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Jeffrey C. Fuhrer

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Monetary Policymakers: An Overview*

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after Bretton Woods*

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Goals, Guidelines, and Constraints Facing Monetary Policymakers: An Overview

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The International Monetary Fund 50 Years after Bretton Woods

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Central bankers in the United States and abroad must grapple with a broad array of questions about how best to conduct monetary policy. How much should the goal of price stability be emphasized relative to the goal of employment stability? Does central bank independence aid in achieving either or both of these goals? Does a stable, short-run trade-off between inflation and unemployment exist, and can it be exploited by a central bank? What instrument should the central bank manipulate in order to achieve its short-run and long-run goals?

In June of 1994, the Federal Reserve Bank of Boston sponsored a conference to address these questions. The five papers presented fell into three broad areas: first, the efficiency of U.S. monetary policy; second, the usefulness of monetary aggregates for the conduct of monetary policy; and third, an examination of international evidence to shed light on questions of central bank independence and accountability. This article offers an overview of the five papers presented and the comments of the discussants. 3

In July 1944 at Bretton Woods, New Hampshire, delegates from 44 nations agreed upon an international monetary system to be established following World War II. At the heart of the system was the International Monetary Fund, which was to foster economic prosperity by promoting international monetary cooperation, orderly exchange-rate arrangements, restriction-free multilateral payments, and efficient balance-of-payments adjustment.

This article surveys the functioning of the IMF, focusing on recent experience. The article discusses the means and methods the IMF has employed to achieve its goals and the degree of success it has attained. One conclusion is that the IMF's goals should be expanded to include the abolition of restrictions on payments for international capital, as well as current transactions. In addition, the organization should issue fairly detailed evaluations of its lending activities—which seem to have had very limited success—and of its technical assistance programs. 17

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Restructuring, the NAIRU, and the Phillips Curve

Geoffrey M.B. Tootell

Recent news stories about corporate downsizing have increased concerns that the labor market is being permanently restructured. The press implicitly, and some economists explicitly, have concluded that this "restructuring" in the labor market has increased the rate of unemployment that is consistent with stable inflation. This rate is known as the NAIRU, the non-accelerating-inflation rate of unemployment, the unemployment rate below which inflation tends to rise, and above which inflation tends to fall.

This article examines both macroeconomic data and more disaggregated data in search of evidence that the NAIRU has increased. The author finds that neither type of data supports a conclusion that NAIRU has risen in the past few years. He concludes with a brief assessment of the difficulties of estimating the NAIRU. 31

New England Job Changes during the Recession: The Role of Self-Employment

Katharine L. Bradbury

During the recent recession in New England, the number of unincorporated self-employed individuals grew while all the other major classes of workers shrank. A shift into self-employment represents one part of a set of changes in the mix of workers and jobs that reflects the nature of the region's downturn and the economic adjustments it entailed. This article examines patterns of job and income change for different classes of workers in New England from the pre-recession peak year of 1988 to the recession-low year of 1992, with an emphasis on the role of the self-employed.

Income data suggest that the self-employed fared better than the unemployed during the recession, but their earnings declined more, on average, than the earnings of individuals still working for other employers in 1992. Thus, self-employment apparently represented a successful stopgap measure, for some, to keep earning after the loss of a wage and salary job, but typically at a lower level. A key question is the degree to which these adjustments will be reversed as the New England economy recovers. 45

Goals, Guidelines, and Constraints Facing Monetary Policymakers: An Overview

The rate of inflation in the consumer price index over the past three years has been low and stable, averaging 2.8 percent and never exceeding that average by more than one-half percentage point in any quarter. Attending this success on the inflation front has been a gradual decline in the unemployment rate to a level that most economists agree is consistent with full employment. In broad terms, the Fed appears to have achieved the low-inflation "soft landing" that it sought.

Attaining this desirable economic state was not an easy task. Along the way, the Federal Reserve had to balance the often competing goals of price stability and full employment, relying on a broad set of indicators to guide monetary policy in a changing financial environment. Maintaining this desirable state presents significant challenges as well. As Donald Kohn suggests in his comments on a paper by William Poole, "a central bank believing that it had learned sufficiently from its history to guarantee that it would not repeat its mistakes would be suffering a serious attack of hubris."

Looking forward, central bankers in the United States and abroad must grapple with a broad array of questions about how best to conduct monetary policy. How much should the goal of price stability be emphasized relative to the goal of employment stability? Does central bank independence aid in achieving either or both of these goals? Does a stable, short-run trade-off between inflation and unemployment exist, and can it be exploited by the central bank? And whether such a short-run trade-off exists or not, is there a long-run trade-off in the variability of employment and inflation? What instrument should the central bank manipulate in order to achieve its short-run and long-run goals? What indicators will prove most reliable in signalling the level and direction of change of the central bank's ultimate goals?

In June of 1994, the Federal Reserve Bank of Boston sponsored a conference to address these questions. The five papers presented at the

Jeffrey C. Fuhrer

Assistant Vice President and Economist, Federal Reserve Bank of Boston. This article summarizes the Bank's economic conference held June 19-21, 1994.

conference fall into three broad areas. First, John Taylor and Jeffrey Fuhrer each discuss the efficiency of U.S. monetary policy, taking as given that policy has both inflation and (in the short run) output targets, and that monetary policy adjusts an interest rate instrument in response to deviations of inflation and output from their target values. William Poole's paper (which by itself constitutes the second group) suggests ways in which the monetary aggregates may still be useful for the conduct of monetary policy. The third group, which comprises papers by Charles Goodhart and José Viñals and by Guy Debelle and Stanley Fischer, examines international evidence in order to shed light on the questions of central bank independence and accountability. A concluding panel considered ways in which monetary policy could be

Looking forward, central bankers in the United States and abroad must grapple with a broad array of questions about how best to conduct monetary policy.

improved, in light of the discussion in the preceding sessions.

As one might expect, it was impossible to reach a consensus on many of the issues. Opinion ranged widely about how much emphasis should be placed on stabilizing employment relative to prices. One view suggested that the Fed cannot reliably affect any real variables and thus should not try to control them; the other worried about the seemingly exclusive focus on price stability and suggested that monetary policy must be responsible for prompt and appropriate management of real variables. Laurence Ball and Jeffrey Fuhrer reached exactly opposite conclusions about whether gradual or "cold turkey" disinflations were less disruptive. Finally, the assembled group disagreed about the nature of the "monetary transmission mechanism"—how changes in monetary policy instruments, such as the federal funds rate, affect the ultimate goals of policy.

Still, several broad conclusions emerged from the proceedings. First, many conference participants agreed that U.S. monetary policy had been quite

successful over the past 15 years. The use of an interest rate instrument to bring inflation under control while minimizing disruption to output and employment has been a winning strategy. Second, most agreed that the role of the monetary aggregates in the conduct of monetary policy has been and should remain downgraded. Finally, most conference participants agreed with the broad conclusions of the Debelle and Fischer paper, namely that clear articulation of the central bank's goals is desirable, while constraints that dictate how the goals should be achieved are not desirable.

How Efficient Has Monetary Policy Been?

John Taylor's paper, "The Inflation/Output Variability Trade-off Revisited," considers the trade-offs between inflation and output that monetary policy faces in pursuing its ultimate goals. If no long-run trade-off exists between inflation and real output, as Milton Friedman and Edmund Phelps first suggested and most economists today accept, and if we acknowledge considerable uncertainty about the nature of the short-run inflation/output trade-off, then is there any such trade-off that may be reliably exploited by monetary policy? If not, then monetary policy should focus exclusively on inflation (or the price level) and ignore the consequences, if any, for the real economy.

The Inflation/Output Variability Trade-off

Taylor suggests that we consider the inflation/output variability trade-off. Its essence is straightforward: Keeping the inflation rate extremely stable about a target may entail accepting much greater fluctuations of GDP about potential (or unemployment about the natural rate), even in the long run. If so, monetary policy may wish to balance its effects on inflation and output variability.

The Taylor paper provides a simple motivation for the long-run trade-off. The motivation is based on a textbook macroeconomic model in which output depends on real interest rates, inflation responds to deviations of GDP from potential, and monetary policy sets the short-term nominal interest rate in response to deviations of inflation from target and deviations of output from potential. The combination of the aggregate demand equation and the policy response implies that the output gap is negatively related to deviations of inflation from its target: If

inflation exceeds its target, monetary policy will raise interest rates and depress output.

This simple characterization of the macroeconomy makes it easy to see why a trade-off between inflation and output variability may exist. When the economy is subjected to a price shock that raises the inflation rate, for example, the amount of output disruption that will occur depends on the response of monetary policy to inflation and output deviations. The more vigorously the Fed moves the interest rate

The essence of Taylor's inflation/output variability trade-off is straightforward: Keeping the inflation rate extremely stable about a target may entail accepting much greater fluctuations of GDP about potential. If so, monetary policy may wish to balance its effects on inflation and output variability.

to offset deviations of output from potential, the smaller will be the variability of output and the larger will be the variability of inflation. The converse is also true. Thus this simple model, coupled with alternative monetary policy behaviors, suggests a trade-off between the variability of inflation and the variability of output that monetary policymakers may be able to exploit in the long run. Based on rough calibration of the model to recent history, Taylor suggests that an approximately balanced response to inflation and output deviations would yield roughly equal variance of inflation and output.

Taylor also discusses other potential long-run trade-offs, especially the effect of inflation on potential GDP, which is ruled out in the simple model that he uses. Reviewing work by Fischer (1993) and Motley (1994), he suggests that the link between inflation and productivity growth merits additional study.

Finally, Taylor considers the possibility that output fluctuations affect long-run growth, an idea that dates back to Schumpeter (1939). The notion that recessions might provide opportunities for firms to

make structural adjustments that enhance productivity—a “cleansing effect”—has recently been advanced by Davis and Haltiwanger (1990) and Caballero and Hammour (1991). Taylor finds this link from fluctuations to growth unpersuasive, since a good deal of restructuring (through “job destruction”) occurs during years when output is at or above potential. In addition, he suggests that greater output variability would have no net effect on the amount of restructuring, as larger positive fluctuations would decrease job destruction, while larger negative fluctuations would increase job destruction. The net effect of increased variability on productivity-enhancing restructuring would be zero.

Discussant Laurence Ball agrees with Taylor that monetary policymakers ought to focus more on medium- to long-term strategy than on the short-run trade-offs involved in the Phillips curve. Thus, the attention to the variability of inflation and output is appropriate. He also applauds the simplicity of the model used to motivate the variability trade-off but cautions that, while the model may be quite useful for normative purposes, it may be less useful for positive purposes. The reason is that the model assumes that inflation always reverts to the monetary authority's fixed inflation target whereas, over the past several decades, the inflation target appears to have moved around with a good deal of persistence. Understanding monetary policy has largely been a matter of understanding why the inflation target has changed, Ball suggests. Thus, while the model may fit the behavior of the economy since the late 1980s quite well, it is unlikely to fare well in explaining the behavior of the economy from the 1970s, when the inflation target apparently drifted up, through the 1980s, when the target declined precipitously under the direction of Fed Chairman Paul Volcker.

Ball, however, expresses some doubt that policymakers face a “painful trade-off between more variable output and more variable inflation.” He notes that if demand shocks—shocks to Taylor's I-S curve and policy rule—are the only important sources of fluctuations, then it is, in principle, possible for the Fed to eliminate all of the variability in both output and inflation. In Taylor's simple model, in the face of a demand shock—an unexpected surge in defense expenditures, for example—the Fed can, by raising the interest rate tremendously, offset any effect of the shock on output *and* on inflation. Ball recognizes that Taylor's model abstracts from important features of the economy that make it very difficult in practice for policymakers to completely offset demand shocks.

In the face of significant supply shocks—unexpected increases in the inflation rate in Taylor’s model—Ball professes agnosticism about the presence of a trade-off between inflation and output variability. He notes, however, that in Taylor’s simple model, the sum of the deviations of output from potential after a supply shock is invariant to the

Ball agrees that monetary policymakers ought to focus more on medium- to long-term strategy than on the short-run trade-offs involved in the Phillips curve.

particular policy response chosen. The *timing* of the deviations can be affected: A policy that puts greater weight on output will spread the output deviations over a longer, smoother path. This reduces the variance of output, but not the sum of the output losses. Simply put, Ball questions whether two years of 1 percent lower output are preferable to one year of 2 percent lower output. Measured by variability, the first outcome would be preferred.

Finally, Ball suggests that a policy that tried to minimize output variability might not actually produce less output loss, although Taylor’s model implies that it would. The reason is related to Ball’s finding (Ball 1994) that moving inflation back gradually to its target is more costly than a rapid decrease in inflation. If so, then a policy that tried to minimize output variability by gradually reducing inflation after a supply shock could actually *increase* the output loss.

Optimal Policy Responses to Inflation and Output Fluctuations

Jeffrey Fuhrer’s paper on “Optimal Monetary Policy and the Sacrifice Ratio” focuses on an age-old question: Is it less costly to disinflate gradually, or rapidly? In the small macro model developed previously in Fuhrer and Moore (1994), he finds that gradual disinflation is less costly. The reason is that, in a world in which wages and prices are predetermined by contracts, previously negotiated contract wages and prices cannot adjust immediately to the announcement of a disinflation. The more quickly

and vigorously the Fed disinflates, the more contracts it catches unexpired. When these contract wages and prices cannot adjust to a monetary contraction, quantities of labor hired and goods produced must adjust, and thus the disinflation causes more disruption to the real side of the economy.

According to estimates presented in the paper, the U.S. central bank (the Federal Reserve) has recently chosen monetary policies that emphasize inflation far more than they emphasize deviations of output from potential. The consequence has been that the “sacrifice ratio”—the shortfall of output below potential, per percentage point decrease in the inflation rate—has been quite high during the disinflations of the past 12 years. The paper suggests that the sacrifice ratio could have been lowered substantially by increasing the emphasis on output fluctuations in the Fed’s reaction function.

If the Fed were already responding optimally to inflation and output fluctuations, increasing emphasis on output fluctuations would of necessity yield improvements in the variability of output at the expense of increased variability of inflation about its target. But could the responses required to reduce the sacrifice ratio also yield decreases in the variability of both output and inflation about their targets? Fuhrer argues that they could. Because vigorous inflation responses of the Fed have been suboptimal—they did

Fuhrer finds that gradual disinflation is less costly than rapid, because previously negotiated contract wages and prices cannot adjust immediately, and thus rapid disinflation causes more disruption to the real side of the economy.

not result in the smallest inflation and output variability combination attainable—the Fed could alter its responses to inflation and output so as to lower the sacrifice ratio *and* decrease the variability of inflation about its target. Thus, the Fed could achieve improvement on all fronts by suitable reaction to its ultimate goals.

N. Gregory Mankiw finds three broad areas of disagreement with Fuhrer's paper. The first is motivation: Why should we care about the sacrifice ratio in the way Fuhrer has defined it? In the typical discussion of the sacrifice ratio, one wishes to minimize the output loss during a one-time reduction in

Mankiw doubts that gradualism is less costly than cold turkey, and he argues that credibility effects may be extremely important in determining the cost of disinflations.

the inflation rate. But this paper looks at the ongoing effect of a particular monetary policy rule on the sacrifice ratio. In this context, a larger sacrifice ratio means a larger output loss when the inflation target falls, but it also implies a larger output gain when the inflation target rises. A better measure for this type of ongoing concern for output volatility is the variance of inflation, also considered in the paper.

The second disagreement is with respect to methodology. Mankiw suggests that, because expectations enter the model only through the wage contracting mechanism and through the effect of long-term interest rates in the I-S curve, the model may still be subject to instability across policy regimes, that is, the Lucas critique. In addition, Mankiw finds some of the identifying restrictions imposed by the rational expectations assumption in this model to be akin to Sims's "incredible" identifying assumptions. Mankiw stresses that we do not know enough about the price-adjustment process to trust the policy conclusions that arise from a particular rendering of the sticky-price paradigm. He argues that we need to find rules that are robust across a wide variety of competing models.

Finally, Mankiw doubts the paper's main conclusion that gradualism is less costly than cold turkey. Citing cross-country comparisons by Ball (1994, forthcoming) that impose little structure on the data, he feels more comfortable with the empirical regularity found there, which indicates that more rapid disinflations are less costly. In addition, Mankiw argues that credibility effects, ignored in the Fuhrer paper,

may be extremely important in determining the cost of disinflations. He cites the disparity between the Council of Economic Advisers' forecasts of inflation for the five years beginning in 1981 and the actual outcomes for those years as evidence that the Volcker policy was "not credible even to the Administration that had appointed Volcker" and thus may have played a role in the recession that accompanied the disinflation.

Summary discussant Martin Eichenbaum points out the similarities between the frameworks used by the Fuhrer and Taylor papers. Both assume that monetary policy uses the short-term nominal rate as its instrument, that the inflation rate responds sluggishly to aggregate demand, that policy-induced rises in the short-term rates are mirrored in long-term real rates, that long-term real rates affect aggregate demand, and that monetary policy affects inflation through its effect on aggregate demand.

Eichenbaum points out that the common structure employed by Fuhrer and Taylor ignores many of the financial market imperfections—credit crunches, liquidity constraints, and the like—that academics and Fed Chairman Alan Greenspan have alluded to in recent policy discussions. He considers the lack of direct evidence in support of the assumed monetary transmission a weakness of both papers.

Second, Eichenbaum suggests that while the models used in both the Taylor and Fuhrer papers imply an inflation variability/output variability trade-off, both papers should have included some direct evidence of the trade-off.

Eichenbaum concludes that any empirical rendering of a Fed reaction function should include a reaction to the forward-looking information in commodity prices.

Eichenbaum then explores a vector autoregression (VAR) analysis of the three variables considered in the Taylor and Fuhrer papers. He finds that, for a particular ordering of the variables in the VAR, a positive shock to the funds rate causes a rise in the inflation rate. He suggests that this puzzling correlation arises because commodity prices are excluded

from the reaction function. The positive response of inflation to an increase in the funds rate in the three-variable model is really masking a positive response of the funds rate to a rise in commodity prices—which preceded rises in inflation in the 1970s—and a subsequent fall in inflation.¹ Thus, Eichenbaum concludes that any empirical rendering of a Fed reaction function should include a reaction to the forward-looking information in commodity prices.

Comparing Direct and Intermediate Targeting

William Poole provides a monetarist perspective on the question of where monetary aggregates should fit into the current policy process. Focusing on the past dozen years, Poole acknowledges both the problems with the behavior of monetary aggregates and the success in using an interest rate instrument to conduct monetary policy. However, he counsels that recent experience does not preclude effective use of a monetary aggregate in the conduct of monetary policy. He suggests that “there is a strong case for paying much more attention to M1 than has been true in recent years.”

Poole proposes a modification of current monetary policy that builds on the successful use of the interest rate instrument but allows a role for money growth targets.

Poole suggests two explanations for the breakdown between money growth and inflation in recent years. The first is that, in an environment of low inflation and low nominal interest rates, the penalty for holding non-interest-bearing money is small. As a result, fluctuations in the stock of money created by the central bank are largely absorbed by the public; they do not translate into higher inflation.² The second is that a consequence of a well-executed monetary policy is that the observed correlation between monetary policy instruments and policy goals will be zero. If the Fed has moved its policy instru-

ments (monetary aggregates) so as to pin its ultimate goals at their targets, then one will not be able to observe any correlation between the instrument settings and the ultimate goal, since the goal has not moved from its target. A corollary to this proposition is that a search for the best monetary aggregate by comparing correlations of aggregates to policy goals will be unsuccessful if the Fed is doing a good job.

Poole points out that monetary policy when using an interest rate instrument is less predictable and more difficult to communicate to the public than monetary policy when using a monetary instrument. Generally, a 1 percentage point decrease in money growth yields a 1 percentage point decrease in inflation and nominal interest rates in the long run. The simplicity of the monetary prescription for lowering inflation is lost when using an interest rate instrument, however. In order to lower inflation, the Fed must first *raise* nominal interest rates, then lower them. And Poole argues that we cannot say with any confidence how much of an increase in rates is required to lower the inflation rate 1 percentage point.

Poole suggests that the difficulty of the Fed's job under an interest rate regime is compounded by the interaction of the Fed's expectation of how its actions will affect the credit markets with the credit markets' expectations of how the Fed will act. He asserts that it may be impossible to build a model that incorporates this simultaneity of expectations and implies a reliable rule of thumb such as the 1 to 1 rule implied by a monetary aggregates approach.

A Proposed New Role for Money Growth Targets

In light of the preceding observations, Poole proposes a modification of current monetary policy that builds on the successful use of the interest rate instrument but allows a role for money growth targets. He suggests that the Fed should allow the federal funds rate to “vary within a considerably wider band, perhaps 100 basis points, between FOMC meetings,” as the demand for bank reserves fluctuates, keeping the supply of bank reserves on a

¹ In contrast, the impulse responses for Fuhrer's model reported in Fuhrer and Moore (1994) show that inflation *falls* following a positive shock to the funds rate.

² One standard description of the link from money creation to increased inflation is as follows. If the Fed wishes to increase the stock of money, it must induce the public to hold the money by reducing the cost of holding money—the interest rate on alternative means of storing value. A fall in the interest rate raises demand for interest-sensitive spending, which may increase aggregate demand sufficiently to put upward pressure on prices.

steady path. The advantages of this policy, according to Poole, would be twofold. First, the transition to higher or lower interest rates would be smoother than the discontinuous path followed by rates under the current regime. Second, movements of credit market rates could once again provide important information to the Fed, as rates would reflect the markets' assessments of the significance of incoming data, not only "market speculation on how the Fed will respond to the data."

Benjamin Friedman reads the history of using the monetary aggregates to guide monetary policy somewhat differently. In response to Poole's two-pronged defense of monetary aggregate targeting, Friedman voices several objections. First, he argues that the objection that "no baseline prediction exists . . . as to how much . . . inflation will rise if the central bank, say, lowers interest rates by 1 percentage point" is invalid; the two papers in the first

Friedman suggests that the empirical support for the interest rate approach is arguably stronger than that for the monetary aggregates approach.

session of this conference provide examples of models that do exactly that. Conversely, a stable money demand function, the cornerstone of the baseline money model, is nearly impossible to find in the U.S. data. Thus, the empirical support for the interest rate approach is arguably stronger than that for the monetary aggregates approach. In addition, Poole's objection to a policy that *permanently* fixes the nominal interest rate carries little force, because no one has ever suggested that the central bank pursue such a policy.

