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The natural rate of unemployment is a key concept in modern macroeconomics. Its use originated with Milton Friedman's 1968 Presidential Address to the American Economic Association in which he argued that there is no long-run trade-off between inflation and unemployment: As the economy adjusts to any average rate of inflation, unemployment returns to its "natural" rate. Higher inflation brings no benefit in terms of lower average unemployment, nor does lower inflation involve any cost in terms of higher average unemployment. Instead, the microeconomic structure of labor markets and household and firm decisions affecting labor supply and demand determine the natural rate of unemployment. If monetary policy cannot affect the natural rate, then its appropriate role is to control inflation and, in the short run, help stabilize the economy around the natural rate. Doing so would be consistent with maintaining low and stable inflation.

A second important unemployment rate is the "Non-Accelerating Inflation Rate of Unemployment," or NAIRU. This is the unemployment rate consistent with maintaining stable inflation. According to the standard macroeconomic theory enshrined in most undergraduate textbooks, inflation will tend to rise if the unemployment rate falls below the natural rate. Conversely, when the unemployment rate rises above the natural rate, inflation tends to fall. Thus, the natural rate and the NAIRU are often viewed as two names for the same thing, providing an important benchmark for gauging the state of the business cycle, the outlook for future inflation, and the appropriate stance of monetary policy.

The overall unemployment rate in the U.S. has hovered around 4.5% of the labor force so far this year. Much of the current debate over the stance of monetary policy can be expressed in terms of a comparison between this historically low rate and the NAIRU. If the NAIRU is above 4.5%, then monetary policy may need to act to slow the economy to prevent a future rise in inflation; if it is below

4.5%, then such a policy would be unnecessary. Economists debate whether the natural rate has fallen in recent years, and some argue that the whole concept of the natural rate, or the NAIRU, is not useful in formulating monetary policy, an argument critically discussed by Judd (1997). In this *Economic Letter*, the factors that influence these two unemployment rates and their role in the formulation of monetary policy are discussed.

Is the natural rate the same thing as the NAIRU?

No. While the two are often viewed as synonymous, Estrella and Mishkin (1998) argue that it is important to distinguish them. The natural rate is the unemployment rate that would be observed once short-run cyclical factors have played themselves out. Because wages and prices adjust sluggishly, the natural rate can be viewed as the unemployment rate when wages have had time to adjust to balance labor demand and supply. It depends on structural factors characterizing the labor market and is generally assumed to change slowly over time. Since cyclical factors can take significant time to work themselves out, however, the natural rate may be less useful for policymakers concerned about the outlook for inflation over the next year or two.

The NAIRU, in Estrella and Mishkin's view, should be interpreted as the unemployment rate consistent with steady inflation in the near term, say, over the next 12 months. The level of unemployment consistent with a steady inflation rate over such a time horizon can change significantly. For example, if weather conditions push up food prices, the level of unemployment consistent with a steady Consumer Price Index (CPI) inflation rate would increase, representing an increase in the short-run NAIRU. An increase in productivity that puts downward pressures on prices would lower the short-run NAIRU. Hence, the level of unemployment in the absence of cyclical factors need not be the same as the rate consistent with steady inflation in the short-run, and the short-run NAIRU will fluctuate much more than the natural rate.

Is the natural rate still 6%?

The average long-run unemployment rate measured since 1961 is 6.09%, and during the 1980s and early 1990s, most economists placed the natural rate quite near that, in the 6-6.5% range. But attempts to measure the natural rate precisely are problematic, since we cannot observe it directly. For example, Staiger, Stock, and Watson (1997) based a measure of the natural rate for 1994:Q1 on the CPI measure of inflation, and found a 95% probability that it was between 3.9% and 7.6%! Using a measure of core CPI inflation, this interval narrowed to 4.5% to 6.9%, still wide enough to raise questions about its usefulness in policy discussions.

Figure 1 shows two additional estimates of the natural rate, together with the actual total civilian unemployment rate and the long-run average rate. The estimate labeled Natural Rate 1 is obtained by removing an estimate of short-run cyclical unemployment from the actual rate. This estimate assumes that any persistent change in actual unemployment is associated with a change in the natural rate. The estimate labeled Natural Rate 2 was constructed by Stuart Weiner (1993), who combined evidence on the relationship between unemployment and inflation with a disaggregated approach that accounts for shifts in the composition of the labor force between different age/gender groups. Although these estimates are quite different from point to point, they do seem to move together broadly.

