper records do not clearly characterize economic conditions either as “prosperous” or as in “depression/recession,” then the panic is assigned a 2 on the second dimension. Lastly, in situations where the newspaper records are uninformative in identifying causes or in characterizing the state of the economy, I simply exclude the panic from the ranking. This occurs when contemporary observers do not seem to

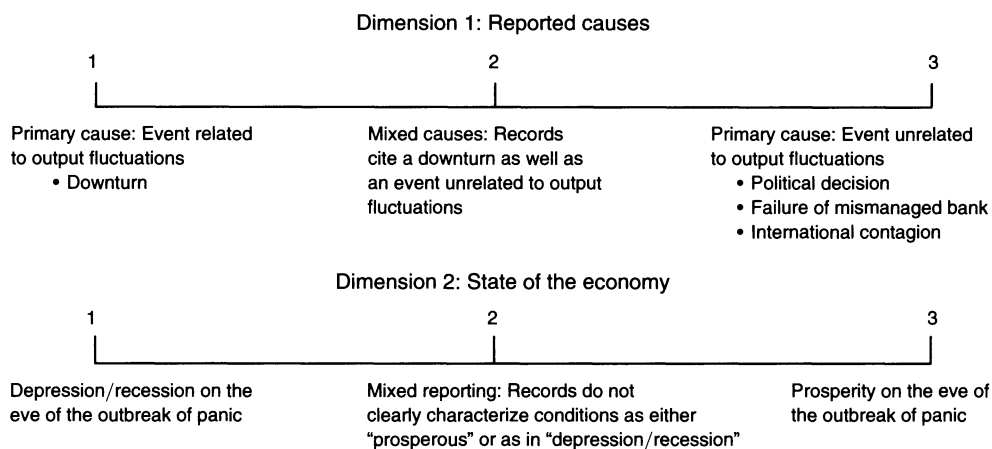


FIGURE 2. CLASSIFICATION ALGORITHM

know what caused the panic and are in widespread disagreement or when the newspaper records simply do not contain descriptions of the state of the economy on the eve of the outbreak of panic.

The online Appendix to the paper provides a detailed description of the classification of each of the major banking panics on this scale. Due to space constraints, I reserve this information for the online Appendix (see Sections A6 and A7 on pp. A-26 to A-40). However, to illustrate the essence of this approach, I discuss a few examples below.

First, consider the Panic of 1833. The narrative evidence describes the Panic of 1833 as the result of a political decision—the removal of the government deposits from the Bank of the United States—that caused a rapid change in market participants' expectations regarding the stability of the banking system. In the eyes of many historians, the Bank of the United States was a quasi-central bank, aiding the economy in times of stress. However, for ideological reasons, President Andrew Jackson was a consistent opponent of the Bank of the United States and chose to withdraw the government deposits from the Bank of the United States, beginning on October 1, 1833. Shortly thereafter, confidence in the Bank of the United States and in the country's overall banking system became impaired, precipitating runs. Fears that the country's quasi-central bank would be weakened and that the nation's banking system might be destabilized were widely reported by the press. The historical news records attribute the panic's origins to the destruction of "aggregate individual confidence."³⁵ Moreover, on the eve of the outbreak of the panic, there were no visible signs of a recession, according to the historical news reports. Commentators described "the unexampled prosperity of the year"³⁶ and reported "every thing has the appearance that an early and extensive fall business will done."³⁷ As a result, the Panic of 1833 receives a 3 on both dimensions of the scale. According to the narrative

³⁵"Correspondence for the Commercial Advertiser," *New York Commercial Advertiser*, Jan. 6, 1834.

³⁶*New York Commercial Advertiser*, Wed Oct. 2, 1833, 2.

³⁷"Review of Market," *New York Commercial Advertiser*, Aug. 17, 1833.

accounts, the Panic of 1833 was the result of an idiosyncratic disturbance—a political decision—and did not break out in the midst of a downturn.³⁸

Next, consider the Panic of 1857. According to the historical narrative record, the catalyst for the Panic of 1857 was the failure of the Ohio Life Insurance Company. Its failure was attributed to mismanagement and fraudulent activities. The collapse of this banking firm triggered the panic. The Ohio Life was considered one of the most reputable firms in the nation and initially, the cause of its failure was unknown. Its demise shocked the financial community and sparked runs on banks throughout the country. Over the succeeding weeks, fear spread and the panic gained in intensity. The news reports identify this contagion of fear following the failure of the Ohio Life as the cause of the panic. Moreover, similar to the Panic of 1833, the Panic of 1857 also broke out during a period of economic prosperity. Before the outbreak of the panic, commentators wrote, “the country continues prosperous”³⁹ and predicted continued prosperity, “the general business of the country is in a good condition, presenting both present and prospective, a most healthy appearance.”⁴⁰ According to the narrative evidence, the Panic of 1857 was the result of an idiosyncratic disturbance—a contagion of fear in the aftermath of the failure of the Ohio Life Insurance Company—and did not break out in the midst of a downturn. As a result, the Panic of 1857 receives a 3 on both dimensions of the scale. Thus, the narrative records indicate that like the Panic of 1833, the Panic of 1857 is a relatively exogenous disturbance. These two panics are legitimate observations that can be used to identify the output effects of banking panics.

