

The Nation in Depression

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The economic cataclysm of the 1930s was an international phenomenon experienced by countries in all parts of the globe. Countries as diverse as the United States, Germany, Chile, and Japan all experienced significant depressions in the 1930s. Thus, the title of Charles Kindleberger's classic book *The World in Depression* (1973) captures an important feature of the Great Depression. These international aspects, especially the importance of the gold standard in causing the downturn and transmitting depression from one country to another, have been emphasized in recent years in excellent books by Peter Temin (1989) and Barry Eichengreen (1992). These books have rightly received widespread attention and have successfully changed the focus of much analysis of the Great Depression from the United States to the world economy.

While such a change from American provincialism is surely healthy and warranted, adopting an international perspective on the Great Depression risks losing sight of the many ways in which the U.S. depression differed in timing and severity from depressions elsewhere. More important, it may obscure the many uniquely American causes of America's Great Depression.

This paper examines the ways in which the U.S. experience during the 1930s resembled that of other countries in some regards, and fundamentally differed in other aspects. I also evaluate the evidence on the causes of the Great Depression in the United States and the sources of the eventual recovery. I suggest that the path of American output and unemployment before 1931 can be explained quite well with only domestic factors. Even after 1931,

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international factors affected American economic conditions mainly through their impact on American policy decisions. In many ways the broad conclusion of this paper is summarized well in another classic book on the interwar era. In *Economic Survey, 1919–1939*, Arthur Lewis states (1949, p. 52):

It is clear that the centre of the depression was the United States of America, in the sense that most of what happened elsewhere has to be explained in terms of the American contraction, while that contraction is hardly explicable in any but internal terms.

Comparative National Experiences

The experiences of various countries during the 1930s is a well-worked topic.¹ This section uses annual data on industrial production for 24 countries to illustrate many salient features of the individual national experiences. I focus on industrial production because this series is often the most accurately measured national indicator of macroeconomic health.² Furthermore, many other series that one might think are more representative of a business cycle, such as the unemployment rate or real GNP, are very highly correlated with industrial production.

The Great Depression started in most countries at around the same time. This can be seen in Figure 1, which shows industrial production in five major countries between 1927 and 1937. In annual data, the peak in industrial production occurred in 1929 for 13 of the 22 countries for which a peak can be identified.³ Seven countries peaked in 1930 and two peaked in 1931. The only country to peak in 1928 was Poland, which was a fairly minor industrial country.⁴ The countries in which production peaked in 1929 include most of the major industrial producers, such as the United States, Canada, Germany, Japan, and the United Kingdom. France and Sweden were the largest industrial countries to peak in 1930.

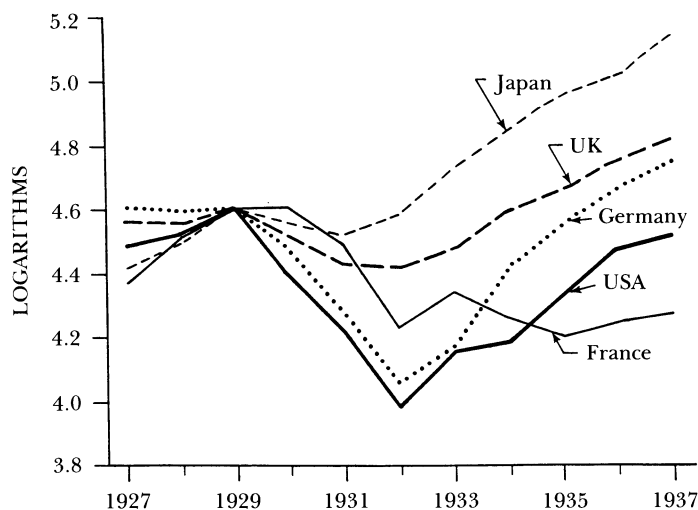
¹In addition to Kindleberger (1973) and Lewis (1949), Eichengreen (1992) and Eichengreen and Sachs (1985) point out crucial similarities and differences in the experience of various countries during the Great Depression.

²The industrial production data reported by the League of Nations were typically compiled by government agencies in the individual countries. As a result, the quality of the series differs substantially from one country to another. The American series, which is from the Board of Governors of the Federal Reserve System, is among the more comprehensive and reliable national indexes.

³No peak or trough can be identified for the Soviet Union, because it grew continuously through the Great Depression, or for South Africa, because the data for 1931 and 1932 are missing.

⁴In the League of Nations index of world industrial production, Poland gets a weight of 2.1 percent, while the United States gets a weight of 31.1 percent. The weights assigned to the other countries in the top five are: Germany, 17.5 percent; United Kingdom, 12.9 percent; France, 10.1 percent; and Japan, 5.9 percent (League of Nations, 1932, p. 47).

Figure 1
Annual Industrial Production in Five Countries, 1927–1937



Sources: The data on industrial production for 24 countries are from the League of Nations (1936, Appendix II, Table 2, p. 142 and 1938, Table 1, p. 44).

Based just on industrial production, there is little in the timing of the onset of the Great Depression to set the United States apart from the 12 other countries tied for first place. If one wanted to argue that the United States was in some sense earlier than the others, the series to analyze would be some indicator of building activity. Construction was the first sector to weaken in the United States and it weakened sooner here than elsewhere. Of the 11 countries for which the League of Nations provides data on building permits or some other indicator of building plans, only the United States and Belgium peaked in 1928.⁵ Planned construction did not turn down in countries such as Germany, France, and the United Kingdom until 1929 or later.

While the early downturn in construction is one way in which the onset of the Depression in the United States differed from other countries, more important differences involve the immediate severity of the Great Depression in the United States and the peculiar composition of the decline in American output. For most countries, the first year of the Great Depression was a fairly ordinary bad year. Table 1 shows the distribution of the percentage fall in industrial production between 1929 and 1930. The median decline in output for the 15 countries experiencing a decline was just over 9 percent. Industrial production in the United States, in contrast, declined 21 percent in the first

⁵The building activity data are from the League of Nations (1936, Appendix II, Table 3, pp. 154–155). In this comparison I only include countries for which the data reflect permits or some other indicator of planned, rather than completed, construction.

