

Romer, Christina D.

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Income Families, *San Francisco: Public Policy Institute of California*, 2002; D. Neumark and S. Adams, "Do Living Wage Ordinances Reduce Urban Poverty?" NBER Working Paper No. 7606, March 2000, forthcoming in *Journal of Human Resources*; and D. Neumark and S. Adams, "Detecting Effects of Living Wage Laws," forthcoming in *Industrial Relations*.

²¹ For preliminary information on enforcement of living wage laws, see R. Sander and S. Lokey, "The Los Angeles Living Wage: The First Eighteen Months," (mimeo) UCLA and the Fair Housing Institute, Los Angeles (1998).

²² For these business assistance living wage

laws, the estimated elasticity of wages with respect to living wages in the bottom decile of the wage distribution is approximately 0.1, while for contractor-only living wage laws the estimated elasticity is indistinguishable from zero. While the 0.1 elasticity may suggest a small impact, it is an average wage increase experienced by low-wage workers, whereas the actual consequence would most likely be a much larger increase concentrated on a smaller number of workers directly affected by the living wage law.

²³ The estimates imply an elasticity of the proportion of poor families with respect to the living wage of about -0.19. This seems like a large effect, given a wage elasticity for low-wage workers of approximately 0.1. Of

course no one is claiming that living wages lift a family from well below the poverty line to well above it. But living wages may help nudge a family over the poverty line, and we have to recall that these average wage effects will in fact be manifested as much larger gains concentrated on a possibly quite small number of workers and families. Thus, even coupled with some employment reductions, living wages can lift a detectable number of families above the poverty line.

²⁴ See D. Neumark, "Living Wages: Protection For or Protection From Low-Wage Workers?" NBER Working Paper No. 8393, July 2001.

Monetary Policy

Christina D. Romer*

Actions by the Federal Reserve are commonly thought to be a key determinant of short-run macroeconomic fluctuations. Much of my recent research analyzes this crucial link between monetary policy and economic activity. Some of the papers look directly at the effects of Federal Reserve actions on output, prices, and interest rates. Other papers look at the motivation behind Federal Reserve actions — why has the Federal Reserve done what it has done at various times? In all of the papers there is an element of economic history. Some of the papers look specifically at monetary policymaking in the past. However,

*Christina D. Romer is a Research Associate in the NBER's Programs in Monetary Economics, the Development of the American Economy, and Economic Fluctuations and Growth. She is also the Class of 1957 Professor of Economics at the University of California, Berkeley.

even the papers with a modern focus use some of the techniques of economic history, such as an analysis of narrative evidence and other non-standard sources.

Federal Reserve Information and the Behavior of Interest Rates

In one paper with my co-author, David Romer, I analyze the response of interest rates to Federal Reserve actions.¹ In particular, we investigate why interest rates at all horizons typically rise when the Federal Reserve tightens and fall when the Federal Reserve loosens. While simple portfolio theory can explain why short-term rates rise when the Federal Reserve sells bonds, the similar behavior of longer-term rates documented in a

number of studies is more puzzling. A tightening by the Federal Reserve presumably should lower inflation in the future; therefore longer-term nominal rates plausibly should fall rather than rise. Our research suggests that interest rates at all horizons respond to Federal Reserve actions because the Federal Reserve has private or superior information about the future behavior of inflation and output which is revealed by monetary policy actions.

Our evidence that the Federal Reserve possesses private information is the most important finding of the paper. This analysis uses the Federal Reserve's internal forecasts: the "Greenbook" forecasts. These forecasts have been produced by the staff of the Board of Governors for every meeting of the Federal Open Market Committee since the mid-1960s. We think of a person with access to several private forecasts and the Federal Reserve's internal forecast trying to

form the best prediction of future inflation. Our empirical analysis suggests that such a person could minimize his forecast error by putting a large amount of weight on the Federal Reserve's forecast and essentially no weight on the other forecasts. That is, once one knows the Federal Reserve's forecast, other available forecasts provide virtually no useful information. We find that the most likely source of this informational advantage on the part of the Federal Reserve is not inside information about government statistics or future policy. Rather, it is simply that the Federal Reserve devotes many more resources to forecasting than any private forecaster. The finding that the Federal Reserve possesses private information about future economic developments suggests that asymmetric information between the monetary authority and private economic agents is a fundamental feature of modern economies.

