Volume Title: The Great Inflation: The Rebirth of Modern Central Banking

Volume Author/Editor: Michael D. Bordo and Athanasios Orphanides, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-006695-9, 978-0-226-06695-0 (cloth)

Volume URL: http://www.nber.org/books/bord08-1

Conference Date: September 25-27, 2008

Publication Date: June 2013

Chapter Title: Introduction to "The Great Inflation: The Rebirth of Modern Central Banking"

Chapter Author(s): Michael D. Bordo, Athanasios Orphanides

Chapter URL: http://www.nber.org/chapters/c9155

Chapter pages in book: (p. 1 - 22)

Introduction

Michael D. Bordo and Athanasios Orphanides

> For eight years economic policy and the news about the economy have been dominated by inflation. . . . Many programs have been launched to stop it—without success. Inflation seemed a Hydra-headed monster, growing two new heads each time one was cut off.
> —Council of Economic Advisers (1974, 21)

Overview

Maintaining an environment of low and stable inflation is widely regarded as one of the most important objectives of economic policy, in general, and the single most important objective for monetary policy, in particular. The reasons are clear. An environment of price stability reduces uncertainty, improves the transparency of the price mechanism, and facilitates better planning and the efficient allocation of resources, thereby raising productivity.

The Great Inflation from 1965 to 1982 caused significant damage to the US economy and to the economies of many other countries and was a serious policy concern. Inflation in the United States rose from below 2 percent in 1962 to above 15 percent by 1979. Attempts to control it in the early 1970s included the Nixon administration imposition of wage and price controls, which were largely ineffective but that added to distortions in the US economy and likely contributed to the deep slump of 1974. The inflation rate in the 1970s also contributed to a marked decline in the US stock market and volatility in the US dollar, including a serious exchange rate crisis in 1978 and 1979. The period was also coincident with a marked decline in productivity growth, which by the end of the 1970s was only a fraction of its performance during the 1960s.

Since the early 1980s, the United States, as well as other industrialized and

Michael D. Bordo is professor of economics at Rutgers University and a research associate of the National Bureau of Economic Research. Athanasios Orphanides is former governor of the Central Bank of Cyprus.

For acknowledgments, sources of research support, and disclosure of the authors' material financial relationships, if any, please see http://www.nber.org/chapters/c9155.ack.

some emerging countries, has been highly successful in controlling inflation. This is evident in the ability of the monetary authorities to stick to their basic low inflation objectives in the face of significant recent oil price shocks and other supply shocks.

By the end of the twentieth century, a consensus view had developed that the Great Inflation represented the most costly deviation from a period of stable prices and output growth in the period between the Great Depression and the recent financial crisis in the United States, as well as many other developed countries. It would appear self-evident that understanding the fundamental causes of this event, and avoiding its repetition, should be viewed as an important issue for macroeconomists. Many attempts to understand what happened can be identified, but over the past three decades there have been substantial disagreements, misconceptions, and misunderstandings of the period, which makes it quite hard to compare even seemingly reasonable and plausible alternatives and to draw useful lessons. In addition, recent research has produced new useful perspectives on what might have led to the unprecedented peacetime run-up in inflation.

The objective of the conference was to bring together this research, helping put the pieces together and to draw the important policy lessons necessary to help avoid the repetition of the Great Inflation. Because of the likelihood that once the present recession is past, inflationary pressure may return, this would seem an opportune time to revisit the Great Inflation. The findings of the research in this volume could have lasting influence on policy.

This introduction briefly describes the dimensions of the Great Inflation. The next section surveys the themes that have dominated the research on the Great Inflation from the 1970s to the present. We summarize the conference proceedings in the final section.

The Dimensions of the Great Inflation

The Great Inflation was a worldwide phenomenon, experienced throughout the developed world. As can be seen from a plot of inflation in the G7 countries (figure I.1), inflation started to trend upwards in the second half of the 1960s, although the defining decade when its virulence was better understood was the 1970s. Two sharp increases resulting in two peaks, one in the middle of the 1970s and the second around 1980, are evident in all countries. The second peak was followed by disinflation, sharp in some cases, during the first half of the 1980s. Though the contours of inflation were similar, there were significant differences in the extent of the problem. Inflation exceeded 20 percent in the United Kingdom and Italy, reached double digits rather briefly in the United States, but did not exceed single digits in Germany.

In addition to the adverse developments in inflation, the 1970s saw increases in unemployment and a notable slowdown in growth, relative to

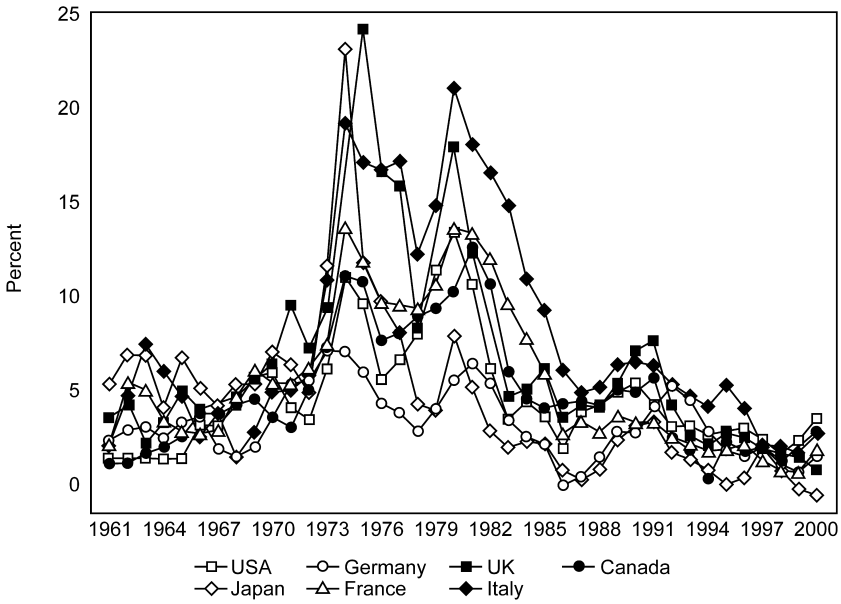

Fig. I.1 Inflation

what had been experienced earlier in the post–World War II period (figures I.2 and I.3). Unemployment levels were historically low in the 1950s and 1960s and productivity increased rapidly. In this light, the relative stagnation of the 1970s, together with the increases in inflation, raised alarms that the worst of both outcomes was being observed, popularizing a description of the period with one word—stagflation.[1] Following a long period of relative stability, the Great Inflation developments surprised policymakers and academics alike. Inflation ran higher than anticipated for long stretches. In the United States, survey data indicate that business economists were notably biased in their forecasts, expecting lower inflation than materialized for several years. Similarly, policy forecasts proved over optimistic. For example, at the Federal Reserve, the staff forecasts prepared for (Federal Open Market Committee) FOMC meetings and shown in the Green Book were on average predicting lower inflation.