The Panic of 1907, however, stands in contrast to these other two episodes. Though the newspaper records attribute the outbreak of the panic, at least in part, to a contagion of fear generated in the aftermath of the failure of a few prominent New York City trust companies that had misappropriated funds to speculate on rising copper prices, they also indicate that growing signs of a recession may have undermined confidence. The *Commercial and Financial Chronicle* reports, “The more immediate causes for the upheaval deserve narration here ... adverse developments kept piling up one after another ... There were ... multiplying evidences of a reaction in the iron and steel trades and of recession in general business.”⁴¹ As a result, on the first dimension of the scale, the Panic of 1907 receives a 2—the newspaper records identify two causes (a contagion of fear and growing signs of a recession). Moreover, prior to the outbreak of the panic, there were signs of a developing

³⁸This episode may be an ideal natural experiment for identifying the real output effects of banking panics. A strong case can be made that the removal of the government deposits from the Bank of the United States represents a type of simulated government-induced depositor bank run on a major financial institution. In addition, though the narrative records describe economic conditions as prosperous on the eve of the withdrawal of the government deposits, they subsequently report a swift deterioration in real economic activity. There are many accounts of business failures, rising unemployment, tight money conditions, and general distress. Moreover, according to the Davis Index of Industrial Production, output decreased by 4 percent from 1833 to 1834. That output declined so rapidly following an exogenous disturbance may indeed be taken as strong evidence that banking panics cause substantial declines in output. This episode bears a familiar resemblance to the types of natural experiments identified by Friedman and Schwartz (1963) via their use of the narrative approach in their study of US monetary history from 1867–1960.

³⁹“Commercial Chronicle and Review,” *Merchants’ Magazine and Commercial Review*, September 1857, 325.

⁴⁰“Cincinnati Gazette of Tuesday, Aug. 25” in *New York Commercial Advertiser*, August 27, 1857.

⁴¹“Review of October,” *Commercial and Financial Chronicle*, Nov. 2, 1907, 22.

TABLE 7—CLASSIFICATION OF PANICS

Panic	Dimension 1	Dimension 2
1833	3	3
1837	No rank	No rank
1839	No rank	No rank
1857	3	3
1873	3	3
1893	3	1
1907	2	1

recession. The news records make frequent references to an “existing depression”⁴² and to a “recession in business.”⁴³ Thus, on the second dimension of the scale, the Panic of 1907 receives a 1. These findings do not necessarily mean that the Panic of 1907 was definitely the product of a downturn, but it does mean that greater caution is merited.

Table 7 presents the full classification of panics along this scale. Moreover, as noted earlier, detailed accounts of the reported causes of each of these panics—along with an extensive description of the classification of each of the major banking panics along this scale—is contained in the online Appendix to this paper (see Sections A6 and A7). Indeed, the online Appendix provides richly detailed documentation of the narrative evidence I have gathered on the relative exogeneity of each of these panics.

Equipped with this additional narrative evidence on the causes of panics, I restrict the VAR to only include certain panic observations. Specifically, I estimate three different VAR specifications, with each specification corresponding to a distinct restriction on the panic dummy variable. In the first specification, I include panics that received a 3 on the first dimension of the scale in the panic dummy, in the second, I include panics that received a 2 or a 3 on the first dimension, and in the third, I include only those panics that received a 3 on both dimensions of the scale. The first specification presents the baseline case in which all panics that received a 3 on the first dimension of the scale—those that the newspaper records attribute to events unrelated to output fluctuations—are included in the panic dummy variable. The second specification takes into account the possibility that panics that received a ranking of 2 on the first dimension of the scale were, in fact, not caused by output fluctuations. The third specification presents the most restrictive case in which only panics that received a 3 on both dimensions of the scale—those that did not break out in the midst of a downturn and that were not caused by output fluctuations, according to the newspaper records—are included in the panic dummy.

Figure 3 displays the results. It presents the impulse response functions of output to a unit shock in the restricted panic dummy and the impulse response functions of the restricted panic dummy to a shock of 1 percentage point in output growth. The impulse response functions are similar to those from the unrestricted VAR. The impulse response functions of output to a unit shock in the restricted panic dummy

⁴²“The Financial Situation,” *Commercial and Financial Chronicle*, Oct. 5, 1907, 826–8.

⁴³“Review of October,” *Commercial and Financial Chronicle*, Nov. 2, 1907, 22.

