

# The natural rate of unemployment

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Why does unemployment exist? If there is a central question in macroeconomics, this is it. There are few bigger wastes than the loss to idleness of hours, days and years by people who would rather be working. Unemployment can ruin lives, sink budgets and topple governments. Yet policymakers do not wage all-out war on joblessness. Most, like the Federal Reserve, America's central bank, target what is known as unemployment's "natural" rate, at which inflation is stable.

The importance of this concept is hard to overstate. The Fed's argument for its recent interest-rate rises, for example, hinges on stopping unemployment from falling too far beneath the natural rate. Yet the natural rate is in many respects an article of faith, always sought but never seen. Where does it come from?

There are several reasons why unemployment cannot simply be eradicated fully. It takes time for people to move from one job to another: this is said to cause "frictional" unemployment. If people cannot find jobs because they have outdated skills—think hand weavers after the invention of the loom—they might become "structurally" unemployed.

But it is the trade-off between unemployment and inflation that most preoccupies central bankers. John Maynard Keynes, the great British economist, took a first step towards the natural-rate hypothesis when he focused minds on "involuntary" unemployment. In his book "The General Theory", published in 1936 in the aftermath of the Depression, Keynes noted that many people could not find jobs at the going wage, even if they had comparable skills to those in work. Classical economics blamed artificially high wages, perhaps caused by trade unions. But Keynes pointed to lacklustre economy-wide spending. Even if wages fell, he reasoned, workers would have less to spend,

making the demand deficiency worse. The answer, he thought, was for governments to manage aggregate demand in order to keep employment "full".

Keynes was not the father of all that is now thought of as "Keynesian". Inflation, for instance, barely entered his analysis of unemployment. But by the late 1960s Keynesianism had become associated with the idea that when managing aggregate demand, policymakers are not just choosing a rate of unemployment. They are simultaneously choosing how fast prices rise.

The relationship between inflation and unemployment was first studied by Irving Fisher in 1926. But the "Phillips curve", as it came to be known, owes its name to a study in 1958 by William Phillips of the London School of Economics. In his study, Phillips traced the relationship between unemployment and wage growth in Britain over the course of almost a century. He found that from 1861 to 1957 the relationship had been pretty stable: the lower the unemployment rate, the faster wages rose. This was remarkable, given the changes over that period in workers' rights. In 1861 most workers could not vote; by 1957 the post-war Labour government had nationalised much of the economy.

Paul Samuelson and Robert Solow, two other economic luminaries, subsequently investigated the relationship in America, and reported that there was no such stability there. The Phillips curve shifted around. But in any given era, Samuelson and Solow wrote, "wage rates do tend to rise when the labour market is tight, and the tighter the faster." They described the relationship as a "menu", encouraging the idea that the job of Keynesian policymakers was to pick a point on the curve that best aligned with their preferences. How low unemployment could fall, in other words,

depended only on what level of inflation was tolerable (for rising wages would surely end up lifting prices, too).

It is unclear whether policymakers actually thought of the relationship between inflation and unemployment as a menu. But the idea was prominent enough by the late 1960s to attract withering criticism. Its two main detractors, Edmund Phelps and Milton Friedman, would each go on to win a Nobel prize.

Mr Phelps began writing groundbreaking models of the labour market in 1966. A year later, Friedman gave what became the canonical criticism of the old way of thinking in an address to the American Economics Association. In it, he argued that, far from there being a menu of options for policymakers to pick from, one rate of unemployment—a natural rate—would eventually prevail.

Suppose, Friedman reasoned, that a central bank prints money in an attempt to push unemployment lower than the natural rate. A larger money supply would lead to more spending. Firms would respond to increased demand for their products by expanding production and raising prices, say by 5%. This inflation would catch workers by surprise. Their wages would be worth less than they bargained for when they had negotiated their contracts. Labour would, for a while, be artificially cheap, encouraging hiring. Unemployment would fall below the natural rate. The central bank would achieve its goal.

The next time pay was negotiated, however, workers would demand a 5% raise to restore their standard of living. Neither firm nor worker has gained or lost negotiating power since the last time real wages were set, so the natural rate of unemployment would reassert itself as firms shed staff to pay for the raise. To get unemployment back down again, the central bank could embark on another round of easing. But workers can be fooled only for so long. They would come to expect 5% inflation, and would insist on commensurately higher

wages in advance, rather than playing catch-up with the central bank. Without an inflation surprise, there would be no period of unexpectedly cheap labour. So unemployment would not fall.

The implication? For a central bank to keep unemployment below the natural rate, it must keep outdoing itself, delivering inflation surprise after inflation surprise. Hence, Friedman reasoned, Keynesians were wrong to pin a low rate of unemployment to a given, high rate of inflation. To sustain unemployment even a little below the natural rate, inflation would need to accelerate year in, year out. Friedman's and Phelps's natural rate became known as the "non-accelerating inflation rate of unemployment" (NAIRU).

