

NAIRU: Dangerous Dogma at the Fed

BY DEAN BAKER

The Full Employment and Balanced Growth Act of 1978 established two goals to guide the Federal Reserve's conduct of monetary policy: price stability and full employment, defined by the Act as four percent unemployment. While the central bank has diligently pursued the first goal, it has often given the second part of its mission short shrift. Indeed, past Fed policymakers have publicly labeled four percent unemployment unobtainable for practical purposes.

Instead of their statutory mandate, these central bankers sought guidance from the so-called non-accelerating inflation rate of unemployment, or NAIRU. Proponents of the NAIRU doctrine claim that some fixed level of unemployment exists that will yield a stable rate of inflation. If the actual unemployment rate surpasses this level, they say, the inflation rate will decline. If unemployment drops below this level, inflation will increase. Most economic research over the last two decades placed the NAIRU between 5.8 and 6.6 percent.

The operating differences between a legal target of four percent unemployment and a NAIRU target matter tremendously for the economy and the public. If the Federal Reserve believes that the NAIRU stands at six percent, it alone has the power to enforce its belief by adjusting interest rates to slow economic activity, raise unemployment to this level and frustrate countervailing efforts to increase aggregate employment. Specific actions and policies by citizens or government may have the effect of redistributing unemployment

among various groups. But if the Federal Reserve is committed to steering the economy above its presumed NAIRU, the overall unemployment rate will not fall below the central bank's target level.

This paper examines the logic of the NAIRU doctrine and describes the process through which the theory came to dominate thinking in the economics profession and shape the conduct of monetary policy. The paper also chronicles the challenge that America's recent economic performance poses for accepted estimates of the NAIRU and offers a set of general recommendations for Fed policymakers in the future.

THE BASICS OF THE NAIRU

For many years, the notion of a fixed trade-off between the rate of unemployment and the rate of inflation generally held sway among economists (Tobin, 1972; Lipsey, 1960). According to this view, a low rate of unemployment fosters price pressures that result in a predictable uptick in inflation. By contrast, the NAIRU model allows for no trade-off. Rather, it foresees inflation

accelerating indefinitely if unemployment continues to fall below the NAIRU.

The distinction is crucial for analytical as well as policymaking purposes. If a fixed trade-off exists between inflation and unemployment, then one may reasonably compare the gains associated with a specific reduction in the unem-

These nuances aside, the main implication of NAIRU theory is that consistently sub-NAIRU levels of unemployment will produce unacceptable levels of price instability. The theory's cold consolation is that inflation need not rise indefinitely as long as society's level of joblessness eventually returns to the NAIRU.

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ployment rate with the resulting cost in terms of higher inflation. However, the NAIRU view precludes this comparison by insisting that the cost of any unemployment rate consistently below the NAIRU is continually rising inflation. Even though this cost may initially seem tolerable, inflation eventually will rise to a level that threatens economic stability and efficiency if the unemployment rate remains below NAIRU.

As a theoretical construct, the NAIRU has always contained some built-in uncertainties. Even proponents have acknowledged the difficulty of determining the non-accelerating rate with precision. Moreover, the idea of a NAIRU does not presuppose wildfire increases in inflation at comparatively low levels of unemployment. Contrary to the rhetoric of past policy debates, most NAIRU models agree that allowing unemployment to fall below the prescribed level does *not* cause inflation to explode instantly. Indeed, virtually all research on the topic suggests that if joblessness drops below the NAIRU for a short period of time, the impact on inflation will be small.¹

CONCEPTUAL FOUNDATIONS I: THE NATURAL RATE AND THE NAIRU

The conceptual foundations of a NAIRU trace back to the late 1960s, when Milton Friedman and Edmund Phelps both published articles that elaborated on the concept of a natural rate of unemployment – the level of joblessness that would exist if everyone who was willing to work at a wage equal to his or her marginal productivity had a job (Friedman, 1968; Phelps, 1967). This notion essentially corresponds to full employment in the sense that everyone who wants a job would have one at the wage his or her skills command. The ranks of the unemployed would include only those individuals who voluntarily decided they were unwilling to work at the wages they could get in the market.

To construct a NAIRU atop this concept, Friedman and Phelps assumed that increasing inflation could fool workers into thinking their pay buys more goods and services than it actually does. Suppose, for example, a worker's skills command \$10 an hour in the market. At this wage, the worker decides that he or she would

rather stay home with the kids. Now suppose the inflation rate suddenly jumps from zero to two percent. Recognizing that all prices in the economy have risen by two percent (including the price of the goods it produces), a firm willingly offers an additional 20 cents an hour to this worker. As a result of this “higher” offer, the worker accepts a job at \$10.20 per hour. Spread across the entire economy, Friedman and Phelps argued, this inflationary dynamic reduces the number of unemployed people.

Initially, continued the economists, two percent inflation might be sufficient to trick individuals into working for a lower real wage than they consider acceptable. But after a period of time, workers would anticipate inflation averaging two percent and incorporate this expectation into their wage demands. In order to fool them again, the inflation rate must rise again. In other words, reducing unemployment below its “natural” level requires ever-higher rates of inflation.

