

**Stock Market Crashes, Productivity Boom Busts and Recessions:
Some Historical Evidence.**

Michael Bordo¹

Rutgers University

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The recent boom and bust in high technology stocks and the ensuing recession leads to the question—have we seen this pattern before? Financial history is replete with stock market crashes and the business cycle goes back at least to the first Industrial Revolution in the mid-eighteenth century. The record suggests that while not all stock market crashes are associated with recessions, many are. The record also suggests that most stock market crashes are not associated with the collapse of productivity booms but rather with monetary instability, political events such as wars and as predictors of future recessions. However, there have been a few earlier historical episodes which may have resonance for today.

We first document some evidence from the historical experiences of the United Kingdom and the United States for the past two centuries on stock market crashes, recessions, and possible productivity boom busts. We then consider some salient episodes of boom-busts in each country's history which have relevance for the recent experience.

A. Evidence

Table 1 presents the statistical record. For each country in turn, we show evidence on stock market crashes (column 1) defined as a 20 percent or higher decline in prices from peak to trough (See Mishkin and White, 2002); an indication as to the cause, e.g., war (column 2);

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recessions that coincided with stock market crashes, defined as one or more years of a decline in real GDP, (see WEO April 2002 Chapter III) (column 3); stock market booms (changes from preceeding to succeeding peak) (column 4); an indicator of banking crises (column 5); and an indicator of severe financial distress (column 6) based on an Index of Financial Stability developed by Bordo, Dueker, and Wheelock (2001, 2002).

In general, we see some salient patterns. First, there were frequent stock market crashes in both countries (17 in the United Kingdom, 20 in the United States). Second, more than half of the crashes in each country were associated with recessions (8 in the United Kingdom, 15 in the United States). Third, historical narratives suggest that only very few of these could be defined as productivity booms and busts. Fourth, most of the crashes cum recessions involved banking panics, especially in the United States before 1933, and many involved severe financial distress.

B. Historical Episodes

United Kingdom

Stock market crashes and recessions can be traced back to the eighteenth century (Kindleberger, 1996), and asset booms and busts even earlier, e.g., the famous Dutch Tulip mania of the 17th century (Garber, 2000), the John Law Mississippi Bubble and the South Sea Bubble, both in 1720. None of those were new technology induced manias, although the South Sea and Mississippi Bubbles were associated with expected future profits from the opening up of world trade.

The earliest and probably most infamous boom-bust in the modern era was 1824–25 (See Neal, 1998, and Bordo, 1998). It is not clear that it could be called a productivity boom. It began after the Napoleonic wars and the successful resumption of the gold standard in 1821. The British economy began a period of rapid expansion, characterized by both an export boom to the newly independent states of Latin America, and at the same time,

important infrastructure projects (e.g., gas lighting, canals, and railroads) stimulated investment expenditures. The sale of stocks to finance those ventures, in addition to gold and silver mines (some real, some fictitious) in Latin America, as well as sovereign government debt propelled a stock market boom fueled by the Bank of England's easy monetary policy. The stock market boom became a bubble as investors bid up the prices of real and imaginary stocks (e.g., bonds from the imaginary South American Republic of Poyais). As always happens, the bubble burst. It is unclear exactly what caused the April 1825 collapse, but the Bank of England had in March sold a very large block of exchequer bills, presumably to "contract the circulation." (Clapham 1965). The Bank, in succeeding months, continued to follow a cautious policy. The collapse of stock prices triggered commercial failures and country bank failures. When several important London banks failed, a full-fledged panic ensued in early December. The Bank of England then modified its discount policy and began acting as a lender of last resort. Although the Bank's discount policies were very liberal, it acted too late to prevent massive bank failures, contraction of loans, and a serious recession in early 1826. (The annual data used in Table 1, based on an industrial production index, does not pick up this recession but it is evident in monthly series on unemployment and business failures in Gayer, Rostow, and Schwartz, 1953).

The 1840s railroad mania was perhaps the closest precedent to the recent IT boom (Crafts, 2000). Over a decade after the first successful railroad, the Liverpool and Manchester Railway was established in 1830, massive investment in rails and rolling stock extended the network across the United Kingdom. Railroad stock prices rose by 62 percent from 1843 to 1845 and then collapsed by 100 percent in the next four years. Although railroad investment was extensive, the consensus is that there was considerable overinvestment reflecting over optimism about potential profits. Also widespread was fraud from "false prospectuses and criminally deceitful accounting practices" (Crafts, 2000).

