

Recessions: Causes and Lessons

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April 9, 2010

Was the shock that initiated the 2008-2009 recession real or monetary? Did it take the form of investor herd behavior that created an asset bubble whose collapse rendered financial intermediation dysfunctional? In doing so, did it overwhelm the stabilizing role of the real interest rate? Alternatively, was the shock monetary in the form of an inertia imposed on the funds rate in 2008 arising from policymaker concern for inflationary expectations in excess of acceptable inflation? Did that inertia reproduce the contractionary monetary policy observed in the stop-phases of stop-go monetary policy? The correlations in the data are consistent with either explanation. How then does one impose discipline on the choice of shocks to avoid making observed data fit a preconceived view of the world?

Brian Gaines provided invaluable advice and assistance. The views expressed here are those of the author not the Federal Reserve Bank of Richmond.

What causes recessions? What have economists learned about them? Has the experience with them better enabled economists to offer advice on the design of institutions to render them less likely? Once having arisen, are fiscal and monetary policy useful tools for mitigating their consequences? What should change, if anything, about the way in which the Federal Reserve System conducts monetary policy? The 2008-2009 recession is particularly significant not only because of its severity but also because popular discourse has resurrected the credit-cycle view that dominated thinking in the 19th and first half of the 20th centuries. Briefly, this view attributes cyclical fluctuations to the dramatic mood swings of investors from optimism about the future to pessimism and the resulting disruption to financial intermediation. Does that resurrection of an ancient view mean that the modern models of macroeconomics based on forward-looking individuals who use information efficiently contain little new, useful knowledge?

Addressing these issues requires addressing the fundamental issue of the usefulness of economics as a discipline. The “better” the price system works to allocate resources, the more useful is economics as a discipline for understanding how the world works. Adam Smith in *The Wealth of Nations* provided a useful metric in the form of how well the price system works to allocate resources. That is, a particular factor of production, labor or capital, is equally productive in different applications. In the jargon of economics, competitive markets leave no trades unexploited that could make some parties better off without making others worse off.

For this optimal allocation of resources to occur, the price system must provide accurate signals about the scarcity of goods. The focus of attacks on Smith’s fundamental hypothesis about the efficacy of the price system has been on whether his assumption of competitive markets is likely to emerge under laissez faire policies, which allow free entry into markets. The counterattack on Smithian economics is that market (monopoly) power is the normal state of the economy. The credit-cycle explanation of the business cycle builds on the way in which the herd behavior of investors overwhelms the stabilizing properties of the price system. In its manifestation in Keynes

General Theory, swings in the animal spirits of entrepreneurs overwhelm the ability of monetary policy understood as the level of the interest rate to stabilize the economy.

The first section offers a heuristic discussion of the issues. It does so by building on the example of price controls and shortages and their general applicability to monetary policy. The second section illustrates the durability of credit-cycle views of the business cycle in which excessive swings from optimism to pessimism drive the business cycle. As Charles Mackey (1841 [2009]) wrote, “Men think in herds ... [and] they go mad in herds.” The third section reviews monetary-disorder explanations of the business cycle.

The fourth section discusses the difficulties in identifying the shocks necessary to test the implications of alternative models of the business cycle. The fifth section discusses the use of theory to discipline the choice of shocks. The sixth section asks, how useful are estimated Taylor rules in identifying monetary policy shocks? The seventh section illustrates the use of historical narrative to identify the analogue in monetary economics of controlled experiments. The paper concludes with a brief discussion of the 2008-2008 recession.

I. Market Dysfunction: Market Power or Government Interference?

Economics 101 begins with a graph of a downward-sloping demand curve and an upward-sloping supply curve, each drawn as a function of price. The price of the good varies to clear the market. With government price fixing, say, through a commodity-stabilization program in which the government decrees a price that is high or low relative to the market-clearing price, a surplus or a shortage of the good appears.

In a microeconomic context, economists are comfortable in defending on efficiency criteria the way in which the price system allocates resources. Markets clear. That is, individuals make all feasible trades that make them better off. Economists are also comfortable making predictions about government policies based on their belief that individuals respond to incentives. Why do economists

argue on efficiency grounds for a significant degree of resource allocation through the market? Why do they defend economics as a discipline for understanding how the world works?

The reason is that economics offers refutable predictions. Experience since the publication of Smith's *The Wealth of Nations* has built up a body of hypotheses that are regularly confirmed. With free entry and free exit and in the absence of price controls, shortages and surpluses in markets are an evanescent phenomenon. In contrast, price controls yield shortages and surpluses. Moreover, economies grow secularly when government protects property rights in the broad sense of guaranteeing to individuals the ability to compete in any market and, conversely, of allowing free exit of those who do not compete successfully. Figure 1 exhibits the secular increase in output per capita in the United States over the interval 1869 through 2009. The market specialization made possible by the price system not only enhances the wealth of nations but also encourages the innovation that causes wealth to grow over time.

However, consensus among economists about the efficiency of the price system in allocating resources breaks down with regard to the intertemporal fluctuations in output—recessions. Figure 1 also shows fluctuations in output around a trend line calculated as a moving average.¹ Deep recessions are accompanied by enormous personal suffering as evidenced by the demands placed upon the political system to create jobs. There is a failure of markets to clear. On the one hand, wants are unlimited. On the other hand, unemployed individuals beyond some normal frictional amount associated with job search want to engage in the production of goods but cannot. The next section illustrates the perennial popularity of explanations for the business cycle that stress market failure due to the market power coming from the collective swings from optimism to pessimism

¹ Proponents of the real-business-cycle (RBC) view maintain that markets operate with equal efficiency at all times and that cyclical fluctuations reflect variations only in productivity. Hopefully, without minimizing the seriousness of this research agenda and its significant contributions, I set it aside.

among investors about the future.

II. Credit Cycle Views

An eternally popular explanation of the force that drives the business cycle is the alternation in financial markets of periods of greed and fear. Speculative mania starts a boom phase, followed inevitably by bust and deflation. Shifts in investor psychology drive a “credit cycle.” Washington Irving (1819-1820 [2008, 4]) wrote:

Every now and then the world is visited by one of these delusive seasons, when the ‘credit system’... expands to full luxuriance: everybody trusts everybody; a bad debt is a thing unheard of; the broad way to certain and sudden wealth lies plain and open.... Banks... become so many mints to coin words into cash; and as the supply of words is inexhaustible, it may readily be supposed that a vast amount of promissory capital is soon in circulation.... Nothing is heard but gigantic operations in trade; great purchases and sales of real property, and immense sums made at every transfer. All, to be sure, as yet exists in promise; but the believer in promises calculates the aggregate as solid capital....

Now is the time for speculative and dreaming of designing men. They relate their dreams and projects to the ignorant and credulous, [and] dazzle them with golden visions.... The example of one stimulates another; speculation rises on speculation; bubble rises on bubble.... No ‘operation’ is thought worthy of attention, that does not double or treble the investment.... Could this delusion always last, the life of a merchant would indeed be a golden dream; but it is as short as it is brilliant.

Commenting on the same event, William Graham Sumner (1874, cited in Wood 2006, 4) quoted from a report of the Pennsylvania legislature that attributed the distress of the 1819 recession to the prior excesses of an expansion in bank credit begun during the War of 1812.

In consequence ..., the inclination of a large part of the people, created by past prosperity, to live by speculation and not by labor, was greatly increased. A spirit in all respects akin to gambling prevailed. A fictitious value was given to all kinds of property. Specie was driven from circulation as if by common consent, and all efforts to restore society to its natural condition were treated with undisguised contempt.

One obvious reason for taking credit-cycle explanations of cyclical fluctuations seriously is their recurrence as evidenced by popular discourse during the 2008-2009 recession. In the spirit of the American populist tradition, speculation in financial markets creates paper wealth that does not correspond to any corresponding ability to produce goods. In the jargon of economics, bubbles in asset prices emerge detached from fundamental values. Speculation entails excessive debt creation.

In the inevitable bust phase of the boom-bust cycle, debt liquidation creates deflation and recession through a disruption in financial intermediation for productive purposes. These explanations stress the increase in asset prices and the reduction in risk premia in boom periods and the decline in asset prices and the increase in risk premia in bust periods. They also often stress the propagation of the business cycle through the “seeds sown by easy money” during economic recovery that allows the leverage that again pushes asset prices to unsustainable levels. Finally, in the American populist tradition, the credit-cycle view personifies the forces that create recession in the form of the excessive, unrestrained greed of bankers.

Another reason for taking credit-cycle explanations seriously is the influence they exerted on the monetary policy of the Fed up until World War II. Understanding Fed actions in the 1920-1921 recession and in the Depression is essential to understanding the origin of the shocks that initiated these economic declines. A quotation by Elihu Root aptly summarizes the understanding of cyclical fluctuations that shaped monetary policymaking subsequent to World War I. Root, senator from New York and earlier Secretary of War under McKinley and Secretary of State under Roosevelt, had opposed creation of the Fed on grounds that it would initiate boom-bust cycles through easy money. In 1928, when the Fed raised interest rates to deflate what it considered to be a bubble in equity prices on the New York Stock Exchange (NYSE), it acted as though Root had prophetically forecast such a failing. In a speech in 1913, Root (cited in Grant 1992, p. 143) stated:

With the exhaustless reservoir of the government of the United States furnishing easy money, the sales increase, the businesses enlarge, more new enterprises are started, the spirit of optimism pervades the community. Bankers are not free from it. They are human. The members of the Federal Reserve Board will not be free of it. They are human. All the world moves along upon a growing tide of optimism. Everyone is making money. Everyone is growing rich. It goes up and up, the margin between costs and sales continually growing smaller as a result of the operation of inevitable laws, until finally someone whose judgment was bad, someone whose capacity for business was small, breaks; and as he falls he hits the next brick in the row, and then another, and then another, and down comes the whole structure.