The natural rate concept provides a coherent theoretical explanation why inflation must necessarily accelerate to keep the unemployment rate below the NAIRU. However, it does not fit well with evidence about wage and quit rates over the business cycle. Nor does it square with most people’s sense of the nature of unemployment.

First, the natural rate theory implies that real-wage trends should move in countercyclical fashion. If labor market dynamics reflected the natural rate hypothesis, inflation-adjusted wages would reach low ebb at the peak of the business cycle – i.e. when the unemployment rate is low because more and more workers have been successfully tricked. Conversely, real wages would peak at the lowest point of a cyclical downturn when workers are no longer being fooled. However, most studies have found real wages to be procyclical or acyclical (demonstrating no regular movement) over the course of the business cycle (Barsky and Solon, 1989). Quit rates also belie the natural rate

theory. They generally reach their peak when the unemployment rate falls and decline sharply when the economy moves into a downturn (Okun, 1981). In other words, rising unemployment rates do not seem attributable to workers voluntarily leaving their jobs.

The cyclical nature of wage trends and quit rates underscore a central problem with the natural rate concept: most people don’t think of unemployment as voluntary. The natural rate model suggests that laid-off workers are actually happier when the unemployment rate increases, eliminating their job and the deceptively low paycheck that goes with it. In reality, of course, most people view unemployment as a catastrophic event for those who experience it. The gulf between theory and evidence explains why few economists still adhere to the natural rate view of the NAIRU, its internal consistency notwithstanding.

CONCEPTUAL FOUNDATIONS II: THE NEO-KEYNESIAN NAIRU

In the 1980s, a group of mainstream economists developed an alternative explanation for the NAIRU that seemed to line up more persuasively with the evidence and with intuitive insights into unemployment. Like Keynes, this group of economists believed that individuals could be involuntarily unemployed as a result of the normal workings of the market.

The numerous variations on the neo-Keynesian NAIRU model share a common theme: at lower levels of unemployment, upward pressure on wages emerges and is passed on in the form of higher prices.² A simple bargaining-power story furnishes one straightforward illustration of this central theme. If the unemployment rate is extremely high, a firm can offer jobs at a very low wage and see if jobless workers are willing to accept them. At these high levels of

joblessness, workers lack bargaining power and their wage gains likely will trail inflation – which in turn slows the rate of price increases. If the unemployment rate falls, however, workers develop the leverage to demand and receive higher pay, placing upward pressure on prices. The switch point in this formulation, the level of unemployment where the rate of inflation remains stable, is the NAIRU.

This explanation has much more intuitive appeal than the natural rate perspective. For one thing, it accords with the actual movement of real wages and quit patterns over the business cycle. It also makes more sense that unemployed workers are suffering in some way, not opting for leisure because real wages are somewhat lower than they desire. But as a foundation for the NAIRU, the neo-Keynesian model lacks a crucial explanatory link.

Unlike natural-rate proponents, neo-Keynesians did not posit a real wage below which individuals would refuse to work and above which companies would refuse to hire. Rather, they assumed that: a) most workers would prefer continued work at lower real wages to layoffs; and b) presented with a favorable bargaining position, workers would push for higher pay. These assumptions describe a process that could plausibly lead to upward pressure on wages and prices at lower rates of unemployment. But the existence of such pressure doesn't mean inflation must necessarily accelerate if the unemployment rate dips below the NAIRU. Indeed, several different channels could absorb the growing wage increases that result from lower unemployment.

First, increases in productivity growth could check wage-driven inflation. Productivity growth tends to rise when unemployment rates fall, because a burgeoning economy generates increased demand that allows workers' time to be more fully utilized. This is especially true in manufacturing industries, which typically involve

a significant amount of overhead labor associated with engineering, management, sales, and maintenance. When output increases in response to swelling demand, manufacturing firms need not expand this overhead labor proportionately, so output per worker rises.

Falling unemployment rates also boost productivity by changing the dynamics of the workplace. If workers are hard to replace, firms have substantial incentives to train existing employees to ensure their productivity and to retain highly valued individuals by offering opportunities to develop new skills. In addition, low levels of unemployment often mean the least productive, lowest paying jobs go unfilled. Convenience stores unable to fill the night shift may close at midnight. Or restaurants may give up trying to hire valets to park cars. As the overall mix of jobs shifts towards more productive occupations, average productivity rises on an economy-wide basis.

The extent to which these factors drive productivity increases is unknown. And some phenomena associated with low unemployment (such as increased turnover) probably reduce productivity. But while the net effects of diminishing unemployment on productivity may be difficult to pinpoint – and may differ depending on historical circumstances – it still seems clear that productivity effects could offset some of the inflationary impact of higher wages.