The surprises did not end with developments in inflation. Another area where a deterioration was slowly recognized was in productivity. In the 1950s and 1960s rapid productivity growth in much of the developed world raised expectations of the prospects for sustained increases in prosperity. In this environment, estimates of potential output growth—the natural rate of growth that could be expected to be achieved with price stability—were

1. See Nelson and Nikolov (2004) for the origin of the word in the United Kingdom.

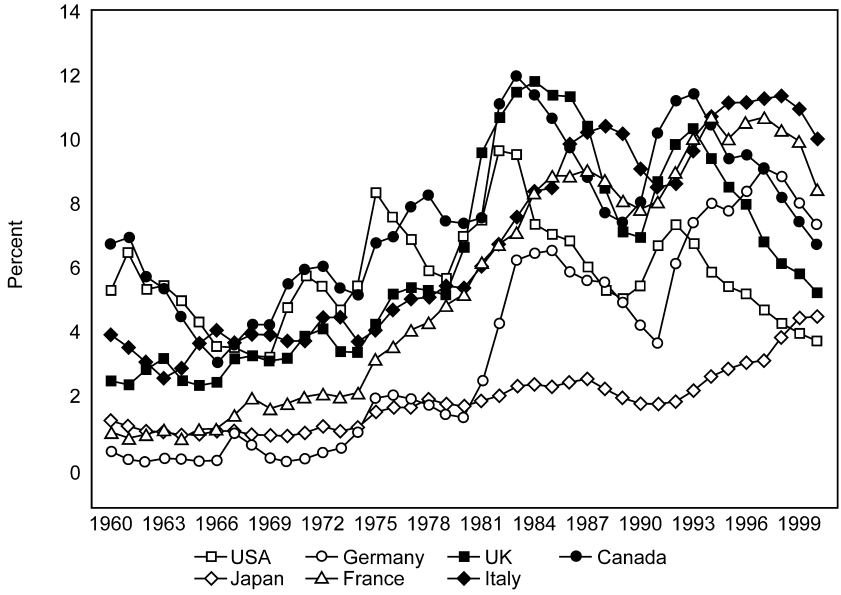

Fig. I.2 Unemployment rate

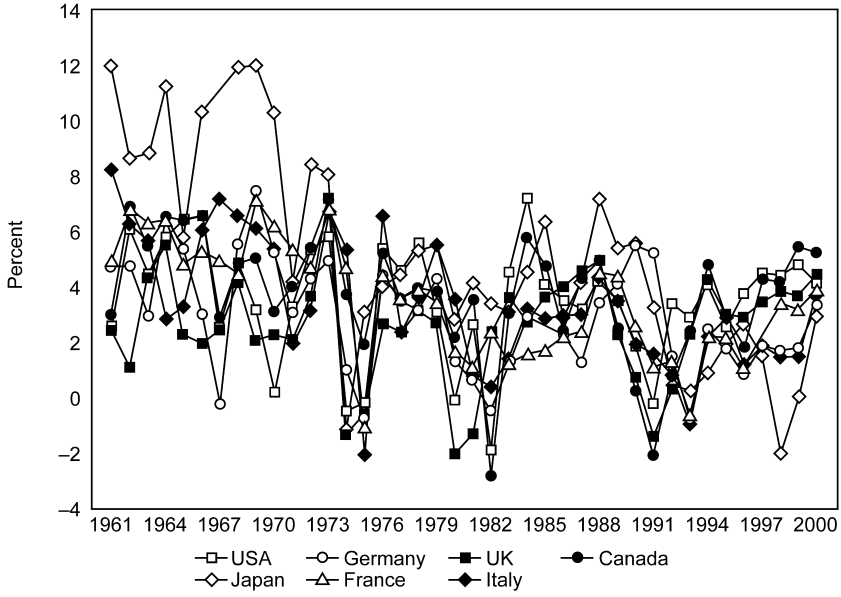

Fig. I.3 Real output growth

increased. But, as was noted in an Organization for Economic Cooperation and Development (OECD) report by a group of independent experts headed by Paul McCracken (OECD 1977), throughout the developed world subsequent developments disappointed and potential output prospects were marked down as the 1970s progressed. In the United States, suspicions that productivity was slowing down were already expressed by some before the end of the 1960s but the degree of deterioration and successively more pessimistic assessments of productivity and potential output became common as the 1970s progressed.

The malaise was also evident in deteriorating outcomes on employment during the period. During the 1970s, a secular upward trend in the rate of unemployment became evident. In the United States, whereas during the 1950s and 1960s it was increasingly accepted that an unemployment rate of 4 percent or so corresponded to the economy's full employment potential, by the end of the Great Inflation 6 percent of even higher unemployment rates were considered more appropriate reflections of the natural rate. Similar developments were observed elsewhere, and in Europe, in particular, the deterioration in what constituted full employment was even more dramatic.