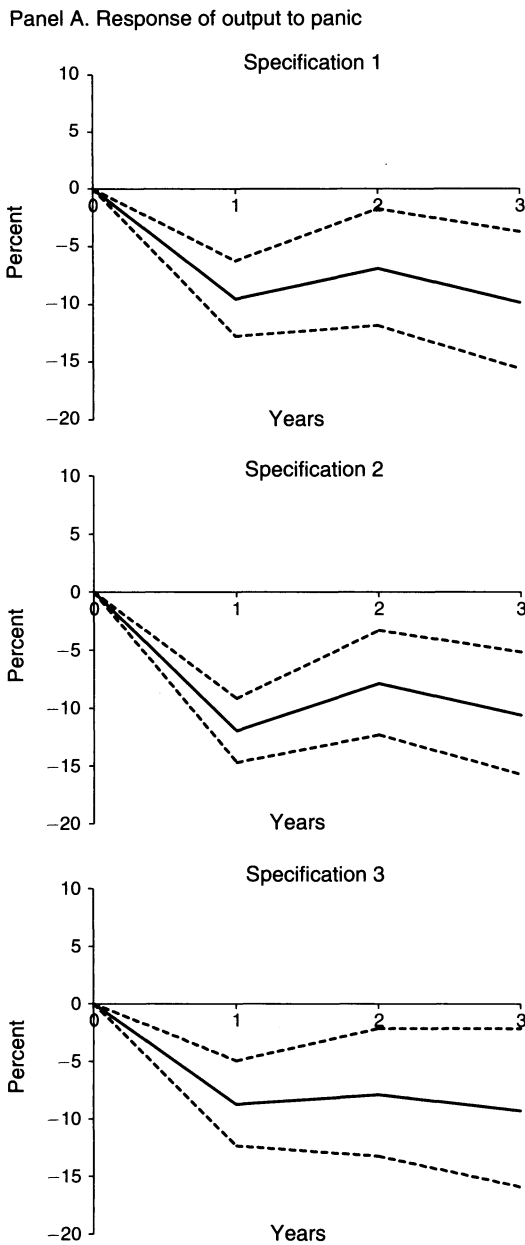


FIGURE 3. RESULTS OF THE RESTRICTED VARs

(Continued)

indicate that panics have large and strongly negative effects on output. In the year following the panic, there is a large decline in output: 9.6 percent according to the first specification (t -stat = -2.80), 12.0 percent according to the second (t -stat = -4.06), and 8.7 percent according to the third (t -stat = -2.26). The impact remains fairly constant in years 2 and 3, decreasing slightly in year 2, but then increasing slightly again in year 3. By contrast, the impulse response functions of

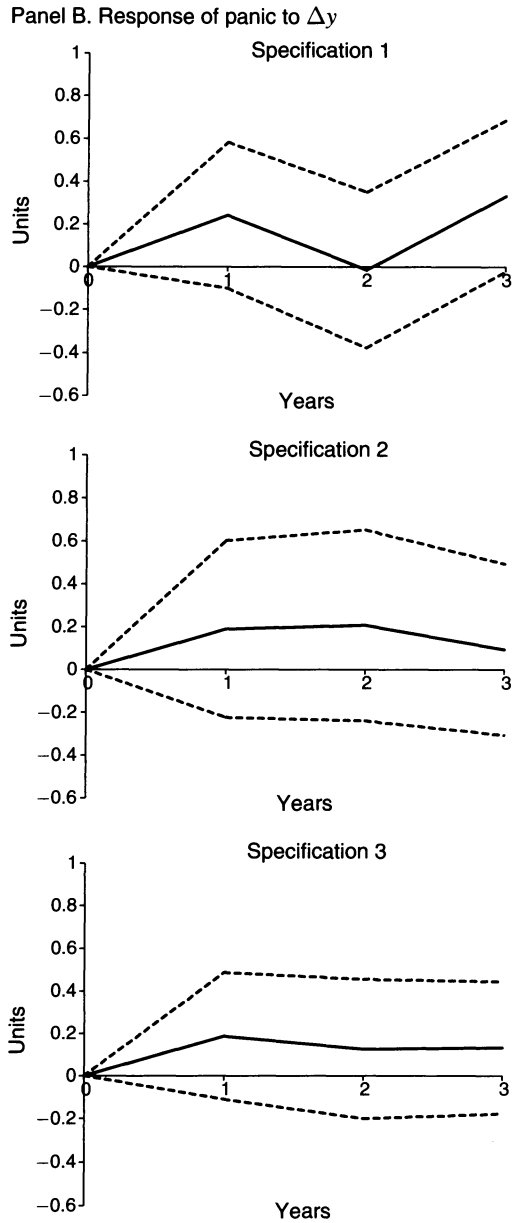


FIGURE 3. RESULTS OF THE RESTRICTED VARs (Continued)

Notes: The figure displays the impulse response functions of output and the restricted panic dummy to shocks of 1 percentage point in output growth and one unit in the panic dummy. The restricted panic dummy includes those panics that receive a 3 on the first dimension of the scale (specification 1), a 2 or 3 on the first dimension (specification 2), and a 3 on both dimensions (specification 3). The dashed lines are one standard error Monte Carlo bands.

the panic dummy to a 1 percentage point shock in output growth are insignificant. The results are robust across all three specifications.

