

Why Money Matters: A Fourth Natural Experiment

James R. Lothian*

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Abstract: Milton Friedman (2005,2006) compared the behavior of money supply, nominal income and stock prices in the United States during the course of the 1920s and early 1930s with behavior in two other historical episodes, Japan in the 1980s and early 1990s and the United States in the 1990s and early 2000s. The three episodes, he argued, provided a natural experiment to test his and Anna J. Schwartz's explanation of the Great Depression of the 1930s. I use similar data for the U.S. recession that began in the fourth quarter of 2007 as a fourth such natural experiment. What makes this episode particularly interesting are the continuing comparisons between it and the Great Depression that were made as events unfolded. The results are clear cut. In the recent recession, like the U.S recessions at the start of this century and the Japanese recession in the 1990s, there were no severe monetary shocks of the sort experienced in the 1930s. This recession, again like the other two, has been very much milder, and very likely will prove very much shorter than the Great Depression. This, in turn, is exactly what the Friedman and Schwartz hypothesis predicts.

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* Fordham University, School of Business, 113 West 60th Street, New York, NY 11209, USA; tel. 1 212 636-6147; emails, lothian@fordham.edu, jrmlothian@aol.com. John Devereux and Gerald P. Dwyer, Jr. provided helpful commenst on an earlier draft.

In an article published posthumously in the *Wall Street Journal*, “Why Money Matters,” Milton Friedman compared the behavior of money supply, nominal income and stock prices in the United States during the course of the 1920s and early 1930s with behavior in two other historical episodes, Japan in the 1980s and early 1990s and the United States in the 1990s and early 2000s.¹

“These three episodes,” Friedman argued, “provide [d] the equivalent of a controlled experiment” to test his and Anna J. Schwartz’s explanation of the Great Depression of the 1930s – in their terminology “the Great Contraction.” This experiment, Friedman went on to say, “consist[ed] in observing the effect on the economy and the stock market of the monetary policies followed during, and after, three very similar periods of rapid economic growth in response to rapid technological change.” The other two episodes, in addition to the Great Depression itself, were the recessions in Japan in the 1990s and in the United States near the start of this century.

1. A Fourth Episode

As it turns out, we now have a fourth, albeit not yet completed, episode with which to test the Friedman and Schwartz hypothesis – the recession in the United States that began in the fourth quarter of 2007 and the boom period that preceded it. What makes this episode particularly interesting are the continuing comparisons between it and the Great Depression made by various commentators as events unfolded.

In this episode, like the earlier three, the quantity of money serves as the counterpart to the experimenter’s input while nominal income and stock prices serve as the counterpart to the

¹ An earlier version of the article was published in the *Journal of Economic Perspectives* in 2005.

experimenter's output. Like all three earlier contractions, the one now concluding was preceded by a period of continual increases in nominal income, stock prices and the quantity of money.

In all of these episodes, history provides the counterpart to the experimenter's laboratory controls. For, as Friedman argued in connection with the earlier three episodes and as is true in this latest one, the booms all occurred in very similar economic settings – “developed private enterprise market economies, involved in international finance and trade, and with similar monetary systems, including a central bank with power to control the quantity of money.”

Completing the analogy with a laboratory experiment, are the differences that history has provided in the time pattern of variations in the quantity of money, the input variable. In the expansion phases of all four of these episodes, the behavior of the quantity of money was more or less the same, increases of varying degrees during most of the for expansions. In the contraction phases, in contrast, behavior differed substantially across the four episodes, much as it would in a proper laboratory experiment.

The question of interest, therefore, is whether the behavior of the output variables in the four contractions mirrored these differences in the behavior of the input variable, the quantity of money. For the three episodes that Friedman investigated, the answer was a rather emphatic “yes.” For this latest episode, the same thing holds.

Figures 1 through 3 and Table 1, all of which are patterned on Friedman's presentation of empirical results, speak to this issue. Figures 1 through 3 show the quarterly time paths of the quantity of money, nominal income (GDP or GNP, depending upon data availability) and stock prices during the course of the 1930s contraction and the current contraction and the boom periods that preceded them. In all three charts, the series are quarterly averages aligned at the

cycle peak. As in Friedman's presentation, all of these data are in the form of indices expressed as ratios of the quarterly observations to the respective averages during the six years prior to the cycle peak. The top half of Table 1 shows the cumulative increases in the quantity of money, nominal income and stock prices in all four boom phases; the bottom half shows the cumulative changes in the three variables in the contraction phases thereafter. The data for Japan in the 1990s and the United States in the 1990s and early 2000s come directly from Table 2 in Friedman's article. Those for the United States in the 1920s and early 1930s and in the latest episode are my calculations.²

What stands out in particular in Figure 1 is the contrast between the behavior of the money stock after the respective business cycle peaks in the Great Depression and this latest episode. Prior to the peak, M2 followed close to an identical upward course for much of the period in both episodes. Then, a year or so before the peaks, the two time paths began to diverge, M2 growth slowing in the 1920s episode but continuing more or less apace in the latest one. After the peaks, however, is when the real divergence sets in, with M2 during the course of the Great Depression ultimately falling by an historically unprecedented 33 per cent and in this latest episode, in contrast, actually accelerating since the peak.