Wage-driven inflationary pressures also may be offset by the tendency of wage growth to move in different patterns for different groups of workers. Throughout the period 1979-1996, wage gains dramatically trended away from low- and middle-income workers toward those at the top end of the pay scale (Mishel, Bernstein, and Schmitt, 1999). But as unemployment has dropped in recent years, this redistribution has slowed, underscoring the possibility that lower-paid workers have benefited more than others

from the low unemployment rates of the late 1990s (Galbraith, 1998; Bernstein, 2000). If so, higher-paid workers haven't seen their compensation rolled back. Instead, they've simply realized smaller increases than they would if low-wage workers didn't gain as much.

Similarly, rising wages also could come at the expense of corporate profits. Over the course of the 1990s business cycle, economic gains shifted from wages to profits as the capital share (profits plus interest) of corporate income rose from 18.8 percent at the profit peak of the previous business cycle (1988) to 21.3 percent at the 1990s peak in 1997 (Bureau of Economic Analysis, 2000). This large increase shows that wage and profit shares are not fixed. It also suggests

they generally do. But large gaps have frequently occurred between real wage growth and productivity increases. These gaps may recur because workers possess only limited knowledge of inflation and productivity growth rates at a given point in time. More important, as economists at least as far back as Keynes have observed, workers may care more about relative than real wages. Thus, even if employers decide to pass along higher wages in the form of higher prices, their actions may not lead to an upward wage-price spiral. Instead, workers may accept real pay increases that lag the growth in productivity.

All these dynamics underscore a simple point: once the natural-rate foundation is aban-

Lower unemployment clearly positions workers to get larger pay increases. But numerous factors can offset such increases. One may accept that lower rates of unemployment lead to higher wage growth without adopting the NAIRU postulate that consistently low unemployment inevitably generates an accelerating wage-price spiral.

that what goes up can come back down. Wage gains can displace corporate earnings just as readily as they can be passed on in the form of higher prices. Because they receive such a small share of national income, low- and middle-income workers could enjoy more rapid wage growth at relatively little cost to corporate profits or to better-paid workers.³

Indeed, in the real world, workers don't necessarily receive the same real wage increase each year at any given level of unemployment. In principle, real wages should keep pace with productivity growth – and over the long haul

done, no compelling link remains between sub-NAIRU unemployment rates and rising inflation. Lower unemployment clearly positions workers to get larger pay increases. But numerous factors can offset such increases. One may accept that lower rates of unemployment lead to higher wage growth without adopting the NAIRU postulate that consistently low unemployment inevitably generates an accelerating wage-price spiral. Despite its shaky premises, however, the neo-Keynesian NAIRU assumed a preeminent place in economic thought during the 1980s and 1990s.

THE HEYDAY OF THE NAIRU

In the late 1970s, Americans witnessed the unraveling of a formidable consensus that had informed postwar macropolicy. During the preceding decade, the U.S. experienced much higher inflation than in previous years and also higher rates of unemployment. These developments severely discredited the once-widespread belief in a fixed trade-off between inflation and unemployment. If such a trade-off actually existed, its terms had clearly gotten considerably harsher in the 1970s.

At first, proponents of the NAIRU could claim a fairly convincing alternative explanation of these economic patterns. Numerous studies of the relationship between prices and employment found seemingly solid statistical support for a NAIRU interpretation of low unemployment leading to increased rates of inflation (Weiner, 1994; Congressional Budget Office, 1994; Gordon, 1982).⁴ In hindsight, however, this empirical evidence was not as compelling as it first appeared.

Close inspection revealed that the statistical foundation for the NAIRU rested on just four instances when low rates of unemployment ap-

In the late 1960s, for example, the U.S. was using more than two percent of its GDP to fight the Vietnam War. Had these resources not gone to the military, they would have accommodated real wage increases of close to three percent, thus alleviating some inflationary pressure. In the 1970s, OPEC's decision to hike oil prices fueled a surge in inflation. And in the late 1980s, the dollar fell by more than 30 percent against other major currencies. This depreciation boosted the price of imports, which accounted for a major share of the era's inflationary uptick.⁵

Despite its omission of these events, economists came to embrace the NAIRU doctrine with near-universal acceptance,⁶ dismissing skeptics as dishonest or ill informed. In an article entitled "Voodoo Revisited," the distinguished economist Paul Krugman compared people who challenged the NAIRU theory to scientists who disputed evidence of damage to earth's ozone layer. Like honest scientists who recognized the undeniable danger to the ozone layer, said Krugman, serious economists were rightly offended by the "political reopening of what they regarded as a settled

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peared to be pushing inflation higher: the late 1960s, the early 1970s, the late 1970s and the late 1980s. But in each of these periods, factors unrelated to the labor market played a role in ratcheting up inflation. And in each case, the standard NAIRU models omitted these factors.

issue" (Krugman, 1995). Written on the threshold of the sustained low unemployment of the late 1990s, Krugman's article not only typified mainstream economic opinion but also crystallized the governing precept behind monetary policy.⁷

NAIRU AT THE FED

At the Federal Reserve, the NAIRU theory gradually ascended to dominant status after the central bank's brief flirtation with monetarism. At the beginning of the 1980s, the Fed claimed to be applying a predetermined growth rule to the money supply, regardless of its impact on interest rates or the economy. This monetarist policy had the desired effect of bringing down inflation, which fell from 11.2 percent in 1980 to 4.2 percent in 1983. But it also threw the U.S. into its worst recession of the postwar period, as unemployment soared to nearly eleven percent in 1982.