3. Monthly Measures of Output and Prices.—It is also useful to analyze the impact of banking panics on monthly measures of output and prices. A monthly

output series—the Long Index of Urban Construction—is available beginning in 1868. Likewise, a monthly price series—the USA Annalist Wholesale Price Index—is available beginning in 1854. The VAR that I estimate has three variables: a panic dummy series that equals one in the month in which a major banking panic breaks out, the log of the USA Annalist Wholesale Price Index, and the log of the Long Index of Urban Construction.⁴⁴ The sample period is 1868–1914.⁴⁵

Figure 4 displays the results. Panels A and B show the impulse response functions of the panic dummy to a shock of 10 percent in the log Long Construction Index and to a shock of 1 percent in log prices. The movements of the panic dummy in response to either an output shock (proxied by the Long Index) or a price shock are small, irregular, and insignificant. Neither output movements nor price movements Granger cause the panic dummy series. The p -value for the test that all of the output coefficients are zero is 0.64 and the p -value for the test that all of the price coefficients are zero is 0.34, indicating that the panics are unrelated to prior movements in both output and prices. That the monthly impulse response function of the panic dummy to an output shock is insignificant corroborates the results from the VARs estimated using annual data. Together, they provide strong evidence that major banking panics are not systematically related to prior movements in output.⁴⁶

Panels C and D present the main results of the VAR. They show the response of construction and the price level to a unit shock in the panic dummy, together with one-standard error bands. The impulse response functions reveal that panics have rapid effects on both output and prices. Panel C shows that construction declines to its lowest level two months after the panic; the estimated impact at month 2 is –53.9 percent (t -stat = –4.66).⁴⁷ For the following two months, construction

⁴⁴The three-variable monthly VAR is analogous to the two-variable annual VAR. It treats the three equations symmetrically and only includes lagged variables on the right-hand side. However, like the annual VAR, the key finding of the monthly VAR—that shocks to the panic dummy are associated with strongly significant effects on output and prices, but not vice versa—is robust to alternative VAR specifications. The specific monthly VAR that I report includes 12 lags.

⁴⁵The Long Index measures building construction in 35 major cities. In his work *Building Cycles and the Theory of Investment*, Long (1940) argues that building was a leading investment goods industry in the nineteenth and early twentieth centuries and as a consequence, that his series can be used as a proxy for investment. Grossman (1993) adopts this interpretation. At the very least, the index is a reliable measure of construction, an important indicator of real economic activity. The USA Annalist Wholesale Price Index comes from globalfinancialdata.com. The index incorporates the wholesale prices of 25 commodities.

⁴⁶The impulse response function of the panic dummy to a price shock is also interesting in its own right. There are reasons to suspect that panics might be preceded by either periods of deflation or inflation. On the deflationary side, the debt-deflation hypothesis, first articulated during the Great Depression by Irving Fisher (1933), suggests that deflation, by raising the real value of debts, increases bank distress and raises the likelihood of a banking panic. On the inflationary side, others—see, for example, *America's Great Depression* by Murray Rothbard (1963)—have contended that financial crises occur when economies overheat—that is, when economies operate above their normal capacity; in that scenario, financial crises would be preceded by a run-up in inflation. My results provide no evidence in favor of either view; they suggest that major banking panics are not systematically related to prior movements in prices.

⁴⁷This decline in construction can be converted into a corresponding decline in industrial production by regressing the growth rate of the Davis Index on the growth rate of the Long Construction series. Specifically, to convert the monthly construction series into an annual series, I calculate the average value of the Long Index in each year. I then calculate the log difference in the average value of the Long Index to estimate the growth rate in the construction series in each year. The coefficient on the growth rate of the Long Index in this regression is 0.175 (t -stat = 2.88). This indicates that an increase in the growth rate of the construction series of 1 percentage point is associated with an increase in the growth rate of the Davis output series by 0.175 percentage points. It also suggests that the 53.9 percent decline in the level of construction is equivalent to a decline in the level of industrial production of roughly 12.7 percent.