Second, Friedman dismisses Poole's explanation of the vanishing money-income correlation. Friedman points out that, even if the Fed had pursued an optimal monetary policy, the *partial* correlation between money and income—the correlation holding the effects of other variables on income constant—would not be driven to zero; in fact, it would increase. Thus, the estimates of the partial correlation

between money and income are not consistent with Poole's optimal monetary policy story.

Donald Kohn focuses on Poole's proposal to fix the supply of reserves and allow the federal funds rate to fluctuate within a band in response to changes in the demand for reserves. Kohn argues that the unpredictability in the demand for reserves would yield a volatile funds rate that often hit the upper or lower end of its band, imposing significant uncertainty on financial markets. He also asserts that it

Kohn argues that no feasible alternative is available to the present practice of using a short-term interest rate as a policy instrument and looking at all kinds of information to gauge progress.

would be neither more nor less difficult to obtain information from asset prices under the fluctuating funds rate regime; market prices would still be determined in part by expectations of short-rate movements, now with the added burden of anticipating reserves demand.

Policymakers have drawn two important lessons from the experience of the past 25 years, Kohn argues. First, no feasible alternative is available to the present practice of using a short-term interest rate as their policy instrument and looking at all kinds of information to gauge their progress. Second, given the lags in the monetary transmission mechanism, policymakers must be ready to move their instrument quickly in response to new information.

Lessons from International Experience

Charles Goodhart and José Viñals's paper "Strategy and Tactics of Monetary Policy: Examples from Europe and the Antipodes" provides a comprehensive taxonomy of the current and projected issues facing monetary policymakers in Europe, Canada, and Australia/New Zealand. They first document that in virtually every country, price stability has become the primary objective for the central bank. Interest-

ingly, where legislation has accompanied the focus on price stability, it is rare to find a precise definition of price stability. Most, although not all, arrangements allow the central bank to respond to other economic conditions, often with the stipulation that the prime directive be accomplished first.

Price Stability: The Central Bank's Primary Goal

As Goodhart and Viñals note, much of the support for an independent central bank with a primary objective of price stability has come from the theoretical economics literature. The time inconsistency argument, for example, asserts that central banks under pressure from the electorate will consistently accept unexpected output gains at the cost of increased inflation, thus building in an inflationary bias. While this bias towards inflating is widely cited as an argument in favor of legislating price stability as the only goal of the central bank, relatively little empirical backing for the inflationary bias exists, and thus some have questioned the exclusive focus on price stability. As an alternative, many economists have suggested a nominal GDP target, which gives equal weight to prices and to deviations of output

Goodhart and Viñals document that in virtually every country, price stability has become the primary objective for the central bank, and point out the possibility of a deflationary bias.

from potential. Goodhart and Viñals point out that central banks nonetheless have overwhelmingly opted for the price stability goal, perhaps because potential GDP is hard to estimate; data on GDP are available only with a lag and are subject to revision; and a focus on price stability underscores that central banks cannot be responsible for real variables in the long run.

The paper goes on to review the more detailed issues pertaining to the achievement of price stability: Should the central bank target the price level or the rate of change of prices? Should central banks adopt target ranges for prices, rather than point targets? At

what horizon should the central bank announce that it intends to attain its goal? Which index (producer prices versus consumer prices, for example) should be used as the measure of price performance? Should explicit contracts that reward central bankers for good performance be used to provide the incentive to achieve the goal?

Next, Goodhart and Viñals address the merits of direct versus intermediate targets in achieving price stability. Citing Persson and Tabellini, they argue that "An inflation contract . . . generally dominates contracts based on intermediate monetary targets." Nonetheless, relatively few direct inflation targets are observed among central banks clearly concerned with price stability. Apart from historical accident, one reason may be that the effect of monetary policy on prices occurs with considerably more delay than the effect on monetary aggregates or other financial variables. Thus, use of a financial aggregate as an intermediate target could provide an earlier signal that policy has deviated from the agreed-upon course. Most European countries have made the exchange rate their primary target, on the grounds that it responds instantaneously to interest rates and is widely understood by the public. The larger and less open countries, such as Germany, France, and the United Kingdom, have chosen monetary targets, primarily in their belief that monetary aggregates are reliably linked to nominal variables, can be controlled by the central bank, convey information to the public about the stance of monetary policy, and thus facilitate monitoring by the public of monetary policy.

Goodhart and Viñals point out the possibility of a *deflationary bias* among central banks committed to price stability.³ Given uncertainty about both the structure of the economy and the shocks that might perturb the economy during the delay between policy action and its effect on prices, central banks may attempt to lower inflation to its target level quickly, so as not to suffer derailment at the hands of unpredictable events. In fact, the experience in both Canada and New Zealand is consistent with this hypothesis: Both central banks have reduced inflation to, or below, their target levels in advance of the agreed horizon.

Finally, Goodhart and Viñals discuss the impact of a monetary union on monetary strategy and tactics in Europe. Countries currently differ significantly

³ This hypothesis provides an interesting counterpoint to the *inflationary bias* of central banks suggested by Barro and Gordon (1983).

with regard to implementation of monetary policy: Reserve requirements, the discount window, and open market operations are used to differing degrees across Europe. Considering the diversity of current practice, the need to unify both policy formulation and policy execution remains a daunting task for the European Monetary Institute.

Cooper stresses that a central bank should remain accountable to the political process even though reasonably independent of it.

Richard Cooper points out that the excellent price stability performances by the central banks in the United States and Japan—the first an independent bank with no explicit targets, the second a central bank with little independence—run counter to the generalizations drawn in the Goodhart and Viñals paper. He also criticizes the easy acceptance that Goodhart and Viñals grant to price stability as the central bank's primary objective. Cooper stresses the importance of the central bank's role in maintaining the smooth functioning of the financial system in the face of large real and financial shocks, and also the "lubrication" that inflation can provide in allowing real wage adjustments when nominal wages are difficult to reduce.

Cooper points out the importance of the distinction between the independence and the accountability of a central bank. The central banks of the United States and Germany, he claims, are reasonably independent of the political process, but they are still accountable to it. The design of the European System of Central Banks essentially makes the central bank completely independent of the political process. Cooper finds this institutional arrangement "highly undesirable" because it removes a degree of longer-term accountability to the political process from the central bank's actions. Finally, he dismisses other rationalizations of the focus on price stability—money only affects prices in the long run, inflation decreases real growth and productivity—as lacking in empirical support.

The Costs and Benefits of Central Bank Independence

Guy Debelle and Stanley Fischer's paper "How Independent Should a Central Bank Be?" answers the question with a blend of sensible interpretation of empirical regularities and compact theoretical analysis. The authors stress the multidimensional nature of central bank independence. In particular, they distinguish between *goal* independence and *instrument* independence. They argue that the optimal outcome may be one in which a legislative body sets the central bank's *goals*, but the central bank sets its *instruments* however it believes it can best attain the prescribed goals.

Debelle and Fischer begin by reviewing the results that relate measures of central bank independence and macroeconomic outcomes for various countries. They find that independence is negatively correlated with the rate of inflation: Countries with more independent central banks generally experience lower inflation rates. In addition, countries with greater central bank independence appear to attain better economic performance, perhaps because they are generally better disciplined and thus suffer fewer and smaller self-inflicted shocks. Thus, independence appears to be a "free lunch": Increased central

Debelle and Fischer distinguish between goal independence and instrument independence for a central bank, arguing that the optimal outcome may be one in which a legislative body sets the goals, but the central bank sets its own instruments.

bank independence yields better inflation outcomes with no loss to output.

Having said this, Debelle and Fischer turn to a comparison of German and U.S. performance during recent disinflations. Many believe that when a more credible central bank announces a disinflation, expected inflation will fall, prices will adjust in line with the newly expected inflation rate, and output will not

suffer. Thus disinflations should be noticeably less costly in countries with credible central banks. The Bundesbank—widely viewed as the most credible central bank in the world—should have earned a “credibility bonus” that would allow it to disinflate with less cost than a central bank without such credibility. Debelle and Fischer, drawing on work by Ball (1994), find that German disinflation has been purchased at a *higher* cost than U.S. disinflation, particularly in the case of the 1981–86 episode. In addition, they find that this relationship extends beyond the U.S.-German comparison. For the countries in their sample, the output loss associated with a disinflation is higher for countries with greater central bank independence. This finding suggests a cost to greater independence, and is consistent with their conclusion that independent central banks must be held accountable for their actions, so that they do not pursue price stability to the exclusion of aggregate demand management.

In discussing Debelle and Fischer’s paper, Robert Hall points out an intriguing irony in the evolution of macroeconomic theory and monetary policy implementation. Soon after the academic community warned of the inherent inflationary bias of central

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banks—which arises “for the same reason that a judge will impose too lenient a sentence on a miscreant—the crime has already been committed and the sentence can’t deter it”—central banks proceeded to relentlessly wring inflation from most of the developed countries in the world. Thus, the prediction made by believers in the inflationary bias not only was not borne out, it was sharply contradicted by central banks around the world.

Hall regards the conclusions drawn by the Debelle and Fischer paper as “schizophrenic” with regard to the relationship between central bank independence and output volatility. Early in the paper, they suggest that the pursuit of hawkish policies has no cost in terms of real performance. On the other

hand, their final figure shows that hawkish countries appear to have more severe recessions. Germany and the United States have low output *variances* but the largest output *sacrifice ratios* during disinflations. Thus, any conclusion about the costs of maintaining central bank independence depends critically on the measure of output loss used.

With regard to the theoretical section of the paper, Hall points out that the Debelle-Fischer model violates Friedman’s natural rate law. Sustained and fully anticipated inflation stimulates output in their model and creates a bias towards inflationary monetary policies.

Finally, Hall emphasizes that he agrees with the basic conclusion of the paper. We should not appoint central bankers who reflect our own preferences, since they will tend to produce too much inflation. One approach is to appoint inflation hawks, as in Rogoff (1985); the problem with this approach is that hawks will consistently underrespond to recessions. The best solution is to appoint central bankers with our preferences and build in incentives that penalize chronic inflation.

Panel Discussion

The conference closed with a panel discussion among five eminent macroeconomists. The panel revisited and expanded upon many of the themes taken up in the preceding sessions.

Paul Samuelson warns against lashing ourselves to the mast of a fixed policy rule; having seen any number of proposed rules come and go, he is skeptical that any rule is likely to perform well in practice. A little good sense goes much further. He sees no necessity that the Fed pursue a single goal, arguing that “God gave us two eyes and we ought to use them both.” Rather, he suggests that to run the Fed, you need to focus on both the price level and the real output profile. He argues against reading too much from movements in the bond markets; they are, after all, only a reflection of our own actions. To do so would be to behave like a monkey who discovers his reflection in the mirror and “thinks that by looking at the reactions of that monkey—including its surprises—he is getting new information.” Finally, he counsels against trying to isolate the central bank too much from the democratic process. This strategy cannot work in the long run; if the people are sufficiently displeased with the actions of the central bank, any legislation that shields the Fed will be overturned.

James Tobin agrees with many other participants that monetary policy did "pretty well" in the Volcker era. However, he observes that the economy has spent considerably more years producing below its potential than above it. Part of the explanation for this phenomenon, Tobin asserts, is that the public believes that a recovery is defined as a period of nonnegative growth in GDP, instead of growth at or above the rate of potential. Tobin suggests that the result of this misconception is that "pressure for expansionary policy vanishes once the quarterly real growth report is positive." Tobin advises further that, because the link between the federal funds rate and the real economy is somewhat tenuous, the Fed should consider conducting open market operations in longer maturities that are "closer to the points of meaningful contact between the financial and real economies."

Tobin expresses dismay at the widely supported proposition that central banks ought to ignore real growth and employment and focus exclusively on price stability. Monetary policy must worry about real outcomes, Tobin argues, because it is unlikely that fiscal policy will be flexible enough to effectively manage them. Finally, Tobin cautions against using zero inflation as the default target, citing several arguments—the downward rigidity of nominal wages, the policy constraint of the zero floor of nominal interest rates, and upward biases in standard measures of inflation—in favor of a *positive* target rate of inflation.

Robert Barro urged the central bank to focus exclusively on control of nominal variables such as the price level, monetary aggregates, and nominal GDP, rather than real variables such as employment and real GDP. Nominal variables are the proper domain of monetary policy, he asserts, because monetary policy has "uncertain, and usually short-lived and minor, influences over . . . real variables." But for a price stabilization program to be successful, it must be attended by a credible commitment to the goal. Otherwise, the temptation will always be to accept *ex post* the real-side advantages that attend unexpected and unfavorable price shocks, thus deviating from the path of price stability. A commitment will likely be viewed as more credible the more binding are its legislative underpinnings; therefore, Barro cites the growing support of legislated, independent central banks as a reasonable means of committing to a rule.

Lyle Gramley also emphasized the successes of monetary policy in the 1980s, suggesting that they were attributable to the sharper focus on price stability as the goal of monetary policy, and to more

Panel Comments

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For a price stabilization program to be successful, Barro noted, it must be attended by a credible commitment to the goal.

Gramley strongly advocates the use of an interest rate instrument to conduct monetary policy, and favors legislated definition of the Fed's goals.

McCallum suggests that the Fed use policy rules, not as external constraints, but as benchmarks in the decision-making process.

forward-looking monetary policy. In addition, Gramley strongly advocates the use of an interest rate instrument to conduct monetary policy. This would decrease the cost to businesses of highly variable interest rates and improve overall performance relative to a monetary aggregates strategy. Finally, he argues for legislated definition of the Fed's goals, as suggested by Debelle and Fischer.

Bennett McCallum suggests that the Fed use policy rules, not as external constraints imposed on policymakers' behavior, but as benchmarks for use in the decision-making process. McCallum favors a rule in which the monetary base is adjusted so as to attain a nominal GDP target. He suggests a GDP target because keeping GDP growth close to target would

ensure a low average rate of inflation; the same cannot be said of achieving a target growth rate for a monetary aggregate. Using the base as the policy instrument is desirable, McCallum argues, primarily because it requires a very simple policy rule: Increase base growth when nominal GDP is below target, and decrease it when nominal GDP is above target. By contrast, an interest rate instrument requires a more complex rule, in part because what constitutes a restrictive interest rate depends on the rate of inflation and the state of the rest of the economy. For example, McCallum cites the confusing rule he tells his students: "If the Fed wants interest rates to be lower [through lower inflation], then it must raise the interest rate." McCallum has found that, in model simulations, his monetary base rule performs quite well.

Conclusion

At the first Federal Reserve Bank of Boston Conference in 1969, Paul Samuelson opened his comments with the declaration: "The central issue that is debated these days in connection with macro-economics is the doctrine of monetarism . . . the belief that the primary determinant of the state of macro-economic aggregate demand . . . is money." Twenty-five years later, the status of money in the thirty-eighth conference is far from central; indeed, William Poole's paper strives hard to find *any* role for the monetary aggregates in the conduct of monetary policy.

In his opening remarks for the 1978 Federal Reserve Bank Conference, Federal Reserve Bank of Boston President Frank Morris expressed dismay that "it will be a long time before we again have the complete confidence which we had in the early 1960s—that we knew exactly what we were doing."

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Judging by the comments of many of the 1994 conference's participants, we should have regained in the 1990s some of the confidence that we lost in the 1970s: "the Fed has performed well indeed in recent years" (William Poole); "the results of monetary policy in the 1980s were remarkably good" (Lyle Gramley). At the time of the conference, it appeared that inflation was under control, real growth was positive and sustainable, and the Fed had found a policy strategy that could keep it that way.

Nevertheless, participants expressed concern about whether the current success could be maintained in a dynamic, changing economy. As this conference pointed out, we are still quite ignorant about much of the way the economy works. Economists do not agree on the degree of emphasis monetary policy should place on prices versus output; they do not agree on the size of the output loss associated with further decreases in the inflation rate, or how to minimize that loss; and they do not agree on the mechanism by which monetary policy affects output and inflation. If monetary policy had to respond to a sizable supply shock, for example, these areas of ignorance would become more obvious weaknesses.

As with the 1978 conference, we did not expect this conference to produce the new synthesis that would dispel our ignorance. But we hoped that it would, as Frank Morris hoped, "generate a building block or two upon which a new synthesis will be based." The building blocks that emerged from this conference include a beginning understanding of the inflation/output *variability* trade-off that monetary policymakers face, a better understanding of the consequences of using a short-term interest rate as the instrument of monetary policy, and preliminary international evidence on the costs and benefits of central bank independence.

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Goals, Guidelines, and Constraints Facing Monetary Policymakers

At the Federal Reserve Bank of Boston's most recent economic conference on June 19, 20, and 21, 1994, bankers, economists, and other financial specialists met to consider three broad questions about the conduct of monetary policy. First, how efficiently has U.S. policy balanced the goals of price stability and full employment? Second, have rapidly changing financial markets made the use of intermediate targets, such as monetary aggregates, obsolete? Third, what can domestic policymakers learn from the tactics and strategies employed by foreign central banks? The conference agenda is outlined below.

How Efficient Has Monetary Policy Been?

John B. Taylor, Stanford University

Discussant: Laurence M. Ball, The Johns Hopkins University

Jeffrey C. Fuhrer, Federal Reserve Bank of Boston

Discussant: N. Gregory Mankiw, Harvard University

Summary Discussant: Martin S. Eichenbaum, Northwestern University

Comparing Direct and Intermediate Targeting

William Poole, Brown University

Discussants: Benjamin M. Friedman, Harvard University

Donald L. Kohn, Board of Governors of the Federal Reserve System

Lessons from International Experience

Charles A.E. Goodhart, London School of Economics

José Viñals, Bank of Spain

Discussant: Richard N. Cooper, Harvard University

Stanley Fischer, Massachusetts Institute of Technology

Guy Debelle, Massachusetts Institute of Technology

Discussant: Robert E. Hall, Stanford University

How Can Monetary Policy Be Improved? A Panel Discussion

Robert J. Barro, Harvard University

Lyle E. Gramley, Mortgage Bankers Association of America

Bennett T. McCallum, Carnegie Mellon University

Paul A. Samuelson, Massachusetts Institute of Technology

James Tobin, Yale University

The proceedings, Conference Series No. 38, will be published late this year. Information about ordering will be included in a later issue of this *Review*.

New England Fiscal Facts

New England
Fiscal Facts
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The Rising Cost of Operating State Prisons

Some governments in some regions of the country have sharply increased corrections spending in recent years to cater to rising and swelling prison populations (Chart 1). The growing number of inmates in each state has led to an increasing number of prisons, especially for a large and large state prisons in maximum security facilities. These populations are likely to expand rapidly for several years just because their lifetimes sentences in the public prison system have risen since an increasing prison sentence and reducing expenditures for parole. Corrections budgets include the housing expenses on an on-going basis.

New England Trends
New England 1990-1993 per capita state spending for corrections is shown in the following table.

State	1990	1991	1992	1993
Connecticut	1.2	1.3	1.4	1.5
Massachusetts	1.1	1.2	1.3	1.4
New Hampshire	0.8	0.9	1.0	1.1
New Jersey	1.0	1.1	1.2	1.3
New York	1.3	1.4	1.5	1.6
Rhode Island	0.9	1.0	1.1	1.2
Vermont	0.7	0.8	0.9	1.0
Mean	1.0	1.1	1.2	1.3

New England Corrections Spending by District
Change in State Spending by Correctional District in 1993 (1992=100)

District	1993
Connecticut	115
Massachusetts	110
New Hampshire	105
New Jersey	112
New York	118
Rhode Island	108
Vermont	102
Mean	110

Source: U.S. Department of Justice, Bureau of Prisons, "Prison Statistics, 1993" (Washington, D.C., 1994). Figures are in constant 1993 dollars. The mean is calculated as the arithmetic mean of the 1993 spending per inmate for each state.

This newsletter is designed to brief readers on fiscal developments in the New England states. Published three times a year, *Fiscal Facts* presents short analyses of fiscal issues especially relevant to New England. Tables and text also provide the most recent information about state budgets and spending. The Fall 1994 issue features an article on the rising cost of operating state prisons. There is no charge for this publication. For a copy of *Fiscal Facts* and for subscriptions, phone (617) 973-4252 or write to the Research Department, Attn: *Fiscal Facts*, Federal Reserve Bank of Boston, P.O. Box 2076, Boston, MA 02106-2076.

The International Monetary Fund 50 Years after Bretton Woods

In July 1944 at Bretton Woods, New Hampshire, delegates from 44 nations concluded an agreement outlining an international monetary system to be established following World War II. At the heart of that system was a proposed international organization, the International Monetary Fund, which was to monitor the system. The IMF, or Fund, began operations in Washington, D.C., in May 1946 with 39 members.

At this writing the IMF has 178 members and a record extending over nearly half a century. The purpose of this article is to survey the functioning of the institution, focusing on recent experience. Although evaluation is not the primary purpose, any seeming opportunities for substantial improvement will be considered. The article discusses the purposes of the IMF, the means and methods employed to achieve those purposes, the degree of success, and then some changes that might be desirable.

I. The Purposes of the IMF

The purposes of the IMF are set forth in the *Articles of Agreement of the International Monetary Fund*, adopted in July 1944 and amended in 1969, 1978, and 1992. They are ambitious:

- (i) To promote international monetary cooperation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems.
- (ii) To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy.
- (iii) To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.

Norman S. Fieleke

Vice President and Economist, Federal Reserve Bank of Boston. Rachel Cononi provided valuable research assistance.

- (iv) To assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade.
- (v) To give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity.
- (vi) In accordance with the above, to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.

These were the original purposes of the Fund, and they remain its purposes today. Their formulation was strongly influenced by the experience of the prewar depression years, when countries raised barriers against imports and devalued their currencies in an effort to improve their balances of international payments and raise their national incomes and employment. Since one country's payments balance could be improved only at the expense of other countries, the end result was simply more instability and restrictions and less world trade and income.

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Drawing on this experience, the Bretton Woods delegates incorporated in the *Articles of Agreement* a cooperative approach toward enhancing world trade, income, and employment—an approach that eschews exchange restrictions and competitive exchange depreciation and offers loans to countries with payments difficulties so that they can refrain from these and other measures inimical to prosperity.