Table 1

Distribution of the Percentage Change in Industrial Production

A. 1930		
Percentage Change		Countries
5.1 to 10%		Denmark, South Africa, New Zealand
0.0 to 5%		Chile, France, Greece, Norway, Sweden
-0.1 to -5%		Estonia, Romania
-5.1 to -10%		Finland, Hungary, Italy, Japan, Netherlands, UK
-10.1 to -15%		Belgium, Czechoslovakia, Germany
-15.1 to -20%		Austria, Canada, Poland
-20.1 to -25%		USA

B. Peak to Trough		
Percentage Change		Countries
-0.1 to -10%		Greece, Japan, New Zealand
-10.1 to -20%		Denmark, Romania, Sweden, UK
-20.1 to -30%		Chile, Estonia, Finland, Hungary, Norway
-30.1 to -40%		Belgium, France, Italy
-40.1 to -50%		Austria, Netherlands
-50.1 to -60%		Canada, Czechoslovakia, Germany
-60.1 to -70%		Poland, USA

C. 1933		
Percentage Change		Countries
15.1 to 20%		USA
10.1 to 15%		Denmark, Finland, France, Germany, Japan, Netherlands, Romania
5.1 to 10%		Chile, Greece, Hungary, Italy, UK
0.0 to 5%		Austria, Belgium, Canada, Estonia, New Zealand, Norway, Poland, Sweden
-0.1 to -5%		
-5.1 to -10%		Czechoslovakia

Sources and Notes: The data on industrial production for 24 countries are from the League of Nations (1936, Appendix II, Table 2, p. 142 and 1938, Table 1, p. 44). The data for 1925 to 1929 are converted to a 1929 base to be consistent with later data. The Soviet Union is excluded from all parts because it did not experience any fall in output during the 1930s. South Africa is excluded from Parts B and C because the data for 1931 and 1932 are missing.

year of the Depression. Thus, the Depression was “great” in the United States sooner than elsewhere.

Another feature of the American experience in 1930 was that the initial fall in industrial production was more concentrated in consumer goods and less concentrated in investment goods than in many other countries. For example, the ratio of the percentage fall in the production of investment goods to the percentage fall in the production of consumption goods was just over two for

the United States, but close to three for Canada and over four for Germany.⁶ In the United Kingdom, however, the decline in industrial production in 1930 was even more skewed toward consumption goods than in the United States.

As the Great Depression dragged on through 1931 and 1932, nearly all countries experienced a significant depression. However, there was again substantial variation in the peak to trough amplitude across the countries for which the League of Nations collected industrial production data.⁷ In this contest the United States was a clear loser, with a peak to trough fall in industrial production of 62 percent. Only Poland also experienced a fall in production of this magnitude. The experiences of all of the countries are shown in Part B of Table 1. As can be seen, Canada, Czechoslovakia, and Germany experienced peak to trough declines in output approaching that of the United States. On the other hand, several major industrial countries, including the United Kingdom, Japan, and Sweden, experienced remarkably mild downturns. For example, the peak to trough decline in industrial production in the United Kingdom was less than a third as large as that in the United States. France had a reasonably large peak to trough fall in production of just over 40 percent, but between the peak in 1929 and the absolute trough in 1935 there was a significant recovery in 1933.

The timing of the trough in industrial production, on which the preceding amplitudes are based, is remarkably similar across countries. Of the 22 countries for which a trough can be identified, 15 reached their lowest point in 1932. Figure 1, which shows industrial production in the five largest industrial producers, shows that the United States, Germany, and the United Kingdom are among the countries that have a trough in 1932. Japan, along with Chile, Finland, New Zealand, and Norway, hit bottom earlier, in 1931. Czechoslovakian industrial production reached its lowest point in 1933 and French industrial production, as just mentioned, did not reach its absolute minimum until 1935. Production in all of the remaining countries reached its lowest level in 1932.

Based on these turning points, there is no evidence that the United States was particularly unusual in the duration of the declining phase of the Depression; most of the industrial world turned around at roughly the same time. The

⁶These composite indexes of the production of investment goods and current consumption goods are from the League of Nations (1938, Appendix III, Table 2, pp. 124–25). This comparison quite likely understates the peculiarity of the behavior of American consumption in 1930 because the consumption series indexes include mainly nondurables, while an unusually large fraction of the initial decline in consumption in the United States was in durable goods.

⁷The peaks and troughs refer to the actual highs and lows in the annual data on industrial production. For most countries there was no ambiguity in these dates because there was a single high followed by a single low. However, for France, the observations for 1929 and 1930 were the same and there was an intervening peak in 1932 before the absolute trough in 1935; 1930 and 1935 were chosen as the turning points. For Romania, there was a local peak in 1929 and a local trough in 1930 before the absolute extremes in 1931 and 1932; 1931 and 1932 were chosen as the turning points.

United States was somewhat unusual, however, in the strength of the initial recovery. As can be seen in Part C of Table 1, industrial production in 1933 grew faster in the United States than in any other nation, though France, Germany, and Japan were all close behind. U.S. growth slowed noticeably in 1934, but then surged again in 1935 and 1936.

The composition of the growth of industrial production during the early recovery in the United States was also somewhat different from that of many other countries. While the initial downturn had been skewed toward a fall in the production of consumer goods, the initial upturn in the United States was skewed toward an increase in the production of investment goods. According to League of Nations statistics, the output of investment goods in the United States rose 42 percent in 1933, while the output of consumer goods rose 10 percent, a ratio of more than four to one. In Japan and the United Kingdom, in contrast, production of investment goods rose only about twice as fast as production of consumption goods, and in France production of investment goods grew less rapidly than production of consumption goods. Germany had a composition of production growth that was similar to that of the United States.

While various countries began their recoveries at roughly the same time, there was much variation in when each economy was (in some sense) fully recovered. A crude measure of the date of recovery is simply the year in which industrial production reached its pre-Depression peak. This occurred in 1932 for New Zealand; 1933 for Japan, Greece, and Romania; 1934 for Chile, Denmark, Finland, and Sweden; 1935 for Estonia, Hungary, Norway and the United Kingdom; 1936 for Germany; and 1937 for Canada, Austria, and Italy. The United States, Belgium, Czechoslovakia, France, the Netherlands, and Poland did not recover before the end of the sample in 1937.⁸ This comparison suggests that the United States was not only among the first countries to slip into depression, but also among the last to recover.