The collapse of the railroad boom was associated with the banking panic of 1847—one of the worst in British history. The panic led to many bank failures and a serious

recession. It only ended when the Bank of England requested a temporary suspension of the Bank Charter Act (Dornbusch and Frenkel, 1984). Subsequently, the Bank of England was blamed for not fulfilling its role as a lender of last resort (Schwartz, 1986).

A number of stock market crises cum recessions occurred in the rest of the pre-1914 era but it is not clear that they were associated with productivity booms and busts. The 1873–78 episode was not confined to the UK. Kindleberger (1990) views it as an international financial crisis reflecting both a building boom on the continent and the massive French gold indemnity to Germany on its loss of the Franco-Prussian war. In the interwar period, the United Kingdom had two serious crashes, with ensuing recessions: post-1918 and post-1928. The former was associated with both postwar disarmament and contractionary monetary policy to restore gold convertibility. The latter shadowed the United States' stock market boom and bust to be discussed below.

United States

The United States has had 20 stock market crashes in the past two centuries and most have been associated with recessions. Also, before 1933, many of these were associated with banking panics and severe financial distress. Indeed, a well known phenomenon in United States' macro history is that serious financial instability characterized most severe recessions (Zarnowitz, 1992).

It is not clear that productivity-induced booms and busts describe many of the crashes cum recessions before 1914. The period from 1834 to 1843 encompassed the most serious recession before the Civil War (Temin, 1969). The Jacksonian era is identified by major investment and speculation in cotton, cotton land, and canals (1834–36). The boom was followed by a stock market crash and two banking panics (1837 and 1839), sovereign debt defaults by a number of states and, as noted, by one of the most serious recessions in history. Another serious episode that occurred in 1857 was associated with the crash of speculation in railroad stocks.

The post-Civil War era was characterized by rapid growth, particularly of heavy industry, and the opening up of the west. Two major episodes of crashes and recessions: 1892–94 and 1906–08 seem to be mainly offshoots of political and monetary instability—the free silver movement in the 1890s—and international events and possibly the San Francisco earthquake in 1906–08. In both of these episodes, there were banking panics.

In the twentieth century, before World War II, three episodes stand out: 1919–21, 1928–33, and 1936–38. 1919–21, as in the United Kingdom, reflected post war readjustment; 1936–38 many believe was a consequence of mistaken tight Federal Reserve policy (Friedman and Schwartz, 1963, Meltzer, 2003).

The episode with the most resonance for today is 1928–33. The 1920s experienced a major stock market boom associated with massive investment that brought the major inventions of the late nineteenth century to fruition. These included: electricity, automobiles, communications, and petrochemicals. These innovations, many believe, were responsible for a great surge in productivity that lasted through much of the century (Gordon, 2000, David and Wright, 1999). In addition to the advances on the real side, the 1920s saw major innovations in industrial organization and corporate finance. Much of the new investment was financed by the issue of equities. New financial institutions were established to facilitate marketing of stocks, e.g., investment trusts and investment activities of commercial banks (White, 1990). Two salient examples of the 1920s “new economy”—GM and RCA—were favorites of the stock market.

Debate swirls over whether the boost in stock prices of these and other famous new companies of the time was based on reasonable estimates of future earnings. White believes that this was the case until the Spring of 1928. Afterwards, he argues (following Galbraith, 1954) that there was a bubble. Others contend, however, that stock prices completely

reflected fundamentals until the crash of October 1929 (Fisher 1930, Sirkin, 1975, and Prescott and McGrattan, 2002). Regardless of the outcome of this debate, the market crashed in October 1929 and the crash is usually blamed on tight Federal Reserve policy. The Fed, following its adherence to the “real bills doctrine” was increasingly concerned over stock market speculation beginning in 1927. After policy was tightened through 1928 and early 1929, a recession began in July 1929. This, according to White (1990), led to a revision of the prevailing optimism and the crash in equity prices.