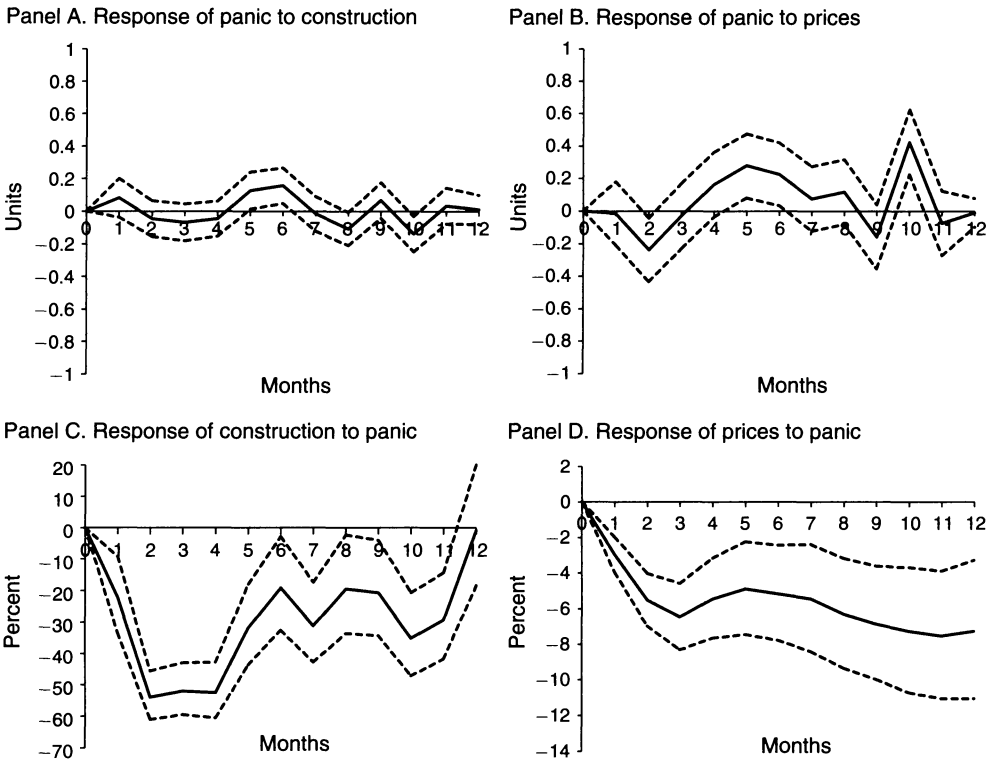


FIGURE 4. RESULTS OF THE VAR ESTIMATED WITH MONTHLY DATA

Notes: The figure displays the impulse response functions implied by the monthly VAR. The dashed lines are one standard error Monte Carlo bands.

remains at a depressed level, before increasing in month 5, where it fluctuates within a band for the remainder of the period. Panel D shows that prices decline quickly; the impact at month 3 is -6.5 percent (t -stat = -3.40). The decline slows down over time, but continues over the course of a year.⁴⁸

B. Related Macroeconomic Findings

Armed with the new panic series, this subsection investigates three related macroeconomic issues: (1) the role of panics as a source of economic instability before the founding of the Fed, (2) how downturns with major banking panics differed from downturns without them, and (3) the behavior of trend output in the aftermath of panics.

1. Panics as a Source of Output Volatility, 1825–1914.—In assessing the determinants of historical changes in output variability, DeLong and Summers (1986) conclude—using their series—that financial panics were not a substantial source

⁴⁸Restricting the monthly VAR with narrative evidence—in a manner similar to the restrictions imposed on the annual VARs—does not change the results.

TABLE 8—DOWNTURNS FROM 1825–1915

Peak	Trough	Major panic	Percent output decline
Antebellum industrial cycles			
1828	1829	No major panic	–6.0
1833	1834	Panic of 1833	–4.5
1836	1837	Panic of 1837	–1.4
1839	1840	Panic of 1839	–4.7
1856	1858	Panic of 1857	–8.0
Civil War industrial cycles			
1860	1861	No major panic	–0.9
1864	1865	No major panic	–5.2
Postbellum industrial cycles			
1873	1875	Panic of 1873	–6.0
1883	1885	No major panic	–6.3
1892	1894	Panic of 1893	–15.3
1895	1896	No major panic	–3.1
1903	1904	No major panic	–4.7
1907	1908	Panic of 1907	–15.6
1910	1911	No major panic	–3.7
1913	1914	No major panic	–10.2

Source: The Davis Chronology of Business Cycles comes from Davis (2006).

of economic instability prior to World War II.⁴⁹ According to my new series, how important were panics as a source of economic instability?

The Davis Chronology of Business Cycle Turning Points provides a useful indicator for the pre-WWI period. Davis (2006) isolates 15 turning points—15 downturns—between 1825 and 1915 using the Davis Index of Industrial Production. Table 8 presents the Davis Chronology. Seven of these 15 cycles—or 47 percent—contained major banking panics: 1833–1834, 1836–1837, 1839–1840, 1856–1858, 1873–1875, 1892–1894, and 1907–1908. This suggests that banking panics either caused or—at the very least—seriously aggravated nearly half of all business cycle downturns between 1825 and 1914. If I exclude the three cycles contained within a major war—the two Civil War cycles from 1860 to 1861 and 1864 to 1865 and the World War I cycle from 1913 to 1914, then 7 of the 12 nonwar downturns—or 58 percent—contained major banking panics.