Causes of the American Depression

Documenting the timing and severity of the Great Depression in the United States and abroad is more straightforward than explaining what caused the national and international collapse. Not surprisingly, an experience as devastating and complex as the Great Depression has many different causes. Fortunately, the source of the Great Depression is a topic that has generated a vast literature and many fruitful conclusions. This section argues that the path of output and employment in the United States in the 1930s is, contrary to common perception, very well understood. I also suggest that, at least up until

⁸The League of Nations data are not kept on the same basis after 1937. Using the modern Federal Reserve Board index of industrial production (the League's American statistics are based on an early version of this index), industrial production in the United States returned to its 1929 level in 1937, but then fell again in 1938.

the start of the third year of the American Depression, domestic factors were the prime cause of the drastic decline in American output.

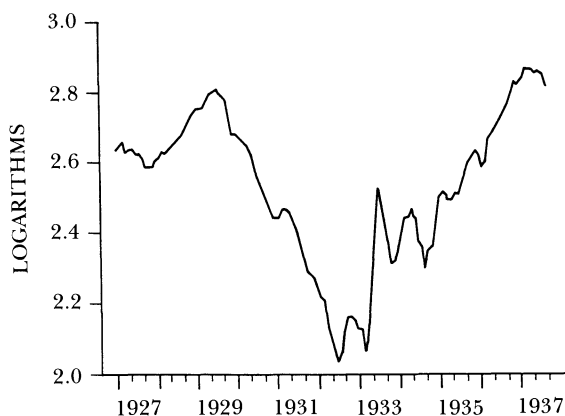
Framework

At the broadest conceptual level, the Great Depression in the United States can be analyzed quite well with the simple aggregate supply-aggregate demand model familiar to introductory economics students. Between 1929 and 1933, a series of shocks caused aggregate demand to decline repeatedly in the United States. These declines in aggregate demand moved the economy down along an upward-sloping aggregate supply curve. The net result was both progressively worsening unemployment and deflation.

There is substantial disagreement among scholars about why and when the U.S. aggregate supply curve became upward sloping, though nearly all agree that wages and prices were far from perfectly flexible in the 1920s and 1930s. Some studies of price flexibility conclude that wages and prices have been sticky since the turn of the twentieth century, implying that the only thing unique about the Great Depression was the size of the shocks (Allen, 1992; Schultze, 1981; Gordon, 1980). Other studies, using different data and different specifications, find that wages and prices did not become less flexible until around the time of the Great Depression (Sachs, 1980; Mitchell, 1985; O'Brien, 1989). For example, O'Brien argues that nominal wages became particularly rigid in 1929 and 1930 because firms were mistakenly convinced that maintaining wages would be good for business. He suggests that this belief had its origins in the bankruptcies of the early 1920s and President Hoover's oratory. Other factors often cited as explanations for increased rigidity after World War I are the rise of internal labor markets, which replaced day-to-day wage agreements with set pay scales, and the increasing size and market power of American corporations, which broke the lockstep relationship between costs and prices.⁹

There is also substantial disagreement about whether more wage and price flexibility would have prevented aggregate demand movements from having the large real effects that they had in the 1930s. In the conventional textbook model a fall in wages and prices raises real balances, lowers interest rates, and thus stimulates investment. The rise in investment serves to counteract at least some of the fall in demand. Tobin (1975) and De Long and Summers (1986) suggest that this traditional model is too simplistic because it ignores the effect of deflation on expectations. Since the expected real interest rate is what matters for investment decisions, deflation, which generates expectations of further deflation, could in fact depress aggregate demand further by raising real rates. Proponents of the debt-deflation hypothesis, first enunciated in the context of the Great Depression by Irving Fisher (1933), add that unanticipated

⁹Jacoby (1985) discusses the rise of internal labor markets and Alfred Chandler (1977) documents the fundamental change in the structure of American business around World War I.

*Figure 2***Monthly Industrial Production in the United States, 1927–1937**

Sources and Notes: The industrial production series is from the U.S. Board of Governors of the Federal Reserve System (1986, Table A.5, p. 171). This series is on a 1977 base and is seasonally adjusted.

deflation, by raising the real value of existing debt, raises the risk of default and depresses the economy by limiting credit availability.

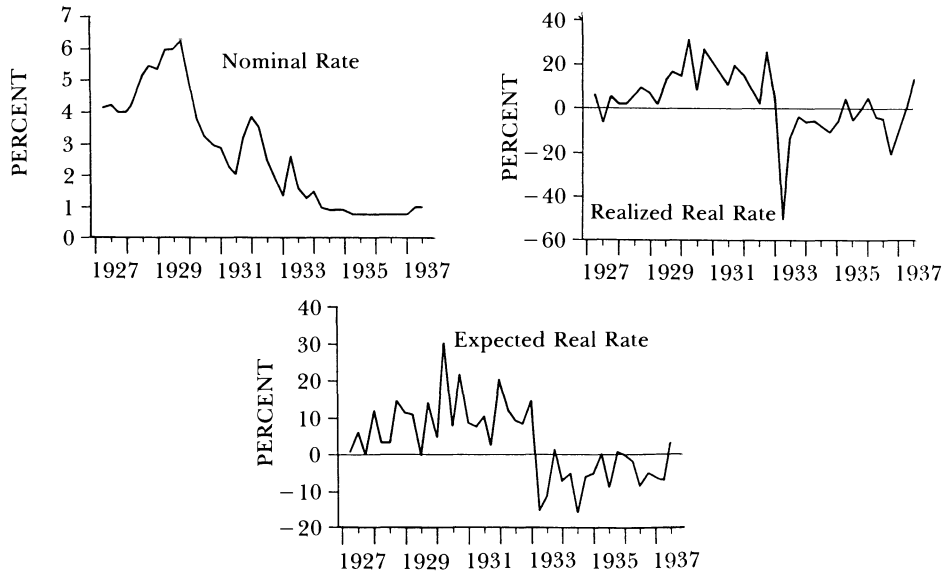
Despite this debate on the role of deflation, the fact that prices and wages were not perfectly flexible in the 1920s and 1930s means that movements in aggregate demand had real effects. Thus, the discussion about the causes of the Great Depression in the United States has rightly focused on the source of the collapse in aggregate demand in the late 1920s and early 1930s. The evidence suggests that domestic spending shocks related to the stock market crash were crucial in the first year of the Depression, while monetary shocks were important in later years. The later monetary shocks were partly the result of slavish adherence to the gold standard and partly due to the peculiarities of American financial institutions and policies.