Consistent with Friedman's earlier results, the difference in the time paths of the money stock is reflected in similar differences in the time paths of nominal income and stock prices. We can see this in Figures 2 and 3. In the Great Depression, nominal income began its decline at the

² Some of my data for the United States in the 1920s and early 1930s are from different sources than Friedman's and, therefore, result in slightly different estimates of the cumulative changes during the boom and contraction phases of that cycle

reference cycle peak and fell continuously thereafter, reaching a trough 14 quarters later at less than half its value at the peak. In this latest episode, the pattern has been very different. Nominal income continued to rise for three quarters after the business cycle peak, reflecting both the delayed decline in real income and continued increases in the GDP deflator. Nominal income declined during the next three quarters, reaching a trough in second quarter 2009 at 97 per cent of its peak value, but then in the two quarters that followed made up most of the shortfall.

In broad outline, stock prices in these two episodes exhibited similar patterns to nominal income. In the current episode, the boom was much less pronounced and, because the data span the earlier dot-com decline, began later than in the 1920s. More important from the standpoint of the Friedman-Schwartz hypothesis, however, are the patterns of declines thereafter. In this latest episode the Standard and Poor's index, peaked in 2007.2, remained very nearly constant over the next two quarters and then, following the peak in the economy in 2007.4, began a five-quarter decline. It reached a trough in 2009.1 a little below 45 per cent of its peak value. In the Great Depression, in contrast, the index peaked in 1929.3 coincident with the peak in the economy and after a brief bounce back declined continuously over the following eleven quarters. When it finally reached its trough in 1932.1, the index stood 82 per cent below its peak value.

To add to the picture, I have plotted the data for real income in the two episodes. These data are shown in Figure 4. Like the three series examined above, real income increased substantially – though not continuously – during the respective boom periods. After the reference-cycle peaks were reached, however, is when the difference in the behavior of the two series again becomes manifest. Following the reference-cycle peak in 1929.3, real income declined precipitously – a cumulative 36 per cent drop until the reference-cycle trough was

reached in 1933.1. In the latest episode – again as in the earlier comparisons – it behaved almost entirely differently. Real income declining for one quarter following the reference-cycle peak in 2007.4, in the next quarter more than made up that decline, and over the course of the next four quarters declined further. In 2009.2 – the likely date of the reference-cycle trough – it stood 3.8 per cent below its value in 2008.2. That decline, however, is less than a tenth of the decline experienced during the Great Depression. Its duration is less than a third that of the real-income decline during the Great Depression. In the two quarters, that have followed, moreover, the subsequent growth in real income has erased half of that 3.8 per cent loss.

Data summarizing the movements in the nominal money stock, nominal income and stock prices in both the expansion phases and contraction phases of the Great Depression, the latest episode and the two additional episodes studied by Friedman are shown in Table 1. These tell a very similar story to the data for the current episode. In the latter two episodes, we see very much the same picture as the latest one – substantial increases in the nominal money stock, nominal income and stock prices during the expansion phase, and decreases thereafter that pale in comparison to those in the Great Depression.

Table 2 shows the rank correlations between the cumulative changes in the nominal money stock on the one hand and nominal income and stock prices on the other. We see a positive correspondence between the magnitude of the changes in money and the other two variables on the upside in all four episodes and, more important from the standpoint of the Friedman-Schwartz hypothesis, an even closer positive correspondence on the downside. These correlations range from .63 for money and nominal income during the expansion phases to 1.00 for the same two variables during the contraction phases.

2. Some Additional Observations

The results that I have reported here are completely consistent with the broader set of findings on the role played by money in business contractions historically. Friedman and Schwartz in a lengthy article published the same year as their *Monetary History of the United States*, entitled “Money and Business Cycles,” (Friedman and Schwartz, 1963a,1963b) based on an analysis of U.S. data over the period 1867-1960 concluded that:

[There is] an extraordinarily strong case for the propositions that (1) appreciable changes in the rate of growth of the stock of money are a necessary and sufficient condition for appreciable changes in the rate of growth of money income; and that (2) this is true both for long secular changes and also for changes over periods roughly the length of business cycles.

They added, however, that:

The case for a monetary explanation is not nearly so strong for the minor U.S. economic fluctuations that we have classified as mild depression cycles as the case is for the major economic fluctuations. Clearly, the view that monetary change is important does not preclude the existence of other factors that affect the course of business or that account for the quasi rhythmical character of business fluctuations. We have no doubt that other factors play a role.