The deterioration in both inflation stability and economic growth and employment prospects experienced during the Great Inflation were disappointing but also perplexing as they challenged the view prevailing during the 1960s regarding advances in the understanding of the workings of the economy and associated improvements in policy conduct. The timing of the deterioration was especially disheartening to policy economists as it came following a period of what was thought to be a great advance in doctrine. In the United States, the "New Economics" that guided economic policy starting with the Kennedy administration was seen as a period of great promise. (See the accounts of some of the protagonists: Heller 1966; Tobin 1966, 1972; and Okun 1970.) Whereas before the 1960s, policymakers appeared content to ensure that the economy was growing satisfactorily and recessions were avoided, starting with the 1960s, active management of aggregate demand counteracting any shortfall or excess relative to the economy's potential was pursued. As Arthur Okun, whose work on the measurement of potential was critical for the implementation of this strategy explained: "The revised strategy emphasized, as the standard for judging economic performance, whether the economy was living up to its potential rather than merely whether it was advancing" (Okun, 1970, 40). Following many years of growth and declining unemployment with relative price stability, the Great Inflation proved a tremendous letdown. Characteristic of the sentiment were the titles of some postmortems written after the destructive forces of the Great Inflation were fully recognized. Arthur Burns titled his 1979 Per Jacobson lecture delivered shortly after he stepped down as Federal Reserve chairman, *The Anguish of Central Banking.* The title of an essay

written in 1980 by Robert Solow (1982) in honor of Walter Heller was an apt question: "Where Have All the Flowers Gone?"

The Debate over the Causes of the Great Inflation

The Great Inflation posed a major intellectual challenge because considerable disagreement prevailed as to its immediate causes in both policy and academic circles, both while it was happening and in the decades since.

A number of hypotheses have been advanced as possible explanations, or at least as contributing answers to some of the questions that must be addressed on the way to providing a thorough understanding of the possible causes. Questions such as: What went wrong? What started the Great Inflation? What stopped it? Why did the inflation start in the mid-1960s and accelerate in the 1970s? What accounts for the disinflation of the 1980s? Was the increase in inflation intentional or was it an unavoidable consequence of exogenous factors against which policy was helpless? Were exogenous factors ("bad luck") or endogenous decisions ("bad policy") or a deficient institutional structure ("bad institutions") to blame? To what extent was the initial realization of higher inflation a surprise to policymakers? When was the threat of persistently higher inflation recognized by policymakers? How did households' and businesses' perceptions and attitudes regarding inflation evolve? Did policymakers try to contain inflation and fail or did they decide to let it continue once they understood its persistence? Alternatively, did policymakers perceive constraints that discouraged or rendered infeasible the adoption of policies that could have stopped it? To what extent was the inflation a conscious policy choice responding to the sociopolitical environment of the times? Was it preordained by the institutional environment that evolved following the world wars? Or was it the outcome of the prevalent economic reasoning during the period?

Price changes arise from imbalances in demand and supply and either supply or demand shocks can have influence. In the aggregate, inflation could arise from either source. Identifying the relative importance of "demand" and "supply" shocks as drivers of inflationary developments is a perennial issue, and, unsurprisingly, a matter of controversy with regard to the Great Inflation. In the post–World War II era, including during the Great Inflation, the identification of "cost push" versus "demand pull" inflation occupied many discussions but perceptions varied with schools of thought. Among the economists identified as "monetarists," overexpansionary monetary conditions and excessive nominal aggregate demand, virtually axiomatically, were given prominence in explaining inflation outcomes. Among those identified as "Keynesians," the adverse inflationary outcomes were more often than not identified as due to adverse supply.

During the 1970s in the United States, a common explanation of the inflationary developments was that it resulted from a series of adverse supply

shocks. Based on the analysis by Gordon (1975, 1977), Eckstein (1978), and Blinder (1979, 1982), one could argue that the bulk of the two sharp increases in inflation during the 1970s, in 1973 to 1975 and in 1978 to 1980, could be explained due to the unusual developments in food, energy, and other commodities were taken into account to supply shocks in food and energy. In addition to the oil-cartel–induced increases in energy prices, reference was made to agricultural shortages due to unusual weather phenomena, and price increases in other commodities. In his 1977 analysis, Gordon found that structural wage and price equations that were developed to fit the 1954 to 1971 sample, prior to the realization of the unusual supply shocks observed during the first half of the 1970s, tracked the inflation developments well. According to this view, the 1970s experience represented a break from earlier history as a result of the unique supply shocks that hit the economy. The state of aggregate demand and macroeconomic policy did not need to be invoked as an important part of the explanation, and policy directed toward managing aggregate demand—either fiscal or monetary—did not play a major role in determining the adverse inflationary outcomes of the period.

Perhaps the Great Inflation would not have been characterized as such if it were not for the spikes in inflation experienced during the 1970s. While the supply shock hypothesis makes contact with the sharp increases in inflation associated in time with the two sharp increases in oil prices during the 1970s, it does not address the upward drift in inflation evident already from the mid-1960s and through the end of the 1970s. Thus, other factors must have contributed to an underlying aggregate demand pressure that may have persisted for over a decade and could have played a role over and above the supply shock explanation. Further, Barsky and Kilian (2001) suggest skepticism regarding the exogeneity of the commodity shocks of the 1970s and argue that the oil shocks, in particular, were largely the endogenous outcome of accumulated worldwide aggregate demand pressures. If this interpretation is correct, then at least some—if not all—of what is attributed to temporary supply factors should also be attributed to inflationary demand developments and the understanding of the Great Inflation must center on explaining the causes of what may have been a persistently inflationary aggregate demand imbalance.

An underlying element in a number of explanations of the Great Inflation is that policymakers accepted the increase in inflation as an unavoidable choice, necessary to advance overall economic welfare. One such mechanism is based on the time-inconsistency problem of discretionary monetary policy advanced by Kydland and Prescott (1977) and Barro and Gordon (1983). In that model, the time-consistent inflation rate that arises from the monetary policymaker's decisions increases with the economy's natural rate of unemployment. Parkin (1993) and Ireland (1999) use this link to argue that the upward drift in inflation was due to a corresponding drift in the natural

rate of unemployment. Indeed, exogenous factors including demographic changes and a productivity slowdown seem to have caused an upward drift in the natural rate of unemployment during the late 1960s and 1970s so the time-inconsistency problem could serve as an explanation if policymakers recognized the upward drift in the natural rate at that time and set policy accordingly. The disinflation of the 1980s is harder to reconcile with this explanation alone, however, as it does not similarly coincide with a downward drift in the natural rate.