The high short-term interest rates that resulted from the Fed's tightening also put enormous strains on the nation's financial system. Despite the deregulation of interest rates on bank accounts, depository institutions struggled to attract deposits. And a significant portion of the thrift industry teetered on the edge of insolvency. Faced with the possibility of a financial meltdown, the central bank eased its strict monetary rule in the second half of 1982.

That move provided space for the economy to recover, as the combined stimulus from President Reagan's tax cuts and military build-up eventually blossomed into a full-fledged expansion in 1984. Economic growth continued throughout the rest of the decade and unemployment gradually drifted down to more normal levels. By March 1989, the unemployment rate reached five percent, its low point for the decade.

During this period, the Fed substantially revised its approach to policymaking. Records of Federal Open Market Committee meetings in the early 1980s are full of references to surprising and unexplained movements in all three standard measures of the money supply.⁸ Within the FOMC, bewilderment progressively gave way to a conviction that rigidly tying monetary policy to any of these measures would prove disastrous.

Without fanfare, the Federal Reserve abandoned its stated commitment to monetarism's fixed rule and moved toward a more discretionary policy regime that focused on immediate trends in inflation, economic growth and employment.

The declining value of the dollar ensured that rising inflation would become one reference point for Fed policy in the late 1980s. Between 1986 and early 1990, the core rate of inflation – which excludes erratic movements in food and energy prices – rose from less than four percent to over five percent. As the rate of inflation inched up, the central bank moved to slow the economy by raising the federal funds rate – the Fed-controlled interbank borrowing rate that benchmarks all short-term lending. Between the fourth quarter of 1987 and the first quarter of 1989, the central bank bumped up the funds rate from just under seven percent to nearly ten percent.⁹

Inflation alone, however, did not explain the Fed's actions. Members of the Open Market Committee viewed the declining unemployment rate – then moving below six percent – as a signal of the economy reaching its potential level of output. Any further drop, they reasoned, would lead to accelerating inflation. In February 1989, Fed Chairman Alan Greenspan made this point in reasonably straightforward language to the Senate Banking Committee:

As a result of the robust expansion in the last few years, the U.S. economy has absorbed much of its unused labor and capital resources. No one can say precisely which level of resource utilization marks the dividing lines between accelerating and decelerating prices. However, the evidence – in the form of direct measures of prices and wages – is clear that we are now in the vicinity of that line.

Records of its meetings clearly show that the Open Market Committee believed the economy was operating near or above its capacity. In minutes of its October 1989 meeting, for

example, the FOMC asserted, “with margins of unutilized labor and other production resources still low, the underlying trend in inflation was not expected to show much improvement” (Board of Governors, 1989, page 7). Noting an undiminished rate of wage growth, the July 1990 minutes commented, “the latest data on wages suggest no improvement in underlying trends” (Board of Governors, 1990, page 4).

At that point, the economy had already begun to sink into a recession, largely as a result of the central bank’s previous decisions to hike interest rates. Moreover, despite the Fed’s concerns about excessive wage growth, average hourly pay wasn’t keeping pace with the rate of inflation. Between January 1989 and the onset of recession in July 1990, real wages declined by 1.1 percent.¹⁰

The 1990-91 recession eventually pushed the unemployment rate to 7.7 percent, safely above anyone’s estimate of the NAIRU. And high unemployment seemed to have the anticipated effect of slowing inflation. Discounting the impact of Gulf War-related hikes in oil prices, the underlying rate of inflation averaged just over four percent prior to the recession. After two-and-a-half years of high unemployment, the core inflation rate fell to just over three percent.

GREENSPAN AND NAIRU IN THE 1990S

While several different rationales could plausibly explain Federal Reserve actions in the late 1980s, the NAIRU doctrine clearly emerged as the lodestar of central bank policy in the early and mid-1990s. To spur recovery from the 1990-91 recession, the Fed undertook a long series of interest rate cuts that by yearend 1992 whittled the federal funds rate to three percent – approximately the same as the rate of inflation. The Fed allowed the funds rate to remain at this level until

February of 1994, when it reversed direction and initiated a tightening that doubled the funds rate over the course of 14 months.

Did powerful evidence of actual or incipient inflation trigger the Fed’s dramatic change of direction? Hardly. In 1994, the core rate of inflation dipped to 2.6 percent, down from 3.2 percent in 1993 and 3.3 percent in 1992. Indeed, as the Fed continued hiking rates during the second half of 1994, the annualized core rate of inflation registered less than 2.2 percent. Nor did earlier stages of the production process reveal signs of accelerating price movement. The core finished goods index rose at a 1.6 percent annual rate in 1994 – up from an extraordinarily low 0.4 percent rate in 1993, but below the 2.0 and 3.1 percent rates for 1992 and 1991, respectively.