An alternative measure of the role of panics as a source of output volatility is the R^2 in a regression that includes a panic dummy equal to one in the year in which a major banking panic breaks out, three lagged panic dummies, and three lagged log changes in output (measured using the Davis Index) as right-hand side variables and that includes the log change in output as the left-hand side variable. The R^2 in such a regression is 0.28, indicating that roughly 28 percent of the variation in the growth rate of output can be explained by the right-hand side variables. By contrast, the R^2

⁴⁹Specifically, using their series, DeLong and Summers (1986) find that no more than a small portion of the variance in output between 1890 and 1910 can be attributed to financial panics. On this basis, they conclude, “The view that financial panics were a principal cause of economic instability before World War II does not seem to be strongly supported. This finding weakens the monetarist argument linking output variability to erratic monetary growth by showing that relatively little of the variability in output observed before World War II can be linked to exogenous changes in the money stock” (DeLong and Summers 1986, 692–693).

TABLE 9—DOWNTURNS WITH AND WITHOUT MAJOR BANKING PANICS

	Percent change in output	Length in years	Recovery in years	Average growth rate
<i>Downturns without major banking panics</i>				
Pre-Civil War				
1828–1829	–6	1	1	16.8
Average	–6.0	1.0	1.0	16.8
Post-Civil War				
1883–1885	–6.3	2	1	11.5
1895–1896	–3.1	1	1	6.3
1903–1904	–4.7	1	1	14.6
Average	–4.5	1.3	1.0	10.8
<i>Downturns with major banking panics</i>				
Pre-Civil War				
1833–1834	–4.5	1	1	11.2
1836–1837	–1.4	1	1	2.5
1839–1840	–4.7	1	1	5.5
1856–1858	–8.0	2	1	12.8
Average	–4.7	1.3	1.0	8.0
Post-Civil War				
1873–1875	–6.0	2	3	3.3
1892–1894	–15.3	2	3	6.4
1907–1908	–15.6	1	2	10.5
Average	–12.3	1.7	2.7	6.7

Notes: The table displays: (i) the percentage change in output from peak to trough, (ii) the length of the downturn in years (the length of time from peak-to-trough), (iii) the length of the recovery in years (the length of time output takes to recover from the trough back to its predownturn peak level, and (iv) the average annual growth rate of output during the recovery years (from the trough until output reaches its predownturn peak).

Source: The data come from Davis (2004, 2006). Output is measured using the Davis Index of Industrial Production.

in a regression that excludes the contemporaneous and lagged panic dummies—but otherwise remains the same—is 0.01.

These results suggest that banking panics were a substantial source of output volatility in the 85 years prior to the founding of the Federal Reserve. Indeed, the presence of major banking panics in nearly half of all business cycle downturns prior to WWI and their reoccurrence during the Great Depression—the sharpest downturn in US history—suggest that panics were a significant source of economic instability throughout much of US history.

2. Downturns with Major Banking Panics versus Downturns without Major Banking Panics.—Equipped with an accurate listing of when major banking panics occurred and with the Davis Chronology, I am able to examine how downturns with major banking panics differed from downturns without them. Table 9 compares downturns with major banking panics and downturns without major banking panics on four dimensions: severity (the percentage decline in output from peak-to-trough), the length of the downturn (the length of time from peak-to-trough), the length of recovery (the length of time output took to recover from its trough back to its predownturn peak level), and the average annual growth rate of output during the years of recovery (from the trough until output reaches its predownturn peak). The

table reports averages for the pre-Civil War and post-Civil War subperiods. Because wartime conditions represent special economic circumstances that may have their own unique features, the table omits the three downturns that occurred in the midst of major wars—that is, the two downturns during the Civil War (1860–1861 and 1864–1865) and the downturn at the beginning of World War I (1913–1914).

Table 9 reveals that in the post-Civil War period, downturns with major banking panics differed from downturns without them. Between 1865 and 1915, downturns with major banking panics were slightly longer and substantially more severe than downturns without major banking panics on average, output recoveries for downturns with major banking panics were two-to-three times the length of output recoveries for downturns without them, and the average growth rate of output during the recovery was lower for downturns with major banking panics than for downturns without them. Specifically, for downturns with major banking panics, the average percentage decline in output was 12.3 percent, the average length of time from peak-to-trough was 1.7 years, the average length of recovery was 2.7 years, and the average annual growth rate of output during the recovery was 6.7 percentage points. For downturns without major banking panics, the average percentage decline in output was 4.5 percent, the average length of time from peak-to-trough was 1.3 years, the average length of recovery was 1 year, and the average annual growth rate of output during the recovery was 10.8 percentage points.⁵⁰

However, similar patterns do not hold in the pre-Civil War period. Before the Civil War, downturns with major banking panics were not, on average, more severe than downturns without them, and the average length of recovery was the same for both downturns with major banking panics and downturns without them. Why do strong differences exist in the post-Civil War era but not in the pre-Civil War era? One hypothesis is that structural changes to the US economy over time—the transformation of an agricultural economy to a more industrial one or a greater reliance on bank credit—rendered the US economy more vulnerable to disruptions in the banking sector. The hundred years prior to the Great Depression was a period of dramatic economic transformation; it is highly plausible that changes to the US economy increased the susceptibility of the real economy to banking panics over time.⁵¹

3. Trend and Level Effects.—How long do the effects of banking panics last? Are panics shocks to the economy that get rapidly undone? Does output quickly revert back to trend? Or do panics disrupt the normal dynamics of output in ways that persist over time? There appears to be a growing consensus in the literature that banking crises can have highly persistent and lingering effects on output. Several recent studies—primarily confined to international banking crises over the past half-century—have arrived at this conclusion.⁵²

⁵⁰These findings indicate that the longer recoveries for downturns with major banking panics, relative to downturns without major banking panics, are the result of two forces: (i) deeper recessions and (ii) slower growth once the recession ends.