Another mechanism relating to the time-inconsistency issue that potentially explains episodes of high inflation is the presence of expectations traps, as argued by Chari, Christiano, and Eichenbaum (1998) and Christiano and Gust (2000). An expectations trap arises when an increase in private agents' inflation expectations in the economy pressures the monetary authority to accommodate those expectations to meet other objectives, for example, to avoid a costly recession. A key element in the story is the presence of multiple expectational equilibria. While under commitment a unique equilibrium with low inflation obtains, episodes of high and low inflation can arise in the absence of commitment in monetary policy. The expectations traps provide a mechanism for translating temporary shocks that influence adversely inflation expectations to permanent changes in the inflation tolerated by discretionary policymakers. Thus, it can explain the Great Inflation as due to the combination of adverse shocks and the policymakers' decision to accommodate their inflation consequences permanently. Although policymakers did not seek higher inflation in this story, they decided to accept it as they considered the costs associated with pursuing disinflation too high. Under these circumstances, the disinflation started once policymakers became unwilling to continue to tolerate high inflation.

The willingness of policymakers to accept high inflation is also a feature of the monetary neglect hypothesis advanced in Hetzel (1998, 2008), Nelson and Nikolov (2004), and Nelson (2005a). In this story, monetary policymakers appear unwilling to push for a disinflation once inflation starts because they doubt the effectiveness of monetary policy to tackle inflation relative to alternative policies. The story emphasizes the role of nonmonetary explanations of inflation, such as the belief that inflation can be a purely cost-push phenomenon. The prevalence of such beliefs is thus identified as culprit for the neglect toward achieving price stability. Disinflation started once the dominance of such beliefs receded.

Tolerance for inflation and an aversion to the monetary policy actions needed to end it is also at the heart of political explanations of the Great Inflation. Politics are always an unavoidable part of economic policy design and this was not different during the Great Inflation period (see Mayer 1999 and Stein 1984). Even if fiscal policy is politically motivated, however, price stability should prevail if the monetary authority can independently decide and implement its policies. The question is whether independent central

banks tolerated inflation or whether central banks lacked the necessary independence to do so. Documenting several episodes of political pressure at the Federal Reserve, Meltzer (2005, 2010) argues that politics was an important part for the start, the continuation, and the end of the Great Inflation. The unprecedented public bashing by both the administration and the Congress of Chairman Martin following a policy-tightening with which the administration disagreed in December 1965 marked the start of the episode. According to Meltzer, monetary policy in the second half of the 1960s became more accommodative of the administration's policy objectives. As inflation rose, lack of political consensus for incurring the costs that disinflation would induce tied Chairman Burns's hands. Inflation was ended only when the high costs of inflation were recognized and sufficient political support for disinflation mustered.

An alternative set of explanations, dubbed the "Berkeley story" by Sargent (2002), gives prominence to the rise of views during the 1960s regarding the policy trade-offs implied by a downward sloping Phillips curve. Samuelson and Solow (1960) presented a menu of choices between unemployment and inflation that could be available to policymakers, according to the statistical relationship between inflation and unemployment following World War II. Although they were careful to qualify the stability of this relationship, the policy menu was interpreted as suggesting that if unemployment was deemed intolerably high (as it was in the early 1960s), it could be reduced by pursuing expansionary policies that corresponded to a higher level of inflation. According to DeLong (1997) and Romer and Romer (2002), following Kennedy's election as president in the 1960s, economic policy in the United States was guided by this reasoning and higher inflation was sought and tolerated during the 1960s in an attempt to achieve full employment. DeLong argues that in light of the erroneous beliefs regarding the Phillips curve, the Great Inflation of the 1970s was an accident waiting to happen as policymakers aimed to reduce unemployment toward 4 percent or lower throughout the 1960s. At some point in time, such a policy would trigger accelerating inflation, as implied by the natural rate hypothesis. By the time policymakers accepted the natural rate hypothesis, and adopted an accelerationist view of the Phillips curve (during the Nixon administration), inflation was already embedded in the economy and was difficult to reverse as that would require raising unemployment above the natural rate. Thus, inflation persisted.

Sargent (1999) embeds the discretionary policy of Kydland and Prescott and doubts regarding the natural rate hypothesis in an adaptive model where the policymaker relies on adaptive estimation of the Phillips curve to learn about the policy trade-off. He demonstrates that policy formulated based on the evolving views that arise from the changing statistical relationships between inflation and unemployment in the data gives rise to endogenously determined episodes of high inflation. Using quarterly US data, Cogley and

Sargent (2002) confirm that the pattern of evolving statistical relationships is consistent with the story where policymakers could be misled by the data into exploiting a Phillips curve, resulting in higher inflation. In a related model of learning dynamics, Primiceri (2006) shows that the combination of changing beliefs about the persistence of inflation and the inflation–unemployment trade-offs can account for the evolution of policy during the rise of inflation and also the disinflation that followed.

A different theoretical error is involved in yet another explanation of what might have caused monetary policy to be overly expansionary during the period. The starting point for this explanation is the characterization of monetary policy in terms of a simple policy rule that captures the response of the nominal short-term interest rate to developments in the economy and real economy. As Taylor (1993) suggested, if correctly specified, such policy rules can capture desirable elements of systematic monetary policy and deliver good outcomes with respect to both price stability and economic stability. Taylor (1999) and Clarida, Galí, and Gertler (2000) suggested that a policy rule responding to inflation and the output gap provided a good characterization of the period of monetary stability that followed the Great Inflation and argued that had a similar policy rule been followed during the Great Inflation, that episode would have been avoided. Instead, their analysis suggests that in the late 1960s and 1970s the Federal Reserve failed to increase the nominal rate enough to offset the negative effect of inflation on real interest rates. In this explanation, the Federal Reserve inadvertently eased monetary conditions with inflation, causing a rise in inflation during the period. The episode ended when this error was recognized and policy became more responsive to inflation. Supporting this explanation is the fact that ex post real short-term rates remained quite low or were even negative for much of the 1970s. This view, however, rests on the hypothesis of widespread policy confusion of real and nominal interest rates. The validity of this hypothesis was doubted in work by Orphanides (2003a, 2004), who argued that the empirical results presented by Taylor (1999) and Clarida, Galí, and Gertler (2000) were statistical artifacts of the use by these authors of retrospectively revised data for characterizing policy decisions. If, instead, real-time data and forecasts available to the FOMC when decisions were taken were used to characterize policy decisions, the evidence of insufficient responsiveness of policy to inflation was overturned.