At the onset of the 1994-1995 tightening, Chairman Greenspan told Congress that the Fed would not “force-feed the economy beyond its potential,” lest inflation take flight (Greenspan, 1994, page 10). Apparently satisfied that economic growth had reached its outer limits, Greenspan asserted that with the three percent growth rate projected for 1994, “a further edging down of the unemployment rate from its January reading [of 6.7 percent] is viewed as a distinct possibility” (Greenspan, 1994, page 10). Though willing to countenance a slight drop in this number, Greenspan clearly indicated that the prevailing unemployment rate came close to the NAIRU and did not warrant substantial reduction.

Not all members of the Federal Open Market Committee accepted their chairman’s view on the particulars. But the entire committee seemed to agree that the economy had a NAIRU and that the number provided them a policymaking touchstone. Though a relatively dovish thinker, Boston Fed President Cathy Minehan based her upbeat assessment of sustainable growth levels on the fact that “our projections of the NAIRU are at the low end of the range that seems to be used by

Board staff” (Board of Governors, 1994, page 19). Governor Lawrence Lindsey raised the possibility, suggested by economist James Medoff, that the NAIRU could be as low as 5.5 percent (Board of Governors, 1994, page 29) – significantly lower than the then-prevailing unemployment rate of 6.4 percent, but a NAIRU nonetheless.

Minutes and transcripts of Open Market Committee meetings for 1994 and 1995 contain numerous references to “tight” labor markets and an economy that has reached or exceeded its sustainable potential.¹¹ When the central bank finally began to ease in the second half of 1995, the unemployment rate stood at 5.6 percent. FOMC records indicate that Committee members didn’t intend the joblessness rate to fall further. They just didn’t want it to rise too much.¹²

unemployment rate continued to fall. By yearend 1994, the joblessness rate registered 5.4 percent, well below anyone’s measure of the NAIRU.

CRASHING THROUGH THE NAIRU

In the wake of growing criticism by citizens and elected officials – and faced with evidence that consistently clashed with the NAIRU formulation – Fed policymakers continued to ease modestly. The central bank lowered its federal funds rate in a series of one-quarter percentage point increments in July 1995, December 1995 and February 1996. For the remainder of the presidential election year, the Fed kept monetary policy on hold.

During this period, the unemployment rate never topped 5.7 percent. And inflation remained

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Throughout this period, however, unemployment and inflation data cast profound doubt on the NAIRU theory. In 1994, wage growth barely kept pace with inflation. During the year, the employment cost index (ECI) rose by only 3.1 percent – less than the 3.6 percent growth rate in 1993 and 3.5 percent rate in 1992. Workers were receiving modest real wage gains but those gains trailed the rate of productivity growth. A tight labor market had led neither to rising wage pressures nor accelerating prices. Meanwhile, the

quiescent. In 1995, the core rate of inflation in the CPI was 3.0 percent, virtually duplicating its year-before performance. The rate of wage growth actually slowed somewhat, with average hourly wages increasing by 2.2 percent and the ECI rising just 2.6 percent.

What accounted for the Fed’s apparent change of direction in 1995-1996? Part of the answer may lie in NAIRU theorists’ acknowledgment that inflation accelerates very gradually at sub-NAIRU levels of unemployment. Simply put,

the potential inflationary cost of allowing unemployment to fall was (and is) relatively small and controllable.

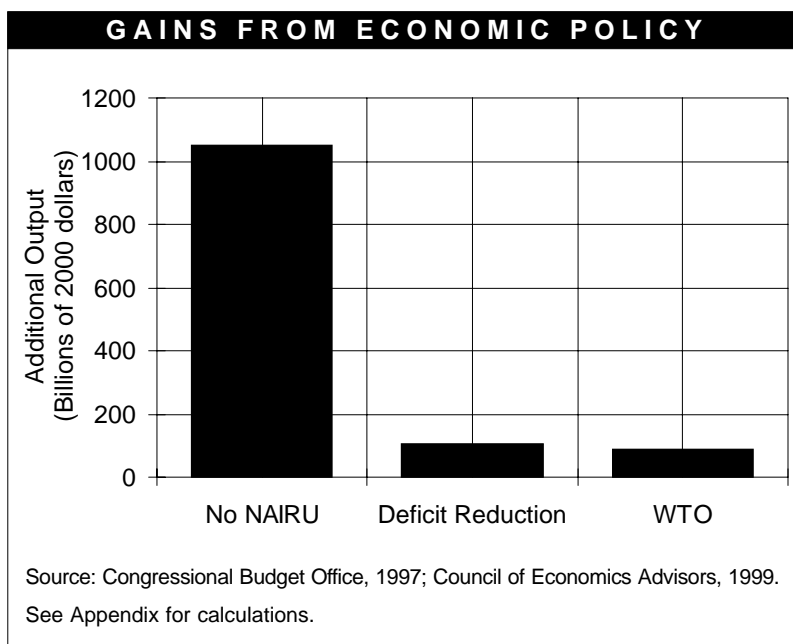
If the reasons behind the Fed’s actions remain shrouded in central bank secrecy, the experience of the last six years has unambiguously repudiated the NAIRU – at least insofar as an economic theory may ever be disproved with evidence. Die-hard adherents simply proclaim the NAIRU a moving target that has shifted, due to other changes in the economy. But none of these advocates has explained convincingly why previous consensus estimates of the NAIRU went so far awry. In a September 2000 survey conducted for Dallas Federal Reserve Bank President Robert McTeer, 57 percent of National Association of Business Economics respondents labeled NAIRU “useless” or “of very limited use.” McTeer himself asked, “what good is a NAIRU if it won’t hold still?”