Nearly all of the purposes to be served by the IMF are means to a greater goal, essentially the goal of fostering economic well-being, as expressed in clause (ii) above. While it would hardly be feasible to

quantify the Fund's overall contribution to economic well-being, or even to the growth of world trade, one can take encouragement from the growth in trade, which clause (ii) calls upon the Fund to facilitate. For example, between 1967 and 1993 the volume of world trade expanded at a compound annual rate of 5.3 percent, which was 1.8 percentage points faster than the growth rate of world output.¹

The other purposes that the IMF is to pursue can be succinctly stated as international monetary cooperation, orderly exchange arrangements, restriction-free multilateral payments, and efficient balance-of-payments adjustment. The following sections discuss the means and methods employed by the Fund, and its success, in attaining these particular goals in pursuit of the greater goal of enhancing economic well-being.

II. Promoting International Monetary Cooperation

To promote international monetary cooperation, the IMF was endowed with the status of a permanent institution, and charged to provide the "machinery" for consultation and collaboration on international monetary problems. In view of this charge, it is not surprising that the highest authority of the IMF, its Board of Governors, consists for the most part of ministers of finance or central bank governors of the member countries. Each member appoints one Governor.

The rule of one Governor for each member does not mean that all members have equal authority. On joining the IMF, each member contributes a sum of money known as a quota, which can be drawn upon by the IMF to lend to members with payments problems. The bigger and wealthier is the contributor's economy, the greater is its quota, and voting power is allocated largely in proportion to the quotas. Thus, the United States now has about one-fifth of the total votes, more than any other country.

The Fund's machinery extends well beyond the Board of Governors. A so-called "Interim Committee," established some 20 years ago, provides continuing advice to the Board of Governors on the functioning of the international monetary system; and a Development Committee, established jointly by the IMF and the World Bank, provides advice on

¹ International Monetary Fund, *World Economic Outlook* (Washington, D.C.: IMF), various issues.

the special needs of poorer countries. The Board of Governors normally meets only once a year, having delegated many of its powers to the Fund's Executive Board, which conducts the organization's daily business at its headquarters in Washington, D.C. The Executive Board appoints a Managing Director, who serves as its chairperson and also heads the IMF staff of some 2,000 international civil servants.

Just what machinery does this substantial institution offer to promote consultation and collaboration on international monetary problems? To begin with, within its own walls the Executive Directors have the opportunity for face-to-face dialogue on a daily basis. And the IMF's Managing Director recently characterized the Fund's Interim Committee as "the only forum where finance ministers representing virtually the whole world meet on a regular basis" (IMF 1994b, p. 179).

The bulk of the technical assistance provided by the IMF goes to the less developed economies and to those struggling to convert from centrally planned to market economies.

Moreover, upon joining the Fund, member countries obligate themselves to supply such information as the Fund deems necessary for its activities, including data on national income, prices, balance of payments, foreign exchange rates, and so forth, and the Fund is authorized to act as a center for the collection and exchange of information on monetary and financial problems. In addition, the Fund is directed to cooperate with other international organizations having responsibilities related to those of the Fund. More generally, many activities of the Fund either require, or afford the opportunity for, consultation and collaboration among the members.

But the IMF is not the only international forum for consultation and collaboration on international monetary issues. Several other organizations with smaller memberships play notable roles. Among the industrial countries, for example, the Organisation for Economic Cooperation and Development (OECD), as well as the Bank for International Settlements (BIS), have well-established functions. The OECD, with 25 member countries, was established in 1960 to promote policies favoring high economic growth and employment, financial stability, and non-discriminatory international trade. The BIS acts as a central bankers' bank. In addition, the Group of 7—the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada—hold periodic meetings of their chief officials at which their respective economic policies are considered and debated. And the member countries of the European Union are striving for the ultimate in collaboration: full monetary union.

While all of these organizations seek to promote international monetary cooperation, their other purposes are not fully identical, and their constituencies differ. With its vast membership, the IMF has by far the largest purview. Moreover, in compliance with its mandate, the Fund does cooperate with the other organizations. A noteworthy example is the assistance it provides to the G-7 deliberations, for which it constructs indicators of economic performance, projects future performance, and represents the interests of non-participating countries.

The bulk of the technical assistance provided by the IMF, however, goes not to the relatively advanced economies such as the G-7, but to the less developed and to those struggling to convert from centrally planned to market economies. This assistance is supplied through several different mechanisms, most prominently the IMF Institute and IMF advisory missions. The Institute offers training for officials from member countries both at its Washington headquarters and abroad, including a facility recently established in Vienna as a cooperative venture between the Fund and other international organizations. Technical assistance missions to participating countries provide instruction in subjects such as fiscal, monetary, and foreign-exchange management, and in related legal and statistical matters.

Largely because of requests from countries in the former Soviet bloc that are introducing freer markets, a virtual explosion has occurred in IMF technical assistance in recent years. In fiscal year 1993 the Fund dispatched 606 technical assistance missions, 336 more than in fiscal 1989 (IMF 1994b, p. 170). This surge in demand suggests that the organization is doing at least one thing reasonably well, although the fact that recipients pay nothing means that the technical advice does not have to meet the test of the marketplace.

More broadly, how successful has the IMF been

in promoting international monetary cooperation? At a minimum, the organization must be credited with providing the machinery. One dramatic illustration of this machinery at work is afforded by the international debt crisis that erupted in 1982 when many developing countries verged on defaulting on huge debts owed to foreign creditors. The IMF played a pivotal role in helping to arrange financing, as well as adjustment programs, to enable the debtor countries to avert defaults that could have bankrupted major creditor banks, whose collapse might have precipitated severe recessions.

More light will be shed on the Fund's role in promoting monetary cooperation in following sections that deal with the organization's other purposes, since progress in attaining those purposes also fosters monetary cooperation. In the final analysis, whether the Fund's members utilize its machinery for cooperation is largely up to them, not the Fund, which has no power to coerce them to do so.

III. Maintaining Orderly Exchange Arrangements

The goal of exchange stability, orderly exchange arrangements, and avoidance of competitive depreciation has posed a major challenge to the IMF and its membership. Over the years the exchange rate system has changed dramatically, and with it the role of the Fund.

The Bretton Woods Par Value System

Largely because of the exchange instability and competitive depreciations experienced during the Great Depression, the original *Articles of Agreement* establishing the IMF called for essentially fixed rates of exchange between national currencies, on the assumption that fixed exchange rates would foster international commerce and cooperation. In order to maintain fixed exchange rates, most governments specified "par values" for their currencies in terms of the U.S. dollar; they then bought or sold their currencies in exchange for dollars whenever necessary to prevent the dollar values of their currencies from deviating from the par values by more than 1 percent. With the values of other currencies thereby fixed in terms of the dollar, it was unnecessary for the United States to fix the value of the dollar in terms of other currencies. Instead, the obligation assumed by the United States was to fix the value of the dollar in

terms of gold for purposes of transactions with foreign monetary authorities. The United States was to supply gold in exchange for dollars presented by these authorities—or to supply dollars in exchange for gold—at the official price of gold, originally set at \$35 per ounce.

To make the par value system work, each government held a stock of international reserves—usually gold or dollars. A government could draw upon these reserves (or upon loans from the International Monetary Fund) to purchase its currency whenever necessary to stop a decline in the foreign-exchange value of its currency. If the currency subsequently tended to rise in value, the government

By the spring of 1973, exchange-rate variation had clearly become a primary means of balance-of-payments adjustment, and for all practical purposes the par value system had been abandoned.

would then reacquire reserves that it had previously paid out. (Of course, such reserve transactions would not have occurred, and reserves would not have been necessary, if governments had not chosen to fix the value of their currencies in the foreign-exchange markets. Instead, foreign-exchange rates would have fluctuated freely.)

Countries experiencing relatively sizable reserve losses or gains were expected to undertake corrective macroeconomic policies. For example, a country with reserve losses (balance-of-payments deficits) might institute more restrictive monetary and fiscal policies, both to restrain demand for imports and to reduce domestic inflation so as to enhance the price competitiveness of its goods in world markets. However, no country was expected to suffer severe unemployment in order to right its balance of payments. Instead, it was allowed to alter its exchange-rate parity to help improve its international competitiveness if its balance of payments was in "fundamental disequilibrium."

The presumption was clearly against such exchange-rate changes, however. A country was permitted to change its original par value by a total of no

more than 10 percent at its own discretion, and for changes beyond that 10 percent it was obliged to seek the approval of the IMF. The Fund was to acquiesce only if it found that the proposed change was necessary and of the proper magnitude, and it could impose certain economic sanctions against countries that defied its decisions.

The par value system worked reasonably well for more than two decades. By the early 1970s, however, its time had clearly come. The United States had incurred large balance-of-payments deficits, and foreign central banks had accumulated dollar balances well in excess of U.S. gold holdings. Confidence dwindled in the ability of the United States to redeem these dollar holdings for gold, and on August 15, 1971, the threat of a run on U.S. gold reserves led the Nixon Administration to suspend its willingness to make such redemptions. More generally, in response to powerful market forces, governments became obliged to allow their exchange rates to change much more, and more often, than contemplated under the par value system. By the spring of 1973, exchange-rate variation had clearly become a primary means of balance-of-payments adjustment, and for all practical purposes the par value system had been abandoned.

Should the IMF, which was to monitor the system, be held responsible for its collapse? Did the organization fail to fulfill its purpose of promoting exchange stability, maintaining orderly exchange arrangements, and avoiding competitive depreciations?

Both at the time and with the perspective of history, the Fund has generally been held relatively blameless. The par value system contained the seeds of its own destruction, fundamental flaws of design that doomed it regardless of the performance of the IMF. One major flaw was the failure to provide an appropriate supply of an acceptable form of international reserves. Another was *too much* emphasis on exchange stability, that is, a failure to accept exchange-rate change as one of the standard remedies for imbalances in international payments. As time passed, it became clear that governments were unwilling to rely solely on monetary and fiscal policy to correct such imbalances, and that the par value system lacked an effective balance-of-payments adjustment mechanism.

A Composite System

Even though the demise of the par value system had become obvious by 1973, it was not until 1976 that a successor was formally acknowledged by the

international community. In January of that year, a committee representing the member countries of the IMF gave its blessing to proposals that would amend the IMF *Articles of Agreement*, both to legitimize the new exchange-rate flexibility and to make other fundamental changes. On April 1, 1978, these amendments entered into force, with significant consequences for the role of the Fund.

While the current international monetary system differs from the par value system in several respects, by far the most important is the greater degree of

Exchange rates now are much more flexible than under the par value system, but substantial official intervention still occurs in the foreign-exchange markets, and many governments still fix rates of exchange over fairly extended periods of time.

exchange-rate flexibility. On the other hand, no government has gone to the extreme of allowing its currency's foreign-exchange value to float completely freely in the market; all governments continue to intervene by buying or selling their currencies, some more vigorously than others, in order to influence the exchange rates for their currencies. In fact, on or about December 31, 1992, the governments of 88 countries belonging to the IMF were pegging the exchange rates for their currencies to some other currency or composite of currencies, while 12 others were pursuing a policy of limited flexibility. A smaller number, 78 in all, were allowing their exchange rates to vary more freely (IMF 1993b, pp. 590–96). Therefore, while exchange rates are much more flexible than under the par value system, substantial official intervention still occurs in the foreign-exchange markets, and many governments still fix the rates of exchange for their currencies over fairly extended periods of time. In brief, the current system is not at all "pure," but is a hybrid, or composite—combining the characteristics of both fixed and flexible exchange rates.

The 1978 amendments to the *Articles of Agreement* sanction these diverse exchange-rate practices, but they also include some general principles of good behavior that IMF members are expected to observe with respect to exchange rates. Specifically, each member agrees to cooperate to assure "orderly" exchange arrangements, especially by promoting orderly underlying economic and financial conditions and by refraining from exchange-rate manipulation designed either to prevent balance-of-payments adjustment or to gain unfair competitive advantage in international trade. Moreover, the IMF is charged with overseeing the adherence of its members to this code of good behavior and with spelling out the code in more detail. Accordingly, the Fund has added to the code of behavior the following principles (as quoted by Crockett and Goldstein 1987, p. 80):

A member shall avoid manipulating exchange rates or the international monetary system in order to prevent effective balance of payments adjustment or to gain an unfair competitive advantage over other members.

A member should intervene in the exchange market if necessary to counter disorderly conditions which may be characterized inter alia by disruptive short-term movements in the exchange value of its currency.

Members should take into account in their intervention policies the interests of other members including those of the countries in whose currencies they intervene.

The IMF has also adopted some guidelines to assist it in judging whether its members are adhering to the foregoing code. These "principles of surveillance over exchange rate policies" call for the IMF to be wary of the following developments (Crockett and Goldstein 1987, pp. 80-81):

- (i) protracted large-scale intervention in one direction in the exchange market;
- (ii) an unsustainable level of official or quasi-official borrowing, or excessive and prolonged short-term official or quasi-official lending, for balance of payments purposes;
- (iii) (a) the introduction, substantial intensification, or prolonged maintenance, for balance of payments purposes, of restrictions on, or incentives for, current transactions or payments, or
(b) the introduction or substantial modification for balance of payments purposes of restrictions on, or incentives for, the inflow or outflow of capital;
- (iv) the pursuit, for balance of payments purposes, of monetary and other domestic financial policies that provide abnormal encouragement or discouragement to capital flows; and
- (v) behavior of the exchange rate that appears to be

unrelated to underlying economic and financial conditions including factors affecting competitiveness and long-term capital movements.

If the Fund suspects a member country of violating the code of exchange-rate behavior, consultations are held with that member. In principle, a serious offender could be denied the right to borrow from the Fund and could eventually be expelled from the organization.

No country has been subjected to such punishments for its exchange-rate policies. Although the IMF consults regularly with its members concerning, among other things, their exchange-rate practices,

The Fund deserves recognition for promulgating a code regarding exchange-rate behavior and for holding regular discussions with members regarding their exchange-rate policies.

suspected violations of the exchange-rate code have been minor or nonexistent or have been fairly quickly resolved, because the public record reveals no significant confrontations. This quietude is reassuring, because serious, persistent offenses would almost surely have been publicized, if not by the IMF, then by countries that considered themselves injured or wrongly accused.

How much credit the IMF should receive for this apparently good behavior is an open question. At the least, the Fund deserves recognition for promulgating a behavioral code and for holding regular discussions with members regarding their exchange-rate policies. It is hard to see how these measures could have failed to exert a salutary impact.

IV. Facilitating Multilateral Payments

The mechanisms used to make payments across national boundaries comprise a key component of the international monetary system. Without an efficient means of making these payments, the international exchange of goods and services would be impeded, and world prosperity would be diminished. The

fourth stated purpose of the IMF stems from recognition of this fact.

Upon joining the IMF, countries obligate themselves to remove any restrictions they may have on payments for current international transactions as soon as their international balances of payments will permit. Failure to honor this agreement could precipitate suspension of their borrowing privileges and, eventually, expulsion from the Fund. Members that have no such restrictions are not to impose them without Fund approval. Similar bars apply to discriminatory currency practices.

A currency that can be used without restriction to make international payments for goods, services, and other current items (as distinct from capital items such as securities) is generally considered to be "convertible." For a currency to attain this status, its holders must be allowed to convert it without limit (again, for current transactions) into other countries' currencies at the going market exchange rates. At the time the *Articles of Agreement* were drafted, restrictions limiting such conversion were widespread, and achieving general convertibility has been the prominent means through which the IMF has sought to facilitate multilateral payments.

Convertibility not only promotes international trade, but also yields other related benefits that may not be so obvious. Once a country's currency can be used freely to acquire foreign currencies (and foreign goods and services), competition will bring the prices of the country's own goods and services into line with prices in world markets, other things equal. Thus, the country's consumers will be able to buy tradable goods at the lowest world cost, while the country's producers will concentrate on supplying the goods that they can produce at those costs. In addition, the removal of government restrictions on the use of a currency eliminates the administrative costs and incentives to corruption associated with such restrictions.

How successful has the IMF been in propagating currency convertibility? By the end of 1946, the organization's first year of operation, only four member countries had officially established such convertibility. Not until the early 1960s did the bulk of the industrial countries embrace convertibility, and thereafter countries did so at a rate of about three per year. In 1993, however, eight countries joined in, bringing the cumulative total to 82 (Nsouli 1993).

The number of countries that have adopted convertibility is not so informative as the percentage of the world's commerce they transact. As can be seen

Figure 1

Percent of World Imports Accounted for by IMF Member Countries Accepting Article VIII Convertibility Obligations and Having No Restrictions on Payments for Current Transactions

Five-Year Intervals, 1957 to 1992



Source: *International Financial Statistics*, taken from Board of Governors of the Federal Reserve System, FAME data base.

in Figure 1, that percentage has risen, albeit irregularly, from only 23 percent in 1957 to nearly 85 percent in 1992. Not all of the Fund's members have embraced convertibility; but those that had done so by 1992 accounted for 88 percent of the total trade of all members.

It is unlikely that the same progress would have occurred without the obligations imposed by the IMF upon its membership. But even though the Fund may have had considerable long-term success in fostering convertibility as conventionally defined, much remains to be done. The conventional definition of convertibility applies only to current transactions, but essentially the same argument that justifies the freeing of payments for current items also justifies the freeing of payments for capital transactions. Yet IMF members that have adopted capital-account convertibility account for a much smaller share of the world's commerce than do the members that have adopted current-account convertibility (Figure 2).

Figure 2

Percent of World Imports Accounted for by IMF Member Countries with No Restrictions on Payments for Capital Transactions

Five-Year Intervals, 1967 to 1992



Source: See Figure 1.

To be sure, facilitating multilateral payments for capital transactions is not among the IMF's chief purposes, so the relative lack of progress in this area does not imply that the organization is failing to fulfill its primary mandate. That mandate should now be expanded with a view to promoting a more efficient allocation of the world's capital resources. Specifically, the *Articles of Agreement* should be amended to establish a strong presumption in favor of unrestricted capital, as well as current, transactions, with sanctions applicable against member countries that cling to such restrictions. Fortunately, precedent exists for amending the *Articles*; it is recognized that they are not carved in stone.

V. Eliminating Balance-of-Payments Disequilibria, and Easing Balance-of-Payments Adjustment through Lending

Of all its purposes, the one for which the IMF is best known is the elimination of balance-of-payments disequilibria, with the process to be eased by Fund

lending that enables deficit countries to avoid taking measures destructive of prosperity. Although this purpose is listed as two separate purposes in the *Articles of Agreement*, the two are so intimately coupled that they are treated here as one. Like the other purposes of the IMF, this one is designed to serve the higher goal of enhancing economic well-being, in this case by facilitating the process of balance-of-payments adjustment.

The Rationale for Balance-of-Payments Lending

A country that is incurring balance-of-payments deficits which deplete its international reserves must take measures to stanch the deficits. One option for the country would be to abandon the practice of spending its reserves to support the value of its currency in the foreign-exchange markets, thus allowing its currency to depreciate and raise the domestic price of imported goods. Another option would be to pursue a more contractionary macroeconomic policy, such as a more restrictive monetary policy. Or controls might be imposed to restrict the purchase of foreign goods or securities.

Whatever course of action is taken, the end result typically must be slower growth, or reduction, in the country's aggregate demand for goods and services, thereby allowing a decrease in the country's imports and/or an increase in its exports. If this adjustment must be taken abruptly, it likely will impose higher costs and more social disruption than if taken more gradually. For example, a sharp tightening of monetary policy that generated a steep contraction in demand could reduce imports rapidly—but before workers and capital had time to shift appreciably into the production of goods to be exported or to replace imports, and out of the production of other goods and services. The ensuing unemployment would not only be a waste of productive resources, but could generate political opposition that would force a premature reversal of the government's balance-of-payments adjustment program.

Such harsh adjustment measures also tend to diminish economic welfare in any foreign nations that experience sharp decreases in their exports to the deficit country. These nations, too, would benefit from a more gradual correction. Even thornier international problems could arise if the deficit country were to introduce controls as part of its adjustment program. In particular, if the country were to erect higher barriers against its imports as part of its adjustment program, the nations whose exports were

impacted might well retaliate with barriers of their own, perhaps leaving all concerned even worse off.

It was to forestall such economic losses that the IMF was directed and enabled to undertake balance-of-payments adjustment lending. An IMF loan bolsters a deficit country's international reserves and thereby empowers it to prevent or moderate the decline of its currency in the foreign-exchange markets while the country's resources are shifting toward the production of goods to be exported and to replace imports. In providing for such loans, the founders of the IMF sought to relieve deficit countries from having to take measures that would eliminate their deficits abruptly at excessive cost to themselves and sometimes to other nations as well.

The Lending Programs of the IMF

As the years have passed, the facilities, or lending programs, offered by the IMF have increased in number, chiefly to accommodate the payments difficulties faced by developing countries or by countries shifting from centrally planned to freer market economies. Currently, members may apply for loans from

The IMF is best known for its work in combating balance-of-payments disequilibria through conditional lending that helps deficit countries avoid taking measures destructive of prosperity.

their credit tranches (percentages of their quotas), from the extended Fund facility, the compensatory and contingency financing facility, the buffer stock financing facility, the systemic transformation facility, the structural adjustment facility, or the enhanced structural adjustment facility.²

To ease the balance-of-payments adjustment process is the underlying purpose of all these loan programs, but some, as their names suggest, are tailored to fit specific kinds of adjustment problems. The standard credit tranche loan is to be repaid within five years or less, while the extended Fund

facility issues loans with durations as long as 10 years, for longer-term adjustment problems. The compensatory and contingency financing facility offers loans with terms of up to five years to offset shocks arising from events beyond the borrower's control, such as temporary shortfalls in export earnings and increases in import prices or world interest rates. (Natural disasters are dealt with through emergency assistance loans.) From the buffer stock financing facility, loans are made to help relieve the strain on a member's balance of payments from making contributions to approved buffer stocks of commodities, again with repayment due in five years or less.

The remaining facilities are designed more specifically for particular categories of countries. For countries undertaking the difficult transition from central planning to freer markets, the systemic transformation facility extends loans of up to 10 years to help offset payments deficits arising from the shift away from trading at nonmarket prices toward trading at world market prices. For low-income developing countries, both the structural adjustment facility and the enhanced structural adjustment facility offer loans at extraordinarily low interest rates, again with maturities as distant as 10 years.