Examining the information available to the FOMC during the Great Inflation reveals misinformation as another potential explanation of the Great Inflation. Orphanides (2003b) points to substantial misperceptions regarding the measurement of full employment as the cause of overly expansionary monetary policy. Using a model with an accelerationist Phillips curve, Orphanides compares the results of counterfactual simulations with policy following the Taylor (1993) policy rule. He shows that while the

Great Inflation would have been avoided had the output gap been properly measured, when the mismeasurement of the output gap observed during the late 1960s and 1970s is introduced then policy following the Taylor rule delivers inflation outcomes similar to the Great Inflation. Alternative policy rules that deemphasize the output gap are more robust to misperceptions. According to this story, the reliance on the output gap (and related unemployment gap) as a guide for stabilization policy was responsible for the inflationary outcomes. A significant lag of recognition of the productivity slowdown and increase in the natural rate of unemployment implied that estimates of potential output in the late 1960s and throughout the 1970s proved overly optimistic. Although monetary policy was properly responding to inflation it was deliberately easy to counter what were perceived as substantial output gaps and unemployment gaps. The perceived gaps were consistent with projected declining paths of inflation, as suggested by the historical record of policy discussions and the Green Books. Thus, policy was not deliberately inflationary. A persistent overestimation of potential output, an activist policy toward closing output or unemployment gaps, and a significant lag of recognition of its implications on inflation during the 1970s are necessary elements for this hypothesis. Narrative evidence confirms the prominence of the output gap following the rise of activist monetary policy during the 1960s and the delayed recognition of the over optimism reflected in real-time estimates. (See, e.g., Solow 1982, who attributes most of the error to the unexpected unfavorable shift in trend productivity that started in the 1960s.)

Whether an activist policy responding to the output gap like the Taylor (1993) rule can explain the large increase in inflation observed in the 1970s in the presence of misperceptions about the natural rate of unemployment or the output gap alone depends on the persistence of inflation dynamics. Since inflation was not very persistent before the Great Inflation, part of the explanation for the episode must account for the increase in the persistence of inflation during the 1970s. Orphanides and Williams (2005) introduce learning dynamics to examine the evolution of inflation expectations and show that the combination of activist policies and natural rate misperceptions could explain the slow rise of inflation persistence and disanchoring of inflation expectations during the 1970s. Had policy been less activist, inflation expectations would have remained well-anchored throughout the 1970s and the Great Inflation would have been avoided. Once Paul Volcker became chairman of the Federal Reserve, the destabilizing role of activist policies on inflation expectations was recognized and less activist policies adopted, ending the inflation episode.

The Great Inflation was an international phenomenon. Inflation was elevated in all advanced countries in the late 1960s and 1970s. Until 1973 most advanced countries were part of the Bretton Woods international monetary system, which operated as a gold dollar standard. The Bretton Woods

articles required that member countries' exchange rates be pegged to the dollar and the dollar be pegged to gold at the official parity of $35 per ounce. Member countries also used the dollar as their international reserve. Like the gold standard that preceded it, monetary shocks would be transmitted between countries in the pegged exchange rate regime through the balance of payments.

There was considerable research in the 1970s and 1980s on the global transmission of inflation under Bretton Woods (see Bordo 1993). Expansionary US monetary policy beginning in 1965 was transmitted through a rising balance of payments deficit that led to dollar flows to the surplus countries of continental Europe and Japan. The central banks in these countries attempted to sterilize the dollar inflows but most led to increases in their money supplies and rising prices. Transmission occurred mainly through the traditional price specie flow plus capital flows channel, less so through commodity market arbitrage (Darby et al. 1983). An alternative, global monetarist view, posited that US monetary growth raised the global money supply and global prices and individual country prices converged to global prices via commodity market arbitrage (Genberg and Swoboda 1977).

In the face of this inflationary pressure, the Europeans, beginning in 1968, staged a series of runs on US gold reserves, converting their outstanding dollar liabilities into gold. The runs ended when President Nixon closed the US gold window on August 15, 1971. An attempt to restart Bretton Woods at different parities at the Smithsonian Agreement in Washington, DC, in December 1971 was unsuccessful. Following a series of currency crises and devaluations in the next two years, all of the advanced countries dropped their pegs by 1973 and began floating their currencies.

The run-up of inflation after the collapse of Bretton Woods was attributed by some to the termination of the Bretton Woods nominal anchor to gold and the departure of the last vestiges of the gold standard. In the 1970s the central banks of other advanced countries followed similar expansionary policies to the Fed. Like the Fed, they were influenced by Keynesian doctrine and many attributed the rise in inflation to nonmonetary cost push forces that could only be contained by incomes policies (see DiCiccio and Nelson for the United Kingdom, this volume, and Nelson 2005b for the cases of Australia, Canada, and New Zealand). Moreover, these countries (like the United States) accommodated the oil price shocks of 1974 and 1979. Germany and Switzerland were notable exceptions to this pattern. Policymakers there did not hold Keynesian views nor did they believe in cost push inflation. They viewed inflation to be a monetary phenomenon (see Beyer and colleagues, this volume). The central banks also appeared to enjoy greater independence. Unlike the other countries, they did not accommodate the oil price shocks. Japan also, after accommodating the first oil price shock in 1974, resisted doing so for the second one (see Ito, this volume).

The Conference Volume

The conference volume covers several salient themes on the causes of the Great Inflation. The first theme covers two of the earliest and most basic explanations for the rapid inflation in the late 1960s and 1970s—the monetarist explanation attributing the inflation to expansionary monetary policy (in chapter 1 by Poole, Rasche, and Wheelock) and the supply shock explanation, especially the oil price shocks in 1973 and 1979 in chapter 2 by Blinder and Rudd.