Phillip Cagan in his companion study (1965) to the Friedman and Schwartz volume, presented additional evidence for the United States in line with Friedman and Schwartz’s conclusions. Cagan’s focus was on the proximate determinants of the money supply – high-powered money, the currency-money ratio and the reserve-deposit ratio and their respective contributions to changes in money both secularly and cyclically. With regard to cyclical movements, Cagan concluded that his evidence was “consistent with, and, taken as a whole, impressively favors emphasis on the decline in the rate of monetary growth as the main reason some business contractions, regardless of what may have initiated them, became severe.” For

milder cyclical contractions, he concluded that the relation between money and income was one of mutual dependence with causation running in both directions.

Wallace Huffman and I (1984), in a study of the transmission of cyclical fluctuations between the United Kingdom and the United States over the period 1833-1932, pursued a two-pronged approach; using historical analysis similar to Cagan's to investigate the money-income relation in severe contractions and then estimating vector-autoregressive models for the two countries combined. We derived three important conclusions from our analyses: that monetary shocks were important independent factors leading to or worsening the severity and duration of the contractions in the two countries; that in severe contractions in both countries, such shocks were the most important causative factor; and that gold flows played a key role in transmitting monetary shocks from the one country to the other.

In testimony before the Joint Economic Committee of the U.S. Congress in October 2009, Christina Romer, the Chair of the Council of Economic Advisers, made yet another comparison between that episode and the current recession (2009, p. 1). She described the U.S. economy as being "in terrible shape" at the start of 2009 stating further "that the shocks that hit the U.S. economy last fall were, by almost any measure, larger than those that precipitated the Great Depression."³ To back up that claim, Romer presented data for both the Great Depression and the current recession for three factors that have figured prominently in discussions of the current episode: the decline in household wealth, uncertainty caused by increased volatility in financial markets and, as she termed it, the mood of "full-fledged financial panic" that had gripped those

³ See the discussions by Bartram and Bodnar (2009), Dwyer and Tkac (2009), Lothian (2009), Melvin and Taylor (2009) and Taylor (2009).

markets. The specific measures Romer used in her comparisons were the percentage change in household wealth from 2007 to 2008 and from 1928 to 1929, the variance of daily stock returns for the periods September to December 2008 and September to December 1929, and the change in the spread between the yields on AAA and BAA corporate bonds from September 2008 to December 2008 and from September 1929 to December 1930.

Whether these factors, as Romer asserts, “precipitated” the Great Depression is open to question, or at least has to be qualified. Nevertheless, the latest recession, like the recessions in the United States at the start of this century and in Japan in the 1990s, has in fact differed substantially from the Great Depression and in exactly the way that Friedman and Schwartz’s hypothesis would predict. During the expansions that preceded all three recessions, the economies in question exhibited similar behavior in terms of movements in the money stock, in nominal income and in stock prices to that of the United States in the run up to the Great Depression. Where the three episodes differed from the Great Depression is in behavior after the economic and stock-market peaks were reached. There were no severe monetary shocks of the sort experienced in the Great Depression and none of the three recessions came anything close in severity to that episode.

3. Conclusions

In Arthur Conan Doyle’s tale “Silver Blaze” the key to Holmes cracking the case was that “the dog did nothing in the night.” The dog didn’t bark. In the current recession, like Japan in the 1990s and the United States at the start of this century and now again more recently, the key is also what did not happen. The Bank of Japan in the early 1990s and the Fed in both this episode

and the one at the start of his century did not let financial dislocations degenerate into classic banking crises with their resultant deleterious effects on money supplies. That in turn, I believe, is the key to why none of the three recessions turned into a “great depression.”

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Table 1. Behavior of money supply, nominal income and stock-price indices in four expansions and the contractions that followed

	US 1920s	Japan 1980s	US 1990s	US 2000s
<u>Ratio of value at peak to value six years earlier</u>				
Money supply	1.27	1.59	1.44	1.19
Nominal income	1.26	1.43	1.37	1.38
S&P index	3.70	3.86	3.20	1.34
<u>Ratio of value in terminal quarter to value at peak</u>				
Money supply	0.72	1.07	1.26	1.55
Nominal income	0.47	1.34	1.18	0.99
S&P index	0.22	0.37	0.58	0.73

Peak, trough and terminal dates are as follows: US, 1920s: 1923.3, 1929.3, 1933.1 for both the business cycle and the stock-market cycle. Japan, 1980s: 1986.1, 1992.1, 1995.3 for the business cycle and 1983.4, 1989.4, 1993.4 for the stock-market cycle. US, 1990s: 1995.1, 2001.1, 2004.3 for the business cycle and 1994.3, 2000.3, 2004.3 for the stock-market cycle. US, 2000s: 2001.4, 2007.4, 2009.4 for the business cycle and 2001.4, 2007.2 and 2009.4 for the stock-market cycle.