The funds for these various loan programs come from the IMF's members, primarily from their quota subscriptions. Not only do the members pay such subscriptions upon joining, but they have agreed to increase them a number of times to finance a larger volume of loans in keeping with the growth of the world economy and other changes in economic conditions. In addition to tapping the quotas, the IMF borrows from its members to finance its lending activities, and has obtained voluntary contributions to fund the structural and enhanced structural adjustment facilities.

Although the Fund's loans are intended to provide a helping hand and are sometimes made on highly concessional terms, they are not to be converted into grants. The statement of the IMF's purposes specifies that the Fund's financial resources are to be made available to the members "temporarily . . . under adequate safeguards." In other words, the Fund is to make only those loans that can prudently be expected to be repaid. Consequently, before ex-

² See *IMF Survey: Supplement on the IMF*, Vol. 22 (October 1993); International Monetary Fund, Treasurer's Department, *Financial Organization and Operations of the IMF*, 3d ed. (Washington, D.C.: IMF, 1993); and *International Monetary Fund Annual Report 1993* (Washington, D.C.: IMF, 1993), esp. pp. 58-59.

tending a loan, the IMF requires the applicant country to describe how it intends to correct its payments problem so that it will be able to repay the loan punctually. This practice of conditioning loans upon corrective policy measures has become known as "conditionality."

To aid in monitoring the progress of the corrective process in the borrowing country, the Fund uses objective indicators, or performance criteria. Among the items commonly subjected to such criteria are the magnitude of domestic credit, the public sector deficit, international reserves, foreign debt, the foreign exchange rate, and interest rates. Thus, ceilings may be agreed with the borrower for the amount of domestic credit to be issued or for the size of the public sector deficit, and targets may be set for the level of international reserves and foreign debt. Loan disbursements to be made to a borrower over a period of time may be withheld until the criteria are met.

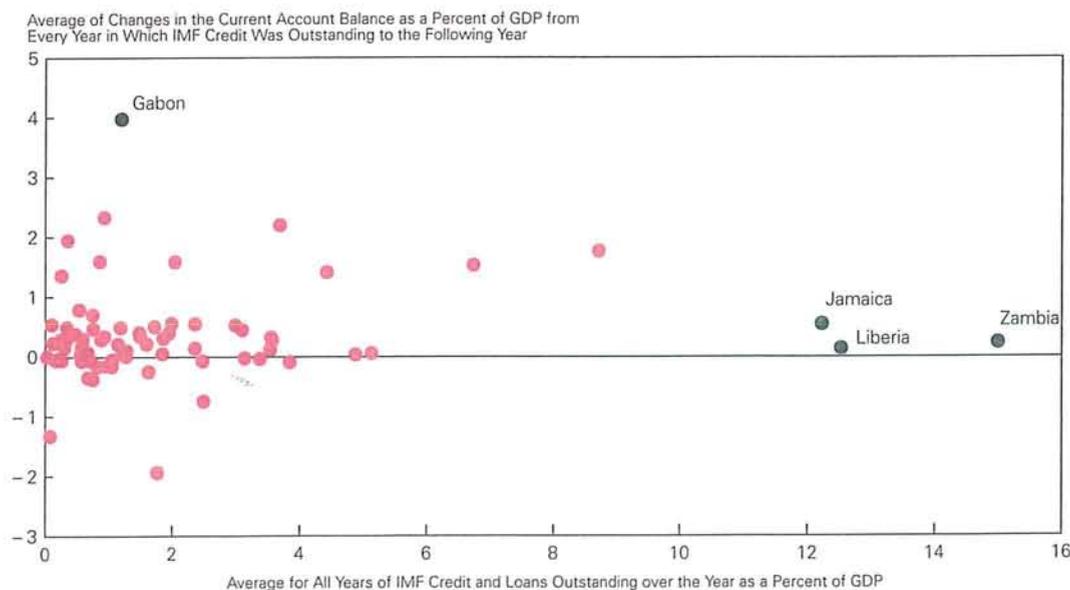
Success of the Lending Programs

How successful have the IMF's lending programs been in facilitating balance-of-payments adjustment? To answer this question, it is not enough to know how the balances of payments and economies of the borrowing countries have actually behaved, for that behavior might be attributable largely to influences other than the IMF's programs—influences that were hardly foreseeable at the time the loans were disbursed. To know what difference the Fund's lending programs have made, one must also know, among other things, how the balances of payments and economies of the borrowers would have behaved in the absence of the loans.

More precisely, what is needed in order to evaluate fully the effects of the IMF's lending programs is an accurate macroeconomic model of every borrowing country, including equations that specify the

Figure 3

Average for All Years of IMF Credit and Loans Outstanding over the Year (as a Percent of GDP) and Average of Changes in the Current Account Balance (as a Percent of GDP), for 73 Countries, 1982 to 1990



Note: GDP is expressed in terms of current U.S. dollar purchasing power parity. Source: IMF credit and current account balance data are from *International Financial Statistics*, from FAME data base; GDP data are from Summers, Robert & Alan Heston, *Penn World Table*, June 15, 1993.

policies the country's officials would have pursued without receiving Fund loans. Not only must the model be conceptually correct, but the data used to operate it must be reliable. No such modeling effort has even been undertaken, let alone completed, given the difficulties of constructing accurate models, the number of countries involved, and the widely varying quality of the available data.

In view of the difficulties, it is not surprising that definitive evaluations of the IMF's lending programs have yet to be produced. The tentative evaluations that have been performed offer mixed and dubious verdicts. For example, two of the more sophisticated appraisals, by economists within the IMF itself, have reached contrasting conclusions. One found that Fund lending programs typically produced no significant effects on the borrower's balance of payments, rate of inflation, or economic growth (Goldstein and Montiel 1986). The other found an improvement in the balance of payments, no significant effect on the rate of inflation, and some decline in the rate of economic growth (Khan 1990, esp. p. 222).

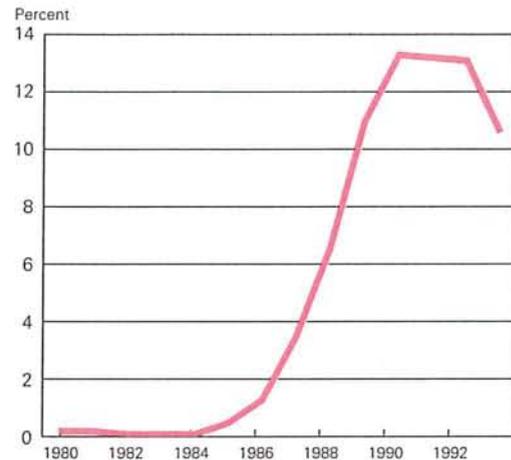
In such circumstances, when macroeconomic modeling is not feasible, less demanding analytical techniques can sometimes be fruitfully employed. Thus, Figure 3 depicts the relationship between the volume of Fund credit outstanding and the change in the international current account balance for each of 73 countries—a relationship that is key, since the primary goal of Fund lending programs is to facilitate reduction of balance-of-payments deficits. Both the credit outstanding to a country and the change in the country's current-account balance are expressed as percentages of the country's gross domestic product, and both percentages are averages of the yearly percentages for the entire period. This use of averages should smooth out random and cyclical variations and help to reveal the impact of the Fund's lending programs.

If Fund lending programs served to improve the current-account balances of the assisted countries, the points plotted in this chart would form an upward sloping pattern, other things equal. In fact, no connection seems to exist between the amount of Fund credit outstanding and the change in the typical country's current-account balance during the following year. Basically the same result is obtained if change in the current-account balance is measured for the same year as the credit outstanding rather than for the following year.³ While hardly conclusive, this finding is somewhat disappointing. It reinforces the doubts raised by other studies, such as the ones

Figure 4

Arrears to the Fund of Members with Obligations Overdue by Six Months or More, as a Percentage of IMF Credit and Loans Outstanding

April 30, 1980 to 1993



Source: See Figure 1.

already cited in this section, about the efficacy of Fund lending programs.

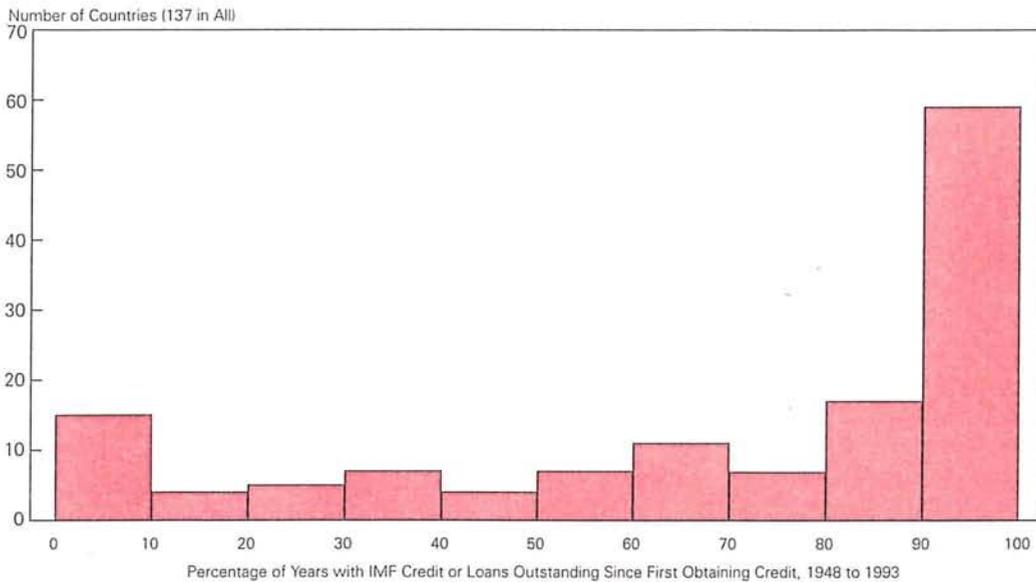
One very simple but important test of the IMF's lending programs is whether the loans have generally been repaid on schedule. Not only is the Fund charged with the responsibility of collecting its loans, but any failures to do so would establish a presumption that the loans in question had not achieved their purpose of facilitating correction of the borrowers' payments deficits. The longer overdue the loan, the stronger would be this presumption.

As can be seen in Figure 4, during the latter 1980s arrears to the Fund of six months or more rose sharply, mounting to more than 13 percent of total Fund credit and loans outstanding, and declining only to roughly 11 percent in 1993. The preponderance of this increase was owed by countries such as Liberia, Peru, Somalia, Sudan, and Zambia, which experienced extreme misfortune, including civil strife.

³ The simple correlation coefficient is 0.10 in the first case and 0.04 in the second.

Figure 5

Countries Grouped by the Percentage of Years with IMF Credit Outstanding since First Obtaining Credit, 1948 to 1993



Source: See Figure 1.

While it would be unreasonable to expect the IMF fully to foresee such calamities, the rapid escalation of arrears is nonetheless somewhat disquieting.

Still another approach to this issue is to determine the frequency with which a country typically borrows from the Fund. Do recipients of IMF loans free themselves from IMF support by correcting their balance-of-payments deficits, or do they become dependent on IMF credit, borrowing from the Fund year after year? More precisely, once countries secure their first credit from the IMF, in what percentage of the following years do they obtain credit?

Of the 137 countries represented in Figure 5, 60 borrowed from the IMF in 90 percent or more of all the years following the year when they first borrowed, and 52 of these 60 borrowed in every following year. For both sets of countries, the median number of years of borrowing was 17. Well over half of the 137 countries—77, to be exact—borrowed from the Fund in 80 percent or more of all the years following their first borrowing. These findings suggest a pattern of chronic balance-of-payments defi-

cits and dependency on Fund loans, raising further question about the success of the IMF's lending programs.

Such appraisals of the lending programs are suggestive, but hardly conclusive. A far better approach would consist of case-by-case analyses. The body best situated to undertake such analyses is the Fund itself. This is not to say that the IMF fails to perform any detailed evaluations of its programs. Much more, however, could usefully be published.

In this area the IMF might well follow the example set by its sister institution, the World Bank, which was also established at Bretton Woods in 1944. Each year the Bank publishes a volume entitled *Evaluation Results*, which presents the Bank's overall assessment of performance on recently completed projects that it helped to finance in less developed countries. In addition, fairly detailed performance evaluations for various projects are issued throughout the year.⁴

⁴ These are entitled *OED Précis*.

These self-examinations by the World Bank have a candid tone. For example, *Evaluation Results for 1991* includes the following conclusions (pp. xv and xvii):

The overall downward trend in project performance . . . has continued. Sixty-three percent of the 1991 cohort projects were rated "satisfactory." This compares with 68 percent for all operations assessed between 1988 and 1990. . . .

. . . assessment . . . confirms the persisting need both for borrowers to improve project preparation and implementation and for the Bank to improve project appraisal and supervision . . .

. . . there is a need for the Bank to improve its analysis of project risks and strengthen its assessment of the role of institutional and political factors in project performance so as to avoid excessive optimism in project appraisal.

Similar published assessments by the IMF would help outsiders to frame better-informed judgments on how well the organization is using the funds contributed by their countries to fulfill its stated purposes. The chief goal of such assessments, however, would be not simply to evaluate performance, but to improve it.

VI. Conclusion

Fifty years ago, while World War II was still raging, 44 nations agreed upon a postwar international monetary system. A crucial component of that system was the newly established International Monetary Fund, which was to foster economic prosperity by promoting international monetary cooperation, orderly exchange-rate arrangements, restriction-free multilateral payments, and efficient balance-of-payments adjustment. While the means and methods used by the Fund to pursue these goals have changed with the times, the goals have remained the same.

To promote international monetary cooperation, the IMF carries on a number of endeavors. Among other things, it affords ample opportunity for discourse among its 178 members, cooperates with other international organizations having related responsibilities, and provides technical assistance both in monitoring and forecasting world economic developments and in managing fiscal, monetary, and foreign-exchange affairs. Thus, the Fund does provide impressive machinery for international monetary cooperation. How effectively its members use that machinery is essentially their responsibility, not that of

the IMF, which is charged simply with promoting cooperation, not with the authority to coordinate.

The Fund's role in promoting orderly exchange-rate arrangements changed dramatically as the Bretton Woods par value system gave way to a composite system incorporating much greater exchange-rate flexibility. The Fund could hardly be held responsible for the collapse of the par value system, whose fragility stemmed chiefly from fundamental flaws of

Fund members should now enlarge the purposes of the organization to embrace the abolition of restrictions on payments for capital, as well as current, transactions.

design. To foster orderly exchange arrangements under the composite system, the IMF has, among other things, promulgated a code of behavior for its members to observe, and has conducted regular discussions with them concerning their exchange-rate policies. It is encouraging that significant violations of the code seem to have been rare or nonexistent.

The chief means employed by the IMF to facilitate multilateral payments has been to secure the removal of restrictions imposed by its members on payments for current international transactions. In this endeavor the Fund has made great progress, although over a period of many years. Its members should now enlarge the purposes of the organization to embrace the abolition of restrictions on payments for capital, as well as current, transactions.

To foster orderly, efficient balance-of-payments adjustment, the IMF makes loans to many nations that need to correct their balance-of-payments deficits. Evaluating the efficacy of these loan programs is very difficult, but the relatively high level of arrears, the chronic nature of balance-of-payments deficits and borrowing on the part of many countries, and the results of statistical studies all suggest that the programs have had very limited success. A first step toward improving this performance would be for the Fund to issue fairly detailed evaluations of its lending programs, including case studies. Similar evaluations of the technical assistance programs would also be fruitful.

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Restructuring, the NAIRU, and the Phillips Curve

Recent news stories about corporate downsizing have increased concerns that the labor market is being permanently restructured. The press implicitly, and some economists explicitly, have concluded that this "restructuring" in the labor market has increased the rate of unemployment that is consistent with stable inflation. (This rate is known as the NAIRU, the non-accelerating-inflation rate of unemployment, the unemployment rate below which inflation tends to rise, and above which inflation tends to fall.) This article examines both macroeconomic data and more disaggregated data in search of evidence for such a conclusion. It finds that neither type of data supports a conclusion that the NAIRU has risen in the past few years.

The policy implications of this debate are significant. Knowledge of the level of the NAIRU is important to monetary policy formation; it helps define the short-run trade-off between unemployment and inflation. If unemployment is below the NAIRU, eventually, inflation will increase; if it is above the NAIRU, inflation will eventually decline. Unless the actual level of inflation is above the desired level, any unemployment above the NAIRU is a waste of resources; the lost output associated with the higher level of unemployment will not move inflation toward its desired level. On the other hand, if inflation is higher than its desired level, unemployment must rise above the NAIRU if the level of inflation is to decline. Thus, knowledge of the level of the NAIRU increases the Federal Reserve's ability to reach its inflation target.¹

Recent articles by Motley (1990) and Weiner (1993) have suggested that the NAIRU is currently higher than traditional estimates. These studies draw this conclusion by examining macro data in a Phillips curve framework. Neither the approach nor the debate is particularly new; in the late 1970s and early 1980s instability in the Phillips curve was used as evidence for an increase in the NAIRU.² However, this study's examination of the Phillips curve provides little support for the conclusion that the NAIRU has increased. Phillips curve estimates of the

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NAIRU are found to hover around the historical estimate of 5.7 percent.³

Even if the historical macro evidence does not show that the NAIRU has increased, a structural break in the relationship between unemployment and inflation may still have occurred recently; insufficient time may have elapsed for this structural break to reveal itself in the macro data. Consequently, this study examines several hypotheses offered to explain why the NAIRU may have changed recently.

Knowledge of the NAIRU is important to monetary policy formation; it helps define the short-run trade-off between unemployment and inflation.

One such hypothesis suggests that defense downsizing, along with its postulated increase in interindustry employment variance, has increased the mismatch between the skills demanded and the skills possessed in the labor market—the skills mismatch theory. Alternatively, it has been suggested that the variation in economic activity between regions of the United States has risen; thus, increased interregional variation has increased the geographical mismatch between the unemployed and the vacant jobs. Either of these two occurrences could raise structural unemployment and the NAIRU. However, recent movements in both the interregional and intersectoral variances provide little support for the hypothesis that the NAIRU has increased.

The remainder of this article presents the relevant data in this debate. The first section examines the evidence contained in the macro data. The second section examines some of the more frequently cited reasons for a recent structural shift in the labor market. Neither type of data supports the hypothesis that the NAIRU has risen. The third section concludes with a brief assessment of the difficulties of estimating the NAIRU.

I. The Macro Evidence

In two recent articles, Motley (1990) and Weiner (1993) resurrected a debate that occurred in the 1970s,

finding instability over time in the Phillips curve relationship. Since one way to estimate the NAIRU is as a byproduct of the estimation of the Phillips curve, any instability in the Phillips curve might affect the estimation of the NAIRU. Most recently, Weiner finds that the Phillips curve changed substantively in the early 1970s. Given this shift, he argues, including data prior to 1973 when estimating the Phillips curve will bias the estimate of the NAIRU. By excluding the early part of the sample data, both Motley and Weiner get higher estimates of the NAIRU.⁴ Before examining the different specifications and samples that can be used to estimate the NAIRU, however, it is useful to explain the relationship between estimates of the NAIRU and estimates of the Phillips curve. The validity of truncating the sample is then examined.

The Phillips Curve

The estimation of the Phillips curve has undergone several transformations since the original article by A.W. Phillips (1958), but the intuition behind it remains essentially unchanged. When slack exists in the labor market, wages tend to decline or do not rise as quickly as expected. Conversely, when the labor market is overheated, wages tend to rise or rise more quickly than expected. Since wages are the major cost to production, the behavior of prices follows suit. The Phillips curve simply translates labor market slack, unemployment, into inflation.

Because workers are concerned with real wages, even a rudimentary specification of the Phillips curve must include expectations of inflation:

$$\dot{P} = \beta * (U_r - U_r^*) + \gamma * (\dot{P}^E), \quad (1)$$

where P stands for prices, U_r is the unemployment rate, U_r^* is the NAIRU, and a dot over a variable symbolizes a percentage change in that variable. β is assumed to be less than zero; the expectations-aug-

¹ Alternatively, if the Fed targeted nominal GDP and cared about the level of inflation, it would need to know the growth rate of potential output while the economy groped toward the NAIRU.

² See Gordon (1982) for an analysis of this debate.

³ In January 1994 the U.S. Bureau of Labor Statistics changed the survey used to measure the rate of unemployment. Since the new measure is available only since then, this study examines only the relationship between inflation and the old measure. The precise relationship between the new measure and inflation is not yet as clear.

⁴ Motley was not convinced that the NAIRU had in fact changed, however, since the shorter sample increased the error surrounding the estimated NAIRU (1990, p. 13).

mented Phillips curve assumes that today's inflation depends negatively on the amount of slack in the labor market. The slack is measured by the difference between the current rate of unemployment and the NAIRU. Furthermore, γ is assumed to equal 1. Today's expectations of inflation affect the actual level of inflation because people are concerned about real wages and prices, not nominal values. If, for example, workers and firms believe that all prices will increase by 10 percent, they too will increase the price of their output, or their labor, by 10 percent. With the assumption that $\gamma = 1$, equilibrium real wages and relative prices are independent of the level of inflation.

Unfortunately for policymakers, the NAIRU is not known, so equation 1 cannot be estimated directly. If, however, one estimates the equation,

$$\dot{P}_t = \alpha + \beta * (U_{rt}) + \gamma * (\dot{P}_t^E) + \varepsilon_t, \quad (2)$$

one can derive a simple estimate of the NAIRU. Readjusting equation 1, and comparing it to the regression in equation 2, produce an estimate of the NAIRU that is contained in the constant term of equation 2,

$$U_{r^*} = -(\alpha/\beta). \quad (3)$$

It is assumed that, in the long run, expectations cannot deviate from reality. Thus, when inflation is stable, the actual inflation rate must equal its expected value. In this way, estimates of the NAIRU can be derived from estimates of the Phillips curve. More complicated specifications of the Phillips curve might allow for lags in the effect of the unemployment rate on current prices, as changes in wages may lag unemployment and changes in prices may lag changes in wages. In that case, the sum of the coefficients on the unemployment rate variables would replace the sole β coefficient in equation 3.