The second theme contains three chapters (3, 4, and 5) that expand on the failure of monetary policy hypothesis. The first, by Goodfriend and King, states that the Fed followed a "business as usual policy" in the 1960s and 1970s that explains how focus on the output gap and interest-rate smoothing at the expense of low inflation raised trend inflation. Levin and Taylor state that rising long-term inflationary expectations became embedded in the Taylor rule. In chapter 5, Orphanides and Williams state that misperception of the natural rate of unemployment and excessive weight on high employment was responsible for making an optimal control (fine-tuning) strategy an engine for high and variable inflation.

The third theme is evidence on the experience of three other major countries during the Great Inflation: Germany, which followed a monetarist framework and largely avoided the Great Inflation; Japan, which had a severe inflation after the Organization of the Petroleum Exporting Countries (OPEC) I reflecting government pressure to keep interest rates low; and the United Kingdom, which had very high inflation and whose monetary authorities had a cost push explanation for inflation that influenced Arthur Burns policies in the 1970s.

The final theme explains the international dimension—the connection between the collapse of the Bretton Woods system and expansionary Federal Reserve monetary policy—the Fed abandoned concern over the balance of payments after 1965 in favor of domestic employment on the assumption that the Treasury would handle external balance considerations.

The conference began and ended with panel sessions. In the first panel session two central bankers (Don Brash of New Zealand and John Crow of Canada) review how they successfully broke the back of inflationary expectations and instituted inflation targeting. In the concluding panel Don Kohn, former vice chairman of the Federal Reserve, reflected on several lessons for policymakers from the experience of the Great Inflation, and Harold James considered the lessons from the Great Inflation from an historical perspective.

Early Explanations

Two early conflicting explanations for the run-up of inflation from the mid-1960s to 1980 were the monetarist views of Milton Friedman and others

who blamed the inflation on overly expansionary monetary policy, and the supply shock view of Alan Blinder, Robert Gordon, and others who attributed the high inflation of the 1970s to a series of oil and other supply shocks.

In chapter 1, Poole, Rasche, and Wheelock explain how the run-up of inflation beginning in the mid-1960s led to criticism by the monetarists Milton Friedman, Anna Schwartz, Karl Brunner, and Alan Meltzer, who attributed it to expansionary monetary policy. Brunner, Meltzer, and Schwartz established the Shadow Open Market Committee (SOMC) in 1973 to monitor and critique the actions by the FOMC. Using a simple quantity theoretic model based on stable demand for money function, the SOMC proposed that a gradualist monetary rule reducing the monetary base by 1 percent per year would achieve price stability with minimal variability in output and employment. The authors simulate such an SOMC rule using a modern New Keynesian model with rational expectations and forward-looking agents. Their analysis shows that price stability could have been successfully achieved in the 1970s and with a much lower cost in real output than the "cold turkey" strategy followed in 1979 to 1981 by Paul Volcker.

Christina Romer, in her comments, suggests that a better counterfactual comparison would have been between the SOMC rule and the interest rate control procedure actually used. Her comparison of the prescriptions for monetary aggregate growth given at each of the SOMC biannual meetings with the actual aggregate growth rates reveals that the only period between 1973 and 1990 that the SOMC prescription would have significantly outperformed the Fed was in the mid-1970s under Burns and Miller.

Blinder and Rudd revisit the supply shock explanation for the Great Inflation in the 1970s using revised data and new theoretical and econometric techniques. They show that the OPEC I oil price shocks combined with rises in food prices and the end of the Nixon wage price controls account for the rapid run-up of headline inflation between 1973 and 1975 followed by a quick reversal. A second price hill from 1979 to 1980 is explained by OPEC II, food price shocks, and other exogenous supply side factors.

Using Phillips curve analysis they also show that some of the supply-side shocks passed through via wages and prices to the core Consumer Price Index (CPI), which followed a more muted drift upwards. The shocks also largely explained the recessions of 1973 to 1975 and 1979 to 1980. According to these authors, monetary policy only played a minor role in accommodating the exogenous shocks.

The Failure of Monetary Policy

Goodfriend and King, in chapter 3, explain the rise and variability in the trend rate of inflation in the United States in the 1970s by two aspects of Federal Reserve policy behavior during the period: smoothing short-term interest rates and stabilizing the output gap. These objectives were held to be more important than a third objective—keeping inflation low. This strategy

they call "business as usual." Under this approach, shocks to the real interest rate (such as the negative productivity shocks that occurred in the 1970s) will raise the trend inflation rate. The Fed may later tighten policy to roll back inflation but if their credibility is low they will quickly return to business as usual and inflation will pick up again. This process will generate a pattern of stop-go inflation.

These views are developed in a three-equation New Keynesian Phillips curve model. Their approach predicts the stochastic (IMA, integrated moving average) inflation trend pattern shown by Stock and Watson (2002) and also the stop-go policies following four Romer and Romer (1989) policy-tightening dates: December 1968, April 1974, August 1979, and October 1979.

Lars Svensson, in his comments, recommends an alternative modeling strategy based on a central bank loss function and optimizing policy for this loss function.

Chapter 4, by Levin and Taylor, develops several measures of long-term inflationary expectations (based on the Livingston and other surveys and the term structure of interest rates) to show that the Great Inflation began in the 1960s and not the 1970s, as argued by Blinder and Rudd and others. Moreover, long-run inflationary expectations ratcheted up from 1965 to 1980 through a series of plateaus (1968–1970, 1974–1976, and 1979–1980). They explain the pattern by a series of temporary anti-inflation policies that were reversed, reflecting political pressure (as unemployment rose and real output fell) against tightening sufficiently to break the back of inflationary expectations. The pattern changed with the Volcker shock of 1980. Their interpretation is backed up by the estimation of a Taylor rule using real-time data and the shifting measures of long-term inflationary expectations, which showed the Fed acting as if its inflation targets had kept rising.

Bennett McCallum, in his comment, compares the Taylor rule used in the chapter to his preferred base growth rule. The latter, he claims, better explains the patterns observed.