No society could tolerate endlessly rising, or falling, inflation. Phillips had observed a correlation in the data, but it was not one that policymakers could exploit in the long run. "There is always a temporary trade-off between inflation and unemployment," Friedman said. "There is no permanent trade-off." Nearly 50 years on, that remains the premise on which rich-world central banks operate. When officials talk about the Phillips curve, they mean Friedman's temporary trade-off. In the long run, they believe, unemployment will come to rest at the natural rate.

The idea has such influence partly because Friedman's and Phelps's contributions were so well timed. Before 1968, America had had two years with unemployment below 4% and inflation below 3%. But when Friedman spoke, prices were indeed accelerating; inflation rose to 4.2% in 1968. The next year it hit 5.4% even as unemployment changed little. The "stagflation" of the 1970s killed off the idea of a stable Phillips curve. Successive shocks to oil prices, in 1973 and 1979, sent both inflation and unemployment surging. In 1975 both were above 8%; in 1980 inflation hit 13.5% even as unemployment exceeded 7%. The idea of the NAIRU looked a little shaky, too; inflation was

meant to fall so long as unemployment was too high. But Friedman's followers could argue that bad supply-side policies, in conjunction with the oil-price shocks, had pushed the NAIRU up.

Around the same time, however, the concept of the NAIRU came under attack from theorists. It was built, in part, on the idea that inflation expectations are "adaptive": to predict inflation, firms and workers look at its current value. But the doctrine of "rational expectations" decreed that firms and consumers would, to the greatest extent possible, anticipate policymakers' actions. Whenever the public suspected that central bankers would try to push unemployment below the natural rate, inflation would rise immediately. On the other hand, a credible promise not to seek any unsustainable jobs booms should keep inflation under control, simply by "anchoring" expectations.

That proposition was put to the test after Paul Volcker became Fed chairman in 1979. Mr Volcker was set on getting inflation down. As it turned out, he would need to prove his mettle. His tight monetary policies—the federal funds rate reached almost 20% in 1981—contributed to a double-dip recession, which pushed unemployment above 10%. It got the job done; inflation tumbled. Since Mr Volcker's time at the Fed, it has rarely exceeded 5%.

To this day, some economists point to the Volcker recessions as proof that inflation expectations are adaptive. The public did not believe inflation would fall just because the Fed said it would. America had to suffer high unemployment to bring inflation down. Policymakers had to grapple with a short-term Phillips curve after all, as Friedman and Phelps had argued.

Yet the experience of the 1980s would not be repeated. In the decades that followed, central banks committed to inflation targets. As they gained credibility, the trade-off between inflation and unemployment weakened.

Economists wrote "New Keynesian" models incorporating rational expectations. By the mid-2000s some of these models showed a "divine coincidence": targeting the best possible path for inflation, after an economic shock, would also result in the best possible path for unemployment.

Few economists think the divine coincidence holds in practice. New Keynesian models usually struggle to explain reality unless they are tweaked to incorporate, for example, at least some people with adaptive expectations. A cursory examination of the data suggests expectations follow inflation (they sank, for instance, after oil prices fell in late-2014).

### **Odd jobs**

Inflation has behaved strangely over the past decade. The recession that followed the financial crisis of 2007-08 sent American unemployment soaring to 10%. But underlying inflation fell below 1% only briefly—nothing like the fall that models predicted. Because the only way economists can estimate the natural rate is by watching how inflation and unemployment move in reality, they assumed that the natural rate had risen (an estimate in 2013 by Robert Gordon, of Northwestern University, put it at 6.5%). Yet as labour markets have tightened—unemployment was 4.3% in July—inflation has remained quiescent. Estimates of the natural rate have been revised back down.

Such volatility in estimates of the natural rate limits its usefulness to policymakers. Some argue that the wrong data are being used, because the unemployment rate excludes those who have stopped looking for work. Others say that the short-term Phillips curve has flattened as inflation expectations have become ever more firmly anchored. The question is: how long will they remain so? So long as low unemployment fails to generate enough inflation, central banks will face pressure to keep applying stimulus. Their officials worry that if inflation suddenly surges, they might

lose their hard-won credibility and end up back in 1980, having to create a recession to get inflation back down again.

This recent experience has led some to doubt the very existence of the natural rate of unemployment. But to reject the natural rate entirely, you would need to believe one of two

things. Either central banks cannot influence the rate of unemployment even in the short term, or they can peg unemployment as low as they like—zero, even—without sparking inflation. Neither claim is credible. The natural rate of unemployment surely exists. Whether it is knowable is another matter.