The Start of Recession

The U.S. economy was clearly cooling off in the summer of 1929, as shown by the monthly data on U.S. industrial production in Figure 2. Seasonally-adjusted industrial production peaked in July 1929 and declined slowly between July and October 1929 (falling 3 percent over three months). The source of this slowdown is almost surely the tightening of Federal Reserve policy in 1928. Hamilton (1987) shows that the Federal Reserve began contractionary open market sales of securities in January 1928. This policy did not result in a drastic decline in the money supply because banks greatly increased their borrowing at the discount window. According to Hamilton (p. 149), banks undertook this heavy borrowing because the boom on the stock market led to enough of an increase in the demand for loans that “banks found it profitable

Figure 3

Quarterly Commercial Paper Rates in the United States, 1927–1937



Sources and Notes: The nominal commercial paper rate data are from the U.S. Board of Governors of the Federal Reserve System (1943, pp. 448–451, and 1976, p. 674). The data cover four- to six-month prime commercial paper and are not seasonally adjusted. The realized real interest rate series is calculated by subtracting the change in the producer price index over the following quarter (at an annual rate) from the nominal commercial paper rate. The producer price index is from the Bureau of Labor Statistics (1986). In this calculation neither series has been seasonally adjusted. The expected real commercial paper rate series is from Romer (1992, Figure 4).

to replace unborrowed reserves with borrowed reserves despite the sharply higher cost of doing so.”

The interaction of the open market sales and the increased demand for money and brokers’ loans caused by the stock market boom (documented by Field, 1984) led to a significant increase in both nominal and real interest rates. Figure 3 shows that the nominal commercial paper rate rose from 4.0 percent in the fourth quarter of 1927 to 5.5 percent in the fourth quarter of 1928. The realized real interest rate—calculated by subtracting the change in the producer price index over the following quarter (at an annual rate) from the commercial paper interest rate—rose even more steeply, from 5.6 percent in the fourth quarter of 1927 to 9.5 percent in the fourth quarter of 1928. Regression estimates of the expected real interest rate (that is the nominal rate less expected inflation), which are given in Figure 3, also show a substantial rise in real short-term rates.¹⁰

¹⁰These estimates are derived from a regression of realized real interest rates on current and lagged values of the growth rate of industrial production, the inflation rate, the nominal commercial paper rate, the growth rate of M1 relative to normal, and quarterly dummy variables. Under the assumption of rational expectations, the fitted values of the regression provide estimates of expected real interest rates. See Romer (1992) for a complete description of this estimation.

This rise in interest rates is enough to explain why the economy was slipping into a recession in the middle of 1929. The industries that started to decline first were those that were typically thought to be interest-sensitive. For example, as discussed previously, building permits for new construction in the United States peaked in 1928 and then declined 21 percent between 1928 and 1929. New automobile registrations peaked in November 1928, rebounded slightly in the spring of 1929, and peaked for the last time in July 1929.¹¹

The monetary explanation for the onset of recession in the United States is more plausible than alternative explanations that stress the fact, evident in Figure 1, that Germany and the United Kingdom experienced a minor recession in 1928 before rebounding somewhat in 1929. Such a recession abroad could have affected the U.S. economy by depressing our exports. However, American exports continued to rise between 1928 and 1929, suggesting that this effect was not present. Furthermore, at their highest, U.S. real exports in the mid-1920s were only a little over 6 percent of real GNP.¹² Therefore, even a large fall in American exports would have been unlikely to depress the U.S. economy greatly.

The likely importance of monetary tightness in mid-1929 suggests that a domestic policy decision was the cause of the onset of the recession that eventually became the Great Depression. However, this policy decision could certainly have had international roots. Hamilton (1987) and Temin (1989) both suggest that the change in Federal Reserve policy came at least partly in response to an outflow of U.S. gold to France because of an undervaluation of the French franc. Thus, adherence to the gold standard was to some degree responsible for the change in monetary policy. As Hamilton notes, however, protection of the gold standard could not have been the only motivation of the Federal Reserve because the monetary stringency continued even after gold inflows began in 1929. Hamilton's (p. 148) view is that "the major factor influencing monetary policy during 1928–1929 was surely the stock market." This view is echoed by Friedman and Schwartz (1963, p. 290), Temin (1989, pp. 22–23), and Eichengreen (1992, p. 217). By all these accounts, the Federal Reserve hoped to stem the stock market boom by raising interest rates.

While adherence to the gold standard was probably not the main factor behind the change in U.S. monetary policy in 1928, it was a crucial factor in determining the response of other countries. Eichengreen (1992) suggests that because the gold stocks of most European countries were already low by the

¹¹The automobile registration data are from Standard Statistics (1930, p. 182). I seasonally adjust this series by regressing the logarithm of registrations on eleven monthly dummy variables, a constant, and a linear trend.

¹²The series on real exports is constructed by ratio splicing the index of the quantity of total U.S. domestic exports from the Bureau of the Census (1975, Series U225, pp. 891–92) onto real exports in 1982 dollars from the Bureau of Economic Analysis (1986, Table 1.2, p. 6) in 1929. Real GNP in 1982 dollars is constructed by ratio splicing the Kendrick real GNP series (1961, Table A-IIa, p. 294) onto the BEA series in 1929.

mid-1920s, the increase in the U.S. interest rates, which drew gold to the United States, forced many countries to tighten their monetary policies along with the United States. Thus, the roughly contemporaneous cooling off of most of the world economy can be understood as a feedback effect from U.S. monetary policy aimed at stemming the American stock market boom.

The Onset of the Great Depression

The recession that started in the United States in the summer of 1929 became suddenly worse following the stock market crash in October 1929. Between October and December 1929, industrial production declined nearly 10 percent, and by the end of 1930 the Great Depression had started in earnest in the United States. Indeed, the decline in output during the first 18 months of the Depression was almost as large as in most previous and subsequent recessions in their entirety. For example, the fall in industrial production from the peak in July 1929 to December 1930 was 37 percent, while the peak to trough decline for the recession of 1921 was 40 percent and for that of 1938 was 39 percent. As discussed above, this was not true of most other countries; the rest of the world experienced much milder drops in industrial output in the first year of the Great Depression.