Our empirical analysis also suggests that changes in the Federal Reserve's target for the federal funds rate, our measure of monetary policy actions, reveal some of this private information. The Federal Reserve tends to raise interest rates when its own forecast of inflation is higher than private forecasts. We also find that private forecasters tend to raise their forecasts of inflation when the Federal Reserve tightens. This behavior is consistent with the notion that private forecasters feel they learn something about future inflation from the Federal Reserve's behavior. The bottom line is that the revelation of the Federal Reserve's private information through its actions can explain much of the puzzling behavior of interest rates. Understanding why interest rates throughout the term structure rise when the Federal Reserve tightens is important because it may provide insight into why monetary policy packs such a powerful punch in the postwar United States.

Monetary Policy, Output, and Prices

In a new paper, David Romer and I look in more depth at the effects of

monetary policy on output and prices. Economists are always searching for a better measure of monetary policy shocks. Conventional measures, such as changes in the federal funds rate or in the money supply, have the problem that the Federal Reserve adjusts its conduct of policy on the basis of its information about likely economic developments. As a result, if one observes, for example, no correlation between these measures of policy and subsequent economic developments, then one cannot conclude that monetary policy does not matter; it may be that the Federal Reserve is using policy effectively to offset movements that would occur otherwise. Because of this difficulty, considerable uncertainty remains about the effects of monetary actions.

We use the Federal Reserve's internal forecasts as a crucial control variable.² To derive a new measure of monetary shocks, we regress the change in the intended federal funds rate on the Federal Reserve's own forecasts of inflation and output growth, as well as real-time estimates of the contemporaneous and lagged values of these variables. This regression captures how this key short-term interest rate typically moves in reaction to these actual and forecasted values of economic fundamentals. We then take as our measure of monetary policy shocks the residuals of this regression. By this measure a monetary shock is a movement in the intended funds rate that cannot be explained by the usual reaction of interest rates to output or prices or to the Federal Reserve's own forecasts of those variables. As a result, the new shock series should be much freer of responses to prospective economic developments than other existing measures.

A crucial step in the derivation of the new measure is the creation of an intended federal funds rate series. In some eras, such as the second half of the 1970s and most of the period since 1985, the Federal Reserve has targeted the federal funds rate closely. In these periods, it is easy to deduce the intended funds rate from the FOMC's *Record of Policy Actions*. However, in other eras, the Federal Reserve was focusing less closely on the funds rate, so their

intentions for the funds rate are less readily available. For these eras, we examine the narrative record closely and use internal Federal Reserve memos to deduce an implicit target series. The result is a consistent indicator of Federal Reserve actions from the late 1960s on that we can use as an input into the rest of our derivation.

Once we have our new measure of monetary policy shocks, we look at the behavior of output and inflation in response to monetary policy. The results are exceedingly strong. A monetary shock of 100 basis points (a substantial tightening of policy) is associated with a maximum drop in industrial production relative to what it otherwise would have been over the next four years of 4.8 percent. The same shock also reduces the price level relative to what it otherwise would have been over the same period by 5.9 percent. The results using the new measure are both much stronger and less anomalous than those using conventional measures of monetary policy, such as the simple change in the intended funds rate. For example, many studies have found that inflation tends to rise for a while following an increase in the funds rate. This "price puzzle" virtually disappears when the new measure of monetary policy shocks is used.

Monetary Policy Over Time

The papers just described concern the effects of monetary policy. Another strand of my recent research concerns the conduct of monetary policy. Why has the Federal Reserve done what it has done at various points in the past? How has monetary policy evolved over time?

This strand of recent research in some ways is both a continuation of an earlier research agenda and the start of a new one. In the 1980s, I wrote a series of papers that showed that short-run fluctuations had not moderated noticeably between the pre-1929 and post-1947 eras.³ This finding is surprising because it is typically thought that the United States and other industrial economies began using both monetary and fiscal policies to stabilize the

economy after World War II. In a recent revisiting of this finding, I found that as the postwar era has lengthened, a more noticeable trend toward stabilization has emerged.⁴ However, that progression has not been linear. While recessions were somewhat frequent in the 1950s and early 1960s, they were typically mild. Then between the late 1960s and early 1980s, the United States experienced a number of severe recessions. Since 1983 business cycles have become both less frequent and less severe.