That, sir, is no dream. That is the history of every movement of inflation since the world's

business began, and it is the history of many a period in our own country. That is what happened to greater or less degree before the panic of 1837, of 1857, of 1873, of 1893, and of 1907. The precise formula which the students of economic movements have evolved to describe the reason for the crash following this universal process is that when credit exceeds the legitimate demands of the country the currency becomes suspected and gold leaves the country.

III. Monetary Disorder as an Explanation of the Cycle

As evident from the above quotations illustrating the credit-cycle view, the implicit presumption of this view is that the shocks that drive the business cycle derive from the private market (not government policy) *and* they overwhelm the stabilizing properties of the price system. The real interest rate is the price of contemporaneous resources in terms of future resources. Why does it not vary sufficiently to smooth fluctuations in output around trend so as to obviate the occurrence of at least major recessions? According to the credit-cycle view, the real interest rate is a weak reed in terms of its ability to offset the swings in optimism and pessimism about the future that arise among investors. According to an opposing tradition, termed here the monetary-disorder view, money creation and destruction interfere with the ability of the real interest rate to serve this equilibrating role.² The analogue of government price fixing through commodity stabilization schemes is the monetary emissions and absorptions of the central bank that interfere with the determination of the real interest rate by market forces.

As an illustration of the monetary-disorder view of cyclical fluctuations, consider an alternative explanation of the 1818-1819 deflation to the one portrayed above in the Washington Irving quotation. It comes from Richard Timberlake (1993, Ch. 2), who was a student of Milton Friedman. With the War of 1812, the government began to run fiscal deficits, which it financed with

² In an earlier version, I referred to economists working in this tradition as quantity theorists and later on monetarists. However, it was evident that these labels come with considerable excess baggage. These economists formulated hypotheses but lacked the analytical tools to construct models. They are important here especially because of the way in which they thought about how to identify shocks.

the issuance of Treasury notes. Banks used these notes, which constituted legal tender, as reserves (clearing balances or high-powered money). As high-powered money, they allowed banks to expand their note issue, which the public used as currency. This expansion in the money stock fueled inflation. With inflation, the paper money price of gold rose and banks suspended the convertibility of their notes into gold.

In 1816, after the end of the war, the government began to run surpluses. In order to achieve resumption of the gold standard, that is, the reestablishment of convertibility between bank notes and gold at the pre-war parity, Treasury Secretary Crawford used these surpluses to retire the Treasury notes. As a result, high-powered money contracted, and deflation replaced inflation. The monetary contraction that began in 1816 led to declines in the price level starting in 1817. By 1818, the country was in severe recession.³ Economists who like Timberlake explained cyclical fluctuations in terms of monetary disorder have included Irving Fisher (*The Purchasing Power of Money* 1922 [1963]); the young John Maynard Keynes (*A Tract on Monetary Reform* 1923 [1971]); and Milton Friedman (“The Optimum Quantity of Money” 1969 [1969]).

Economists working in the monetary-disorder tradition highlighted the correlation between trend growth in money and in prices. In the well-known equation of exchange, the stock of money multiplied by the rate at which it turns over against the dollar transactions of the public ($M \bullet V$) equals the nominal expenditure of the public comprising the product of the price level and real output, say, real GDP ($p \bullet y$). The economists just cited endowed this identity with predictive

³ Timberlake (1993, 25) wrote, “The price level decline in 1818-1820 that resulted in full-scale resumption was accompanied by the usual symptoms of failing banks and business hardships.... The banks then found they were forced [in the language from an 1818 *Treasury Report* written by Treasury Secretary Crawford] “to contract their discounts for the purpose of withdrawing from circulation a large proportion of their notes. This operation, so oppressive to their debtors, but indispensably necessary to the existence of specie payments, must be continued until gold and silver shall form a just proportion of the circulating medium.”

content by assuming that changes in money arose independently of changes in the nominal expenditure of the public. Although this source of identification for the independent origin of monetary shocks has always been controversial, the point here is that economists in this tradition have argued that the central bank retains the ability to control the dollar expenditure of the public. External forces do not periodically overwhelm this ability.

Figure 2 shows annual observations (natural logarithms of) money (M2) per unit of output and the price level with each series normalized to equal one in 1915. Widening gaps in the two series measure fluctuations in velocity (the rate at which money turns over against annual nominal output). Such fluctuations can measure movement along a stable money demand function, for example, if velocity falls because a decline in interest rates reduces the opportunity cost of holding money. Alternatively, they can measure unpredictable shifts in the demand for the empirical measure of money used. Empirical work on money demand demonstrates stability of M2 demand through the 1980s and instability thereafter (Mehra 1993).

Economists working in the monetary-disorder tradition also highlighted the correlation between volatility in money and in real output. Figures 3 and 4 employ a measure of monetary instability used by Friedman and Schwartz (1963, Chart 3). They plot changes in the steps of a step function fitted to annualized monthly growth rates in money (M2 until May 1914 and M1 thereafter) with recessions shown as shaded areas. Monetary deceleration precedes cyclical declines in output. Figures 2, 3, and 4 show correlations. Credit-cycle and monetary-disorder views attribute opposite causation to these correlations. The former emphasizes fluctuations in market power that drive prices and output fluctuations with money pulled along as a consequence. The latter emphasizes behavior of the central bank that arises independently of a response to prices and output but that produces changes in money. Section IV discusses the identification of the shocks that produced these correlations and, as a byproduct, the causation behind the correlations.

IV. Methodologies for Identifying Shocks

Econometrics 101 highlights the issue of identification. One can observe pairs of observations of price and output over time for a particular market. However, one cannot learn anything from these observations about the slopes of the supply and demand schedules whose intersection determines the prices and output. To make that inference, one needs information from outside of the model in the form of knowledge of shocks that impact supply schedules differently from demand schedules. For example, for agricultural produce, weather could impact supply with little effect on demand. One can then imagine a supply schedule moving along an unchanged demand schedule and the resulting observations offering information of the shape of the demand schedule.

The estimation of dynamic models poses the same general issues of identification; however, the difficulties burgeon. When individuals base their production and consumption decisions on future prices, which depend upon both future supply and demand, one can no longer identify factors that exert different effects on supply and demand schedules. How then do economists identify shocks capable of distinguishing between the alternative explanations of the business cycle represented by the credit-cycle view and the monetary-disorder view? Any solution to the identification problem must then address both the issues raised by the credit-cycle model. Namely, do the shocks that drive the business cycle arise independently of the behavior of the central bank and is their magnitude such that they overwhelm the stabilizing properties of the price system?

In thinking about the search for shocks, it is useful to compare economics as a science with, say, electrical engineering. With the latter, the scientist can build a circuit and then shock the circuit repeatedly. That is, the scientist can conduct a controlled experiment by creating a shock that comes from outside the electrical system. What then is the analogue for economists of a controlled experiment? The answer will depend upon the model of the economy selected for testing. The

hypothesis of the monetary-disorder view is that the price system works well to equilibrate fluctuations in output in the absence of interference by the central bank. From this perspective, one needs some criterion for identifying central bank behavior that interferes with the way in which the real interest rate works to keep output fluctuation around trend. One needs to identify central bank behavior that is adventitious to the working of the price system.

V. Using the New Keynesian Model to Discipline Predictions

The test of an hypothesis requires a model capable of generating implications that are refutable. Given agreement over the validity of the model and over the identification of shocks, this exercise yields consensus over the usefulness of the hypothesis. The New Keynesian (NK) model is the general model within which economists work today. Can it yield predictions capable of distinguishing between the credit-cycle and monetary-disorder views? The answer is yes, but there is no way to avoid making controversial decisions about how one uses the model to interpret historical experience. In the end, one must decide between two alternatives. According to the credit-cycle view, periodically shocks external both to the model and to the conduct of policy overwhelm the stabilizing properties of the price system. According to the monetary-disorder view, given an optimal monetary policy rule, the price system works well to stabilize fluctuations in economic activity.

In the NK model, the welfare of individuals depends only upon real variables (physical quantities and relative prices). As a result, a need arises for the central bank to give nominal variables well-defined values, that is, to provide a stable nominal anchor. Because the value of money today depends upon the value individuals expect it to possess tomorrow, the central bank must provide this nominal anchor through consistent behavior—a rule. Moreover, an implication of the simplest NK model is that central bank should stabilize the price level (Goodfriend and King 1998). By implication, the central bank should allow the real-business-cycle (RBC) core of the

economy to determine real variables. There is no desirable Phillips curve trade-off between inflation and employment, either in levels or in changes, which the central bank should exploit. A rule is optimal that provides for this “classical dichotomy” between the central bank’s determination of prices and the real economy’s determination of real variables.

Moreover, the working of the price system imposes a continuity and coherence over time to the behavior of macroeconomic variables. A well-designed rule is one that allows the price system to work. Specifically, it allows the real economy to determine real variables. An optimal rule provides for a stable nominal anchor and allows the real economy to determine the real interest rate and, by extension, other real variables. In the language of Wicksell (1898 [1962]), an optimal rule causes the real value of the Fed’s interest rate target to track the natural rate of interest, that is, the real interest rate determined by the RBC core of the economy (Goodfriend 2004). The issue then is how does the degree of nominal and real stability evolve over time as the central bank changes rules that work better or worse at providing a stable nominal anchor and at allowing the price system to serve its equilibrating role? Given that the Fed uses the language of discretion, which implicitly rejects the idea of policy actions deriving from a systematic response to incoming information on the economy, the economist must use a variety of information concerning the intellectual and policymaking environment and documentary evidence from the policy record to determine the importance of consistency in the conduct of policy and to determine how that consistency has evolved over time.

The stabilization of fluctuations in output works by the price system works through variations in the real interest rate. In the NK model, a first-order condition relates the real interest rate positively to expected consumption growth. “High” expected consumption growth exhibits optimism of individuals about the future, and conversely “low” expected consumption growth represents pessimism about the future. If a central bank uses a short-term interest rate as its policy variable, to assure macroeconomic stability, it must follow a rule that allows the real interest rate to price

resources to offset fluctuations in optimism (pessimism) about the future. At the same time, the central bank requires a rule for discovering this “natural” interest rate, that is, the real rate consistent with a demand for resources equal to potential output. Pessimism requires that the rule yield a “low” real interest rate and optimism a “high” real interest rate. In the absence of a market measure of expected consumption growth that gives practical content to this imperative, a stabilizing rule requires the central bank to infer whether the market real rate is high or low relative to the natural rate of interest.