The source of this sharp decline is almost surely not contractionary monetary policy. The monetary contraction in 1928, though significant, was not large by historical standards. For example, while the nominal commercial paper rate rose $1\frac{1}{2}$ percentage points between 1927 and 1928 (fourth quarter to fourth quarter), it rose nearly three percentage points between 1919 and 1920. Realized real rates, which rose just under four percentage points between 1927 and 1928, rose an unbelievable 140 percentage points between 1919 and 1920 because of an enormous drop in producer prices. Furthermore, immediately following the stock market crash, the Federal Reserve Bank of New York bought large amounts of government bonds, thus increasing the stock of high-powered money. Both nominal and real interest rates fell substantially between the fourth quarter of 1929 and the first quarter of 1930; for example, the nominal commercial paper rate fell from 6.25 percent to 4.88 percent over this interval and the regression estimates of the expected real commercial paper rate given in Figure 3 fell 9.1 percentage points. Real rates surged up again in the second quarter of 1930, but are not consistently high until after the banking panic in October 1930. Thus, it is hard to see how monetary conditions, working through conventional channels, could have caused the nasty turn that the depression took in late 1929.

The onset of the Great Depression in the United States following the stock market crash was led by a collapse in domestic consumption spending. As discussed above, consumer spending played a larger role in the fall in output in the United States between 1929 and 1930 than in many other countries. Temin (1976) points out that consumer spending in the United States declined much more in 1930 than in either 1921 or 1938, the two other significant interwar

Table 2

Decomposition of the Change in GNP in the United States in Recessions

Year	Percentage Change in GNP	Fraction of the Change in GNP Accounted for by:				
		Consumption	Inventory Investment	Fixed Investment	Net Exports	Government Purchases
1904	-1.3	-0.76	0.66	0.83	0.26	0.01
1908	-8.6	0.56	0.24	0.35	-0.05	-0.10
1914	-7.9	0.12	0.23	0.63	0.09	-0.08
1917	-2.4	0.66	0.74	0.74	0.26	-1.40
1920	-1.1	-2.92	-1.71	-0.68	1.44	4.88
1921	-2.4	-1.95	2.56	0.51	0.43	-0.56
1930	-9.3	0.46	0.24	0.38	0.02	-0.10
1931	-6.2	0.38	0.03	0.62	0.06	-0.09
1932	-15.8	0.50	0.20	0.26	0.01	0.04
1933	-3.0	0.66	0.04	0.19	0.09	0.03
1938	-5.5	0.22	0.94	0.38	-0.26	-0.28

Sources and Notes: The data on real GNP and its components are from Kendrick (1961, Table A-IIa, pp. 293–295). The table shows the decomposition of the change in GNP for all years between 1900 and 1942 in which GNP declined. The rows may not sum to one because of rounding.

recessions. Table 2 shows the composition of the decline in real GNP in the United States in every year in which GNP fell between 1900 and 1942. While Temin's comparison of 1930 to 1921 and 1938 clearly overstates the peculiarity of 1930, it is certainly true that consumption accounted for a much larger fraction of the decline in real GNP in 1930 than in most previous or subsequent recessions. Indeed, the only years of GNP decline outside the Depression when consumption was nearly as important were 1917, when the United States was participating in World War I, and 1908, another year of substantial stock market volatility.

Table 2 also re-emphasizes how unimportant net exports were to the onset of the Great Depression in the United States. The fall in net exports in 1930 accounted for just 2 percent of the total decline in real GNP. This is much smaller than the contribution of net exports in the three recessions just before the Great Depression.¹³ This suggests that the international downturn had little feedback effect on the U.S. economy through American exports.

The most likely source of the precipitous drop in American consumption following the stock market crash in 1929 is the crash itself. In a previous paper, I showed that the stock market crash in October 1929 and the subsequent gyrations of stock prices through the middle of 1930 generated tremendous uncertainty about future income; the stock price movements did not necessarily

¹³This result also holds if one examines exports rather than net exports. Real exports accounted for just under 10 percent of the decline in real GNP in 1930. In 1914 they accounted for 11 percent of the fall in GNP; in 1917 they accounted for 51 percent; and in 1921 they accounted for 53 percent.

make consumers and investors pessimistic about the future, only highly uncertain (Romer, 1990). This uncertainty is clearly reflected in the forecasts made by contemporary analysts. Not only was there more variation across forecasts of future income immediately following the Great Crash, but the analysts expressed great uncertainty about their forecasts and speculated that consumers and businessmen felt the same way.

The effect of this uncertainty was that consumers and producers immediately cut their spending on irreversible durable goods as they waited for additional information about the future. This effect is seen most clearly in the fact that department store sales and automobile registrations declined precipitously in November and December 1929, while grocery store sales and ten-cent store sales actually rose; this is exactly what one would expect if consumers were shying away from irreversible goods but had not substantially changed their point estimates of future income. The role of the stock market crash in causing the decline in consumer purchases of durable goods is also seen in regressions of the output of consumer durables on total output, lagged output, wealth, and stock market volatility (Romer, 1990, p. 610). The coefficients from such regressions suggest that stock market volatility has a significant negative effect on the output of consumer durables and that the tremendous rise in volatility in late 1929 and early 1930 can more than account for all of the fall in the production of consumer durables in 1930.¹⁴ In addition to its effect through uncertainty, the stock market crash may also have depressed consumer spending by decreasing wealth (Temin, 1976) and by shifting households' balance sheets toward illiquidity (Mishkin, 1978).

This discussion suggests that both the initial recession in the United States in the summer of 1929 and the acceleration of the decline in late 1929 and 1930 are ultimately attributable to the stock market boom and bust of the late 1920s. The stock market boom is the prime explanation for why the Federal Reserve was pursuing tight monetary policy starting in 1928. The stock market crash is the prime source for the collapse in durable goods purchases starting in November 1929. Pointing to the stock market, of course, only pushes back the mystery one level. However, the research discussed by White (1990) suggests that the boom and bust of stock prices can best be described as a bubble that burst. Since bubbles are, almost by definition, inexplicable events, the stock price swing is legitimately viewed as an exogenous shock. Furthermore, since the stock market boom and crash were, to a first approximation, a uniquely American phenomenon, the onset of the Great Depression in the United States had uniquely American roots.