Given the profound effects that monetary policy has on output, prices, and interest rates, it is natural to wonder if the evolution of monetary policy can account for the evolution of macroeconomic performance. Therefore, another paper with David Romer looks at monetary policy in the first decade of the postwar era.⁵ Even though economic performance was quite good in the 1950s, monetary policy in this era typically is characterized as somewhat inept: unsophisticated and directed toward the potentially misleading indicator of free reserves. We use both narrative and statistical evidence to suggest that this characterization is incorrect.

A detailed reading of the *Minutes of the Federal Open Market Committee* suggests that the Federal Reserve of the 1950s had an overarching aversion to inflation. This dislike of inflation was reinforced by a model of the macroeconomy that posited no long-run positive trade-off between inflation and output growth and held that inflation quite possibly could lead to recessions and slower long-run growth. This deep-seated dislike of inflation prevented the Federal Reserve of the 1950s from making gross mistakes. While crude forecasting and some emphasis on faulty indicators led to a certain amount of volatility, inflation in the 1950s never was allowed to get seriously out of hand. As a result, the Federal Reserve in the 1950s and early 1960s never had to engineer a recession of a magnitude like that of 1974-5 or 1981-2 to bring inflation down.

An empirical analysis of a simple monetary policy rule confirms the picture of a reasonably astute and sensible Federal Reserve in the 1950s that

emerges from the narrative record. We examine the response of the federal funds rate to expectations of the deviation of output from trend and inflation in various eras: the 1950s, the late 1960s and 1970s, the Volcker years, and the Greenspan era. We find that, as in the Volcker and Greenspan eras, monetary policymakers in the 1950s normally raised nominal rates enough in response to expected inflation that the real rate also rose. In the late 1960s and 1970s, in contrast, monetary policymakers allowed real rates to fall in response to expected inflation.

This analysis of monetary policy in the 1950s raises an obvious question: if monetary policy was basically sound in the 1950s, what happened in the 1960s and 1970s? Given that the Federal Reserve had a quite sensible model of the economy in the 1950s, our paper suggests that the temporary triumph of a less sensible macroeconomic framework may have been key. This is a possibility that we are pursuing in our current research.

A final paper in this research agenda returns to the more distant past. Chang-Tai Hsieh and I examine the motivations of the Federal Reserve during one of the most dramatic failures of American monetary policy: the Great Depression of the 1930s.⁶ Beginning in late 1929, output and prices plummeted in the United States and, indeed, throughout the world. In late 1930 the United States experienced the first of four waves of banking panics which would cripple the American financial system and cause devastating declines in the money supply. A key question about the Great Depression is why the Federal Reserve did not do more to stem the financial panics. Friedman and Schwartz's classic NBER study *A Monetary History of the United States* attributed Federal Reserve inaction to incompetence and a power vacuum within the System.⁷ More recently, Barry Eichengreen and Peter Temin have argued that the U.S. adherence to the gold standard prevented the Federal Reserve from responding to deteriorating economic conditions.⁸ Aggressive monetary expansion would have brought the U.S. commitment to the gold standard into question and led to a speculative attack

on the dollar.

To test whether the Federal Reserve really was constrained by the gold standard in this way, Hsieh and I examine in detail the one time in the early 1930s when the Federal Reserve did expand aggressively. Under pressure from Congress, in the spring of 1932 the Federal Reserve undertook an open market purchase program that more than doubled Federal Reserve holdings of government bonds over a four-month period. We look for both empirical and narrative evidence that this monetary expansion led to a loss of credibility of the U.S. commitment to the gold standard.

Empirically, a loss of credibility should reveal itself in the relationship between spot and forward exchange rates. If market participants fear devaluation, the forward exchange rate (expressed as dollars per unit of foreign currency) should rise relative to the spot rate. We find little evidence of a rise in this indicator of devaluation expectations in the spring of 1932. Indeed, in the first month of the program, when open market purchases were largest, the behavior of forward and spot exchange rates suggests that expectations of devaluation actually fell. Interest rates also tell a similar story. Fears of devaluation should cause U.S. interest rates to rise relative to those of countries viewed as firmly wedded to the gold standard. In the spring and summer of 1932, such interest rate differentials did not rise. Thus, we find no empirical evidence that the dramatic monetary expansion of 1932 led to a loss of credibility.

We bolster our empirical findings with a detailed reading of Federal Reserve documents and newspapers from this period. We examine internal correspondence and minutes of Federal Reserve meetings to see if Federal Reserve officials worried that the monetary expansion could cause a speculative attack. We find no evidence of such concerns. Indeed, the gold standard is mentioned only rarely and when it is, the tone is that it is not a constraint on Federal Reserve actions. We look at key newspapers of the time to see if they report fears of devaluation or an imminent speculative attack. Once again, we find no such fears or speculations.