Prior to 1994, the range of estimates of the NAIRU ran from 5.8 percent to 6.6 percent. Since midyear 1994, the unemployment rate has remained consistently below the bottom end of this range. Since July 1997, the unemployment rate has stayed below 5.0 percent – including an ongoing run of sub-4.5 percent joblessness that began in November 1998. During this period, the inflation rate actually declined somewhat. In 1993 the core rate of inflation in the CPI was 3.2 percent, the core finished goods index increased by 0.4 percent and the GDP deflator nosed up by 2.7 percent. In 1999, the same indices rose by 1.9 percent, 0.9 percent and 1.4 percent, respectively. In short, a sustained run of sub-NAIRU unemployment rates accompanied a modest decline in most

measures of inflation throughout the second half of the 1990s.

It would be difficult to overestimate the economic and social benefits of this long period of low unemployment or the enormous costs the Fed would have exacted by adhering slavishly to the NAIRU doctrine. At the most general level, sub-NAIRU levels of unemployment have allowed for much more economic output since 1994. According to Okun’s Law – a rule of thumb that associates a one percentage point drop in the unemployment rate with a two percentage point increase in GDP – the domestic economy realized more than \$1.05 trillion of additional output that would have been forgone had the Fed held the unemployment rate above six percent between 1994-2000.¹³

This enormous sum equals about \$8,000 for every household in the country, or more than \$3,500 per person. No other economic policy can plausibly produce gains on the same order of magnitude. For example, conventional projections of the economic impact of deficit reduction are not even one-tenth as large (CBO, 1997). Likewise, optimistic estimates of the gains from a major trade agreement, such as the Uruguay round



of GATT, would be smaller by a factor of ten (Council of Economic Advisors, 1999).

Okun's Law also implies that an additional six million people obtained jobs between 1994-2000 because the Fed allowed the unemployment

agers. It would be difficult, if not impossible, to imagine a government social program that yielded employment gains on the same scale for these demographic groups.

In addition, considerable evidence suggests

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rate to fall below old estimates of the NAIRU. Even more important, low unemployment disproportionately benefits the worst-off in society – poor people, the least-educated, racial and ethnic minorities. Between August 1994 (when the national unemployment rate stood at six percent) and April 2000 (when the national unemployment rate had dropped to 3.9 percent), the rate of joblessness among African Americans declined from 11.3 percent to 7.2 percent, among Hispanics from 9.8 to 5.4 percent, and among African American teens from 35.9 to 22.2 percent.

Even these numbers may understate the improvement in employment prospects for minorities. Between August 1994 and April 2000, the employment-to-population ratio for African Americans rose from 55.8 percent to 61.4 percent, for Hispanics from 59.2 to 65.3 percent and for African American teens from 24.5 to 31.3 percent. In other words, the likelihood of an African American teenager holding a job jumped by more than one-fourth during this six-year period. Overall, the improvement in employment-to-population ratios translated into an additional 2,400,000 jobs for African Americans, 1,360,000 jobs for Hispanics, and 170,000 jobs for African American teen-

that lower rates of unemployment have been associated with more rapid wage growth for low- and moderate-income workers. Through the first five years of the current economic expansion, real wages continued to decline for most of the workforce, as pay increases lagged inflation (Mishel, Bernstein and Schmitt, 1999). This changed in 1996, as workers in the middle and at the bottom of the wage distribution finally started seeing real wage growth. Between 1996 and 1999, inflation-adjusted hourly pay rose by 10.2 percent for workers in the bottom tenth of the wage distribution. For workers in the next highest tenth, real pay rose by 8.2 percent.¹⁴ A hike in the federal minimum wage and rapid overall productivity growth helped drive up pay for low-wage workers during this period. But labor market tightness clearly played an important role too.

The combination of more job openings and higher wages has yielded enormous benefits for low-end workers. Americans in the bottom quintile of the nation's workforce were 10.3 percent more likely to hold jobs in May 2000 than they would have been with the unemployment rate frozen at widely accepted pre-1994 estimates of the NAIRU.¹⁵ If half the wage gains

of the last four years can be attributed to low unemployment, then the hourly wages of these bottom-quintile workers are approximately five percent higher than they would be if unemployment remained stuck at the old NAIRU level. Combining these effects suggests that total wage income for the poorest fifth of workers was approximately 16 percent higher in the first half of 2000 than it would have been if the Fed hadn't allowed unemployment to fall beneath the old NAIRU. Again, no politically feasible government programs promise benefits of this magnitude for low-wage earners.