¹⁴Only part of the rise in volatility in late 1929 and early 1930 was due to the Great Crash itself. The repeated surging and plummeting of stock prices between November 1929 and June 1930 also increased volatility tremendously. In Romer (1990) I show that overall stock price volatility was much higher in 1929 and 1930 than it was following the stock market correction in October 1987. This difference in volatility is large enough to explain why the real effects were so much smaller in 1988 than in 1930.

The Worsening of the Great Depression

If the American Great Depression was severe by late 1930, over the next two years it became horrific. As Figure 2 shows, after recovering slightly at the start of 1931, industrial production in the United States tumbled steadily from April 1931 until July 1932. Over this 15-month period, industrial production declined nearly 43 percent; by July 1932, the index of industrial production stood at less than half of its peak value in July 1929. Unemployment increased at a rate one would expect given the fall in output; by 1932, the unemployment rate stood at over 24 percent. Prices also behaved as one would expect if the fall in output were caused by a decline in aggregate demand: the producer price index declined by slightly over 40 percent between July 1929 and July 1932.

The source of the continued decline in production in the United States was almost surely a series of banking panics. Beginning with a first minor wave of panics in the fall of 1930, Friedman and Schwartz (1963) document four waves of banking panics in the United States. The second wave occurred in the spring of 1931, the third in the fall of 1931, following Britain's abandonment of the gold standard, and the fourth in the winter of 1933, around the time of Roosevelt's inauguration. Over the four years from 1930 to 1933, more than 9000 banks suspended operations and depositors and stockholders lost roughly \$2.5 billion (Friedman and Schwartz, 1963, p. 351), the equivalent of 2.4 percent of nominal GNP in 1929.

The impact of these banking failures took many forms. First, the bank failures had a direct impact on the money supply. As depositors became nervous about the safety of banks, the ratio of deposits to currency fell dramatically. This greatly reduced the money multiplier, with the implication that a given stock of high-powered money could then support a much smaller total money supply. Because the Federal Reserve did nothing to increase the stock of high-powered money, the money supply declined sharply.¹⁵ For example, M1 (currency plus demand deposits) declined 28 percent between July 1929 and July 1932. The realized real interest rates given in Figure 3 show that real rates were very high in 1931 and 1932. This is what one would expect if the monetary contraction generated substantial deflation and nominal rates were bounded by zero. Regression estimates of the expected real rate also averaged over 10 percent in these two years. Such high real interest rates are no doubt part of the reason that fixed investment plummeted during this phase of the Great Depression.

The banking panics almost surely also affected the economy in ways unrelated to interest rates. For example, Temin (1976) finds that pessimism had replaced uncertainty among consumers and businessmen by the end of 1930. The financial upheaval surely contributed to this pessimism and is likely to have further depressed consumer spending and investment. The financial

¹⁵Indeed, in October 1931 the Federal Reserve deliberately raised the discount rate and as a consequence lowered the money supply substantially further.

panics also disrupted the intermediation function of banks. Bernanke (1983) points out that banks are an important source of funds for small businesses that cannot issue stocks or bonds. When a particular bank fails, all of the long-term relationships and information about local small borrowers accumulated by the bank are lost. It becomes more expensive for another bank to loan to one of the failed bank's customers, because it has to learn all over again which firms are prudent and which are unreliable. Bernanke finds that this rise in the "cost of credit intermediation" caused by bank failures was important in 1931 and 1932 and explains much of the deepening of the Great Depression in the United States during this time. The disruption of intermediation presumably worked through credit rationing of small borrowers and the related decline in investment.

Having argued that the banking crises of 1931 and later were a crucial cause of the deepening and sustaining of the Great Depression in the United States, the obvious questions are what caused the financial panics and why did the Federal Reserve do so little to contain them. The cause of Federal Reserve inaction is the easier of the two questions to answer. Friedman and Schwartz stress ineptitude and fear as the main culprits (1963, pp. 371, 407–19). They believe that certainly up through October 1930, the Federal Reserve could have stepped in with expansionary open market operations which would have raised output and put banks on a firmer footing. In particular, they argue that the U.S. gold supply was such that the Federal Reserve could have pursued a unilateral expansionary monetary policy without running into a serious constraint from the gold standard. The Federal Reserve failed to act, Friedman and Schwartz argue, because of a fear that monetary expansion would reignite speculation on the stock market, and because a power vacuum on the Board of Governors led to deadlock and indecision.

After mid-1931, it is harder to make the argument that the Federal Reserve was unconstrained by the gold standard. When Britain abandoned the gold standard in September 1931, the United States experienced a serious outflow of gold because there was widespread speculation that the U.S. would be forced to devalue soon as well. Eichengreen argues that in this situation the Federal Reserve had no choice but to raise interest rates in hopes of stemming the gold drain (1992, pp. 293–98). Friedman and Schwartz disagree, arguing that the Federal Reserve was in a very strong position to withstand the gold outflow because of its still large gold reserves and its legal power to suspend gold reserve requirements if they should become binding (1963, p. 396). At the very least, Friedman and Schwartz suggest, the Federal Reserve could have been more willing to discount bills brought to them by member banks at the higher interest rate than they actually were, thereby allowing banks experiencing runs to get much needed cash.

Whatever one's view of the pressure that the gold standard ultimately put on the Federal Reserve's ability to respond to the financial panics in 1931, there is little doubt that the Federal Reserve could have done something to stop the

first wave of panics in late 1930. If one believes that the panics built on one another through the effect on income and the effect on expectations, then a different decision by the Federal Reserve in the fall of 1930 might have prevented the later panics that so decimated the U.S. financial system. In this case, one would have to say that American policy mistakes in 1930 played a crucial role in determining the course of output not just in 1930, but in later years as well.

Uniquely American factors are also important for explaining why the United States was so prone to financial panics in the first place. Bernanke and James (1991) point out that many countries in the world experienced financial crises in the 1930s. However, the source of the financial fragility in the United States was quite different from that of other countries. For example, the organization of American banking, with its emphasis on small, undiversified banks, made the American financial system particularly susceptible to local shocks and unable to withstand runs. More important, the great expansion of agricultural lending during World War I left the American farm sector unusually heavily in debt. When deflation started in 1930, farmers were the first to default, and this sent undiversified rural banks into failure (Chandler, 1970, pp. 53–66). The unique conjunction of undiversified banking and a particularly large increase in agricultural indebtedness in the 1920s made the financial panics in the United States both more severe and more persistent than in other countries. Again, the American problems of 1931 and 1932 stem from peculiarly American roots.