To what extent then can one explain changes over time in the relative stability in nominal and real magnitudes as a result of changes in the systematic conduct of monetary policy such that that conduct does a better or worse job of providing a nominal anchor and allowing the market to determine the real interest rate? If this exercise fails to provide insight into the alternation of periods of economic stability and instability, do views that emphasize the periodic exercise of market power work better? In this event, in periods of inflation, does the exercise of monopoly power drive prices? In periods of cyclical instability, does investor herd behavior drive the formation of unsustainable asset bubbles whose collapse renders financial disintermediation dysfunctional?

The issue then comes down to the perennial one of rules vs. discretion. Does the operation of the price system in response to shocks work well enough to provide continuity in the behavior of macroeconomic variables? If so, the Fed should articulate systematic monetary policy procedures (a rule) that allow the price system to work. With a rule, the emphasis is on the systematic response of policy actions (changes in the funds rate) to incoming data that allows markets to forecast a term structure of interest rates that will return output to potential after shocks with no change in trend inflation. Alternatively, do shocks external to the working of the price system arise randomly and overwhelm the stabilizing properties of the price system? If so, the Fed should continue to communicate using the language of discretion. With this language, the Fed communicates fully its

understanding of the contemporaneous state of the economy and places its current policy action in that context. With discretion, the emphasis is on the way in which a concatenation of policy actions, each one of which is optimal in the context of contemporaneous events, yields an optimal policy over time.

VI. Identifying Shocks and the Taylor Rule Literature

The discussion in this section uses the empirical Taylor rule literature to highlight the difficulties in identifying monetary-policy shocks. A consequence of the use by the Fed of the language of discretion is that the Fed itself never suggests any systematic discipline to its procedures. At the same time, the NK model, which is the workhorse model for macroeconomists, disciplines the forecasts made by its agents by basing them on the systematic behavior of policy. To fill the gap left by the Fed's use of the language of discretion and the requirement in the NK model for the conduct of policy by a rule, a large literature has arisen based on a seminal paper by John Taylor (1993). Taylor starts from the obvious observation that the Fed responds both to the behavior of the economy and to inflation. He estimated a Fed reaction function (a Taylor rule) by regressing the funds rate (the Fed's instrument) on measures of inflation and the economy's output gap (the difference between potential and actual output), both variables of obvious concern to the Fed.

Immediately, the issue of identification arises. If there is some easy way to disentangle from the data the systematic component of Fed policy, then one can identify monetary policy shocks either as departures from this systematic behavior or, more generally, as a choice of an unfortunate rule. Has the Taylor rule literature settled the issue of whether the shocks that drive the business cycle are monetary or real? Unfortunately, the answer is negative. The general problem is again the issue of endogeneity. Correlation does not imply causation. Because there are both cyclical and inflation components in short-term interest rates, a regression of the funds rate (a short-term interest rate) on measures of the business cycle and inflation will exhibit positive correlations with these right-hand

variables. However, there is no assurance that the regression has disentangled the reaction of the Fed to the economy as opposed to the reaction of the economy to the Fed. In brief, simply because a reduced form fits the data does not assure that it is structural.

At the same time, a reduced form can manifest aspects of Fed behavior. Evaluation of the adequacy of an estimated Taylor rule as a reaction function (a structural relationship) requires the addition of supplementary information derived from analysis of documentary evidence in the form of speeches and congressional testimony by FOMC members and FOMC transcripts. This author's own work lies within the Taylor rule literature. Hetzel (2008) uses this documentary evidence to argue that in the Volcker-Greenspan (V-G) era the FOMC raised the funds rate in a measured, persistent way when it judged that real output was growing unsustainably fast (the rate of resource utilization was increasing in an unsustainable way), and conversely. The discipline imposed on this procedure was that financial markets believed that funds rate changes would cumulate to whatever degree necessary to prevent real shocks from causing a change in trend inflation. Hetzel (2008) termed this rule-like behavior, which provided consistency to policy in the V-G era, "lean against the wind with credibility," or LAW with credibility.

This characterization avoids the obvious problem with many estimated Taylor rules. Namely the estimation fails to capture the ongoing concern by the FOMC for inflationary expectations. Even apart from the issue of simultaneity bias, many estimated Taylor rules are misspecified because of an omitted variable, the behavior of inflationary expectations. Fluctuations in expected inflation affect both the left-hand-side variable (the funds rate) through the behavior of the FOMC, especially in inflation scares, and the right-hand variable (inflation) through the influence of expected inflation on actual inflation. For example, during inflation scares, the FOMC raised the funds rate sharply so that influence ran from the dependent variable (the funds rate) to the right hand variables, inflation and the output gap (Goodfriend 1993; Hetzel 2008, Ch. 21).

More generally, if in fact the premise of the Taylor rule literature is correct that there is an important systematic component to FOMC decision making, the issue is how to design a rule that accounts for the FOMC's knowledge (or lack of knowledge) about the structure of the economy. There are two sources of uncertainty. The first source is whether contemporaneous measures of inflation are noise or reflect a sustained movement away from the FOMC's implicit inflation target. The focus of the FOMC on shaping the financial market's expectation of trend inflation as measured by the behavior of long-term bond rates allows the FOMC to avoid shocking the real economy to deal with transient inflation shocks. Of course, the FOMC is constrained by the extent of its credibility. The public must not predict changes in trend inflation based on realized inflation.

The second source of uncertainty about the economy is the size of the output gap. Numerous authors have observed the practical impossibility for policymaking of Taylor rules that require knowledge of the magnitude of an output gap.⁴ By focusing on sustained changes in the rate of resource utilization, LAW with credibility eliminates the need for the FOMC to achieve consensus over the level of potential output (the magnitude of the output gap) or the natural rate of unemployment (the difference between the unemployment rate and a measure like NAIRU). In the stop-go era, the FOMC made policy based on an assumption about the unemployment rate consistent with full employment.⁵ In the V-G era, the FOMC limited the knowledge it needed about the structure of the economy by using changes in the size of the output gap.⁶

⁴ See, for example, Kozicki (1999), Orphanides (2001, 2003a and 2003b), and Orphanides and Van Norden (2002) and the references in Hetzel (2008, Ch. 21, fn. 8).

⁵ Orphanides (2003b) showed how the FOMC underestimated the level of unemployment consistent with full employment.

⁶ Orphanides (2003a, fn. 13) discussed the advantages of a "Taylor rule that replaces the output gap with its change." Authors who use changes in an output gap in their estimated Taylor rules for the V-G era include Mehra (2000 and 2002) and Orphanides and Williams (2002). Mehra (2001) includes the bond rate in his estimation to capture the importance of nominal expectational instability

These issues find policy relevance in the current discussion of whether a monetary policy shock produced the 2008-2009 recession. Taylor (2009) used his estimated Taylor rule to generate a forecast of the level of the funds rate over time. He inferred from the fact that the actual funds rate lay below the predicted funds rate in 2003-2004 that stimulative monetary policy produced a bubble in housing prices. Taylor demonstrated a consistency in the relationship between short-term interest rates, inflation, and cyclical movements in output and associated departures from this consistency with stimulative or contractionary monetary policy. Note again, however, that these reduced forms ignore discrete changes in nominal and real expectational stability that can influence the optimal level of short-term interest rates.

In the period 2002-2004, an enormous amount of pessimism existed in financial markets. That pessimism arose from the huge loss of equity wealth that began in 2000, from the corporate governance scandals epitomized by Enron and WorldCom, and by geopolitical uncertainty centering on terrorism after the September 11, 2001, attacks and on the potential for unleashing a new wave of terrorism as a result of the invasion of Iraq. At the same time, there was an unprecedented surge in productivity, perhaps deriving from a delayed response to the IT investment of the 1990s, which raised potential. In these circumstances of extraordinary pessimism about the future combined with high productivity growth, the real interest rate required to track the natural interest rate had to be unusually low—lower than predicted by a Taylor rule. Judged by the fact that that the FOMC achieved its desired inflation target of 2% for core PCE inflation, the FOMC's first-difference procedure that tracks sustained changes in rates of resource utilization produced the correct funds rate. The assumption built into level-form Taylor rule estimation that there is an unchanging "real

as captured by inflation scares.

equilibrium interest rate,” say 2% constitutes an unrealistic assumption about the economy.⁷

Unfortunately, the difficulties in solving the simultaneity problem that arise in estimating empirical Taylor rules leave unanswered the fundamental issue about the nature of the shocks that produce cyclical fluctuations. The observed continuity in empirically-estimated Taylor rules need not indicate consistency in the way in which the Fed conducts monetary policy but rather this continuity need only indicate the absence of large external shocks over the estimation interval. The Fed may indeed have chosen the language of discretion because of the absence in continuity in its procedures. The evolution of the economy depends less upon the systematic behavior of the Fed and more upon whether large shocks, like periodic earthquakes high on the Richter scale, hit the economy. In the terminology of Velde (2004), cyclical fluctuations are above all the story of “poor hand” rather than “poor play.”

VII. Two Grand Experiments

Where then do the shocks come from that produce cyclical fluctuations? Are they shocks of sufficient magnitude that they overwhelm the stabilizing properties of the price system? Alternatively, are they monetary shocks that interfere with the working of the price system? These different perspectives yield different ways of searching for shocks. There is no shortcut to conducting an historical horse race by working through historical experience in a way that looks for episode- specific information about the nature of external or policy-induced shocks. One can then ask whether the credit-cycle view or the monetary disorder view provides a simpler, more coherent view of historical experience. This section examines two “experiments.” The first is the contrast between the high unemployment of the recession and the low unemployment of World War II. The

⁷ Hetzel (2009b) and Hetzel (forthcoming) point to the departure that occurred between spring and fall 2008 when the FOMC, out of concern for a ratcheting up of inflationary expectations, kept the funds rate unchanged despite sustained decreases in the economy’s rate of resource utilization.

second one is the contrast between the nominal and real instability of the stop-go era of monetary policy with the relative stability of the V-G era.