More problematic, however, is finding an estimate of inflationary expectations. The most common approach in the literature has been to use long lags of past rates of inflation to predict future inflation. Since inflation is a slow-moving process, many lags are needed. A more complete version of the Phillips curve, and one more consistent with previously estimated specifications, is, thus, provided in equation 4.

$$\dot{P}_t = \alpha + \sum_{i=0}^n \beta_i (U_{r_{t-i}}) + \sum_{i=1}^k \gamma_i (\dot{P}_{t-i}) + \varepsilon_t \quad (4)$$

The expectation for inflation is represented by a

weighted average of the k lags of inflation, and the γ_i s are assumed to sum to 1. The estimate of the NAIRU is simply minus the constant term, α , divided by the summation of the coefficients on the current and lagged unemployment rates, $\sum \beta_i$.

Historically, various versions of this equation have produced estimates of the NAIRU of approximately 5.75 percent using the old measure of the unemployment rate.⁵ Weiner (1993), however, produces an estimate for the NAIRU of around 6.3 percent for 1994. Weiner's approach differs in two major ways from that implied in equation 4. First, Weiner and others, like Perry (1970) and Motley (1990), have incorporated changes in the age and gender composition of the labor force. This adjustment tends to increase the estimate of the NAIRU in the 1970s and decrease it in the 1980s. Weiner goes

The Phillips curve simply translates labor market slack, unemployment, into inflation.

on, however, to examine the stability of the Phillips curve over the last 30 years. He argues that a structural break occurred in the relationship in the early 1970s. The Phillips curve that he estimates is stable across the 1970s and 1980s but not across either of these periods and the 1960s.⁶ Therefore, he omits the 1960s from the sample. It is this sample truncation that is primarily responsible for his higher estimate of the NAIRU.

It is always dangerous to omit observations from the estimation; tests lose power and short-run perturbations are given more significance than they deserve. Furthermore, any justification for truncating the sample and, therefore, the conclusion that the best estimate of the NAIRU has increased, depends on whether only certain parts of the Phillips curve are unstable. Weiner (1993) and Motley (1990) do not discuss exactly which coefficients in the Phillips curve are unstable. In estimating the NAIRU, only the stability of the particular part of the equation that

⁵ As noted above, the pre-1994 measure of unemployment is used in this paper. The sample ends in 1993:IV, just before the new measure was released.

⁶ The exact test is not quite clear. Is it a test of equality of all the coefficients in the model or only certain ones? See Weiner (1993).

pertains to the estimate of the NAIRU is important: the constant term divided by the sum of the coefficients on the unemployment rate and its lags. It does not matter, for example, if the formation of inflation expectations contained in the Phillips curve has changed through time, or even if the exact sequence of coefficients on the unemployment rate and its lags has evolved. These coefficients can change while the estimate of the NAIRU remains constant. It is the stability of the NAIRU that is important for policy and that is at the heart of this debate.

Using the old BLS measure of unemployment, the NAIRU appears closer to the 5.5 to 5.8 percent range than to the 6.3 percent range suggested recently.

The remainder of this paper will test whether the NAIRU has increased. The next section examines the Phillips curve using different measures of inflation and different specifications to test the robustness of the finding of instability. Next, the stability of the NAIRU is examined directly. Finally, the various explanations for a possible recent breakdown in the relationship are explored.

The Empirical Results

The robustness of findings of instability in the Phillips curve is examined for a traditional Phillips curve specification over the 1960s, 1970s, and 1980s.⁷ This study examines two different price measures—the consumer price index excluding food and energy and the implicit price deflator—as well as one wage measure—nonfarm labor compensation.⁸

Unfortunately, the two price measures, to varying degrees, tend to capture import price inflation. Inflation due to increases in imported goods prices should be ignored when estimating the NAIRU, since it does not result from conditions in the domestic labor market. If, for example, an economy resting at its NAIRU is buffeted by foreign price shocks, domestic measures of inflation tend to increase. The resulting increase in domestic inflation has no bearing on the actual NAIRU, but it tends to bias upward

the estimate of the NAIRU unless the foreign effect is included in the model. Although the price indices suffer from this problem, wages, the measure originally studied in the Phillips curve, is less prone to this mismeasurement.

A traditional Phillips curve specification is used to test for stability of the NAIRU for all measures of inflation examined in this study. Inflation is assumed to depend on the contemporaneous rate of unemployment and a one-quarter-lagged rate of unemployment; further lags of the unemployment rate do not add significantly to the explanatory power of the equation. The relationship between the unemployment rate and inflation is modeled as linear, as in Gordon (1982) and Motley (1990), rather than nonlinear, as in Blanchard (1984) and Phillips (1958). The alternative of a log linear specification was less powerful in most instances. Furthermore, the inflation expectation was assumed to be formed using a long lag (12 quarters) of past inflation rates. The coefficients on lagged inflation were always constrained to sum to 1, assuming that people care only about relative wages and prices. The data could not reject the hypothesis that this constraint holds.⁹ Also included in the model were dummy variables for the Nixon wage and price controls, since these controls artificially limited wage and price inflation when they were in effect.¹⁰ Finally, the import price deflator was included in the equations, in an attempt to capture foreign price increases not driven by excess demand in the domestic labor market.¹¹

The first test of instability follows Weiner (1993)

⁷ Most of the specifications examined in this article require estimating more coefficients than in Weiner (1993); thus, the middle sample period is slightly longer. Furthermore, the results are updated through the fourth quarter of 1993.

⁸ The compensation measure is nonfarm labor compensation. Alternatively the employment cost index was spliced onto the compensation measure after it began in 1981:II. The results are not affected by the exact measure of compensation used. Weiner used the deflator for personal consumption expenditures; this variable is not used here to estimate a Phillips curve since it is not the variable of interest to policymakers nor is it closely related to the labor market.

⁹ For example, in the deflator equation the log likelihood ratio for this constraint, distributed as a χ^2 with 1 degree of freedom, was 0.05, well below its critical value of 3.9.

¹⁰ The Nixon variable equals 1 from 1971:III to 1972:III, and zero otherwise. The Nixoff variable equals 1 from 1974:II to 1975:I, and zero otherwise.

¹¹ In order to be parsimonious, two lags were selected as they were the only significant ones. Motley (1990) constrained the coefficients on a similar variable to sum to zero, arguing that supply shocks do not get imbedded in inflationary expectations. A priori, the case for that claim is not strong; empirically imposing that constraint was rejected.

Table 1
*Stability of the Phillips Curve: Full Sample
 with Different Constants for Each Decade*

	GDP Deflator		CPI _{XFE}	
Constant	.007*	.008*	.007*	.008*
Σ Unemployment Rate	-.0012*	-.0015*	-.0012*	-.0016*
Σ \dot{P}	1.0	1.0	1.0	1.0
Σ \dot{M}	.057*	.048*	.081*	.075*
Nixon	-.0027	-.0021*	-.0046*	-.0038*
Nixoff	.0049*	.0054	.0059*	.0063*
1970s		.0011		.0015
1980s		.0007		.0019*
Log Likelihood	591.14	591.72	594.52	597.29
No. of Observations	135.0	135.0	135.0	135.0
Estimated NAIRU	5.6		5.5	
Estimated NAIRU 1960s		5.4		5.0
Estimated NAIRU 1970s		6.1		5.9
Estimated NAIRU 1980s		5.8		6.2

*Significant at the 5 percent level.

Note: 1970s represent 1973:I through 1982:IV; 1980s represent 1983:I through 1993:IV. The estimated NAIRUs are calculated using the unrounded coefficients.

and Gordon (1982). The equation allows the constant term to differ between the 1960s, 1970s, and the 1980s.¹² Table 1 provides the estimated coefficients for the two price Phillips curves. The Phillips curve using the GDP deflator shows no statistically significant difference between the three periods; both dummies are insignificant. If the core CPI is used instead, the constant term for the 1980s is significantly greater than zero, implying a higher NAIRU in that decade for that specification.¹³ This evidence, thus, is mixed. However, since the GDP deflator is less affected by foreign price shocks, the insignificance of the decennial dummies in the GDP deflator equation may be more reflective of changes in the actual NAIRU. Further, note that the NAIRUs estimated over the full sample hover around 5.5 percent, far from the 6.3 percent asserted as the current estimate by those who believe that some sort of labor market restructuring has occurred.

Table 2 examines whether the group of coefficients in each equation is identical over the three subperiods. For both the GDP deflator and the core CPI, one cannot reject the hypothesis that the groups

of coefficients are identical for the 1960s and 1980s. On the other hand, for both of these price series, the hypothesis that the estimated coefficients are identical over the 1970s and 1980s is strongly rejected. For these two price measures, and this test, the results contradict Weiner's; if anything, the 1960s and the 1980s seem identical, with the 1970s as the outlier, not the 1970s and 1980s together and the 1960s the anomaly, as he found.

Table 2 also presents the pattern of NAIRU estimates over the three periods. The estimated NAIRU in the 1960s is about 5.5 percent; it rises to about 6.5 percent in the 1970s and then falls to around 6.0 percent in the 1980s. This 6.0 percent approaches the estimate Weiner produced for the 1980s. Since it cannot be rejected that the coefficients are identical between the 1960s and the 1980s, the NAIRU estimate combining these two subsamples should be examined. In that case, the estimated NAIRU ranges from 5.5 to 5.8, depending on the price measure used.

It is possible that any instability in the Phillips curve occurs for reasons unrelated to changes in the NAIRU. For example, the method of forming inflationary expectations may have changed; the individual coefficients on the lagged inflation rates could differ between the subsamples.¹⁴ Although the process that produces the best inflation forecast might change over time, this instability has little to do with the long-run value of the NAIRU. Also, a test of whether the set of all coefficients differs across time periods could obscure differences among individual coefficients. A more relevant test for labor market restructuring and its effects on inflation would be an examination of the stability of the estimated NAIRU over the three subperiods.

Table 3 shows the results of likelihood ratio tests of the stability of the NAIRU over the different subperiods, for the two measures of price inflation. With these two price measures it can be rejected that the NAIRU is the same between any two of the three sample periods. In short, the results using these two price measures are ambiguous. Broad tests of the

¹² The exact subsamples selected are meant to follow Weiner as closely as possible yet still allow for enough degrees of freedom to estimate the equations reliably. The three periods are 1960:I to 1972:IV, 1973:I to 1982:IV, and 1983:I to 1993:IV.

¹³ The equation for the GDP deflator produces an estimate of the NAIRU in 1980s of about 5.8 percent. If the core CPI is used the estimate for the NAIRU in the 1980s is around 6.2.

¹⁴ For example, in the 1970s, when inflation accelerated, expectations may have become more responsive to changes in inflation.

Table 2
Stability of the Phillips Curve: Subsamples

	GDP Deflator						CPI _{XFE}					
	Full Sample	1960s	1970s	1980s	1960s & 1980s	1970s & 1980s	Full Sample	1960s	1970s	1980s	1960s & 1980s	1970s & 1980s
Constant	.007*	.011*	.020*	.014*	.008*	.010*	.007*	.009*	.021*	.007*	.006*	.010*
Σ Unemployment Rate	-.0012*	-.002*	-.0030*	-.0023*	-.0015*	-.0016*	-.0012*	-.0016*	-.0034*	-.0012*	-.0010*	-.0017*
$\Sigma \dot{P}$	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
$\Sigma \dot{M}$	.057*	.085	.0016*	.043	.064	.037*	.081*	-.091	.090*	.013	-.016	.072*
Nixon	-.0027	-.0021			-.0024		-.0046*	-.0030			-.0033*	
Nixoff	.0049*		.0048			.0049*	.0059*		.0046			.0068*
Log Likelihood	591.14	226.25	179.67	217.29	430.02	378.95	594.52	245.39	169.99	228.86	462.75	365.13
No. of Observations	135.0	51.0	40.0	44.0	95.0	84.0	135.0	51.0	40.0	44.0	95.0	84.0
Estimated NAIRU	5.6	5.4	6.8	6.0	5.5	6.1	5.5	5.6	6.3	6.0	5.8	6.1
Log Likelihood Ratio					27.05	36.01					23.0	67.43

*Significant at the 5 percent level.

The likelihood ratio test is distributed as a χ^2 with 18 degrees of freedom. The 5 percent critical value of the statistic is 28.9.

Note: 1960s represent 1960:II through 1972:IV; 1970s represent 1973:I through 1982:IV; 1980s represent 1983:I through 1993:IV. The estimated NAIRUs are calculated using the unrounded coefficients.

group of coefficients suggest stability between the 1960s and the 1980s, with the 1970s as an outlier, while a more specific test of the stability of the NAIRU alone suggests that all three periods are different.

Yet, do these ambiguous results on the stability of the Phillips curve provide good information on shifts in the NAIRU or good information on the

imperfections of these price measures? During the 1970s, the economy endured several severe energy price shocks. The resulting stagflation resulted in simultaneous increases in inflation and the unemployment rate.¹⁵ Since these price disturbances were of foreign origin, independent of the strength of the domestic economy, the measured NAIRU would look much higher than its actual value. Even if the actual NAIRU had remained constant in the 1970s, the measured rate over that period would have increased substantially, highlighting the dangers of truncating the sample. Thus, if anything, one would, a priori, suspect that estimates of the NAIRU that include the 1970s would be biased upward, particularly when examining measures of inflation that do not effectively filter foreign price shocks. And, in fact, Table 2 shows that the estimated NAIRU over the three samples rises in the 1970s and falls back down in the 1980s.

The presence of large and frequent foreign price

Table 3
Stability of the NAIRU across Subperiods

	1960s vs. 1980s	1970s vs. 1980s	1960s vs. 1970s
GDP Deflator			
Log Likelihood Ratio	12.66	39.31	41.25
Estimated NAIRU	5.5	6.1	6.6
CPI _{XFE}			
Log Likelihood Ratio	7.64	37.13	54.35
Estimated NAIRU	5.7	6.1	6.6

Note: Critical value for χ^2 with 1 degree of freedom at the 5 percent level = 3.9.

1960s represent 1960:II through 1972:IV; 1970s represent 1973:I through 1982:IV; 1980s represent 1983:I through 1993:IV.

¹⁵ Although the oil price shocks were really price level adjustments, the Phillips curve regression interprets them as inflation since they took a long time to work themselves through the economy. Furthermore, evidence that these one-shot changes became embedded in inflationary expectations is found in the rejection well beyond the 1 percent level that the coefficients on import prices sum to zero.

Table 4
Compensation Phillips Curve Estimates

	Full Sample	Full Sample	1960s	1970s	1980s	1960s & 1980s	1970s & 1980s
Constant	.0072*	.0096*	.0068	.0145*	.0069	.0081*	.0092*
Σ Unemployment Rate	-.0015*	-.0019*	-.0012	-.0022*	-.0014*	-.0016*	-.0018*
$\Sigma \dot{P}$	1.0	1.0	1.0	1.0	1.0	1.0	1.0
$\Sigma \dot{Q}$	1.0	1.0	1.0	1.0	1.0	1.0	1.0
$\Sigma \dot{M}$	.065*	.016	-.162	.028	-.059	-.068	.078*
Nixon	.00008	.00145	.004			.004	
Nixoff	.0056*	.00717*		.005*			.005
1970s		.0036*					
1980s		-.0002					
Log likelihood	559.01	565.47	225.17	191.78	200.95	400.23	357.56
NAIRU	4.9	4.9	5.7	6.5	4.8	5.0	5.2
NAIRU 70s		6.8					
NAIRU 80s		4.8					

*Significant at the 5 percent level.

Note: 1960s represent 1960:II through 1972:IV; 1970s represent 1973:I through 1982:IV; 1980s represent 1983:I through 1993:IV.

shocks during the 1970s necessitates a search for a cleaner price measure. Not only was labor compensation the first measure examined by Phillips in 1958, but it should be less responsive to foreign price shocks than the PCE deflator, the core CPI, or the GDP deflator. Nominal wage inflation should depend on three different variables, the unemployment rate, expectations about future price inflation, and productivity growth:

$$\dot{W} = \alpha + \sum_{i=0}^n \beta_i (U_{t-i}) + \sum_{i=1}^k \gamma_i (\dot{P}_{t-i}) + \sum_{i=1}^L \theta_i (\dot{Q}_{t-i}). \quad (5)$$

Workers and firms care only about real wages and prices, so expectations of future price increases are incorporated into wage increases, and these price coefficients sum to 1. Furthermore, in equilibrium labor is assumed to be paid its marginal product, so the coefficients on the lagged productivity terms sum to 1; thus, these constraints ensure that, in the long run, the increase in the real wage is equal to the increase in labor productivity.¹⁶

¹⁶ This assumption is valid if production has constant elasticity of substitution. The log likelihood ratio for the constraint that the coefficients for the productivity terms sum to 1, distributed as a χ^2 with 1 degree of freedom, was 0.4, well below its critical value of 3.9. In the long run, wages, prices, and productivity growth do, in fact, move together, as suggested by equation 5. In an unconstrained regression, compensation, prices, and productivity are cointegrated.

Table 4 presents estimates of this more traditional Phillips curve. As in the equation for the GDP deflator, the constant terms do not differ between the 1960s and the 1980s. In fact, as can be seen in column 2, the constant term for the 1970s is statistically significantly higher than those for the other two decades. Comparing all the coefficients in each subsample produces results different from the price equations, however. With compensation growth, it can be strongly rejected that all of the coefficients in the model are identical for any of these three periods. It is not clear from this test whether these differences occur because inflation expectations are formed differently over different subsamples, because productivity changes are incorporated into wage changes

Table 5
Stability of the NAIRU in Compensation Phillips Curve

	1960s and 1980s	1970s and 1980s	1960s and 1970s
Likelihood Ratio	2.02	46.97	24.83
Estimated NAIRU	5.3	5.8	6.5

Note: 1960s represent 1960:II through 1972:IV; 1970s represent 1973:I through 1982:IV; 1980s represent 1983:I through 1993:IV. The likelihood ratio is distributed as a χ^2 with 1 degree of freedom whose critical value at the 5 percent level is 3.89.

differently across these periods, or because each sample has a different NAIRU.

Table 5 examines whether the NAIRU is different across these subperiods. As can be seen in column 1, the hypothesis that the NAIRU is the same in the 1960s and the 1980s cannot be rejected. The hypothesis that the NAIRU in the 1970s is the same as the NAIRU in the 1980s can, however, be strongly rejected. As with the price measures, the estimated NAIRU is higher when the sample includes the decade of the 1970s; again, the 1970s seem to be the anomaly, not the 1960s. As shown in Table 5, omitting observations from the 1970s, and only constraining the NAIRUs to be identical across the two other periods, produces an estimate of the NAIRU of about 5.3 percent.

The evidence appears to suggest that if the sample is to be truncated, it is the 1970s and not the 1960s that should be removed. Using the compensation Phillips curve, which avoids many of the upward biases in the estimation of the NAIRU inherent in the other price measures during this sample period, the NAIRU in the 1980s has not changed significantly from that in the 1960s. This conclusion is not surprising, because foreign price shocks that drive a wedge between the actual and the measured NAIRUs occurred more frequently in the 1970s. Whether the 1960s and the 1980s or simply the full sample is used to estimate the NAIRU, however, it appears closer to the 5.5 to 5.8 percent range than to the 6.3 percent range suggested recently.

The Composition of the Labor Force

One frequent explanation for a shift in the NAIRU is a change in the demographic composition of the labor force. Much of the Phillips curve literature simply assumes that demographics affect the NAIRU. For example, Perry (1970) constructed a weighted measure of unemployment, based on the assumption that the composition of the labor force affected the NAIRU; Gordon (1982) used that measure; Blanchard (1984) used the unemployment rate for married males; and Motley (1990) and Weiner (1993) constructed their own measures.

It is not altogether clear, however, why demographics should affect the NAIRU. Clearly, a measure of the attachment of the population to the labor force is essential in determining the natural, full-employment rate of unemployment. It is not, however, obvious why the NAIRU cannot be higher than the natural rate, or whether the NAIRU should be

strongly affected by changes in demographics. Furthermore, it is not at all clear that weighting the unemployment rate based on estimated relationships between the natural rates of different subgroups accurately captures the effects on the Phillips curve of changes in the demographic composition of the labor force.¹⁷ There is no reason to believe that the amount of wage pressure produced by one subgroup when below its "full employment" unemployment rate

It is not altogether clear why demographics should affect the NAIRU; in fact, including the two largest shift factors in labor force composition, teens and women, has little if any effect on any of the Phillips curves.

would be similar to the amount of wage pressure produced by another. The substitutability between subgroups, and the wage dynamics in the different markets if they are distinct, must be known before predictions about the NAIRU can be derived from information about the demographic composition of the labor force. Moreover, the natural rate of unemployment for many of these subgroups is notoriously variable.¹⁸ The importance of these compositional variables, however, is an empirical question.

Table 6 presents estimates of the Phillips curve for all three price and wage measures, including various labor force composition measures. If the share of the labor force of certain groups does affect the NAIRU, these labor force shares should be significant in the Phillips curve equation. For example, as teens became a larger percentage of the labor force, the NAIRU should have increased, and the coefficient

¹⁷ The population is typically broken down into subgroups by age, gender, race, and marital status, for example.

¹⁸ For example, the labor force participation of women changed significantly over the sample period studied here, as did their mean unemployment rate. Any adjustments of the unemployment rate in the later part of the sample based on the female unemployment rates found in the earlier part of the sample would be invalid; the "natural rate" would be overestimated as the labor force participation of women rose.

Table 6
Labor Force Compensation and the Phillips Curve

	GDP Deflator		CPI _{XFE}		Compensation	
Constant	.0055*	.0061*	.0029	.0089*	.010*	.0024
Σ Unemployment Rate	-.0013*	-.0012*	-.0014*	-.0012*	-.0013*	-.0014*
$\Sigma \dot{P}$	1.0	1.0	1.0	1.0	1.0	1.0
$\Sigma \dot{Q}$					1.0	1.0
$\Sigma \dot{M}$	.0056*	.0053*	.082*	.089*	.063*	.045
Nixon	-.0026*	-.0029	-.0044*	-.004*	-.00003	-.006
Nixoff	.0051	.005*	.0064*	.0058*	.0051	.0057*
LFW	.0053 (.0063)		.014* (.0056)		-.012 (.010)	
LFT		.012 (.023)		-.028 (.019)		.060* (.030)
Log Likelihood	591.39	591.26	596.34	595.22	559.79	560.90

*Significant at the 5 percent level. Standard errors are given in parentheses.
 LFW: percentage of labor force represented by women. LFT: teens.

on the share of teens in the labor force in the Phillips curve equation should be positive and statistically significant. If the composition of the labor force is important, then using an unadjusted unemployment rate in the estimation should produce inflation errors correlated with changes in these compositional variables.