In chapter 5, Orphanides and Williams use a three-equation model based on a New Keynesian Phillips curve, real-time data on the unemployment gap, and forecasted survey data on expected inflation, to test the efficiency of the Fed's pursuit of an optimal control approach to monetary policy that approximates the fine-tuning views of the New Economics prevalent in the 1960s and 1970s. They also assume a high weight to low unemployment relative to low inflation, as prevailed after 1965. They find that if policymakers knew the true parameters of the structural model and had correctly estimated the natural rate of unemployment and if all agents had rational expectations, that such a strategy would have anchored inflationary expectations in the 1960s and 1970s and prevented the Great Inflation.

If however, policymakers had underestimated the true natural rate of unemployment, then the optimal control approach would have led inflation

expectations to become unhinged so that in the face of the supply shocks of the 1970s, the Great Inflation (high and variable inflation) would have prevailed. Had policymakers attached a very low weight to unemployment stability, relative to price stability, then even in the presence of the misperceived natural rate of unemployment the Great Inflation could have been avoided, although the variability of inflation would still have been high.

The authors also show that simulation of a simple first difference instrument policy rule (in which changes in the policy rate respond slowly to deviation of inflation from trend and changes in unemployment) based on learning dynamics rather than on rational expectations, closer to the policy that appears to have been followed in the 1980s and 1990s, would have led to even better performance in the 1960s and 1970s than if the optimal control policy were followed.

Seppo Honkapohja, in his comment, makes the case for models based on dynamic learning rather than rational expectations. He interprets the authors results as driven by misperceptions about the true natural rate of unemployment. He argues that a model based on learning by private agents rather than being based on rational expectations best explain why the Great Inflation arose.

Other Countries' Experiences during the Great Inflation

Germany (and Switzerland) were two advanced countries that largely avoided the Great Inflation. Chapter 6, by Beyer, Gaspar, Gerberding, and Issing, explains the monetary targeting framework followed by the Bundesbank from 1974 to 1998. The Bundesbank was founded in 1953 as an independent central bank whose sole mandate was to maintain monetary stability. During the Bretton Woods era its domestic price stability objective was constrained by the external peg. After the breakup of the Bretton Woods system in 1973, the Bundesbank shifted to a quantity theoretic monetary targeting strategy in 1974. The policy followed used a short-term policy rate to hit the preannounced monetary targets based on forecasts of money demand. With the exception of the OPEC I oil price shock in 1973, which was partially accommodated, the Bundesbank was the most successful major central bank in keeping inflation low in the 1970s and 1980s.

The chapter describes how the monetary targeting framework was used, both to control inflation and anchor inflationary expectations. Thus, when the Bundesbank missed its targets it would always clearly state its reasons. The authors embedded the Bundesbank monetary targeting rule in a dynamic stochastic general equilibrium (DSGE) model. Based on the model, they derive an interest instrument rule like the Taylor rule. Estimation of the rule over the period 1965 to 1998 demonstrates that the Bundesbank always followed the Taylor principle that real interest rates would rise sufficiently to offset inflation. This is compared to the United States, where the Taylor

principle was violated in the Burns/Miller era and the United Kingdom, where it was violated throughout the Great Inflation.

Bejmamin Friedman, in his comments, is critical of the authors' derivation of their Taylor rule, which, he argues, does not clearly isolate the contribution of monetary targeting to the outcomes of monetary policy described by the Taylor rule.

Takatoshi Ito analyzes Japan's experience during the Great Inflation in the 1970s in chapter 7. The Bank of Japan followed a loose monetary policy in 1972 under government pressure to restrain appreciation of the yen after the breakdown of Bretton Woods. Then when OPEC I hit in 1973 the bank was too slow to tighten, leading to an inflation rate of 20 percent in 1974. Ito attributes this outcome to the bank's lack of independence. Later, in the fall of 1975, the bank tightened monetary policy, aggressively attenuating the inflation spike. In the face of OPEC II in 1979 the bank, according to Ito, having learned from its mistake in the early 1970s, kept monetary policy tight and avoided the inflation that affected the United States, United Kingdom, and other countries. The author argues that the bank had achieved de facto monetary policy independence since the Japanese government did not oppose the tight policy in 1979.

To back up his story, Ito estimates a Taylor rule for the period of low inflation from 1982 to 1995 and then uses the coefficients of the Taylor rule and real-time data to calculate counterfactual best practice interest rate policy for the 1970s. He finds that such interest rates between 1972 and 1975 would have been much higher than they were, but between 1979 to 1980 actual policy rates were very close to those based on the Taylor rule.

Frederic Mishkin, in his comments, doubts that the Bank of Japan achieved de facto independence in 1975. Rather, he sees the bank as continuously subordinated to government pressure throughout the period. What differed at the end of the 1970s was that the government favored tightening. He also posits that the Japanese experience demonstrates that if the central bank has credibility for low inflation that oil price shocks need not be inflationary.

In chapter 8, Riccardo DiCecio and Edward Nelson argue that the UK experience with inflation in the 1970s was very similar to that of the United States. This they attribute to common adherence to the same mistaken nonmonetary views of the source of inflation. A narrative analysis of the UK Treasury's views in the 1960s and 1970s shows their emphasis on cost push factors (wage push) rather than monetary expansion as the key source of the run-up of inflation in the 1970s. The dominant role of wage driven inflation was used to make the case for incomes policy rather than tight money to reduce inflation. The authors argue that the UK Treasury did not believe in a long-run Phillips curve trade-off nor did they emphasize the output gap in their analysis. Instead their analysis posits that the economy has a "speed-bump"—the first difference of the output gap—that if exceeded would in a

nonlinear way trigger inflation. Hence monetary policy would be ineffective in stemming inflation without wage price controls.

The authors further posit, based on narrative analysis, that Arthur Burns adopted this framework after he became Federal Reserve chairman in 1970. This framework, they argue, explains Burns's advocacy of the wage-price controls adopted by the Nixon administration in 1971.