Unfortunately, examination of the Great Depression in isolation is not sufficient to yield an answer to what caused the cyclical decline in output. Huge shocks could have overwhelmed a price system that works only poorly when confronted with large shocks. More generally, assessment of a particular episode of recession or inflation must occur in the context of an examination of the entire available history including periods of stability and instability. This broad overview yields a prior about how well the price system works and the character of inflation as monetary or nonmonetary. With this prior, one can ask whether the credit-cycle view or the monetary-disorder view of a particular episode of instability conforms better to the long-run pattern of nominal and real instability.

What was the Depression experiment? The quotation of Elihu Root above illustrates the credit-cycle view, which dominated the thinking of policymakers in the Depression. According to this view, the Fed's easy money policy in 1926 and 1927, undertaken to aid Britain's return to the gold standard, created a bubble in asset prices in the equities traded on the NYSE. The founders of the Fed based its design on the real bills principle of avoiding the speculation, the collapse of which, they believed led to recession.

Real bills are short-term, self-liquidating IOUs that finance the production of goods. According to the real bills principle, the Fed should limit speculation and the creation of asset bubbles by extending credit only through its discount window and only for real bills. However, the view prevailed that the easy money created by the Fed to aid Britain in its return to the gold standard had circumvented real-bills principles and created a speculative bubble in equity prices. The failure of the excessively risky bets made by bankers created the dysfunction in financial markets that led to the Depression. Policymakers believed that the persistence of the Depression came from the long

process of debt liquidation required to restore the health of balance sheets.

The analysis by Keynes substituted swings in the animal spirits of the businessman for the swings in the herd behavior of investors highlighted by the credit cycle. In both cases, these psychological swings from extreme optimism to extreme pessimism about the future presumably overwhelmed the ability of a low interest rate to revive spending. The association of monetary policy with the level of the interest rate along with the historically low level of short-term interest rates led to the conclusion that monetary policy was impotent to deal with recession. However, Keynes did not accept the inevitability of a long period of recession necessitated by the long length of time required for debt liquidation. Instead, he argued that deficit spending by the government could make up for the shortfall in spending by the public from full-employment spending. For Keynesians, the relevant experiment was the contrast between the absence of policy activism, especially, in the Hoover administration, and the massive government expenditures in World War II. The replacement of the high unemployment of the Depression then yielded to the low unemployment of wartime.

The monetary-disorder view stresses the contradiction between actions of the Fed to control real variables in the form of its attempt to lower the P/E ratio of stocks traded on the NYSE and price stability. The increase in interest rates in 1928 produced a monetary deceleration. Out of fear that low interest rates would revive the speculation it held responsible for the recession, the Fed lowered interest rates only reluctantly after the peak in the business cycle in August 1929. Monetary contraction in combination with an interest rate target then created an expected deflation trap: a. The Fed raised interest rates to deflate a presumed asset bubble in equity prices on the NYSE. b. Monetary contraction resulted. Given the unit banking system, the forced reduction in the money stock took the form of bank failures. c. Prices fell. d. The public began to expect deflation. e. Real

interest rate rose. f. The deflationary cycle intensified.⁸

In March 1933, with the decision by the incoming Roosevelt administration to leave the gold standard, the expectation of inflation replaced the expectation of deflation. High real rates became negative. Economic recovery followed. Monetary policy became restrictive again in 1936-1937 when the Fed raised reserve requirements to eliminate bank holdings of excess reserves. Another business cycle peak followed renewed monetary deceleration. Recovery began again when banks rebuilt their excess reserves and money growth resumed. The gold standard propagated contractionary monetary policy in the US to other countries depending upon whether they were also on the gold standard. From the monetary-disorder perspective, the experiment was one of an alternation of contractionary and expansionary monetary policy propagated or not depending upon the monetary arrangements of countries.

The second episode considered is the contrast between monetary policy in the stop-go era, which lasted from mid-1965 through the end the 1970s, and monetary policy in the V-G era. Although in the stop-go era, policymakers had left behind the real bills view of the credit-cycle explanation of cyclical fluctuations, there remained considerable intellectual overlap. In the stop-go era, policymakers made policy based on the assumption that the price system works only poorly to maintain full employment. Moreover, they continued to make policy based on the assumption of market power, albeit in the form of the monopoly power of large corporations and unions rather than the herd behavior of investors.

Francois Velde (2004) characterized debate among economists about monetary policy in the stop-go era as “poor hand” or “poor play.” Economists arguing for “poor play” pointed to stop-go monetary policy with its alternation of contractionary and expansionary monetary policy. In contrast,

⁸ See the discussion in Hetzel (2008) of Table 3.1, which shows the behavior of the real interest rate in the Depression.

economists arguing for a poor hand, pointed to shocks that arose externally to the working of the price system that overwhelmed the stabilizing properties of the price system. These economists” emphasized OPEC-created increases in oil prices and the exercise of market power by large corporations and labor unions.

Specifically, policymakers assumed that inflation was a real phenomenon caused by the exercise of market power by large players—greedy corporations and unions. Inflationary expectations untethered by systematic monetary policy turned this cost-push inflation into a wage-price spiral. Because powerful real forces created inflation, only a countervailing force in the form of high unemployment could restrain inflation. This Phillips curve trade-off posed a cruel dilemma for the policymaker. Incomes policies and, in their extreme form, wage and price controls offered the only realistic escape from this dilemma. These beliefs produced stop-go monetary policy accompanied by upward drift over the business cycle in inflation.

In go phases, the Fed stimulated aggregate nominal demand to lower unemployment under the belief that “high” unemployment would restrain inflation. In stop phases, the FOMC restrained aggregate nominal demand to lower inflation. In stop phases, the FOMC restrained reductions in the funds rate in the hope of creating a negative output gap of moderate magnitude to lower inflation without significant recession. When unemployment rose to unacceptable levels, the go phase restarted. With stop-go policy, procyclical money growth was a manifestation of cyclical inertia in short-term interest rates (Hetzel 2008).

The consistency of monetary policy in the V-G era came from the desire to discipline expectations of trend inflation by stabilizing them at a low level that was invariant both to inflation shocks and to cyclical movements in output, especially strong economic recoveries. With this discipline, markets forecast a term structure of interest rates that allowed for cyclical movements in short-term rates but that removed the cyclical inertia in the term structure of real interest rates that

had characterized the stop-go era. In terms of the NK model, credibility for a low, unchanging inflation target disciplined the price setting of firms setting prices over multiple periods while allowing the Fed to move the funds rate in response to persistent changes in resource utilization rates so that the real funds rate tracked the natural rate.

When the Volcker and Greenspan FOMCs succeeded in stabilizing inflation at a low level without recourse to periodic bouts of high unemployment, the intellectual environment moved away from the Keynesian consensus. The rational-expectations assumption that the central bank can discipline inflationary expectations and price setting by following a credible rule became an acceptable part of macroeconomic models. Models out of Chicago and Minnesota, which featured forward-looking agents who use information efficiently, became standard, as illustrated by the NK model. The Lucas critique of discretion (1976 [1981], 1980 [1981]) became accepted in academia. Because rules enhance the working of the price system, they are essential to economic stability. While the desirability of rules became the accepted norm in academia, the Fed never signed on and never articulated what, if anything, it considered to be systematic about the conduct of policy in the V-G era.

VIII. The 2008-2009 Recession

If one accepts the characterization of policy in the V-G era as LAW with credibility in Hetzel (2008), then the relative economic stability in the post-1983 period following the Volcker disinflation provides evidence in favor of the hypothesis that the price system works well to stabilize the economy provided the central bank follows a rule that allows for market determination of the real interest rate and that provides a stable nominal anchor. Of course, for this hypothesis to be convincing, the 2008-2009 recession must evince a departure from this behavior. How then does one evaluate the 2008-2009 recession?

In a section entitled “The Unprecedented Policy Response,” in Chapter 2 (“Rescuing the

Economy from the Great Recession”), *The Economic Report of the President* (2010) states:

Given the magnitude of the shocks that hit the economy in the fall of 2008 and the winter of 2009, the downturn could have turned into a second Great Depression. That it has not is a tribute to the aggressive and effective policy response.

According to the *Economic Report*, the 2008-2009 recession is an example of good play but an even worse hand. The following offers a very brief analysis of the recession in the spirit poor hand and poor play (see Hetzel 2009 and especially Hetzel forthcoming). The point is not to offer a comprehensive overview of the 2009-2009 recession but rather to make the point that one’s analysis of a particular episode of recession will depend upon the prior derived from the historical record about how well the price system works to offset shocks.

Figure 5 shows the deviation of monthly figures on real personal consumption expenditures (PCE) from a trend line fitted from the March 2001 business cycle peak to the December 2007 cycle peak. The onset of the decline in spring 2007 corresponds to the flatness in real disposable personal income produced by the persistent energy price increase, which peaked in summer 2008. Another real shock occurred in the form of a decline in residential investment ongoing since 2006. These real shocks appear likely to have produced a moderate recession. Any explanation of why a moderate recession turned into a major recession must take account of the fact that the intensification of the recession happened before the financial turmoil associated with the bankruptcy of Lehman on September 15, 2008.

For example, in the half year after the cyclical peak in December 2007, January through March 2008, total nonfarm payroll employment declined on average each month by 31,000; for the months April through July by 196,000; and for August and September, respectively, the declines amounted to 334,000 and 458,000. Note that the payroll surveys are conducted in the second week of the month, which places the September decline chronologically before the Lehman bankruptcy. Based on the employment numbers, the intensification of the recession began in August 2008.

Figures on consumption tell the same story about the intensification of the recession. For the four quarters of 2008, real PCE grew at annualized rates, respectively, of -.6%, .1%, -3.5%, and -3.1%. The barely positive second-quarter figure was probably boosted by income tax rebates.