In fact, including the two largest shift factors in labor force composition, teens and women, has little, if any, effect on any of the Phillips curves. Four of the six coefficients are statistically insignificant, and the two that are significant derive all their explanatory power at the expense of the constant terms. The results indicate that using the simple unemployment rate should not produce any problems for this analysis, a finding which is consistent with Fair (1978).

The macro data suggest that the NAIRU is about 5.5 to 5.7 percent. If concerns about the stability of the coefficients across time were to force a truncation of the data, it is the 1970s, not the 1960s, that should be dropped, producing a lower estimate of the NAIRU than the full sample estimate. The macro evidence does not support a conclusion that restructuring has occurred in the labor market.

On the other hand, if the Phillips curve relationship shifted only very recently, it would take a while for the errors to become large enough to reflect that change. The next section of the paper looks at some commonly asserted explanations of why the relation-

ship between the unemployment rate and the inflation rate may have suddenly and recently changed for the worse.

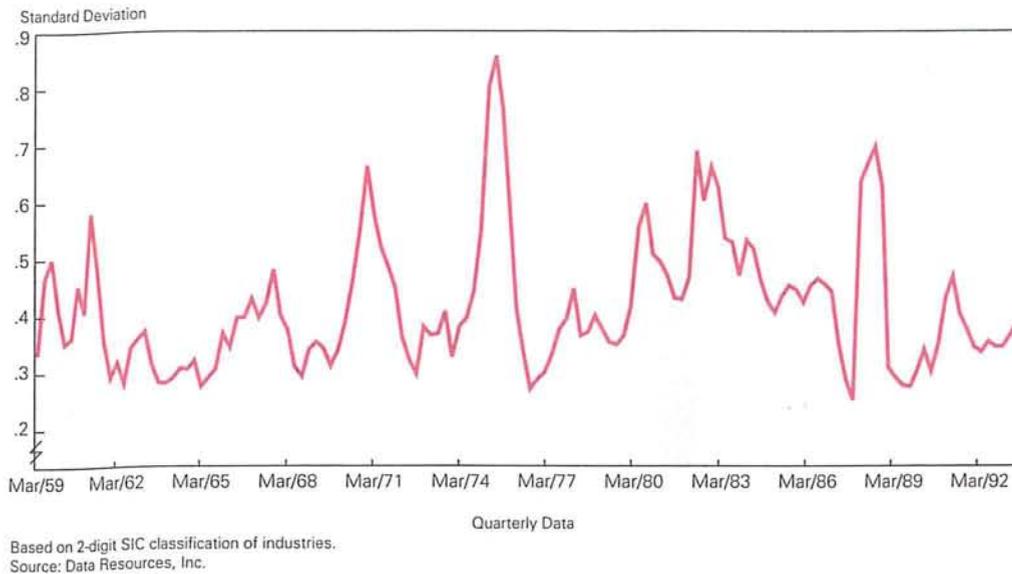
II. Causes of Recent Restructuring

Two hypotheses have been set forth asserting that the historically estimated Phillips curve relationship has recently broken down. The one most frequently cited is that a large shift from defense to civilian production has increased the mismatch between workers' skills and the skills demanded by employers. Somewhat related to this explanation is an alternative view that a geographical mismatch between workers and jobs has worsened since the mid 1980s; an unusually high variance in economic performance across different sections of the country has resulted in job openings and unemployed workers being located in different regions. The serious downturn in the Southwest in the 1980s, and the proportionately more severe and enduring downturns in the Northeast and in California of late, are cited as evidence in support of this second hypothesis.

If the interindustry variation in employment growth were to increase, the NAIRU might also increase. The higher variance would require much more movement of employment across industries. Since skills from one industry may not be as useful in another, more time-consuming job search and re-

Figure 1

*Standard Deviation of Annual Growth in Employment
across Industries*



training might be required for the unemployed to find work; this would increase the unemployment rate without necessarily putting increased downward pressure on wages, since the pool of “correctly” skilled labor would not increase along with the unemployed. Increasing aggregate demand in this case would not increase the demand for these currently mismatched, unemployed workers but would simply increase the demand for the workers who already have jobs; as a result, wages would tend to rise at a higher level of unemployment, implying that the NAIRU has increased.

A second explanation offered for labor market restructuring is that interregional variation has increased. This hypothesis asserts that only the coasts performed poorly while the rest of the country did well in the last recession and the early part of the recovery. If true, job growth would be strong everywhere but California and New England, exactly where the largest excess supplies of labor are to be found. The increased variation between regions would require that the unemployed in New England and California migrate to other parts of the country to find employment or that capital migrate to these coastal regions. The matching of job openings to

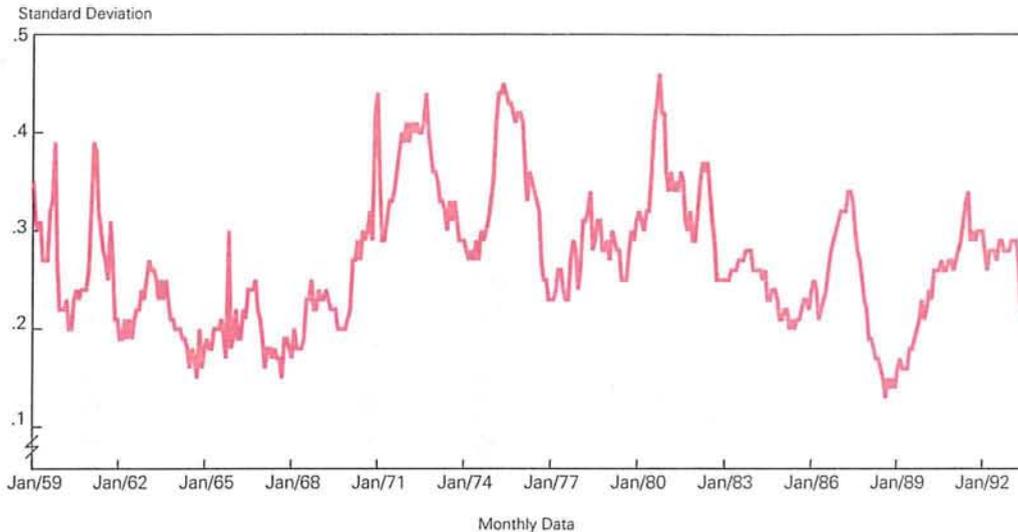
unemployed workers is much more difficult when the two are concentrated in different regions of the country, and the NAIRU could increase because of the migration necessary to find employment and the increased time spent searching for a new job.

In fact, neither of these variances is particularly high right now. Figures 1 and 2 present the intersectoral and interregional variations. Both measures are highly cyclical, and neither grew particularly large during the recent recession. By far the largest inter-industry variance occurred after the 1974–75 oil shock, which hit the auto and auto-related sectors hard while simultaneously stoking our energy industry. Intersectoral variation is actually low now relative to the past, and there is no evidence that interindustry mismatch has raised the NAIRU.

Interregional variation is also low, relative to its past values. The hump in the mid 1980s represents the collapse of the Southwest economy due to the drop in oil prices, and the increase in this variable since 1988 reflects both the problems in New England and California and the normal effects of the last recession. Still, interregional variation was not abnormally high during this recession, nor is it abnormally high now. Neither measures of regional nor mea-

Figure 2

*Standard Deviation of Annual Growth in Employment
across States*



Source: Data Resources, Inc.

asures of sectoral dislocation suggest that the NAIRU has increased recently.

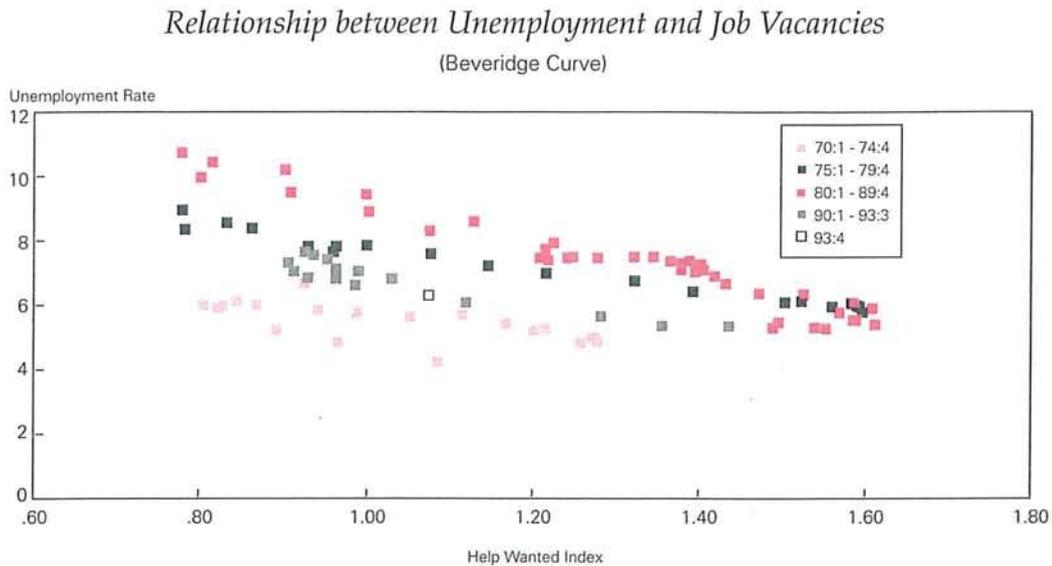
No matter what their values, however, these two variances seem to have little effect on the NAIRU. If either variation is important in the determination of the NAIRU, it should be significant in estimates of the Phillips curve. Columns 2, 5, and 8 of Table 7 reproduce the basic Phillips curve specification used throughout this paper, but include as a determinant of inflation the intersectoral variance, measured as the variation of annual employment growth across all 66 2-digit industry groupings for each year from 1959 to 1993. As can be seen, this variation does not help explain inflation beyond the variables already used.

Alternatively, if increases in the interregional variances increased the NAIRU, a measure of the interregional variation should be a significant determinant of inflation, beyond the variables already included in the Phillips curve. The first, fourth, and seventh columns of Table 7 include this variation in the Phillips curve estimation. It is not statistically significant in any of the equations. Neither of these variance measures appears to affect the NAIRU. There is no evidence that a rise in the geographical or intersectoral mismatch between the unemployed and

the vacant jobs has increased the natural rate of unemployment.

Higher interregional and intersectoral variations produce the same result—they increase the mismatch between the labor that is demanded and the labor that is unemployed. A higher mismatch, for whatever reason, could increase the NAIRU. This mismatch can also be measured by the position of the Beveridge curve. Figure 3 plots the relationship between the level of unemployment and the level of job vacancies, as measured by an index of help-wanted ads. The red squares seem to represent one Beveridge curve. As the economy expands, the unemployment rate falls and job vacancies rise, moving down that curve. The higher the mismatch between vacant jobs and unemployed workers, or the higher the frictional rate of unemployment, the farther the curve will be from the origin. Thus, for any given unemployment rate, help-wanted advertising should be high if the mismatch has increased. As can be seen by the clear square and the grey squares, help-wanted ads are currently low, given the unemployment rate. The Beveridge curve did shift out, but the shift occurred in the late 1970s and early 1980s (represented by the black and red squares) when interregional and inter-

Figure 3



sectoral variances were at their peaks. This indicator of the degree of mismatch in the labor market does not support that rising frictional unemployment has increased the NAIRU.

The effect of shifts in the Beveridge curve on the

NAIRU can also be examined in the Phillips curve regressions. Holding the unemployment rate constant, a shift out in the Beveridge curve means that vacancies, measured by the help-wanted index, are higher. Thus, if a shift out in the Beveridge curve

Table 7
The Phillips Curve and the Beveridge Curve

	GDP Deflator			CPI _{XFE}			Compensation		
Constant	.0064*	.0066*	.0056*	.0069*	.0075*	.0047*	.0050*	.0086*	.0080*
Σ Unemployment Rate	-.0014*	-.0014*	-.0013*	-.0012*	-.0010*	-.0013*	-.0018*	-.0012*	-.0014*
$\Sigma \dot{P}$	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
$\Sigma \dot{Q}$							1.0	1.0	1.0
$\Sigma \dot{M}$	.049*	.056*	.047*	.082*	.079*	.072*	.045	.061	.065*
Nixon	-.0038*	-.0027*	-.0024*	-.0042*	-.0044*	-.0044*	-.0029	.0004	-.00007
Nixoff	.0055	.0050	.0060	.0058	.0062*	.0073*	.0063	.0062*	.0050
σ Region	.0072			-.0018			.017		
σ Sector		.0028			-.0049			-.0074	
Help Wanted			.0017			.0024*			-.0011
Log Likelihood	578.22	577.95	578.92	580.05	581.33	583.17	548.65	547.86	546.84

*Significant at the 5 percent level.

increases the NAIRU, adding help wanted to the Phillips curve should produce a positive and significant variable. As columns 3, 6, and 9 of Table 7 reveal, the help-wanted index is only marginally statistically significant in the Phillips curve regression. Thus, even if the Beveridge curve had shifted out in the 1990s (which it did not), it should have had very little effect on the NAIRU.¹⁹

III. Conclusion

As the economy approaches capacity, the estimate of the NAIRU becomes more and more important. Recently, it has been suggested that macro data reveal an increase in the NAIRU. This paper finds little support for such a conclusion. Although regressions for a sample of the past 10 years can produce higher estimates of the NAIRU, the validity of truncating the sample in this way is dubious, and the standard errors around the NAIRUs estimated in these shorter regressions are large. On the other hand, the hypothesis that the NAIRU has increased because of some very recent restructuring in the labor market appears unfounded. The reasons often cited are not supported by the data.

Although the NAIRU can vary over a 35-year period, the actual NAIRU is not nearly as variable as the estimated NAIRU when a series of large supply shocks affect our measures of inflation over the sample period. Many factors relating to both labor supply and labor demand might cause the NAIRU to change. Attempts have been made to capture these effects, as in Perry (1970) and Clarke and Summers (1979). This approach attempts to construct the NAIRU estimate from the ground up. The problems with adjusting for the demographic effects discussed above are an example of the difficulties encountered by this approach.

Neither constructing the NAIRU nor estimating it via the Phillips curve is a foolproof method. Perhaps the best way to get a feel for the current NAIRU is to examine the last time the economy approached it. The 1987–89 period resulted in reasonably stable

inflation. With a one-period lag on unemployment in the Phillips curve, the unemployment rate averaged approximately 5.7 percent over that period, roughly the full-sample estimate of the NAIRU. However, from early 1988 to the end of 1990, the unemployment rate fell below 5.7 percent, producing an increase in inflation in late 1989 and 1990, in keeping

The latest incident near the NAIRU supports the conclusion of a NAIRU near 5.7 percent, using the old BLS measure of unemployment. Little evidence has been found to suggest that the NAIRU has changed significantly since then.

with the Phillips curve estimates in this paper. A Phillips curve estimated over the full sample does not underpredict the amount of inflation that occurred in this period. Thus, the latest incident near the NAIRU supports the conclusion of a NAIRU near 5.7 percent. Little evidence has been found to suggest that this estimate of the NAIRU has changed significantly since then.

Estimating the NAIRU is fraught with hazards. Deriving it from Phillips curves is risky, owing to potential coefficient instability and because our measures of inflation are imperfect for the task. Yet, when controlling for this method's most obvious problems, using the Phillips curve may be the most effective tool we have to derive an estimate of the NAIRU. This method produces a fairly consistent estimate of a NAIRU between 5.5 and 5.8 percent.

¹⁹ In a regression over only the last 11 years, inclusion of the help wanted data lowers the estimated NAIRU to around 5.8 percent.

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New England Job Changes during the Recession: The Role of Self-Employment

One of the puzzles regarding the recent recession in New England was a divergence between the two major series on employment, one based on establishments and one based on households. Both show the recession to have been much more severe in the region than in the nation. But while the establishment series shows New England to have lost one in 10 jobs as compared with U.S. recession losses of less than one in 50, the household series shows the region's losses amounting to less than one in 13. The inclusion of unincorporated self-employed individuals in the household employment count but not the establishment series explains part of the divergence. The number of unincorporated self-employed individuals—defined as those who work in their own unincorporated business, profession, or trade—grew between 1988 and 1992, while all the other major classes of workers—farm and nonfarm private, government, incorporated self-employed, and those working without pay—shrank in the region. Some of the additional self-employed were undoubtedly former payroll employees who began working on their own because they lost establishment jobs.

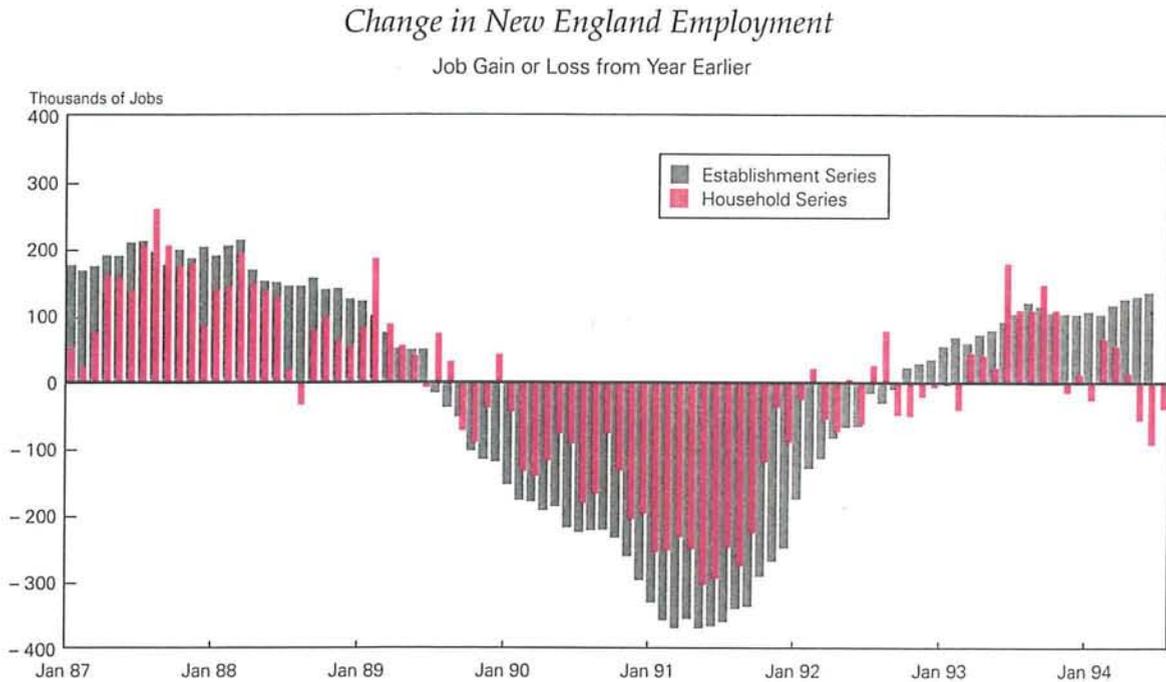
The shift into self-employment represents one part of a set of changes in the mix of workers and jobs that reflects the nature of the region's downturn and the economic adjustments it entailed. This article examines patterns of job and income change for different classes of workers in New England from the pre-recession peak year of 1988 to the recession-low year of 1992, with an emphasis on the role of the self-employed.

Income data suggest that the self-employed fared better than the unemployed during the recession, but their earnings declined more, on average, than the earnings of individuals still working for other employers in 1992. Thus, self-employment apparently represented a successful stopgap measure, for some, to keep earning after the loss of a wage and salary job, but typically at a lower level. A key question is the degree to

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Figure 1



Note: Household data have been adjusted for discontinuity introduced by Census population rebenchmarking in January 1990.
Source: U.S. Bureau of the Census and U.S. Bureau of Labor Statistics.

which these adjustments will be reversed as the New England economy recovers. Although data are not yet available to track the amount of self-employment in New England after 1992, a marked reversal since mid-1992 of the recession's divergence between the household and establishment series job counts suggests that self-employment may be shrinking in the region. Certainly those newly self-employed individuals who have low earnings and few fringe benefits would be expected to seek wage and salary employment as the number of establishment jobs expands. Nonetheless, anecdotal evidence suggests that a subset of the newly self-employed may be unlikely to resume payroll employment.

I. Overall Patterns of Employment Change in the Downturn

The count of payroll jobs at nonagricultural establishments in New England peaked in February

1989 and declined fairly steadily to a low in December 1991; it then moved very little until after June 1992 when it began growing. Losses from peak to trough amounted to 650,000 payroll jobs. When employment is measured based on a survey of households, rather than establishments, the number of employed persons in New England declined by about 500,000 from its peak in February 1989 to its trough in June 1992 (Figure 1).¹ (See Appendix A for a more detailed examination of the differences between the two series' job tallies.)

While total employment declined markedly (according to either measure), one type of employment was growing—the unincorporated self-employed.

¹ These household data are adjusted (additively) for a January 1990 discontinuity that is due to rebenchmarking by the U.S. Bureau of Labor Statistics to the 1990 Census baseline. Without this adjustment, the 1989–90 job losses according to the household series would be even smaller, and the measured discrepancy between the household and establishment peak to trough losses would be even bigger than the text indicates.

Table 1
New England Adults by Labor Force Status and Class of Worker
 Thousands

Labor Force Status, Class of Worker	1988	1992	1988-92 Change	
			Number	Percent
Employed Persons	7,616.2	7,380.7	-235.5	-3.1
Private Employees	5,904.8	5,698.8	-206.0	-3.5
Government Employees	971.1	928.7	-42.4	-4.4
Self-Employed				
Incorporated	243.4	197.7	-45.7	-18.8
Not Incorporated	478.4	547.4	69.1	14.4
Employed without Pay	18.5	8.1	-10.4	-56.3
Persons with Zero Weeks Employment	2,683.6	3,030.1	346.5	12.9
Not in Labor Force (NILF) All Year	2,635.2	2,869.6	234.4	8.9
Unemployed All Year	11.1	82.2	71.1	641.0
Mixed NILF and Unemployed	37.3	78.2	41.0	109.9
Total Persons Age 15 and Older	10,299.8	10,410.7	110.9	1.1
Memo: "Employees" ^a	7,119.3	6,825.2	-294.2	-4.1

Note: Employed persons are individuals employed at least part of the year. Class of worker (private, government, etc.) refers to longest job in year.