LESSONS FOR FUTURE FED POLICY

In hindsight, neither the imperfect evidence of a NAIRU's existence nor the NAIRU doctrine's shaky theoretical foundations ever provided sufficiently compelling grounds for a Fed policy of deliberately slowing the economy to keep unemployment above the presumed NAIRU

pressure. Indeed, periods of low unemployment may be characterized by generally higher – albeit not continually accelerating – inflation than are periods of high unemployment. If so, the relationship between inflation and unemployment may actually resemble the way economists thought of it in the 1960s.

Whatever theoretical model best describes this relationship, the sobering lessons of NAIRU plainly demonstrate the need for maximum caution whenever the Federal Reserve pursues a policy that will throw people out of work. Even in an era of widening asset ownership and high-altitude stock prices, few Americans can afford to maintain a decent standard of living without working. This has always been the case but it is even more true at a time when government policy has made it far more difficult to survive on welfare or other forms of public assistance.

Despite comforting euphemisms like “preventing overheating,” the Federal Reserve's efforts to minimize inflation typically have the

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level. Now, after five years of what used to be called a “growth experiment,” Fed policy has produced an undeniable refutation of the NAIRU concept – unemployment rates substantially below accepted estimates of the NAIRU and a declining rate of inflation.

The refutation of NAIRU does not necessarily invalidate the more general proposition that lower unemployment leads to more inflationary

effect of threatening widespread job loss and pressuring workers to accept lower wages. This painful process not only damages individuals who lose their jobs but also workers who experience declining or stagnant living standards as a result of lower real pay. Even if their decisions turn out to be wrong – meaning they needlessly imposed large costs on the economy and the nation's workers – the Fed officials who fashion

such policy choices never face the immediate consequence of unemployment themselves.

In addition to suggesting the need for caution, this fact also counsels humility. The Federal Reserve Act does not grant members of the Open Market Committee authority to substitute their own judgment or popular theories for the legal mandate to pursue policies aimed at full employment, defined as four percent unemployment. In the past two decades, that mandate has been more honored in the breach than the observance. But the economic experience of the last five years indicates that in this case, the law provided a better guide for monetary policy than the NAIRU doctrine that informed many policymakers' thinking.

While the economy's recent performance

may have dealt this doctrine a fatal blow, many economists at the Fed (and elsewhere) continue to view low unemployment with trepidation.¹⁶ Driven in part by those concerns, the central bank engineered a 1.75 percentage-point increase in the federal funds rate between June 1999 and June 2000 in order to slow the economy. The good news is that public debate and Federal Reserve decision making about employment and interest rates occurred against a backdrop of four percent, not six percent, joblessness. The bad news is that the central bank apparently remains willing to sacrifice jobs and growth in the absence of evidence that low unemployment is causing inflation. The battle over the NAIRU may arise in a different form but it has not yet ended.

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Appendix

Gains From Economic Policy: The estimated gain for “No NAIRU” is based upon the difference between the actual unemployment rate for each year since 1994 through the first half of 2000 (assumed to average 4.1 percent) and a six percent unemployment rate. Following Okun’s Law, the economic gain produced by the drop in unemployment is assumed to be twice this difference, measured as a percentage of GDP. (For example, a decline from a six percent to five percent unemployment rate implies that GDP would be two percent higher than if unemployment had remained at six percent.) Each year’s gains were converted into 2000 dollars using the GDP deflator.

The projected gains from deficit reduction are derived from a Congressional Budget Office estimate (1997, p. 90) that an increase in national income of 1.6 percent will result from running balanced budgets for 35 years instead of maintaining the 1997 debt to GDP ratio (a difference of approximately 2.5 percent of GDP, or \$240 billion at current GDP). This implies an average annual increase in the rate of economic growth of approximately 0.05 percentage points. This growth should accrue disproportionately in the earlier portion of the 35-year projection, therefore the calculation assumes that GDP grew more rapidly by a factor of 0.06 percentage points as a result of deficit reduction. The calculation also assumes that the economy began to experience this more rapid growth in 1994 – so that by the first half of 2000, the economy was 0.39 percent larger than it would have been if the government had continued to run large deficits.

The projected gains from WTO are based upon the Council of Economic Advisors (1999, p.22), which estimated that the Uruguay Round of GATT (which established the WTO) eventually would increase GDP by 0.4 to 0.6 percentage points. It is usually assumed that this full effect will only be achieved after ten years; therefore the calculation assumes that the economy grew by an additional 0.05 percentage points each year beginning in 1994.

Endnotes

1. Even when unemployment deviates from the NAIRU by a fairly significant margin, the short-term effects are thought to be minimal (Staiger, Stock and Watson 1996; Congressional Budget Office, 1994; Gordon 1982). According to research by NAIRU proponents, an economy that produces unemployment one percentage point below the NAIRU for a full year will raise the rate of inflation by only 0.5 percentage points.