The decline in real GDP intensified from 2008Q3 to 2008Q4, going from -2.7% to -5.4%. However, an endogenous response from an inventory cycle can account for the sharp fall in output in 2008Q4. The sustained weakness in consumption growth shown in Figure 5 increased business inventories to unsustainable levels. Inventory/sales ratios (total business) climbed sharply beginning in July 2008 from 1.27 to 1.46 by yearend (Figure 6). The required inventory correction, which took the form of reduction in business fixed investment, created much of the sharp annualized declines in real GDP for 2008Q4 and 2009Q1 of -5.4% and -6.4%, respectively.

The fact that the recession intensified in summer 2008 means that the disruption to financial markets that followed the Lehman Brothers bankruptcy September 15, 2008 could not have accounted for the severity of the 2008-2009 recession. It is true that following the flight of cash investors from the off-balance-sheet entities (the structured investment vehicles or SIVs) created by banks to hold mortgage backed securities and collateralized debt obligations that began in August 2007, wholesale funding markets for some banks, especially in Europe, were disrupted. However, the cash investors who ceased buying the commercial paper of the SIVs left their funds in banks or money market funds. Financial intermediation that had taken place off balance sheet then went through banks.

Moreover, the disruption in the wholesale funding markets for some highly-leveraged banks with weak balance sheets did not show through to the retail loan market apart from the normal increase in risk spreads associated with the mild recession beginning December 2007. For example, Figure 7 shows results from a survey of small businesses conducted by the National Federation of Independent Businesses. Throughout 2008, the percentage of small businesses reporting their most

important problem to be obtaining loans remained modest.⁹

At the same time, from spring through early fall 2008, a cyclical inertia appeared in the funds rate that is characteristic of the stop phases of stop-go monetary policy. Figure 8 displays the growing shortfall of consumption from trend that began in early summer 2007 (the percentage deviation from trend taken from Figure 2). The shaded area highlights the interval of time from March 18, 2008, until October 8, 2008, when the funds rate declined only one-quarter percentage point while real consumption declined steadily below trend. As measured by the LAW-with-credibility benchmark, monetary policy was contractionary over this interval. From this perspective, contractionary monetary policy turned a mild recession into a severe recession and created an extended need for low, negative short-term real interest rates. The severity of the 2008-2009 recession derived from the combined contractionary monetary policy of all the world's central banks. While their economies weakened in 2008, the central banks of countries other than the United States kept their policy rates basically unchanged until October 2008, with the ECB raising rates in July 2008.

The purpose of the discussion in this section is not to assert an explanation for the 2008-2009 recession. Given the endogeneity of macroeconomic variables, identification of the cause of an individual recession will always remain problematic. However, several observations are relevant. As noted, the causation that one assigns to any particular recession will depend upon a judgment made from the entire historical experience about how well the price system works in the absence of monetary shocks. For example, if one believes that shocks are real in origin and large relative to the

⁹ Other measures of credit market tightness also fail to indicate a significant disruption to credit markets in summer 2008. Such measures include credit default swap spreads for banks, non-performing loans as a percent of total loans for commercial banks, banks' willingness to lend to consumers from the Federal Reserve Board's Senior Loan Officer Survey of banks, interest rates charged by banks on credit cards and auto loans, and growth of revolving and nonrevolving consumer loans (Hetzel forthcoming).

ability of the price system to offset them, the cyclical inertia in the funds rate shown in Figure 8 will appear irrelevant. The fact that the funds rate was already “low” at two percent, only two percentage points above the lower limit of zero, means that whatever shock caused the 2008-2009 recession traditional monetary policy had little ability to offset it.

Even apart from the origin of the shock or shocks that initiated the 2008-2009 recession, economists will need to debate seriously the nature of how such shocks propagate. The credit-cycle and Keynesian traditions emphasize the way in which the moods of investors or the animal spirits of businessmen swing violently between optimism and pessimism about the future. Those swings overwhelm the ability of the real interest rate to make resources appear sufficiently cheap in recession or expensive in booms to stabilize aggregate demand around potential output. These traditions highlight a market failure amenable to correction by the government.

Through deficit spending, the government can make up the shortfall in demand from the full employment level. Similarly, through various credit programs, the government and central bank can make up for the shortfall in lending from the full employment level. However, what is striking about the current recession is the prompt, massive response of governments worldwide. Nevertheless, a recession as severe as any in the post-War period still occurred.

One possibility for the propagation of a shock to the real economy is that a discrete increase in uncertainty about the future produced by a large shock requires a reconfiguration of all relative prices. Given the existence of competitive markets, economists feel comfortable about the existence of a set of relative prices that allows all trades to occur that can make individuals better off without making others worse off (Pareto optimality). However, economics has little to say about how markets work to discover those prices. The efficiency of the market system in conveying the information firms need through a limited number of prices emphasized by Hayek (1945) may require that uncertainty about the future not change sharply in a short period of time. If the price discovery

process in such a situation simply takes a long period of time, fiscal, credit, and monetary policy may be inefficacious in shortening recessions. The best that government can do then is to operate with rules that prevent policy itself from becoming a source of disruption.

IX. Concluding Comment

The sudden, unanticipated emergence of world recession in 2008 will create the kind of intellectual ferment that occurred in the early 1970s with the coincidence of high unemployment and inflation. Initially, in the early 1970s, mainstream economists explained this coincidence through the exercise of market power by large corporations and labor unions, supplemented later by supply shocks. The resulting resort to wage and price controls, however, failed to restore price stability. Countries required until the end of the decade to place responsibility for inflation with their central banks.

The current return in public discussion to the ancient credit-cycle tradition could promote a return to the focus of central banks on using contractionary monetary policy to either deflate or to preempt the emergence of bubbles in asset prices. If so, the result is likely to be a return to the chronic deflation that characterized the period between the world wars.

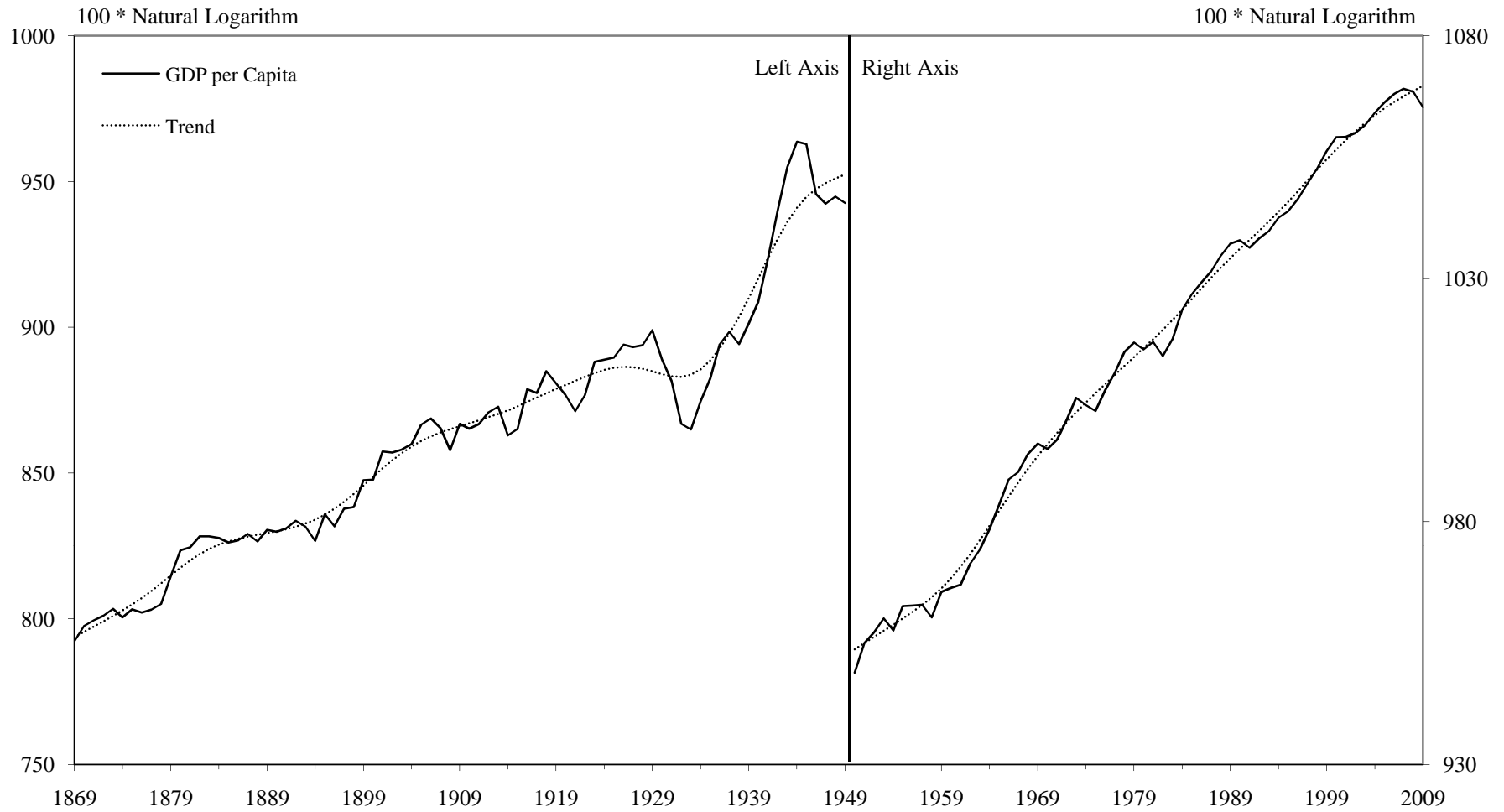
Although nothing can change the past, through an active dialogue between the policymakers in central banks and academic economists, one can learn from the past. An important starting point would be for central banks to evaluate the desirability of communication using the language of discretion. If the price system does impose coherence on the behavior of the economy, it is important to understand what is consistent in the way in which the central bank makes policy, when departures occur, and when those departures lead to a change in the systematic response of the central bank to the economy. Monetary policymakers and academic economists can then use the models of macroeconomics to discipline the systematic study of the past and learn from it.