⁵¹One concern, however, for the pre-Civil War period is that there is only one downturn since 1825 without a major banking panic. Thus, one must be cautious in drawing broad conclusions about the pre-Civil War era.

⁵²See, for example, Cerra and Saxena (2008); Cecchetti, Kohler, and Upper (2009); and the IMF's October 2009 *World Economic Outlook*.

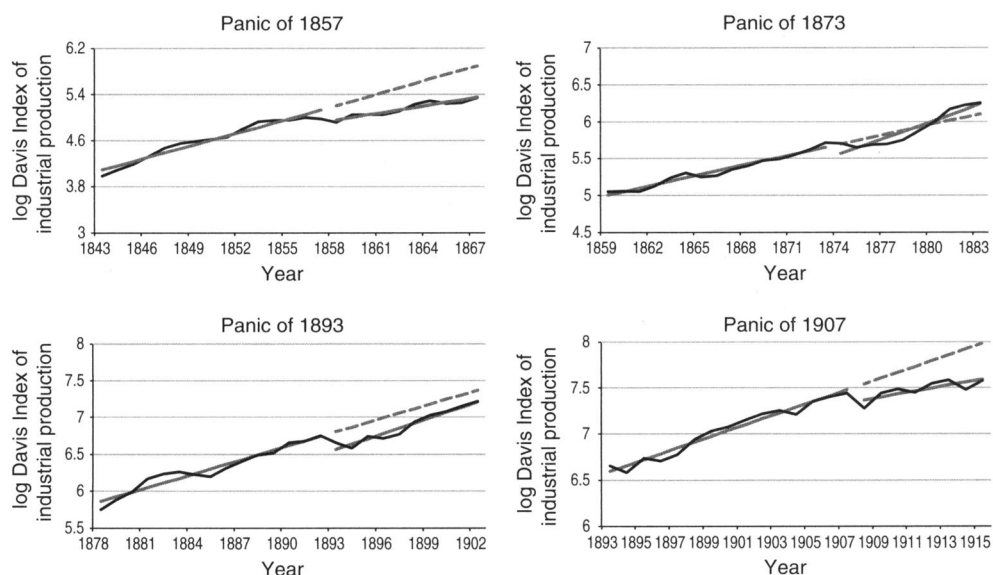


FIGURE 5. ACTUAL AND PROJECTED TREND LINES (*Panics of 1857, 1873, 1893, and 1907*)

Notes: The graphs display the prepanic and postpanic trend paths (solid lines) and the prepanic trend path projected into the postpanic period (dashed lines). The output data come from Davis (2004).

Do similar patterns hold for the banking panics of the pre-Great Depression era? To investigate whether the banking panics of the pre-Great Depression era might have had lingering effects on the behavior of output, I estimate prepanic and postpanic trend paths for output for each major banking panic in the post-Jacksonian period.⁵³ Figure 5 presents these trend paths. It contains four graphs, with each graph corresponding to a different banking panic. Each graph plots the log of the Davis Index of Industrial Production on the vertical axis and year on the horizontal axis. To show where output would have been had it continued to follow its prepanic trend, I project each prepanic trend line out into the subsequent period. The solid lines represent actual trends whereas the dashed lines represent projected trends. Following the panics of 1857, 1893, and 1907, the actual postpanic trend line falls below the projected trend line. In these three instances, output does not rapidly revert back to its prepanic trend. For the panic of 1893, the projected and actual trends are roughly parallel, converging at only a slow rate. For the panics of 1857 and 1907, the actual

⁵³The specific regression that I estimate takes the following form: $\ln y_t = \alpha_0 + \alpha_1 D_t + \beta_0 t + \beta_1 D_t t + \varepsilon_t$, where y_t is the Davis Index of Industrial Production in year t and D_t is a dummy variable that equals 1 if year t is in the postpanic period and 0 if year t is in the prepanic period. I include the dummy variable to identify changes in trend following the panic. Since the Davis Index is available at an annual frequency and since I want to come as close as possible to separating periods by banking panics, I implement a specific criterion for panic years. If the panic broke out in the first half of the year, then I include that year in the postpanic period. If the panic broke out in the second half of the year, then I include that year in the prepanic period. For uniformity across panics, I restrict each prepanic period to the 15 years prior to the panic and each postpanic period to the 10 years following the panic, with the exception of the Panic of 1907 where the postpanic period ends in 1915 (since the Davis Index ends in 1915). Because there were three major banking panics during the 1830s—1833, 1837, and 1839, I begin my analysis in 1840, rather than try to estimate shifts in trend between the panics of 1833 and 1837, which only spans four years, and between the panics of 1837 and 1839, which only spans two years.