Sources of the American Recovery

In the spring of 1932, the Federal Reserve adopted a noticeably expansionary monetary policy, largely under the threat from Congress that if it did nothing the legislature would intervene. The behavior of expected real interest rates shown in Figure 3 and the path of industrial production shown in Figure 2 suggest that this monetary expansion lowered real interest rates and generated a noticeable recovery in real output in the United States. Industrial production rose 12 percent in the four months between July and November of 1932. However, this monetary expansion ceased when Congress adjourned in July and the Federal Reserve was able to return to its policy of caution. In early 1933, the final wave of banking panics pushed the economy back into depression. Only in April 1933 did the American recovery begin in earnest.

The recovery of the United States from the Great Depression has been alternatively described as very fast and very slow. It was very rapid in the sense that the growth rate of real output was very large in the years between 1933 and 1937 and after 1938. Monthly industrial production increased by 79 percent between the trough in March 1933 and the peak in July 1937. As shown in Table 1, annual industrial production in 1933 actually increased

faster in the United States than in any other country. This expansion was not limited to industrial output. Real GNP grew at an average rate of nearly 10 percent per year in the four years between 1933 and 1937, and again in the three years between the recession of 1938 and the outbreak of World War II in the United States in December 1941.

The recovery was nevertheless slow in the sense that the fall in output in the United States was so severe that, despite these impressive growth rates, real GNP did not return to its pre-Depression level until 1937 and its pre-Depression growth path until around 1942. This fact leads to the frequently heard statement that the American Depression did not end until the outbreak of World War II.

The war, however, was not the main source of the American recovery, at least not in the way that is typically thought. In another paper, I find that the U.S. economy began recovering in 1933 primarily because of huge increases in the money supply (Romer, 1992). Soon after taking office, Roosevelt, using emergency powers granted to him by the Congress, allowed the dollar to depreciate substantially. A new lower price for the dollar was fixed by law in January 1934. This devaluation greatly increased the nominal value of existing American gold stocks. The Treasury could have ignored the increase in the nominal value of its gold reserves and left the money supply unchanged. Instead, the Treasury issued gold certificates equal to the amount of the increase in gold reserves and deposited them at the Federal Reserve. As the government spent the money, these gold certificates were converted into Federal Reserve notes, which are a component of the monetary base. As a result, high-powered money in the United States increased 12 percent between April 1933 and April 1934.

Devaluation also brought with it a large inflow of monetary gold from abroad as foreigners traded gold for the now less expensive dollars. After 1934, gold continued to flow to the United States because of political unrest in Europe. Hitler's increasing belligerence caused Europeans to want to invest in American assets, which required that they buy dollars with gold. The Treasury could have sterilized this gold inflow by borrowing the dollars to trade for the gold. Instead, the Treasury paid for the gold with deposits at the Federal Reserve, and then replenished its account by issuing gold certificates. As a result, high-powered money increased another 40 percent between April 1934 and April 1937.

This increase in high-powered money led to an increase in M1 of almost the same amount: M1 increased 49 percent between April 1933 and April 1937. That M1 did not increase by more than the base is evidence that the money supply was growing during the mid-1930s because of policy decisions and political events in Europe, rather than because of endogenous changes in the money multiplier caused by the recovery itself. Temin and Wigmore (1990) argue that, even before the money supply actually increased, devaluation helped to spur recovery by signalling the switch to a more expansionary

monetary regime. They suggest that devaluation immediately stimulated purchases of farm equipment and other capital goods by generating expectations of future monetary ease, inflation, and real economic growth.

After 1934 the huge increases in the American money supply had exactly the effect on the U.S. economy that a traditional aggregate supply-aggregate demand model would lead one to predict. Figure 3 shows that real interest rates plummeted in response to the gold inflows. This came about because nominal rates fell slightly and actual and expected inflation rose substantially (the producer price index rose at over 8 percent per year between January 1933 and January 1937). This fall in real interest rates was followed fairly quickly by a recovery of interest-sensitive spending, such as construction spending and consumer purchases of durable goods. This effect can be seen in the fact that the American recovery, more than in other countries, was led by a surge in the output of investment goods. One piece of evidence that suggests a causal link between the fall in interest rates and the surge in particular types of spending in the United States is the fact that American consumer spending on durable goods turned around before consumer spending on services. This indicates that some factor that affected only durables purchases, such as a fall in interest rates, was initiating the recovery.¹⁶

That increases in the money supply generated the recovery suggests that movements in aggregate demand were as important for ending the Great Depression in the United States as they were for causing it. However, there is an obvious question about whether the increase in the U.S. money supply during the recovery should be considered an accident caused by international developments or the predictable result of conscious American policy. The right interpretation, I believe, is a mixture of both. The political upheaval in Europe that caused gold to flow to the United States was clearly an international shock. Indeed, there is a very real sense in which the tension leading up to the outbreak of World War II in Europe did help to end the American Depression by causing the U.S. money stock to grow.

On the other hand, Johnson (1939) shows that the Roosevelt administration consciously chose to devalue and not to sterilize the subsequent gold inflows, precisely because it wanted to increase the money supply and cause inflation. In this way, the international gold flows may simply have provided a convenient way for the executive branch to bypass the overly cautious Federal Reserve. In the absence of such gold flows, Roosevelt and the Congress would quite possibly have used the threat of amending the Federal Reserve's operating procedures to force the Federal Reserve to increase the money supply. However, devaluation was clearly important in any case, because no country could pursue a wildly expansionary monetary policy for a sustained period and

¹⁶The monetary expansion and the concurrent restructuring of the banking system could also have stimulated construction and investment through increased credit availability.

still maintain a fixed exchange rate. Thus, as argued by Eichengreen and Sachs (1985), the decision to abandon the old gold parity was a crucial precondition for recovery.

Conclusion

The American Depression was unique in many ways. While many countries experienced a depression at roughly the same time as the United States, the onset of decline and the subsequent rebound were much more extreme in the United States than elsewhere. The overall depth of the Great Depression was also larger in the United States than in any country other than Poland. Finally, the American Depression was initiated by a fall in consumption and ended by a rise in investment to a degree that was quite different from the experience of many other industrial countries.