2. Gordon (1990) provides an excellent survey of the literature at the time.

3. The arithmetic here is quite striking. The bottom two-fifths of the workforce accounts for a little less than 19 percent of the total wage bill. This estimate is obtained by taking the average of the hourly wage for workers at the 10th and 30th percentile (Mishel et.al 1999 Table 3.6) and dividing it by the average hourly wage for all workers (Table 3.3). This ratio is slightly over 0.45, which multiplied by the 40 percent of the workforce in the bottom two quintiles, yields the estimate of less than 19 percent. Insofar as lower paid workers are likely to get less generous benefits (relative to their wages) or are likely to work shorter hours, this estimate will overstate the share of the labor compensation going to this group of workers.

Since wages account for roughly 70 percent of national income, the wages of the bottom two quintiles account for slightly more than 13 percent of national income. If these workers all received a two percent increase in their wages and if the increase were fully passed on, it would lead to a rise of less than 0.26 percent in the overall price level. A one percent decline in profits would almost completely absorb the higher labor costs from this group.

Similarly, a decline of less than 0.5 percent in the rate of wage growth for the upper three-fifths of the workforce would fully absorb a two percent increase in the wages of the bottom two-fifths. Again, this would not impose a cut in real wages on higher-paid workers but simply reduce their rate of real wage growth compared to a counterfactual where lower paid workers did not get larger pay increases.

4. Robert Eisner’s work provided an important exception. Eisner found an asymmetric relationship, where high rates of unemployment led to lower rates of inflation but low rates of unemployment did not necessarily lead to higher rates of inflation (Eisner, 1997).

5. From the late 1960s until the early 1980s, a technical problem caused the consumer price index (CPI) to overstate the true rate of inflation by a total of more than seven percentage points compared to the CPI currently used by the Bureau of Labor Statistics. If workers looked to the CPI published at the time to guide their wage demands, it would

have led them to push for higher wages than would a corrected CPI. Baker (1998) finds that wage and price growth appeared to be following the erroneous CPI in use at the time, not the revised measure that is now considered more accurate. The study suggests that mis-measured inflation may have contributed significantly to the actual increase in the inflation rate during this period.

6. The NAIRU first appeared in the 1980 edition of Paul Samuelson's seminal textbook.
7. For example, in its editorial pages, the *New York Times* agreed with the need to clamp down on growth at a time when the unemployment rate was still above 5.5 percent. ("Misplaced Fears About the Fed," November 17, 1994; A18).
8. One of the most serious problems with monetarism as an operating doctrine is the difficulty policymakers face in calculating the money supply. Various measures can be used and monetarists debate among themselves which one provides the best policy tool. The narrowest measure of the money supply is M1, which includes cash and checking accounts. M2 is a broader measure including savings accounts, and M3 is a still broader gauge that also includes money market mutual funds against which checks can be drawn.
9. During this period, the Fed did not publicly acknowledge the federal funds rate as its main instrument of monetary policy. Despite having made a philosophical U-turn, the central bank still insisted in its public pronouncements that it was basing monetary policy on the growth rate of the money supply. Since the Fed did not change its public stance until the 1990s and since its conversion from monetarism to a more pragmatic approach took place gradually, changes in the federal funds rate may be seen in retrospect as indirect evidence of the direction of monetary policy over the course of the 1980s.
10. The real value of the average hourly wage fell from \$7.67 in January of 1989 to \$7.58 in July of 1990 (*Economic Report of the President, 1991*, table B-44).
11. For example, the May 1995 minutes refer to the concern of "a number of members" that, "with the economy already producing at or even slightly above its sustainable potential, inflationary pressures were likely to intensify if the current pause were to be followed by a period of above average growth." (Board of Governors, 1995(a), page 14). Fed officials justified the use of "preemptive" anti-inflation policy by asserting that more draconian levels of unemployment would be required to reverse a rise in inflation than were needed to prevent inflation from increasing in the first place.
12. The minutes of the July meeting show that they were looking at unemployment in a "consensus range of 5-3/4 to 6-1/8 percent in the fourth quarters of both 1995 and 1996." (Board of Governors 1995(b), page 10).
13. Named after economist Arthur Okun, this rule of thumb posits that declines in the unemployment rate translate into jobs not only for those who had been officially counted as jobless but also individuals who previously were not in the labor force (and therefore not counted as unemployed).
14. These data come from Bernstein (2000).
15. This calculation assumes the experience of Hispanic workers to be roughly typical of all workers in the bottom fifth of the wage distribution (who tend as a group to be disproportionately black and Hispanic). Also the non-Hispanic white workers who fall in this category have disproportionately less education than other white workers. Less-educated workers tend to have higher unemployment and lower labor force participation rates than the population as a whole.
16. The most prominent example is Governor Laurence Meyer, who contends that the short-term movement of the NAIRU has diverged from long-term NAIRU levels for transitory reasons.

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