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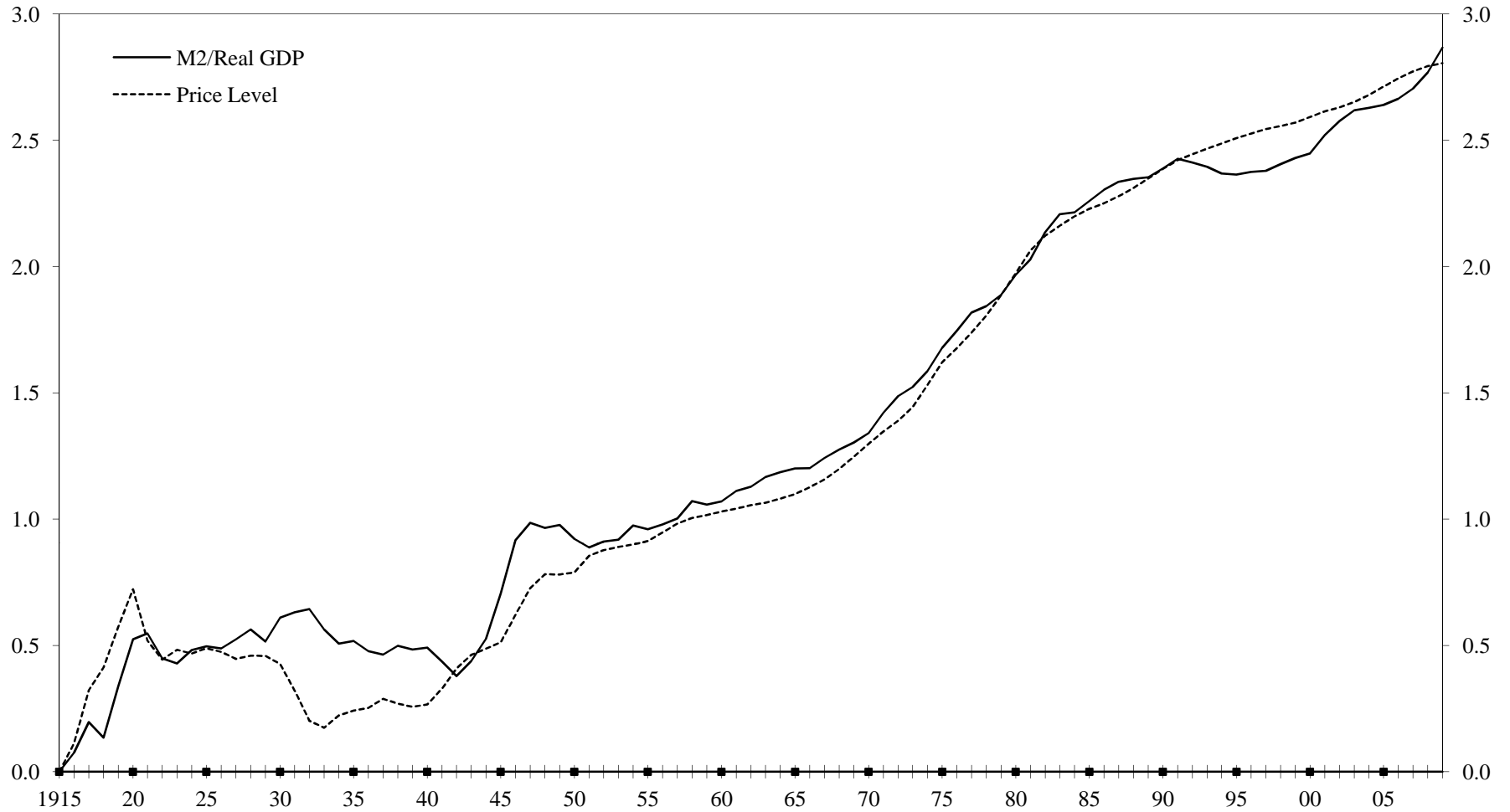
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Figure 1
Real Output per Capita



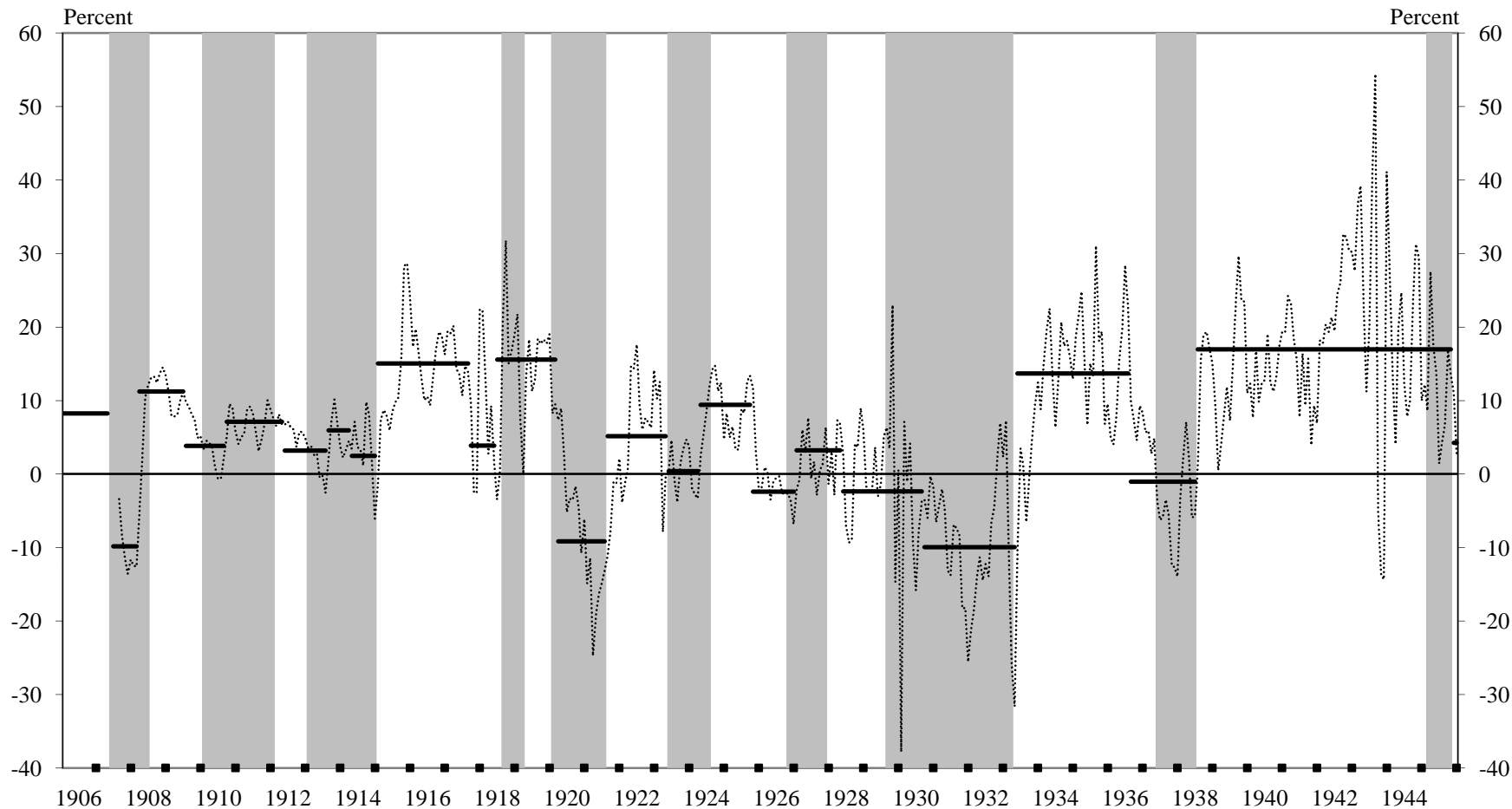
Notes: Series are 100 times the natural logarithm of real output per capita and the HP-filtered trend. Real output is real GNP from Balke and Gordon (1986) until 1929. Thereafter, it is real GDP from the Commerce Department. Series before 1950 are plotted on the left axis, and thereafter, on the right axis.