^aPrivate and government employees plus incorporated self-employed.

Source: Author's calculations based on data from U.S. Bureau of the Census, *Current Population Survey*, March 1989 and March 1993, machine-readable data files.

Table 1 reports data collected during the Current Population Surveys of March 1989 and March 1993, which refer to the preceding calendar years.² The number of unincorporated self-employed workers expanded noticeably in New England while all other classes of workers shrank between 1988 and 1992.³ Even the count of incorporated self-employed declined during the recession, presumably because the red tape involved in incorporating, while not onerous, makes incorporating a less fluid adjustment mechanism. The remainder of this article uses the term "self-employed" to refer to the unincorporated self-employed,⁴ and characterizes the three remaining employment classes who receive pay as "employees," since the incorporated self-employed are considered (for tax purposes as well as survey purposes) to be employees of their corporations.⁵ The relatively small class of unpaid volunteers and family workers is dropped from the analysis.

A sizable fraction of the 69,100 net additions to self-employment were probably individuals who had held a private or government job in 1988. Employment in the other classes of work (private, government, incorporated self-employed, and unpaid volunteer and family workers) fell by more than 300,000

between 1988 and 1992. Many appear to have left the labor force, while others became unemployed for at least part of the year.

² The overall employment losses according to the annual household data shown in Table 1 are noticeably smaller than those based on the monthly data cited in the preceding text paragraph. This is partly because the individual month in which employment peaked obviously showed a higher job count than the average for the year in which employment peaked and, by the same token, the monthly trough was lower than the annual trough. In addition, the annual data, as tallied here, count as employed any adult working at least one week during the year, while the monthly data refer to an individual's employment status in the current month.

³ Comparable data for the United States do not show unincorporated self-employment as the only growing class of worker. The numbers of private employees, government employees, and unincorporated self-employed expanded in the United States from 1988 to 1992 (by 1.0, 5.3, and 4.2 percent, respectively), while the numbers of incorporated self-employed and employed without pay shrank (by 0.2 and 30.7 percent, respectively).

⁴ The only exceptions to this statement are some explicit references to the incorporated self-employed which are clearly labeled as such.

⁵ Ample precedent exists for this grouping. In summary Census classifications, private and government workers are considered "wage and salary" workers, and self-employed incorporated are included with private workers. In Census income data, the earnings of the incorporated self-employed are reported as wages and salaries, not self-employment earnings. Furthermore, the incorporated self-employed are tallied as wage and salary employees in the establishment series.

While the bulk of New England's adjustment to employee cutbacks thus took the form of changes in labor force status, the increase in self-employment raises some interesting questions. Who were the self-employed in the region and how did their characteristics change during the slowdown? In which industries or occupations might those losing private and government jobs have gone into business for themselves, as evidenced by a decrease in the number of employees accompanied by gains in self-employment? What happened to the incomes of employees as compared with those of individuals in the growing pools of self-employed and unemployed? Did these additions to self-employment represent "good" jobs?

While total employment declined markedly in New England between 1988 and 1992, the number of unincorporated self-employed expanded noticeably.

An interesting study of Vermont workers laid off by General Electric from 1988 through 1990 (Kessel and Maher 1991) found a high level of self-employment (38 percent) among exempt workers when follow-up contact was made in early 1991. Their findings provide a preview, in some dimensions, of the apparent effects of New England's general economic slowdown, to be described in this article. The authors speculate that these former G.E. workers' motivations for self-employment ranged from a desire to be one's own boss to a lack of other opportunities, especially for older workers. They found the self-employed former G.E. workers in a wide range of industries and occupations, including innkeepers, artisans, real estate agents, construction, car repair, and retailing.

Nine out of 10 of the self-employed respondents felt that "their current job was 'better' than their G.E. job" (p. 43) and they wanted to remain in it. However, neither earnings, work hours, nor fringe benefits made self-employment "better." Three-fourths were earning less than at G.E., most were working longer hours, and many fewer had fringe benefits.

II. Who Were the Self-Employed in New England and How Did Their Mix of Characteristics Change during the Recession?

Table 2 reports the industry composition of New England employment changes over the 1988-92 period, based on household survey data. In the late 1980s, the self-employed in New England, as in the nation, were concentrated in farming, construction, and services; substantial numbers also worked in retail trade, although the self-employed do not comprise a large fraction of retail workers. During New England's 1988-92 downturn, all the industry categories shown in Table 2 except for retail, some categories of services, and public administration saw cutbacks in the number of employees, while self-employment increased in a broad range of industries—all but natural resources, trade, and business services.⁶

The construction industry accounted for the largest numerical gains in self-employment, even though total construction employment in the region shrank.

The construction industry accounted for the largest numerical self-employment gains (the four years saw a net addition of over 30,000 self-employed construction workers). Nevertheless, total construction employment in the region shrank 20 percent (by more than 110,000 workers) over the four years. Presumably, a subset of the employees let go by construction firms set up their own small-scale con-

⁶ The Current Population Survey's March 1989 and March 1993 samples include just under 10,000 adults in New England to represent just over 10 million adult residents. While this is an ample sample for examining broad trends, when cross-tabulations are undertaken, some cells are quite small and therefore some percentages are unreliable (they have large sampling errors). For example, only six of the New England observations for 1992 were mining employees. For this reason, mining was combined with agriculture, forestry, and fisheries in Table 2. Small sample size probably also accounts for the extremely large measured growth in the self-employed handlers, etc. occupation group shown in Table 3.

Table 2
New England Employment by Industry
 Percent

Industry	Industry Mix in 1988		Percent Change in Employment, 1988-92			Self-Employment as Percent of Total Employment	
	Employees ^a	Self-Employed	Employees ^a	Self-Employed	Total	1988	1992
Natural Resource Industries ^b	1.2	7.3	-18.8	-6.3	-15.2	28.9	31.9
Construction	6.4	20.2	-31.8	35.0	-20.2	17.4	29.5
Manufacturing	22.3	3.1	-15.3	140.6	-13.8	.9	2.6
Transportation and Public Utilities	6.2	2.4	-11.0	2.9	-10.6	2.5	2.9
Wholesale Trade	3.4	3.3	-10.5	-59.3	-13.5	6.2	2.9
Retail Trade	17.0	15.4	2.6	-4.1	2.2	5.8	5.4
Finance, Insurance, & Real Estate	7.5	5.7	-.2	41.0	1.8	4.9	6.8
Business Services	4.8	15.1	-3.0	-10.0	-4.2	17.5	16.5
Personal, Entertainment & Recreation Services	4.0	6.4	7.0	79.0	14.0	9.7	15.2
Professional Services	23.2	21.0	7.6	.3	7.2	5.7	5.4
Public Administration	4.1	.0	6.8	n.a.	6.8	.0	.0
Employed Total	100.0	100.0	-4.1	14.4	-3.0	6.3	7.4
Memo: Services	31.9	42.4	6.0	8.5	6.2	8.2	8.4

Note: Data refer to respondent's longest job in calendar year preceding survey date.

^aPrivate and government employees and incorporated self-employed.

^bAgriculture, forestry and fisheries, and mining.

Source: See Table 1.

struction businesses. By contrast, the large professional services industry (which includes health, engineering, management, legal, and educational services) gained private and government employees as well as (indeed faster than) self-employed.⁷

Table 3 reports the composition of employees and the self-employed by broad occupational group. As in most recessions, the hardest-hit occupations were blue-collar jobs associated with the highly cyclical construction and manufacturing industries: precision production, craft and repair; machine operators, assemblers, and inspectors. The other occupational groups losing jobs over the four years were administrative support (including clerical) and sales occupations. The growth in self-employment was concentrated in executive, administrative, and managerial occupations, along with "other" (not private household, not protective) service occupations, and precision production, craft and repair (the mirror image of the construction industry gains in self-employment shown in Table 2). Apparently, many people who started up and ran their own (unincorporated) business classified themselves as executives or managers, unless they held credentials to offer a specific service

or construction skill.⁸ Technicians also made gains; they tend to be employees of private and government enterprises, not self-employed.

Table 4 indicates that virtually all of the self-employed in New England work in very small firms (defined here as those with fewer than 25 employees). Furthermore, all the growth in self-employment occurred in this size category.⁹

⁷ The "employee" gains in professional services are not attributable to the inclusion of incorporated self-employed with private and government employees. Indeed, the number of incorporated self-employed individuals in professional services shrank between 1988 and 1992, but gains in private and government employees more than offset these losses.

⁸ The number of executives, administrators, and managers also expanded for the incorporated self-employed, but these gains were much smaller than those for private and government employees in these occupations which, as the table makes clear, were in turn much smaller than those of the unincorporated self-employed. The number of incorporated self-employed in professional specialty occupations shrank, just as (indeed, much faster than) did the number of unincorporated self-employed with professional specialties.

⁹ Note, however, that the category of very small firms can grow for two reasons: (1) new firms start up and are small and (2) larger firms shrink and are then counted in the small category. These explanations, especially the latter, actually apply to all size

Table 3
New England Employment by Occupation
 Percent

Occupation	Occupational Mix in 1988		Percent Change in Employment, 1988-92			Self-Employment as Percent of Total Employment	
	Employees ^a	Self-Employed	Employees ^a	Self-Employed	Total	1988	1992
Executive, Administrator, Manager	12.8	10.6	5.1	96.5	10.0	5.3	9.4
Professional Specialty	14.1	22.8	1.8	-9.5	.7	9.8	8.8
Technicians & Related Support	3.3	.9	16.3	6.8	16.1	1.7	1.6
Sales Occupations	12.2	19.8	-5.0	-18.6	-6.4	9.8	8.6
Administrative Support, Including Clerical	16.2	4.0	-5.2	-55.9	-6.0	1.6	.8
Private Household & Protective Services Occupation	2.3	.2	4.1	161.7	4.9	.5	1.3
Other Service Occupations	11.3	6.9	7.1	65.5	9.4	3.9	5.9
Precision Production, Craft & Repair	11.5	24.2	-29.8	22.8	-23.3	12.4	19.8
Machine Operators, Assemblers, Inspectors	7.6	2.8	-16.4	-26.5	-16.6	2.4	2.2
Transporters, Material Movers	3.3	1.4	-1.7	88.6	.8	2.7	5.1
Handlers, Equipment Cleaners, Helpers, & Laborers	3.8	.1	-.6	1272.1	1.0	.1	1.8
Employed Total ^b	100.0	100.0	-4.1	14.4	-3.0	6.3	7.4
Memo:							
White Collar	58.5	58.1	-.0	3.8	.2	6.2	6.5
Blue Collar	26.2	28.5	-18.2	24.2	-15.3	6.8	10.0

Note: Data refer to respondent's longest job in calendar year preceding survey date. White collar includes first five occupations listed above; blue collar refers to final four occupations listed above.

^aPrivate and government employees and incorporated self-employed.

^bTotal includes farming, forestry, and fishing occupations and individuals who were in the armed forces in the previous calendar year but civilian at time of survey, not included in other occupational groups above.

Source: See Table 1.

The self-employed are also somewhat more likely to work part-time or part-year than employees (Table 5). Being one's own boss may allow some of the self-employed greater flexibility in setting a part-time work schedule; others of the self-employed may face inadequate demand to support full-time work.

As the economy deteriorated between 1988 and 1992, the fraction of the self-employed who worked less than the full year (fewer than 50 weeks of employment) rose noticeably.¹⁰ When examining descriptive data such as these, it is important to keep in mind that two factors are at work in the chang-

classes except the largest. Furthermore, a sizable part of this difference in average size of firm between the self-employed and employees must be attributable to the fact that, by definition, it is not possible to have more than one or several (if partners) self-employed persons working in any one firm, with all the remaining workers being counted as employees.

ing characteristics of the self-employed: (1) changes in the characteristics of individuals who were self-employed throughout the period and (2) differences between the characteristics of those joining the ranks of the self-employed during the period and the initial group. As a case in point, Table 5 indicates that the rise in the fraction of the self-employed working part-year or part-time was not attributable to declines in the number of self-employed individuals working full-time or full-year, but rather was

¹⁰ In 1988, the average person for whom self-employment was the longest job spent 46 weeks working, 1 week unemployed, and 5 weeks not in the labor force; by 1992, the average self-employed New Englander's weeks at work had fallen to 44.6 and weeks unemployed had risen to 2.6. About 6 percent of the self-employed in New England experienced one or more weeks of unemployment in 1988, a figure that had risen to 11 percent by 1992 (slightly below the corresponding percentages for employees).

Table 4
New England Employment by Size of Firm
 Percent

Size of Firm (Number of Employees)	Size Mix in 1988		1988-92 Percent Change in Total Employment	Self-Employment as Percent of Total Employment	
	Employees ^a	Self- Employed		1988	1992
Less than 25	25.1	97.5	-3.7	20.7	24.7
25 to 99	14.9	.5	-5.3	.2	.4
100 to 499	16.5	1.0	-.7	.4	.2
500 to 999	6.4	.4	9.6	.4	.0
1,000 or More	37.1	.6	-4.6	.1	.2
Total	100.0	100.0	-3.0	6.3	7.4

Note: Data refer to respondent's longest job in calendar year preceding survey date.

^aPrivate and government employees and incorporated self-employed.

Source: See Table 1.

entirely due to much faster growth in part-time/full-year and full-time/part-year self-employment than in the number of self-employed with other work schedules. One interpretation of the large number of part-year self-employed in 1992 is that many of them were previous employees who experienced a spell of unemployment and then became self-employed.¹¹

Indeed, as shown in the first panel of Table 6, a

sizable fraction of the net additional self-employed over the 1988-92 period were individuals who experienced a spell of unemployment more than two weeks long in 1992. In addition, for some fraction of the self-employed who were not unemployed in

¹¹ Note that "weeks worked" includes all jobs held during the calendar year, while "self-employed" and "employee" status refer to the longest job during the year.

Table 5
New England Employment by Full-Time/Part-Time Status
 Percent

Status	Status of Mix in 1988		Percent Change in Employment, 1988-92			Self-Employment as Percent of Total Employment	
	Employees ^a	Self- Employed	Employees ^a	Self- Employed	Total	1988	1992
Full Time							
Full-Year	62.5	59.8	-7.1	2.8	-6.5	6.0	6.6
Part-Year	15.5	14.9	.3	54.7	3.6	6.1	9.1
Part Time							
Full-Year	8.7	11.2	17.3	38.8	19.0	8.0	9.3
Part-Year	13.3	14.0	-9.2	1.8	-8.5	6.6	7.4
Total	100.0	100.0	-4.1	14.4	-3.0	6.3	7.4
Memo:							
Part-Time	22.0	25.3	1.3	18.2	2.5	7.2	8.3
Part-Year	28.8	29.0	-4.1	29.1	-2.0	6.3	8.3

Note: Data refer to respondent's longest job in calendar year preceding survey date, except for "part-year," which reflects all weeks of employment during the year. "Full-time" tallies individuals who usually work 35 or more hours per week; "full-year" is defined as individuals who were employed 50 or more weeks in the year.

^aPrivate and government employees and the incorporated self-employed.

Source: See Table 1.

Table 6
*New England Labor Force Status
 and Earnings*
 Adults with Earnings, by Class of Worker for Longest Job Held

	1988	1992	Percent Change
Number (Thousands):			
Adults Working 50+ Weeks:			
Employees ^a	5,068	4,857	-4.1
Self-Employed	340	369	8.5
Adults Unemployed >2 Weeks			
Employees ^a	533	895	68.1
Self-Employed	23	59	152.1
Others in the Work Force ^b			
Employees ^a	1,519	1,073	-29.4
Self-Employed	115	120	4.0
Average Annual Earnings (1993 Dollars):			
Adults Working 50+ Weeks:			
Employees ^a	32,050	31,050	-3.2
Self-Employed	30,650	28,700	-6.4
Adults Unemployed >2 Weeks	14,350	11,650	-18.7
Others in the Work Force ^b	10,300	9,600	-7.1

Note: This table excludes adults with zero earnings or with no job all year. Earnings include all earnings in calendar year; employment class refers to longest job in year. Earnings inflated to 1993 dollars using the personal consumption expenditure (PCE) deflator. Annual earnings rounded to nearest \$50.

^aPrivate and government employees and incorporated self-employed.

^bIndividuals in the labor force for at least one week who were employed for less than 50 weeks, unemployed for two or fewer weeks, and out of the labor force for the remainder of the year.

Source: See Table 1.

1992, such a transition through unemployment may have occurred in 1989, 1990, or 1991.¹²

III. Income Changes during the Regional Slowdown

The region's deep recession affected not only the employment status of New England residents, but also their incomes. Average annual earnings declined in real terms over the 1988-92 period in New England. Not surprisingly, real earnings declined the most for adults who were unemployed for part of the year (as shown in the lower panel of Table 6). But among those working all year (50-plus weeks), annual earnings declined twice as fast in real terms for the self-employed as for employees.

Real earnings declined overall in part because job losses meant that fewer adults had any earnings in

1992 than in 1988, in part because the fractions of earning adults who worked part-time and/or part-year rose, and in part because of a decline in real average hourly earnings among those with earnings (Table 7). Average annual earnings of the self-employed declined almost 14 percent in real terms between 1988 and 1992, about four times the pace of real earnings losses for employees.

Average real earnings of the self-employed declined almost 14 percent between 1988 and 1992, about four times the pace of losses for employees.

Average weeks employed declined more for the self-employed than for other workers; self-employed workers averaged more weeks of work in 1988 than employees, but by 1992 they averaged slightly less. Average weekly earnings also declined more steeply for the self-employed—over 10 percent as compared with less than 3 percent for other employees. Just as for annual earnings and weeks of work, the self-employed began with higher weekly earnings but fell below other workers by 1992. Furthermore, the usual workweek declined more for the self-employed than for other workers. Hourly earnings also declined more for the self-employed, but they still remained higher than the average hourly earnings of employees.

All the relative losses experienced by the self-employed that are shown in Tables 6 and 7 suggest that the circumstances of those who became self-employed during this period were not the same as the circumstances of either the initial pool of self-employed or those who retained their private, government, or incorporated self-employed jobs. Indeed, the workweek and earnings of the self-employed became more like those of the unemployed during this period, perhaps not surprisingly since some of the newly self-employed became so after a stint of unemployment. Even the self-employed

¹² Recall that the Current Population Survey does not follow specific individuals over the entire 1988-92 time span. Rather, the population and its characteristics are estimated on the basis of a sample that would have turned over completely between 1988 and 1992.

Table 7
Real Earnings of New England Workers
 Earnings in 1993 Dollars

	1988	1992	Percent Change
Number (000s):			
All Adults	10,300	10,411	1.1
Adults with Earnings	7,598	7,373	-3.0
Employees ^a	7,119	6,825	-4.1
Self-Employed	478	547	14.4
Average Annual Earnings:			
All Adults	\$19,200	\$17,650	-8.1
Adults with Earnings	26,050	24,950	-4.2
Employees ^a	25,950	25,050	-3.5
Self-Employed	27,350	23,550	-13.9
Average Weeks Worked in Year:			
Adults with Earnings	45.1	44.7	-.9
Employees ^a	45.1	44.7	-.9
Self-Employed	46.0	44.6	-3.0
Average Weekly Earnings:			
Adults with Earnings	\$ 547.3	\$ 528.8	-3.4
Employees ^a	545.3	529.9	-2.8
Self-Employed	576.2	515.5	-10.5
Usual Weekly Hours:			
Adults with Earnings	38.9	37.7	-.8
Employees ^a	37.9	37.6	-.8
Self-Employed	40.4	39.1	-3.2
Average Hourly Earnings:			
Adults with Earnings	\$ 14.17	\$ 14.02	-1.1
Employees ^a	14.07	13.93	-1.0
Self-Employed	15.64	15.25	-2.5
Percentage Poor: ^b			
All Adults	6.8	8.1	1.3 ^c
Adults with Earnings	3.1	4.6	1.5 ^c
Employees ^a	3.0	4.3	1.3 ^c
Self-Employed	4.9	7.8	2.9 ^c

Note: Earnings include all earnings in calendar year; employment class refers to longest job in year. Earnings inflated to 1993 dollars using the personal consumption expenditure (PCE) deflator. Annual earnings rounded to nearest \$50. Average weekly earnings calculated as annual earnings divided by weeks employed. Average hourly earnings calculated as average weekly earnings divided by usual weekly hours.

^aPrivate and government employees and the incorporated self-employed.

^b"Poor" is defined as in a family with income below the poverty line.

^cPercentage point change.

Source: See Table 1.

working 50 or more weeks resembled the unemployed more in 1992 than they had in 1988.

The relative declines in hours and weeks of work imply that the self-employed were not as successful at finding as much work as the average employee (with a job), and by inference, as much as they would have liked. These findings are thus consistent with

the stories of self-employment as a stopgap measure, aimed at maintaining some earnings after the loss of a payroll job, albeit a stopgap that was less successful for some of the self-employed than for others. For instance, the data suggest that the average hourly earnings of the *newly* self-employed in 1992 were lower than those of employees, although they were probably higher than those of all earners with a spell of unemployment in 1992.¹³ Thus, the good news is that some individuals who might otherwise have been entirely unemployed were garnering earnings through self-employment. The bad news, however, is that making ends meet was a struggle for a noticeable fraction of the self-employed.

The self-employed were considerably more likely than other employed individuals to be poor (as shown at the bottom of Table 7). Poverty rates reflect the combination of an individual's family situation (the presence of other workers and the size of their earnings and unearned income) and the individual's own earnings and unearned income. Consistent with the changes in real earnings, poverty rates also rose more for the self-employed between 1988 and 1992 than for other adults.