The combination of the empirical evidence and the analysis of contemporaneous documents leads us to conclude that more aggressive monetary policy was certainly possible in the early 1930s. The Federal Reserve could have done much more to counter the spiraling decline without running into limitations imposed by the gold standard. This suggests that much of the blame for the Great Depression rests where Friedman and Schwartz placed it 40 years ago — at the doorstep of the Federal Reserve.

¹ C. D. Romer and D. H. Romer, "Federal Reserve Information and the Behavior of Interest Rates," NBER Working Paper No. 5692, July 1996, and in *American Economic Review*, 90 (2000), pp. 429-57.

² C. D. Romer and D. H. Romer, "A New

Measure of Monetary Policy Shocks: Derivation and Implications," unpublished manuscript, July 2002.

³ C. D. Romer, "Spurious Volatility in Historical Unemployment Data," *Journal of Political Economy*, 94 (1986), pp. 1-37; C. D. Romer, "Is the Stabilization of the Postwar Economy a Figment of the Data?" *American Economic Review*, 76 (1986), pp. 314-34; and C. D. Romer, "The Prewar Business Cycle Reconsidered: New Estimates of Gross National Product, 1869-1908," NBER Working Paper No. 1969, July 1986, and in *Journal of Political Economy*, 97 (1989), pp. 1-37.

⁴ C. D. Romer, "Changes in Business Cycles: Evidence and Explanations," NBER Working Paper No. 6498, February 1999, and in *Journal of Economic Perspectives*, 13 (1999), pp. 23-44.

⁵ C. D. Romer and D. H. Romer, "A

Rehabilitation of Monetary Policy in the 1950s," NBER Working Paper No. 8800, February 2002, and in *American Economic Review*, 92 (2002), pp. 121-7.

⁶ C-T Hsieh and C. D. Romer, "Was the Federal Reserve Fettered: Devaluation Expectations in the 1932 Monetary Expansion," NBER Working Paper No. 8113, February 2001.

⁷ M. Friedman and A. J. Schwartz, *A Monetary History of the United States, 1867-1960*, Princeton University Press for NBER, 1963.

⁸ B. Eichengreen, *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939*, Oxford University Press and NBER, 1995; and P. Temin, *Lessons from the Great Depression*, Cambridge, MA: MIT Press, 1989.

The New Comparative Economics

Andrei Shleifer*

The traditional field of "Comparative Economics," which deals with comparisons of socialism and capitalism, died with the collapse of socialism in Eastern Europe and the Soviet Union a decade ago. But from its ashes, and from the challenging experiences of transition and the Asian financial crisis, emerged a new field. This field, the "New Comparative Economics," shares with its predecessor the notion that by comparing alternative economic systems, we can better understand what makes each of them work. But this new field sees the key comparisons as being of alternative capitalist models prevailing in different countries.

Every capitalist economy has many public and private institutions.

*Shleifer is a Research Associate in the NBER's Program on Corporate Finance and the Whipple V. N. Jones Professor of Economics at Harvard University.

These institutions' function is to choose political leaders, to maintain law and order, to secure property rights, to redistribute wealth, to resolve disputes, to govern firms, to allocate credit, and so on. Political economy over the last two centuries, as well as recent empirical research, demonstrate that these institutions differ tremendously and systematically among countries, and that these differences have significant consequences for economic and political performance. The comparison of these institutions and of their effectiveness, with a focus on understanding which ones are appropriate in what circumstances, is the subject of the New Comparative Economics.

The New Comparative Economics shares with institutional economics the recognition that the pure competitive model is not a useful way to think about capitalist economies, and that political and economic institutions crucially shape performance. Unlike

institutional economics, however, which stresses the common achievements of capitalist economies, such as protection of private property, the New Comparative Economics focuses on institutional diversity. The New Comparative Economics also shares with the field of public choice its emphasis on politics. Most crucial institutional differences among countries — whether regulating markets or regulating politics — are governmental. It is impossible to understand the formation of institutions, their consequences for performance, or their appropriateness for the circumstances without understanding the political forces that drive institutional evolution.

In thinking about institutional diversity and its consequences, it is best to start from first principles. Since the days of the Enlightenment, economists agreed that good economic institutions must secure property rights, enabling people to keep the returns on