Figure 2
M2 per Unit of Output and the Price Level



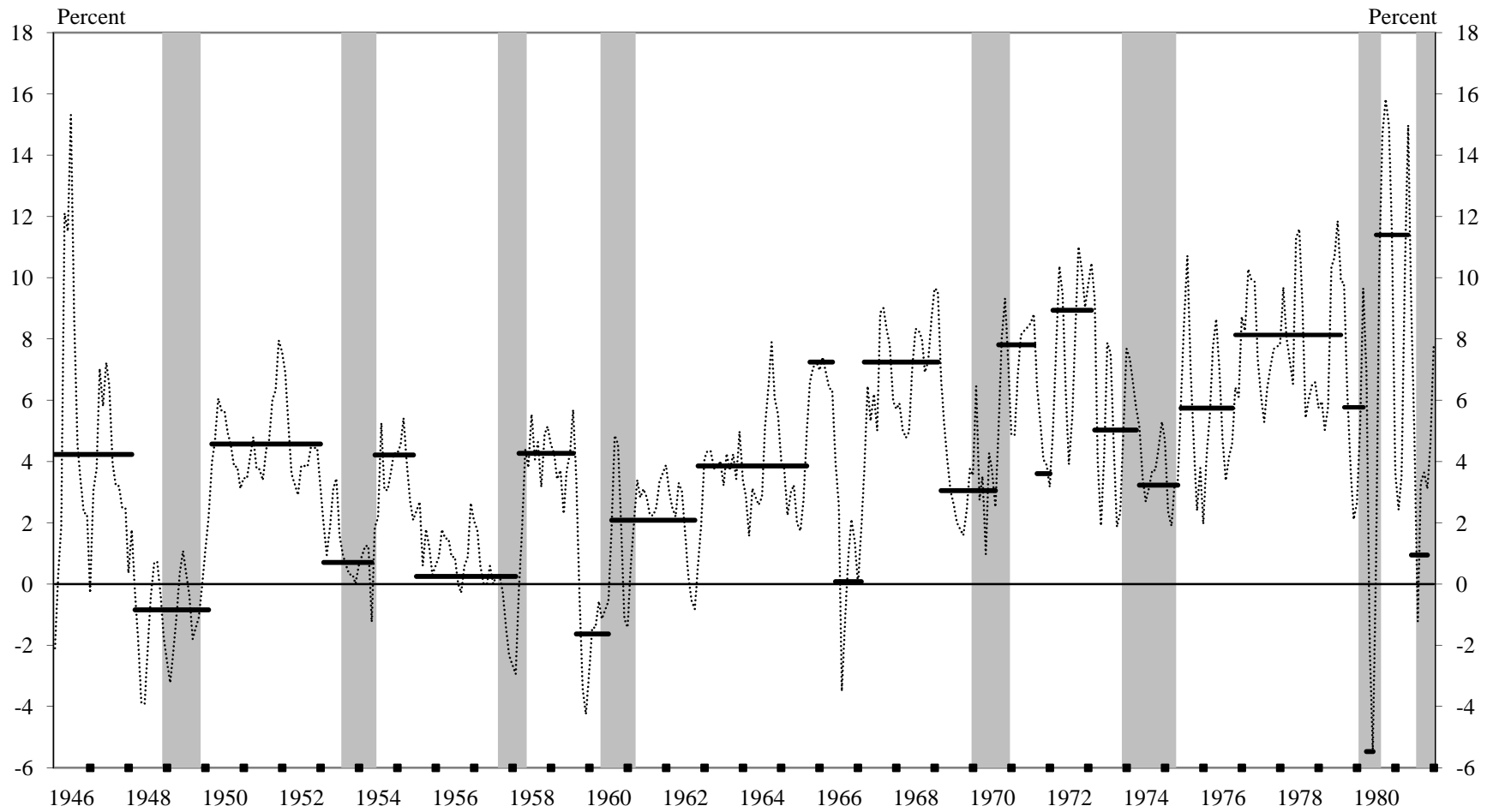
Notes: The series are the price level and M2 divided by real output. Observations are annual values of the natural logarithm of an index number that uses 1915 as a base value. From 1915 to 1929, real output is real GNP and the price level is the GNP deflator from Balke and Gordon (1986). After 1930, real GDP is from the Commerce Department. From 1915 to 1958, M2 is from Friedman and Schwartz (1970). Over this period, it is their M4 series, which corresponds most closely to the current definition of M2. From 1959 on, M2 is from the Board of Governors.

Figure 3
M1 Step Function and Recessions: 1906-1945



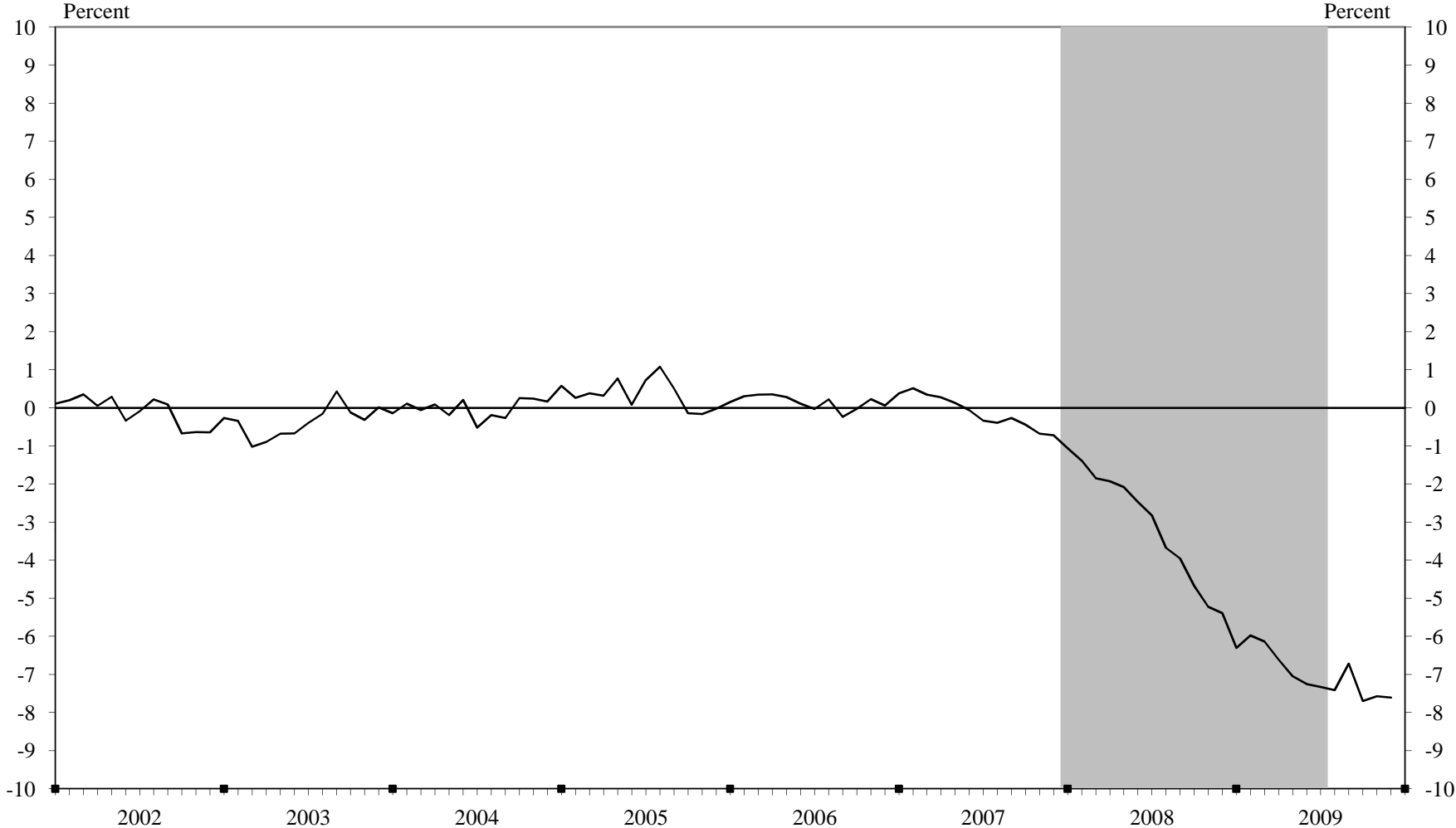
Notes: Series are a three-month moving average of the annualized monthly money growth rates and a step function fitted to monthly annualized growth rates of money. Step function before May 1907 uses annual growth rates based on June observations of M2 from 1900-1907. Observations for money from June 1900 to May 1914 are for M2; observations from June 1914 to December 1945 are for M1. Data are from (Friedman and Schwartz 1970). Shaded areas indicate NBER recessions. Heavy tick marks indicate December.

Figure 4
M1 Step Function and Recessions: 1946-1981



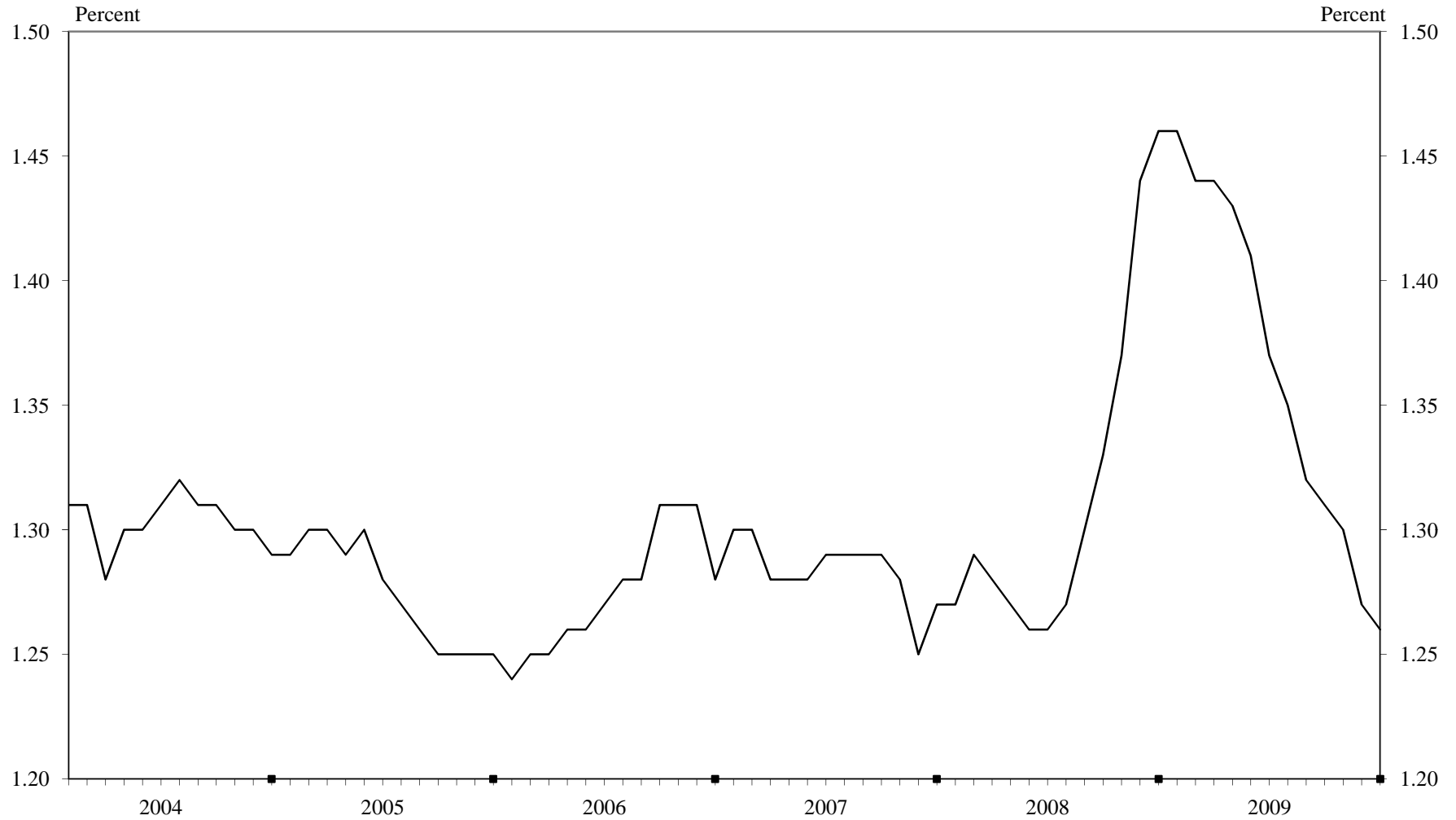
Notes: See notes to Figure 2. Data on money (M1) from January 1946 to December 1958 from (Friedman & Schwartz 1970); January 1959 to December 1980 from Board of Governors. January 1981 to December 1981 M1 is shift-adjusted M1 (Bennett 1982). Shaded areas indicate NBER recessions. Heavy tick marks indicate December.