These changes in annual earnings are summarized in Figure 2, which displays the percentage of employees and self-employed workers falling into three annual earnings classes. All 1988 workers were ranked from lowest to highest annual earnings and then cutoffs between the classes were defined so that each class contained one-third of all 1988 workers. As the chart makes clear, in 1988 the self-employed were much more likely to fall into the bottom and top earnings classes than were employees, indicating greater earnings inequality among the self-employed.¹⁴

The same constant-dollar cutoffs between the classes, applied to 1992, indicate that the fraction of all workers in the bottom earnings class increased noticeably (but not by a large amount, rising from

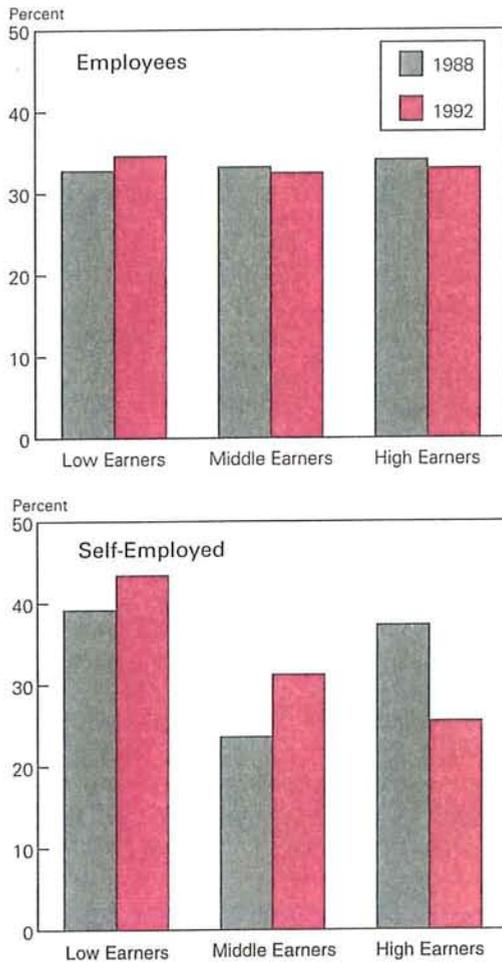
¹³ The rough estimate behind this statement assumes that 478,000 of New England's self-employed (the number in 1988) saw their hourly earnings decline at the 1988-92 pace of employees' hourly earnings, and calculates the hourly earnings implied for the 69,000 net new self-employed, given the average hourly earnings shown in Table 7 for all the 1992 self-employed. Since the changes experienced by both employees and the self-employed actually ranged across a distribution, this "average" calculation is only illustrative.

¹⁴ These data confirm the hints of a more unequal distribution of earnings provided by the fact that the self-employed had higher average earnings but also a higher poverty rate than private and government employees in 1988 (Table 7).

Figure 2

Changes in the Distribution of Annual Earnings in New England

Percentage of Workers with Low, Middle, and High Earnings



Note: Low, middle, and high earnings classes are defined to contain one-third of all workers in 1988; the same constant-dollar cutoffs apply to 1992. The low earners are workers with earnings below \$13,477 in 1993 dollars; high earners are those with earnings above \$30,518. 'Employees' include private and government employees and the incorporated self-employed; 'Self-employed' are unincorporated.

Source: Author's calculations based on data from U.S. Bureau of the Census, Current Population Survey, March 1989 and March 1993.

33.2 percent in 1988 to 35.2 percent in 1992), with offsetting declines in the middle and top classes, as the weakening economy caused the entire earnings distribution to shift down in real terms. This decline in the number of workers with high earnings was much more pronounced for the self-employed: 37 percent of the self-employed were in the top class in 1988, but only 25 percent were in 1992, with some of the loss taken up by the middle earnings class and some by the bottom class.¹⁵

Although real earnings declined as the economy weakened between 1988 and 1992, job-related fringe benefit coverage changed very little. In 1988, the self-employed enjoyed much less health coverage than other workers, and they were much less likely than other employees to be included in their employer's or union's pension or other retirement plan (Table 8). The large number of self-employed with health coverage not offered by their own employer or union include those purchasing health insurance individually and those with coverage through other employed family members. Since the self-employed are their own employers, and most are in very small firms, these facts may be unsurprising.

While the fraction of adults covered by private health insurance actually rose slightly in New England over this period, the fraction with health insurance offered by their own employer or union declined noticeably overall and especially for the self-employed. Access to pension or other retirement plans, by contrast, expanded over the period for both the self-employed and employees. Even after these gains, however, the self-employed were much less likely than employees to be included in a retirement plan.

Such changes in available benefits as well as income and employment status of self-employed individuals in New England obviously reflect recession-induced shifts in the demand side of the labor market, as well as supply. Many firms cut back employment as demand for their products declined, and some former employees responded to these cutbacks by employing themselves. A second-round effect was that some firms explicitly opted for shifting some production to non-employees. Observers have noted increased "outsourcing" of a variety of economic adjustments (during both slack and boom

¹⁵ In fact, the actual number of self-employed individuals with high earnings declined by one-fifth between 1988 and 1992 even as total self-employment increased.

Table 8
Fringe Benefits of New England Workers
 Percent or Percentage Points

	1988	1992	Percentage Point Change
Percentage with Government Health Coverage: ^a			
All Adults	21.5	22.9	1.4
Adults with Earnings	7.9	7.4	-.5
Employees ^b	7.5	7.5	.0
Self-Employed	13.7	6.0	-7.7
Percentage with Private Health Insurance:			
All Adults	75.3	75.9	.6
Adults with Earnings	82.0	83.1	1.1
Employees ^b	82.9	84.1	1.2
Self-Employed	70.1	71.1	1.0
Percentage with Health Insurance Offered by Own Employer or Union:			
All Adults	46.0	42.7	-3.3
Adults with Earnings	57.5	54.4	-3.1
Employees ^b	59.9	57.2	-2.7
Self-Employed	22.6	19.1	-3.5
Percentage Whose Employer or Union Had a Pension Plan:			
All Adults	37.8	38.1	.3
Adults with Earnings	51.1	53.9	2.8
Employees ^b	54.0	57.3	3.3
Self-Employed	8.5	11.3	2.8

^aGovernment coverage includes Medicare, Medicaid, CHAMPUS, VA, or military health care coverage.

^bPrivate and government employees and incorporated self-employed.
 Source: See Table 1.

periods) in the United States, and establishments' increased reliance on the self-employed, from executive consultants to cleaning staff, may be a case in point, at least in New England. A related phenomenon is many industries' increased use of temporary workers.¹⁶ (See the Box for a description of temporary workers in New England.)

The *supply* response of some workers who lost establishment jobs—dropping out of the labor force or offering self-employed labor—thus met an altered mix of employer *demand* for employees, altered both by recession shrinkages and by structural changes such as the move toward outsourcing. For players on both sides of the market, these changes have advantages and disadvantages. Some of the self-employed

might like to go back to being employees, while others may value more highly the independence of self-employment. Similarly, hiring consultants or temporary workers looks to be a long-term money-saver for some employers but others plan to sign on additional permanent employees as soon as product demand picks up enough to justify it.

IV. Will Self-Employment Shrink as New England Recovers?

Given these pluses and minuses for both employers and workers, a key question, looking forward, is the degree to which the recession's growth in self-employment will be reversed as the New England economy expands. Current Population Survey data comparable to those used here are not yet

A key question is the degree to which the recession's growth in self-employment will be reversed as the New England economy expands.

available for 1993 or 1994. Thus, it is impossible to directly estimate changes in the number of self-employed individuals in New England in recent years. Nonetheless, changes in the monthly payroll and household employment totals in the last two years may provide some clues regarding possible changes.

Since the recession low point in mid-1992, measured job growth has been much faster according to the establishment series than according to the household series. The former shows a net gain of 215,000 jobs from June 1992 to June 1994 and the latter less than 90,000. Just as a gain in self-employment was (correctly) inferred from the divergence of the two measures during the recession (Bradbury 1993), it seems reasonable to conclude from their recent convergence that some shrinkage in self-employment

¹⁶ Other documented examples of such outsourcing include auto manufacturers' requirements that their suppliers absorb price cuts and the costs of "just-in-time" inventory practices.

Temporary Workers

Another phenomenon often seen as closely related to growing self-employment is the increasing use of temporary workers. Nationally, a sizable fraction of recent employment growth has been attributed to expanded employment in the "personnel supply services" category of the business services industry; firms in this industry employ workers in a variety of occupations, whom they then supply on an hourly, weekly, or longer-term basis to firms in a variety of industries. In New England as of 1992, about 50,000 employees of personnel supply services comprised about two-thirds of 1 percent of all workers; the industry was comparable in size to the apparel, aircraft, or security brokerage and investment industries in the region.

Temporary workers in New England were considerably more likely than workers in other industries to have experienced a mixture of employment and unemployment in 1992 or a mixture of employment and "not in labor force" status;¹⁷ employees in other industries were much more likely to have been employed for 50 or more weeks in the year. About 40 percent of temporary workers looked for work in one or more stretches, while this was true of only 13 percent of other industry workers.¹⁸ By the same token, one-third of temporary workers had more than one employer (at separate times) during the year, while only one-eighth of other industry workers moved among employers. Temporary workers, unlike the self-employed, were more likely than workers in other industries to be female and nonwhite; like the self-employed, an above-average fraction of employ-

ees in the personnel service industry worked part-time, defined as usually working fewer than 35 work hours per week.

Workers supplied by personnel agencies represented a wide range of occupations but were considerably more concentrated than workers in other industries in administrative support occupations, which include the clerical workers many people associate most strongly with temporary help. Temporary help workers in New England were also over-represented in two of the blue-collar groups: machine operators, assemblers, and inspectors; and handlers, equipment cleaners, and helpers. Interestingly, a slightly above-average fraction of those in the personnel service industry were in executive, administrative, and managerial occupations.

Employees in the personnel supply service industry earned less per year, on average, and were less likely to have fringe benefits associated with their jobs than workers in other industries. Total annual earnings averaged \$18,500 for temporary workers and \$25,000 for workers in other industries in New England in 1992 (earnings in 1993 dollars). Most of this difference in annual earnings was attributable to shorter hours and fewer weeks of work, however; average weekly and hourly earnings of temporary workers were much closer to those of workers in other industries. Only one-fifth of temporary help workers in New England had health insurance offered through (and partly or fully paid for by) their employer or union, as compared with over half the workers in other industries. And only 16 percent of personnel supply service workers were included in a company or union pension plan, as compared with 41 percent of workers in other industries.

has occurred over the two years of recovery in the region.¹⁹

Many of the newly self-employed whose self-employment earnings (and fringe benefits) fell short of their previous wages or salaries (and fringes) can be expected to seek establishment jobs as they become available. Nonetheless, two groups seem less likely to resume payroll employment: Some self-employed individuals may have been "scarred," becoming less attractive to employers because of their stints of unemployment or self-employment; others,

¹⁷ Data on industry (and hence temporary worker status) are not available for individuals who were unemployed all year or not in the labor force all year. Such individuals report no "longest job" for which industry can be ascertained.

¹⁸ New England workers for whom personnel supply services was the industry of longest job averaged 33 weeks of work in 1992, 12 weeks of unemployment, and 7 weeks out of the labor force. Over 40 percent of temporary workers experienced one or more weeks of unemployment in 1992, as compared with fewer than 14 percent of workers in other industries.

¹⁹ Since the region's unemployment rate has fallen to about the national average but not significantly below, it is unlikely that a marked increase in dual job-holding explains the convergence.

like many of the self-employed former Vermont G.E. workers (Kessel and Maher 1991), may have realized that they strongly prefer being on their own. In addition, some establishments will continue to find it advantageous to "outsource" selected operations or functions to self-employed individuals.

V. Conclusions

The economic adjustments engendered by the severe 1989-92 downturn in New England fell heavily on those who lost their jobs. All classes of employees—private, government, the incorporated self-employed—shrank in size from 1988 to 1992; the only net growth occurred in unincorporated self-employment. These shifts imply that some individuals began working for themselves as a way to maintain at least some earnings after losing their establishment jobs.

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Anecdotal evidence suggests that the recession's effects on New England labor markets will not unravel totally even when the region's severe employment losses have been reversed.²⁰ Changes in the way establishments view their operations, including relationships with outside suppliers, wariness about adding to "permanent" payrolls after so recently facing the pain of large-scale separations, and changes in individual attitudes towards self-employment are likely to constrain the amount of establishment hiring that is associated with increases in output. Thus, the regional economy may well continue to have a somewhat larger class of independent workers than would have occurred in the absence of the recession and the adjustments it engendered.

²⁰ This will not happen soon, in any case. According to New England Economic Project forecasts, total employment in New England will not exceed its 1989 peak until almost 10 years later, in the final quarter of 1998 (Kodrzycki 1994).

Table A-1
Employment by Industry in New England
 Thousands of Jobs

Industry	Establishment Data			Household Data			Household Data on "Employees"		
	1988	1992	Change	1988	1992	Change	1988	1992	Change
Total Nonfarm	6,576.5	5,995.1	-581.4	7,484.1	7,275.4	-208.7	7,040.0	6,758.7	-281.3
Manufacturing	1,345.8	1,094.3	-251.5	1,593.8	1,373.4	-220.4	1,578.7	1,337.2	-241.5
Construction	331.2	181.9	-149.3	525.2	411.2	-114.0	428.4	280.5	-147.9
Transportation and Public Utilities	272.5	253.3	-19.2	362.2	337.7	-24.5	350.7	325.8	-24.8
Trade	1,550.5	1,372.2	-178.3	1,536.3	1,528.2	-8.1	1,446.6	1,451.0	4.4
Finance, Insurance, and Real Estate	470.7	430.0	-40.7	534.7	556.7	21.9	507.3	518.0	10.7
Services	1,723.2	1,799.8	76.6	1,958.4	2,135.8	177.4	1,755.6	1,915.9	160.2
Government	877.7	860.3	-17.4	965.7	926.7	-39.0	965.7	926.7	-39.0
Mining	4.9	3.3	-1.6	7.8	5.7	-2.1	7.0	3.6	-3.4

Note: Establishment figures are averages of monthly data; household data refer to individuals employed for pay at least part of the year by industry of longest job. To increase comparability with the establishment data, household data in this table exclude all individuals in the agriculture, forestry, and fisheries industry and reclassify all individuals reporting the "government" class of worker, regardless of industry, as government. Text Table 2, by contrast, includes agriculture and adopts the Current Population Survey convention of "public administration" as the government-related industry category. All workers in the public administration industry are in the government class of worker, but the converse is not true. "Employees" include private and government employees and the incorporated self-employed.

Sources: U.S. Bureau of Labor Statistics and U.S. Bureau of the Census.

Appendix A Discrepancies between Household Series and Establishment Series Job Counts, 1988 to 1992

During the severe 1989-92 downturn in New England, the two basic measures of employment, based on surveys of establishments and households, gave very different readings on the magnitude of the region's employment losses.²¹ From the pre-recession peak year 1988 to the recession-trough year of 1992, the establishment series reported the loss of 581,400 nonfarm jobs while the household series data, after excluding jobs in agriculture, forestry, and fisheries, indicated that "only" 208,700 jobs were lost (Table A-1).²²

Just as for total employment, recession losses by industry were generally greater according to the establishment series than according to the household series.²³ The biggest differences occurred in two of the three biggest industries—trade and services. According to the establishment tally, almost 180,000 payroll jobs were lost in wholesale and retail trade between 1988 and 1992, but the household survey found only 8,000 fewer people reported employed in this industry in 1992 than in 1988. The number of jobs in services actually expanded over this period²⁴—by 177,000 according to the household series but only 77,000 according to the establishment count. Manufacturing, the second largest industry group, showed the biggest job losses according to either source; construction, a relatively small industry, also showed large losses according to both series. Employment in finance, insurance, and real estate declined almost 9 percent according to the establishment series but grew about 4 percent according to the household-based estimates.

One important difference between the two job counts is that the household data are more inclusive: The establishment data include only individuals on the payrolls of nonfarm establishments, while the household measure includes, in addition, the unincorporated self-employed, unpaid volunteers and family workers, and agricultural workers.²⁵ Table A-2 reports 1988-92 changes in these

²¹ This is not the case for the nation; both the establishment and household counts show U.S. job losses of 1.8 million from peak to trough.

²² This discrepancy is quite large, but at the time it appeared to be even larger. Each spring the U.S. Bureau of Labor Statistics revises the establishment employment estimates for the preceding two calendar years on the basis of more complete data that are available only with a lag. In March of 1994, these revisions to the 1992 and 1993 data were very sizable and positive. Thus, before those revisions, the total recession job losses were even bigger, according to the establishment series, than those reported in the text. Note also that the loss figures in Table A-1 do not match the figures cited in the text at the beginning of the article, because of the difference between monthly and annual data discussed in footnote 2.

²³ The Current Population Survey (household series) for the month of March includes data for the longest job each individual held in the calendar year prior to the March survey date. These data, by industry, are compared with the corresponding annual averages of establishment data in Table A-1.

²⁴ Service jobs declined only briefly during the recession even in hard-hit New England, peaking in March 1990 and bottoming out in February 1991.

²⁵ A second important difference between the two sources is that dual job holders are counted as two jobs in the establishment

Table A-2
New England Employment by Class of Worker and Farm/Nonfarm Status
 Thousands

	1988	1992	1988-1992 Change
Household Measure of Total Employed ^a	7,616.2	7,380.7	-235.5
Employed Without Pay	18.5	8.1	-10.4
Agriculture, Forestry, and Fisheries			
Self-Employed, Not Incorporated	34.3	30.8	-3.5
Self-Employed, Incorporated	11.2	.0	-11.2
Private and Government	68.1	66.4	-1.7
Household Measure of Nonfarm Paid Employed	7,484.1	7,275.4	-208.7
Nonfarm Self-Employed			
Not Incorporated	444.1	516.6	72.5
Incorporated	232.2	197.7	-34.5
Nonfarm Private Employees	5,842.1	5,634.3	-207.8
Nonfarm Government Employees	965.7	926.7	-39.0
Household Measure of Total Nonfarm Employees: Nonfarm Private and Government Employees Plus Incorporated Nonfarm Self-Employed ^b	7,040.0	6,758.7	-281.3
Establishment Measure of Total Nonfarm Employment (Annual Average)	6,576.5	5,995.1	-581.4
Differences between Household and Establishment Totals:			
Household Total Employed Minus Establishment Total	1,039.7	1,385.6	345.9
—As % of Establishment Total	15.8	23.1	n.r.
Nonfarm Paid Employment Minus Establishment Total	907.6	1,280.3	372.7
—As % of Establishment Total	13.8	21.4	n.r.
Nonfarm Paid Employees Minus Establishment Total	463.5	763.6	300.1
—As % of Establishment Total	7.0	12.7	n.r.

^aEmployed at least part of the year, as reported in the Current Population Survey of the subsequent March (household series).

^bThe establishment series (U.S. Bureau of Labor Statistics) includes the incorporated self-employed as employees of establishments. Hence this measure is the closest, definitionally, to the establishment data.

n.r. = not relevant.

Source: U.S. Bureau of the Census and U.S. Bureau of Labor Statistics.

components of the household-based measure of employment, comparing several subsets with the establishment series totals. With no adjustments, the household measure of all employed individuals was 16 percent larger than the (and fisheries) from the household measure reduces the discrepancies to 14 and 21 percent. The gaps are reduced

survey but one employed individual in the household survey. A further source of difference is that both series are based on samples, one of households and one of establishments. The establishment survey includes nearly all the large establishments in the region; of necessity, a smaller fraction of small firms is used to represent that universe.

even further, to 7 and 13 percent, by dropping the unincorporated self-employed from the household total.

While the differences in employment counts in the two years are thus about half explained by these known differences in definition, the measured employment losses remain much smaller according to the household series (even the most comparable measure) than the establishment series. Thus, the different treatment of self-employed individuals, farm workers, and those working without pay contributes to the discrepancy between the two employment measures, but these factors do not explain it. The bulk of the difference between the two measures of loss must be attributable to inconsistencies between the two series, including sampling techniques and misreporting by employers or individuals.

Table B-1

New England Employment by Gender, Race, Age, and Educational Attainment

Percent

	Demographic Mix in 1988		Demographic Mix in 1992		Self-Employment as Percent of Total Employment	
	Employees ^a	Self- Employed	Employees ^a	Self- Employed	1988	1992
Male	51.5	70.5	51.9	72.1	8.4	10.0
Female	48.5	29.5	48.1	27.9	3.9	4.4
White	94.4	96.0	94.7	97.4	6.4	7.6
Black	3.8	2.1	3.5	1.3	3.5	3.0
Other Minority ^b	1.8	1.9	1.9	1.3	6.9	5.2
Age 15 to 24	20.0	5.0	16.9	3.9	1.7	1.8
Age 25 to 44	51.0	52.1	53.3	53.5	6.4	7.5
Age 45 to 64	25.2	32.4	26.5	37.4	7.9	10.2
Age 65 and Up	3.7	10.5	3.3	5.3	16.0	11.2
Less than 12th Grade ^c	14.5	12.0	10.9	8.9	5.3	6.2
12th Grade or H.S. Graduate ^c	36.5	36.5	33.7	34.1	6.3	7.5
At Least Some College ^c	49.0	51.5	55.4	57.0	6.6	7.6
Total	100.0	100.0	100.0	100.0	6.3	7.4

Note: Data refer to respondent's longest job in calendar year preceding survey date.

^aPrivate and government employees and incorporated self-employed.

^bAmerican Indians, Alaskan Eskimos, Asians, Pacific Islanders, and other (nonblack) minorities.

^cEducational attainment definitions changed for the March 1993 survey, so 1988 and 1992 data are not strictly comparable.

Source: See text Table 1.

Appendix B The Demographic Characteristics of the Self-Employed

Table B-1 takes another cut at describing the self-nonfarm establishment measure in 1988 and 23 percent larger in 1992. Dropping individuals working without pay and workers associated with farming (agriculture, forestry, employed, summarizing their personal characteristics rather than the characteristics of their jobs (as was done in text Tables 2 through 5). In general, the self-employed in New England were more likely to be male and white than were employees; and the self-employed were also typically somewhat older and more educated than employees. The self-employed in the United States also show a higher fraction male, white, age 25 and older, and with at least some college than U.S. employees (data not shown).

In New England, these four compositional differences between the self-employed and other employees became more pronounced between 1988 and 1992. U.S. self-employment data also show a 1988-92 shift toward men and toward greater age and education, but away from whites.²⁶

²⁶ Other researchers (Devine 1993, 1994; Aronson 1991) have found a long-term shift in the composition of U.S. self-employment toward women and some minorities. That research, however, does not specifically track the recession period. As the text notes, the male percentage of the self-employed in the United States rose between 1988 and 1992 (as in New England, but counter to the long-term U.S. trend), while the white percentage fell slightly (unlike what occurred in New England, but in line with the long-term U.S. trend).

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