The picture that I have painted of the American Great Depression is one that stresses the importance of national, rather than international, aggregate demand shocks; the experience of the United States during the 1930s differed in important ways from that of other countries because the American experience had many uniquely American roots. The United States slipped into recession in mid-1929 because of tight domestic monetary policy aimed at stemming speculation on the U.S. stock market. The Great Depression started in earnest when the stock market crash in the United States caused consumers and firms to become nervous and therefore to stop buying irreversible durable goods. The American Depression worsened when banking panics swept undiversified and overextended rural banks and the Federal Reserve failed to intervene. Finally, the American Depression ended when the Roosevelt administration chose to increase the money supply tremendously after 1933.

Most of these shocks contain an international element, in one way or another. The tight monetary policy of 1928 was partly aimed at stopping a gold outflow. The Federal Reserve was less able to respond to financial panics in 1931 because expansionary monetary policy would have led to a serious loss of gold. Increasing the money supply after 1933 was very simple because capital flight from Europe brought billions of dollars worth of gold to the United States. Although these international complications were present, they were not decisive. At each stage of the Great Depression, it was ultimately American shocks and American policy decisions that determined the path of American output and employment.

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References

- Allen, Steven G.**, "Changes in the Cyclical Sensitivity of Wages in the United States, 1891–1987," *American Economic Review*, March 1992, 82, 122–40.
- Bernanke, Ben**, "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression," *American Economic Review*, June 1983, 73:3, 257–76.
- Bernanke, Ben, and Harold James**, "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison." In Hubbard, R. Glenn, ed., *Financial Markets and Financial Crises*. Chicago: University of Chicago Press for NBER, 1991, 33–68.
- Chandler, Alfred D.**, *The Visible Hand: The Managerial Revolution in American Business*. Cambridge: The Belknap Press of Harvard University Press, 1977.
- Chandler, Lester V.**, *America's Greatest Depression, 1929–1941*. New York: Harper and Row, 1970.
- De Long, J. Bradford, and Lawrence H. Summers**, "Is Increased Price Flexibility Stabilizing?" *American Economic Review*, December 1986, 76:5, 1031–44.
- Eichengreen, Barry**, *Golden Fetters: The Gold Standard and the Great Depression, 1919–1939*. New York: Oxford University Press, 1992.
- Eichengreen, Barry, and Jeffrey D. Sachs**, "Exchange Rates and Economic Recovery in the 1930s," *Journal of Economic History*, December 1985, 45, 925–46.
- Field, Alexander**, "Asset Exchanges and the Transactions Demand for Money, 1919–1929," *American Economic Review*, March 1984, 74:1, 43–59.
- Fisher, Irving**, "The Debt-Deflation Theory of Great Depressions," *Econometrica*, October 1933, 1, 337–57.
- Friedman, Milton, and Anna J. Schwartz**, *A Monetary History of the United States, 1867–1960*. Princeton: Princeton University Press for NBER, 1963.
- Gordon, Robert J.**, "A Consistent Characterization of a Near-Century of Price Behavior," *American Economic Review Papers and Proceedings*, May 1980, 70, 243–49.
- Hamilton, James D.**, "Monetary Factors in the Great Depression," *Journal of Monetary Economics*, March 1987, 19, 145–69.
- Jacoby, Sanford**, *Employing Bureaucracy: Managers, Unions, and the Transformation of Work in American Industry, 1900–1945*. New York: Columbia University Press, 1985.
- Johnson, G. Griffith**, *The Treasury and Monetary Policy, 1933–1938*. Cambridge: Harvard University Press, 1939.
- Kendrick, John W.**, *Productivity Trends in the United States*. Princeton: Princeton University Press for NBER, 1961.
- Kindleberger, Charles**, *The World in Depression*. Berkeley: University of California Press, 1973.
- League of Nations**, *Review of World Production, 1925–1931*. Geneva, 1932.
- League of Nations**, *World Production and Prices, 1935/36 and 1937/38*. Geneva, 1936 and 1938.
- Lewis, William Arthur**, *Economic Survey, 1919–1939*. London: George Allen and Unwin, 1949.
- Mishkin, Frederic S.**, "The Household Balance Sheet and the Great Depression," *Journal of Economic History*, December 1978, 38, 918–37.
- Mitchell, Daniel J. B.**, "Wage Flexibility: Then and Now," *Industrial Relations*, Spring 1985, 24, 266–79.
- O'Brien, Anthony Patrick**, "A Behavioral Explanation for Nominal Wage Rigidity During the Great Depression," *Quarterly Journal of Economics*, November 1989, 104, 719–35.
- Romer, Christina D.**, "The Great Crash and the Onset of the Great Depression," *Quarterly Journal of Economics*, August 1990, 105, 597–624.
- Romer, Christina D.**, "What Ended the Great Depression?" *Journal of Economic History*, December 1992, 52, 757–84.
- Sachs, Jeffrey**, "The Changing Cyclical Behavior of Wages and Prices, 1890–1976," *American Economic Review*, March 1980, 70:1, 78–90.
- Schultze, Charles L.**, "Some Macro Foundations for Micro Theory," *Brookings Papers on Economic Activity*, 1981:2, 521–76.
- Standard Statistics Co.**, *Standard Statistical Bulletin, 1930–31 Base Book Issue*. New York: Standard Statistics Co., 1930.
- Temin, Peter**, *Did Monetary Forces Cause the Great Depression?* New York: W. W. Norton, 1976.
- Temin, Peter**, *Lessons from the Great Depression*. Cambridge: M.I.T. Press, 1989.

Temin, Peter, and Barrie A. Wigmore, "The End of One Big Deflation," *Explorations in Economic History*, October 1990, 27, 483-502.

Tobin, James, "Keynesian Models of Recession and Depression," *American Economic Review Papers and Proceedings*, May 1975, 65, 195-202.

U.S. Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*. Washington, D.C., 1943 and 1976.

U.S. Board of Governors of the Federal Reserve System, *Industrial Production*, 1986 Edition. Washington, D.C., 1986.

U.S. Bureau of Economic Analysis, *National Income and Product Accounts of the United States, 1929-1982*. Washington, D.C., 1986.

U.S. Bureau of Labor Statistics, *Historical Data on the Producer Price Index*. Microfiche. Washington, D.C. 1986.

U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970*. Washington, D.C., 1975.

White, Eugene N., "The Stock Market Boom and Crash of 1929 Revisited," *Journal of Economic Perspectives*, Spring 1990, 4:2, 67-83.