Figure 5
Deviations of Real PCE from Trend



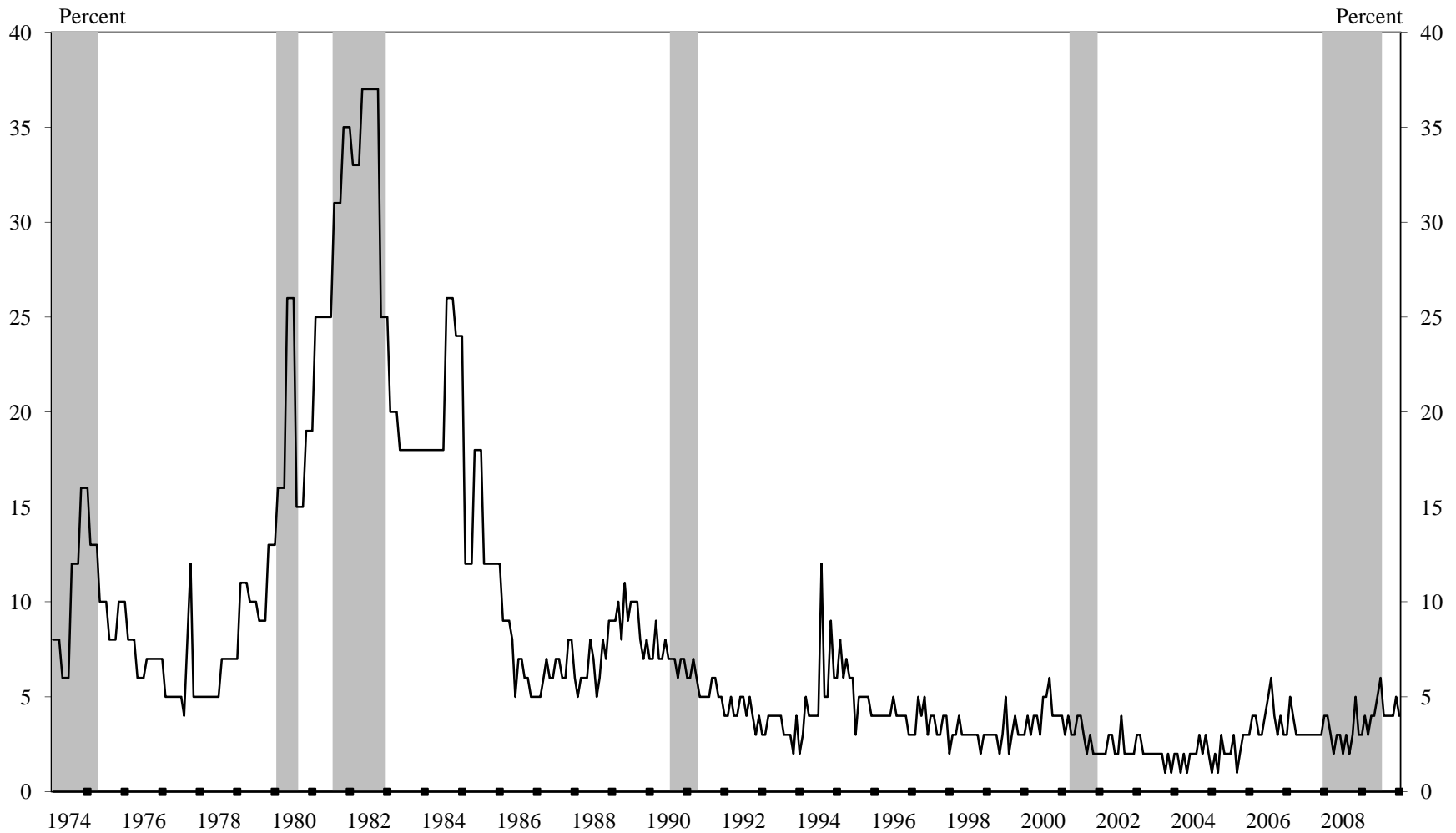
Notes: Trend lines are calculated using the log of real personal consumption expenditures (PCE) between business cycle peaks (see Figure 1). Residuals are deviations of the actual values from the trend. Data from the Commerce Department and Haver Analytics. Shaded areas indicate NBER recessions. June 2009 set as tentative cycle trough. Heavy tick marks indicate December.

Figure 6
Business Inventory/Sales Ratio



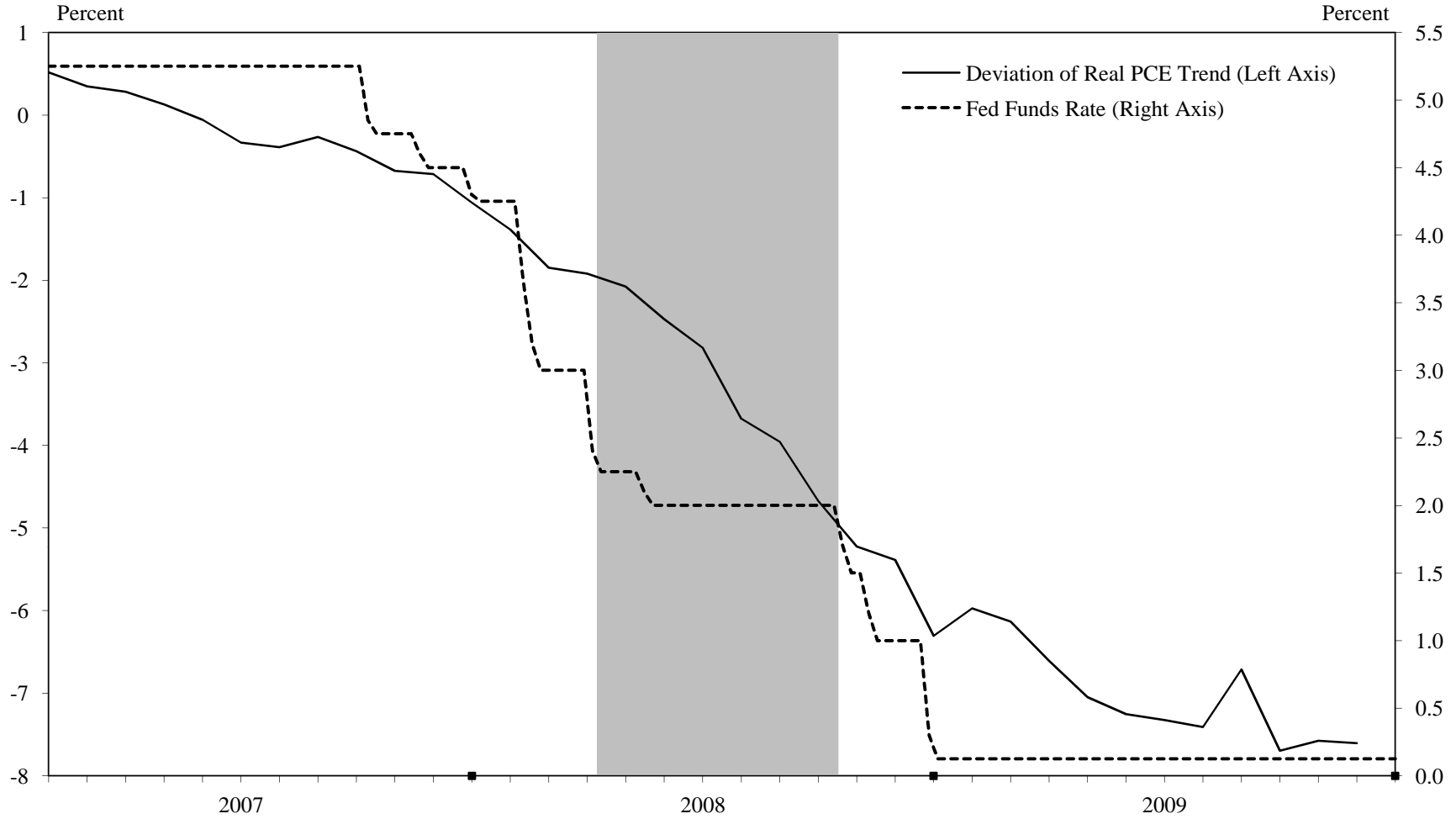
Notes: Monthly observations of inventories divided by sales for all businesses. Data from the Census Bureau via Haver Analytics. Heavy tick marks indicate December.

Figure 7
Relative Important of Financing Difficulties for Small Businesses



Notes: Percent of small businesses reporting that the most important problem facing their business is financial and interest rates. Data from the National Federation of Independent Businesses and Haver Analytics. Shaded areas indicate NBER recessions. June 2009 set as tentative cycle trough. Heavy tick marks indicate December.

Figure 8
Fed Funds Rate and Real PCE



Notes: Deviations of real personal consumption expenditures from trend (see Figure 2). Data from the Commerce Department and Haver Analytics. Heavy tick marks indicate December.