trend is flatter than the projected trend, indicating a decline in trend output growth following these panics. In the remaining projection—the one corresponding to the 1873 panic episode—the actual trend line crosses the projected trend line, indicating that output reverts back to its prepanic trend. However, even in the case of the 1873 panic, output growth in the immediate aftermath of the panic was sluggish. Output did not return to its prepanic peak level until 1878. Thus, while there is some variability across these episodes, these findings for the pre-Great Depression era corroborate the growing consensus in the literature that banking crises are often associated with lingering effects on output. They also suggest that the sluggish performance of output in the aftermath of the banking crisis of 2008 is consistent with the historical record.

IV. Conclusions

There are two major problems in identifying the real output effects of financial panics of the pre-Great Depression era. First, it is not clear when panics occurred because prior panic series differ in their identification of panics. Second, establishing the direction of causality is tricky: are panics causing downturns or are downturns causing panics?

This study sequentially addresses these two problems. It accomplishes this (i) by deriving a new series on banking panics for the 1825–1929 period—one that rectifies many of the problems of earlier series, and (ii) by studying the output effects of major banking panics via VAR/narrative-based methods.

The new series has important implications for our understanding of the history of banking panics in the United States. First, the series recreates a detailed record of when and where banking panics occurred. It identifies 7 major and 20 nonmajor banking panics in the century before the Great Depression. The online Appendix to this paper provides detailed descriptions, gathered from contemporaneous historical news accounts, of each of these panics.

Second, equipped with the new series and with the historical news record, I sort out the inconsistencies across earlier series. I document important mistakes in earlier series, e.g., the misidentification of foreign banking panics as domestic ones (1825 and 1847), the use of dubious rules to identify panic episodes, and the indiscriminate lumping together of an array of different types of financial disturbances—banking panics, stock market disturbances, increases in interest rates—under the common heading of panic. In other instances, however, my results reaffirm key findings of some series, such as those of Wicker (2000) and Sprague (1910), who also separated the disturbances of 1884 and 1890 from 1873, 1893, and 1907, the three full-scale banking panics of the National Banking Era.

Third, the new series sheds light on earlier studies on the causes and effects of panics. While my findings support the general conclusions of Miron (1986) that major financial panics—in particular, major banking panics—were more likely to occur during particular seasons prior to the founding of the Federal Reserve, Miron employed an unreliable panic series—the Kemmerer series—to document the incidence of panics before 1914, leading to spurious conclusions regarding the historical frequency of panics. My results also differ from those of DeLong and Summers

(1986), who concluded—using their series—that financial panics were not a substantial source of economic instability prior to World War I.

Moreover, the development of a pre-Great Depression chronology of US banking panics—a main goal of this paper—is worthy in its own right. For example, recent studies by O’Grada and White (2003) and Carlson, Mitchener, and Richardson (2011) have masterfully analyzed the spread of banking panics through contagion effects. However, the panics that the respective studies examine—the panic of 1854 and the 1929 Florida panic—are not listed in any of the earlier series. Indeed, in the introduction to their paper, O’Grada and White note the absence of the panic of 1854 from any prior panic series and in the title to their paper, Carlson, Mitchener, and Richardson refer to the 1929 panic as “the Forgotten Panic.” It is reassuring confirmation then that the methodology independently employed in this paper to derive a new series on banking panics from historical news sources located both of these panics. It also raises the possibility that among the other panics identified by the new series, some will prove equally valuable to researchers in the future.

As for the results of my empirical tests, I find that major banking panics have large and strongly significant effects on output. According to my estimates, output declines by roughly 10 percent in the year following a major banking panic. Moreover, using monthly data, I show that panics have rapid and strongly negative effects on both output and prices. Output declines to its lowest level two months after the outbreak of the panic and the price level declines by roughly 7 percent over the course of a year.

These findings shed important insights into the causes of the Great Depression. Banking panics cause large declines in output, suggesting that the banking panics of the Great Depression can account for a significant portion of the output losses occurring between 1930 and 1933. These results are consistent with the view of Friedman and Schwartz (1963) that a wave of banking panics converted a normal downturn into a severe depression. They also support the work of Bernanke and James (1991) who find that countries with banking panics had more severe downturns between 1929 and 1933 than countries without banking panics.

Moreover, the empirical findings have important implications both for our understanding of the causes of historical US business cycle fluctuations and of the effects of banking crises on the macroeconomy. My results indicate that banking panics were a primary source of business-cycle fluctuations throughout US history, that downturns with major banking panics differed substantially from downturns without them, and that output does not rapidly revert back to its prepanic trend path following major banking panics. Thus, the empirical findings paint a broad picture of the role of banking panics in amplifying downturns in the century before the Great Depression, in much the same way the events of 2008 unfolded.

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