The consensus view by economists is that the 1929 crash was not the pivot of the Great Depression (Friedman and Schwartz, 1963, Romer, 1993) but that it had a major effect on the first year of the recession. It reduced output via wealth effects on consumption, reduced investment, and reduced velocity. The consensus view is that the recession became a “Great Depression” beginning late in 1930 after the Fed failed to prevent a series of banking panics which erupted in the next three years. The banking panics in turn impacted the real economy through the collapse in money supply, which produced massive deflation (Friedman and Schwartz, 1963) and financial disintermediation (Bernanke, 1983). The depression spread abroad through the fixed exchange rate links of the classical gold standard.

Lessons from History

The historical record suggests that some stock market crashes but not all of them were associated with recessions. However, only a few of these crashes were asset boom and busts similar to the recent tech stock market episode. The key examples are the 1840s in the United Kingdom and the 1920s in the United States. The boom and bust in 1824–25 in the United Kingdom may be another example. The 1928–33 episode clearly was one where the real economy declined more than any other episode in history but the others were not associated with particularly severe recessions.

The key element that seemed to deepen stock-market-crash related recessions was financial weakness. Virtually every severe recession in United States' history before World War II involved banking panics and severe financial distress. This was also the case for the United Kingdom in the first two-thirds of the nineteenth century. The institution of effective lender of last resort policies by the Bank of England in the 1870s and the Federal Reserve since the 1930s, as well as the establishment of federal deposit insurance in 1934, may be the most important factors in reducing the severity of recessions in the post World War II era, whether or not preceded by a stock market crash.

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Table 1. Stock Market Crashes, Booms, and Recessions. United Kingdom and United States, 1800–2000

Episodes	(1) Crashes				(2) Major Causes	(3) Recessions		(4) Preceding Booms			(5) Banking Panic	(6) Severe Financial Distress		
	Stock Price Changes (In percent)					Peak	Trough	GDP Contraction In percent		Previous Peak	Peak	Stock price changes In percent		
	Peak	Trough	Nominal	Real ¹										
United Kingdom														
(1)	1808	1812	-40.8	-54.5	War	--	--	--	--	--	--	--	1810	--
(2)	1824	1826	-37.3	-33.6	Latin America mania	--	--	--	1822	1824	78.4	1825	--	
(3)	1829	1831	-28.0	-27.0	Political agitation	--	--	--	--	--	--	--	--	
(4)	1835	1839	-23.4	-39.1	American boom	1836	1837	-0.6	--	--	--	1837	1839	
(5)	1844	1847	-34.1	-30.5	Railroad boom	1846	1847	-2.5	1840	1844	51.9	1847	1847–48	
(6)	1865	1867	-23.9	-24.5	Overend Gurney Crisis	--	--	--	1858	1865	48.4	1866	1866	
(7)	1874	1878	-31.0	-19.7	European financial crisis	1874	1877	-2.0	--	--	--	--	--	
(8)	1909	1920	-49.2	-80.5	World War I	1918	1921	-23.6	--	--	--	1921	--	
(9)	1928	1931	-60.3	-55.4	Great Depression	1929	1931	-5.6	--	--	--	--	--	
(10)	1936	1940	-50.1	-59.9	Housing boom, war scare	--	--	--	--	--	--	--	--	
(11)	1944	1947	-29.2	-29.8	World War II	1943	1947	-14.7	--	--	--	--	--	
(12)	1948	1949	-32.3	-34.0	--	--	--	--	--	--	--	--	--	
(13)	1968	1970	-18.9	-27.8	Bretton Woods	--	--	--	1965	1968	24.6	--	--	
(14)	1971	1974	-69.3	-76.6	Oil Shock	1973	1975	-1.4	--	--	--	--	--	
(15)	1975	1976	-19.1	-30.8	Pound crisis	--	--	--	--	--	--	--	--	
(16)	1980	1982	-11.4	-27.0	Thatcher Revolution	1979	1981	-3.4	--	--	--	--	--	
(17)	2000	2002	-24.8	-26.7	Information Technology boom	--	--	--	1993	2000	78.4	--	--	

Table 1. Stock Market Crashes, Booms, and Recessions. United Kingdom and United States, 1800–2000 (continued)