To back up their story they estimate a DSGE model with sticky wages and prices for the United Kingdom. They show that the United Kingdom did not follow a Phillips curve in the 1970s but did follow the speed-bump theory—policy rates did not respond to the output gap.

Matthew Shapiro, in his comments, doubts that US policymakers acquired their nonmonetary sources of inflation view from the United Kingdom. Nonmonetary control of inflation was a very prominent feature of US economic policy in the early 1960s (e.g., the wage-price guidelines of the Kennedy administration). He also criticizes the authors for not explicitly including nonmonetary considerations in their model.

International Considerations

Bordo and Eichengreen, in chapter 9, posit that international considerations had an important influence on Federal Reserve policymaking in the early 1960s and that adherence to the Bretton Woods peg of the price of gold at $35 per ounce served as an anchor for a low inflation policy. After 1965, international considerations became less important to FOMC deliberations. This reflects (in part) aggressive policy actions by the US Treasury and the administration to protect the balance of payments and stem gold losses in the early 1960s—policies such as the Interest Equalization Tax Act of 1963, Roosa bonds, and the Gold Pool. On the understanding that the Treasury would deal with international considerations, the Fed placed more emphasis after 1965 on domestic considerations, especially maintaining high employment. Proponents of tight money to stem inflation and protect the balance of payments such as Alfred Hayes, president of the New York Fed, were increasingly overruled by those who placed greater weight on high employment than low inflation.

A narrative analysis of FOMC meetings from 1959 to 1971 showed considerable attention being placed to protecting the dollar in the Eisenhower and Kennedy years. On several occasions, policy was tightened for external balance reasons. After 1965 external considerations received less and less attention and then only during episodes of financial crisis—1967 after sterling was devalued, 1968 after the collapse of the Gold Pool, and 1971 during the final crisis of the dollar. The narrative evidence is backed up by estimation of a Taylor rule from 1959 to 1971 that shows that policy rates erred on the side of tightness before 1965 and on the side of ease thereafter. Several measures of inflation persistence and of inflationary expectations also display a significant break after 1965.

Allan Meltzer, in his comments, emphasizes the changing environment in the US Treasury and the Council of Economic Advisers over the period. In the Kennedy years, Douglas Dillon and Robert Roosa formulated the defense of the dollar strategy. They were succeeded by the New Economics advocates who downplayed external balance considerations in favor of rapid domestic economic growth and full employment.

The Panel Sessions

The conference began with a panel session, "Pioneering Central Bankers Remember," in which two former central bank governors, on whose watch the Great Inflation was vanquished, reflected on their experiences. Donald Brash, governor of the Reserve Bank of New Zealand (RBNZ) from 1988 to 2002, the first country to adopt inflation targeting, described the experience of New Zealand in the Great Inflation era and the events that led to formal inflation targeting. New Zealand had the worst inflation experience from 1970 to 1984 in the OECD. A series of policy moves were attempted with limited success in reducing inflation, including draconic wage price controls in 1982. A major sea change in the economic policy framework occurred in 1984 with the election of the Labour party, which deregulated much of the economy including the financial sector, reduced tariffs and tax rates, floated the exchange rate, and gave the central bank independence with a mandate to reduce inflation. Inflation declined from double digits to well below 10 percent by the late 1980s.

In 1989 the government introduced radical legislation that gave the central bank de jure independence and a clear mandate to produce price stability (defined as an inflation rate of 2 percent or less) as its sole target. The governor of the RBNZ was made accountable to the government in achieving its inflation objective. By 1991 inflation was below 2 percent.

John Crow, governor of the Bank of Canada from 1987 to 1994, describes the background of inflation in Canada and the events that led to the adoption of formal inflation targeting in 1991. Canada was the second country to follow such a path. Canada's inflation experience in the 1970s and 1980s clearly followed that of the United States'. As in the United States, monetary (M1) aggregate targeting was followed in the 1970s in an attempt to gradually reduce the inflation rate. As in the United States, financial innovation weakened the connection between M1 growth and inflation and the bank abandoned the strategy in 1982. The bank then followed an implicit exchange rate target that implied a close shadowing of US monetary developments. By 1987, inflation was down to 4 percent.

Upon becoming governor, John Crow was convinced of the need for the bank to attach the highest priority to maintaining price stability (which he originally defined as 0 percent inflation) and he forcefully presented his views in a series of speeches. In 1991 the government of Canada took the initiative in having the Bank of Canada adopt an inflation target. The bank

was made the agent responsible for hitting the inflation target and for the design of the targets, with the Department of Finance's approval. The target was set at 2 percent in 1993. As in New Zealand, inflation quickly dropped below 2 percent.

The conference ended with Panel Session II, "Lessons from History," involving Federal Reserve Vice Chairman Donald Kohn, Deputy Governor of the European Central Bank Lucas Papademos, and Harold James of Princeton University. Kohn emphasized the lessons that central banks need to learn after experiences like the Great Inflation. The first lesson is that central banks need to focus on price stability as their most important long-run objective. The second lesson is the importance of inflationary expectations for the control of inflation. The third lesson is the importance of vigorous debate inside central banks as well as the input by outside experts to safeguard against serious policy errors. The fourth lesson is that once inflation becomes embedded in inflationary expectations that, to avoid high economic and social costs, central bankers should go to great lengths to diffuse them. His final lesson is for central banks to be humble about what they know.

Papademos, in his remarks, emphasized the role that sound monetary policy made in Germany in not accommodating the commodity price shocks in the 1970s compared to the US case, which accommodated the shocks and exacerbated inflation. He viewed the key lessons learned from the Great Inflation as the importance of the central bank's pursuit of low inflation, the importance of not exploiting a trade-off between inflation and unemployment, the avoidance of fine tuning, not accommodating supply shocks, and the importance of anchoring inflation expectations.

Harold James discussed the nonmonetary aspects of great inflations in the past—of inflation as a way to buy social peace in a politically precarious environment. Viewing inflation as a monetary phenomenon was key to its resolution both in Germany in the 1920s and in the Great Inflation of the 1970s. The development of inflation targeting is the culmination of this process. James warned of the difficulties of measuring inflation, especially of the role of asset price booms.

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