What causes the natural rate to change?

It would seem obvious to answer this question by looking at the factors affecting labor supply and demand, since the natural rate is the unemployment rate when wages have adjusted to balance labor demand and labor supply. But the labor market is not one homogeneous mass of workers, so one should think of wages adjusting to balance demand and supply in the segmented markets for skilled workers, for unskilled workers, for teenagers, for adults, and so forth. The overall natural rate of unemployment will then be affected by changes in the demand or supply in these different segments of the overall labor

market and by changes in the composition of the aggregate labor force.

Several major changes in recent decades have affected labor supply and demand. Perhaps the biggest changes have been on the supply side, associated with the baby boom generation and the entry of increasing numbers of women into the workforce. New entrants to the labor force typically experience high unemployment rates as they search for jobs, change jobs frequently, and shift between school and other non-labor force activities. If the fraction of young workers in the labor force rises, the natural rate of unemployment rises, and this is exactly what happened during the late 1960s and early 1970s (Figure 1) as the baby-boomers entered the labor force. As the baby boomers aged, the natural rate fell, reflecting the fact that older workers tend to have lower natural rates of unemployment. Similarly, the increased participation of women in the labor force initially acted to increase the natural rate, as women historically tended to experience higher unemployment rates than men. In the 1990s, however, male and female unemployment rates have been more similar so that the changing gender composition of the labor force now has little effect on the overall natural rate.

Some economists argued earlier in the 1990s that demand factors were pushing the natural rate up. Declines in the demand for unskilled and low-skilled workers lowered wages for these workers and appeared to increase unemployment, at least among men. Since these changes were not associated with the business cycle, but seemed to reflect more fundamental changes in the skills employers were demanding, the natural rate increased.

More recently, a number of hypotheses have been put forward to explain why the natural rate has fallen. Some of the factors cited are really more likely to have affected the short-run NAIRU than the natural rate. For example, one possible factor is the increased duration of unemployment; workers experiencing long spells of unemployment may act to moderate wage demands, lowering the rate of inflation associated with a given unemployment rate. Another possible factor is increased worker perceptions of job insecurity, perhaps arising from rapid technological changes, which may have acted to moderate wage increases. Finally, increased global competition may have allowed the U.S. to experience lower unemployment without inflation rising.

The role of the natural rate and NAIRU in policy

Currently, the total civilian unemployment rate in the U.S. stands at 4.5%, the lowest level in 25 years. Almost all commentators believe this is below the level of the natural rate. But is it below the short-run NAIRU? If it is, the U.S. should be facing growing inflationary pressures. Yet there is a real debate as to whether inflationary risks are present. Does this mean the natural rate and the NAIRU are not useful concepts? Economists are divided on this question.

As the terms have been used here, the natural rate evolves over time in response to fundamental shifts in labor demand and supply. It represents the economy's sustainable unemployment rate when wages and prices have had sufficient time to adjust to demand and supply pressures. Its role in monetary policy is twofold. First, it provides a reminder that the economy's average unemployment rate does not depend on average inflation and cannot be lowered through inflationary monetary policy. Instead, microeconomic policies directed at the labor market, not policies that affect overall aggregate spending, are the appropriate tools for affecting the natural rate. Second, it serves as the appropriate benchmark if stabilization objectives are a goal of monetary policy. Monetary policy cannot stabilize unemployment around any arbitrary level, but it may help reduce fluctuations of unemployment around the natural rate.

The short-run NAIRU can play a more direct role in the conduct of policy. If the NAIRU helps forecast future inflation, then it can be particularly important in an inflation targeting policy. Unfortunately, the variability of the short-run NAIRU makes it less suitable as a benchmark for explaining policy actions to the public. Basing policy on something that is not directly measured, that changes frequently, and that

is difficult to estimate limits the transparency of policy and makes it more difficult for the public to assess monetary policy.

The NAIRU has been subject to much criticism, yet it continues to appear in policy discussions. In part, this reflects the failure of alternative simple guides to monetary policy. At one time, many argued that growth rates of the monetary aggregates provided useful guides for conducting monetary policy, but in the 1980s, the relationship between monetary aggregates, inflation, and economic activity appeared to break down, reducing their role in policy discussion. Until a clearly superior guide that can help to forecast future inflation comes along, the NAIRU is likely to continue to figure prominently in discussions of monetary policy.

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