**Table 2. Rank correlations:
Data for four cyclical episodes**

<u>Expansion phases</u>	
Money supply, Nominal Income	0.63
Money supply, Stock prices	0.80
<u>Contraction phases</u>	
Money supply, Nominal income	1.00
Money supply, Stock prices	0.80

Figure 1. Money as a percentage of the average for six years prior to peak.

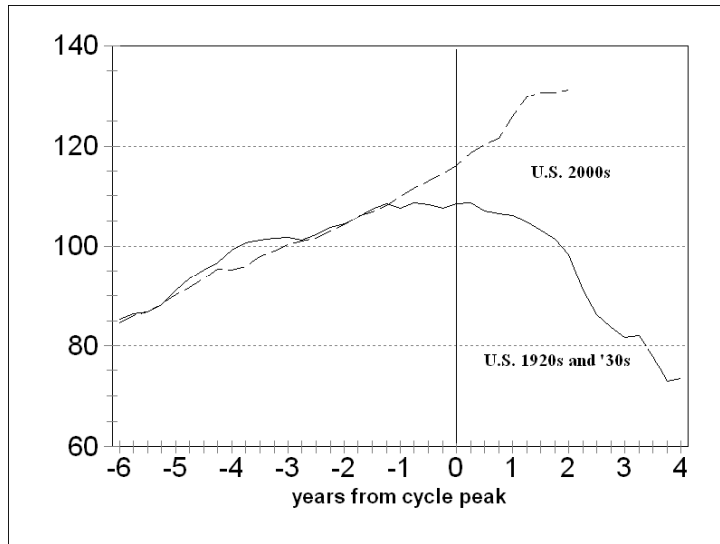


Figure 2. Nominal GDP as a percentage of the average for six years prior to peak.

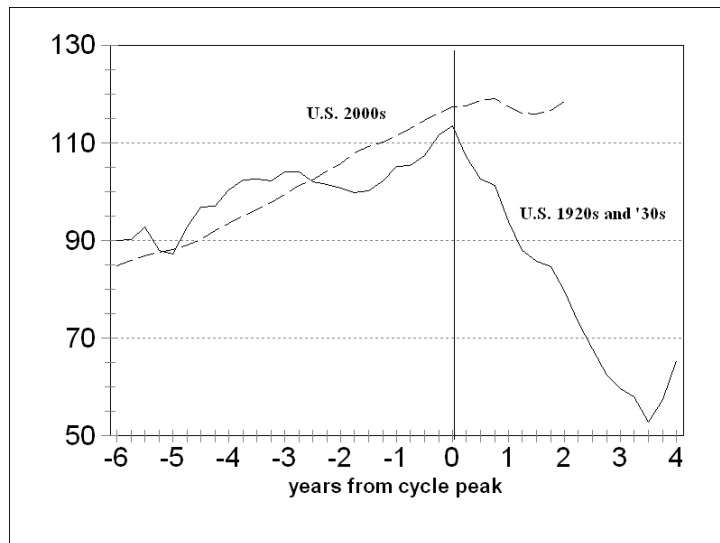


Figure 3. Stock prices as a percentage of the average for six years prior to peak.

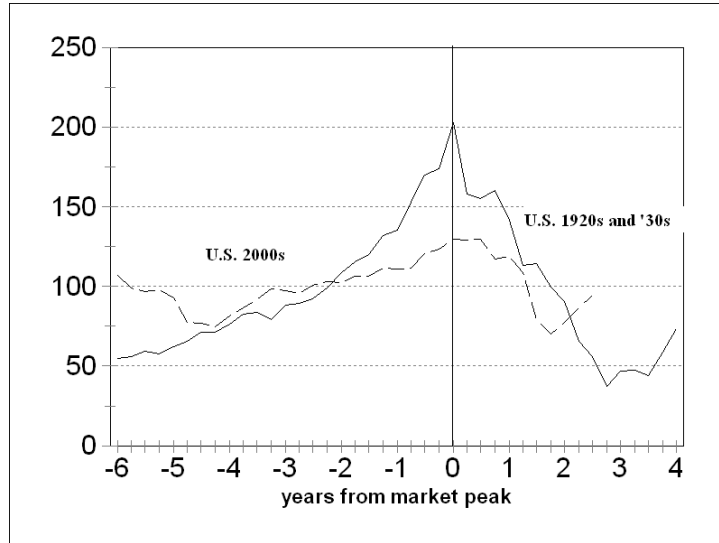


Figure 4. Real GDP as a percentage of the average for six years prior to peak.