Episode	(1) Crashes				(2) Major Causes	(3) Recessions		(4) Preceding Booms			(5) Banking Panic	(6) Severe Financial Distress	
	Stock Price Changes (In percent)							GDP Contraction		Stock price changes			
	Peak	Trough	Nominal	Real ¹		Peak	Trough	In percent	Previous Peak	Peak	In percent		
United States													
(1)	1809	1814	-11.4	-37.8	War	1811	1812	-1.6	--	--	--	1804	--
(2)	1835	1842	-50.6	-46.6	Bank War	1836	1837	-2.0	1828	1835	57.2	1837	1837
						1839	1840	-6.4	--	--	--	1839	--
						1841	1842	-1.0	--	--	--	--	--
(3)	1853	1859	-50.6	-53.4	Railroad Boom	1857	1858	-8.6	--	--	--	1857	1857
(4)	1863	1865	49.9	-22.5	Civil War	1864	1865	-6.2	1860	1863	20.5	--	--
(5)	1875	1877	37.7	-26.78	Railroad Boom	--	--	--	1863	1872	50.5	1873	1873–74, 76
(6)	1881	1885	-26.7	-22.2	Railroad Boom	--	--	--	1875	1881	51.3	1884	--
(7)	1892	1894	-21.0	-16.4	Silver agitation	1892	1894	-3.0	--	--	--	1893	1893 1894 1896
(8)	1902	1904	-16.3	-19.4	Rich man's panic	--	--	--	1899	1902	29.9	--	--
(9)	1906	1907	-19.4	-22.3	World Financial Crisis	1906	1908	-6.9	--	--	--	1907	--
(10)	1912	1914	-15.5	-17.6	War Scare	1913	1914	-7.6	--	--	--	--	--
(11)	1916	1918	-20.4	-42.5	War	1916	1917	--	--	--	--	--	--

Table 1. Stock Market Crashes, Booms, and Recessions. United Kingdom and United States, 1800–2000 (continued)

Episode	(1)				(2)	(3)		(4)			(5)	(6)	
	Crashes				Major Causes	Recessions		Preceding Booms			Banking Panic	Severe Financial Distress	
	Stock Price Changes (In percent)						GDP Contraction			Stock price changes			
	Peak	Trough	Nominal	Real ¹		Peak	Trough	In percent	Previous Peak	Peak	In percent		
(12)	1919	1921	-22.0	-24.5	Disinflation, disarmament	1918	1921	-8.3	--	--	--	--	--
(13)	1929	1932	-73.4	-66.5	Roaring 20s and policies	1929	1933	-29.7	1922	1929	201.8	1930 1931–33	1931 1932
(14)	1936	1938	-25.7	-27.0	Tight Monetary Policy	1937	1938	-4.5	--	--	--	--	--
(15)	1939	1942	-28.1	-38.8	War	--	--	--	--	--	--	--	--
(16)	1946	1949	-10.8	-27.1	Post war slump	1944	1947	-22.7	--	--	--	--	--
(17)	1968	1970	-15.7	-24.4	Bretton Woods	--	--	--	--	--	--	--	--
(18)	1972	1975	-24.1	-38.7	Oil shock	1973	1975	-0.6	--	--	--	--	--
(19)	1976	1979	1.0	-20.9	Oil shock	--	--	--	--	--	--	--	--
(20)	2000	2002	-27.7	-30.8	Information Technology boom	2001 ²	--	-0.5 ²	1993	2000	165.2	--	--

Data Sources by column.

(1) Bordo, Dueker and Wheelock (2000; 2002).

(2) Kindleberger (1996), and others.

(3) Bordo, Dueker and Wheelock (2001, 2002).

(4) *ibid.*

(5) Bordo (1986), Eichengreen and Bordo (2002), and Kindleberger (1996).

(6) Bordo, Dueker and Wheelock (2001, 2002).

¹ Stock market crashes, including their peaks and trough, were determined on the basis of real stock prices. In a few cases peaks and trough in nominal stock price differed from those for real stock prices. The changes in nominal stock prices are based on peaks and troughs of real stock prices.

² The Business Cycle Dating Committee of the National Bureau of Economic Research (NBER), determined that a recession began in 2001 Q2. In the absence of a date for the end of the recession, the GDP contraction covers the period 2001 Q1–2002 Q3, when level declines were recorded.