

The Natural Rate of Unemployment or the Non-Accelerating Inflation Rate of Unemployment (NAIRU)

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Draft – 16 December 2013

PEOPLE: Milton Friedman, Edmund Phelps

RELATED: Phillips Curve, Taylor Rule, Inflation as a Monetary Phenomenon

DATES: Milton Friedman and Edmund Phelps published this in various papers in 1967 and 1968.

CHICAGO: Milton Friedman is one of the best-known economists to have taught at University of Chicago.

VIGNETTE

There is a long-standing belief among the general public and even professional economists that inflation and unemployment (or economic growth) are related – higher growth (lower unemployment) leads to higher inflation. Milton Friedman and Edmund Phelps, in a series of papers during the late 1960s, firmly and decisively critiqued this view. Economic theory says that in the long run there can be no trade-off between inflation and unemployment. There is a “natural” rate of unemployment, the equilibrium rate implied by real quantities – real wages, preferences, demand, production functions, and so on. In the short run the independence of unemployment and inflation may be obscured but in the long run this natural or equilibrium rate is unaffected by inflation.

Friedman and Phelps’s arguments had a significant impact on thinking among economists and policy-makers. And their arguments are as relevant today, in our world of quantitative easing and discussions of Federal Reserve policy, as they were in the 1960s.

The Natural Rate of Unemployment (NAIRU) and the Phillips Curve

Prior to Friedman and Phelps’s work a central tenet among economists was that macroeconomic policy could trade off higher inflation on the one hand for higher growth and lower unemployment on the other. This was commonly termed the Phillips Curve, after the economist William Phillips who published a paper discussing the relationship between unemployment and wage changes.

Friedman presented his ideas in his presidential address to the American Economic Association (“The Role of Monetary Policy,” *American Economic Review* 1968) while Edmund Phelps discussed it in “Phillips Curve, Expectations of Inflation and Optimal Unemployment Over Time,” *Economica* 34, August 1967).

The naïve Phillips curve posits “a stable negative relation between the level of unemployment and the rate of change of wages – high levels of unemployment being accompanied by falling wages, low levels of unemployment by rising wages.” (quoted from Friedman’s 1976 Nobel address “Inflation and Unemployment”). The move from rising wages to rising prices in general is then easy to imagine.

This posited relationship is superficially appealing because it seems like, with low unemployment, employers would have to raise wages. But it confuses nominal wages with real wages.

Friedman's argument around the Phillips curve and the natural rate of unemployment was nicely elaborated in his 1976 Nobel address "Inflation and Unemployment", and the argument was simple. At its core was the argument that unemployment depends on real wages but that inflation may obscure the pattern of real wages and changes in wages. The first part of the argument was that there is a "natural rate" or equilibrium rate of unemployment implied by real quantities – real wages, preferences, demand, production functions, and so on. The word "natural" in this context is not meant to have a normative meaning, nor is it meant to imply that it is unchanging. The term simply means the rate that will result from equilibrium in the markets. The natural rate has also come to be called the NAIRU or non-accelerating inflation rate of unemployment.

The second, and truly insightful part of the argument, was to show that unexpected inflation may push employers and workers from the natural rate, with positive inflation causing a lower unemployment rate – the classic Phillips curve. But most importantly, this effect is only temporary and is dependent on the inflation being unexpected. This was a powerful, in fact fatal, argument against the Phillips curve as a policy tool, a tool which could be used to "fine tune" the economy and exploit a trade-off between higher inflation versus lower unemployment.

To see the second part of the argument let us start by ignoring inflation. Consider an employer who experiences a rise in the price of his output relative to other goods – this effectively lowers the real wage and will induce an increase in the firm's labor demand. Then consider an employee who experiences a rise in the wage relative to all other goods – this effectively raises the real wage and will induce an increase in labor supply.

So far this is straightforward price theory – labor supply and demand both depend on real wages, with demand going up when real wages go down and supply going up when real wages go up. But then Friedman applied a key insight – inflation can obscure changes in prices in just such a way that makes it seem that real wages go down for employers and up for employees. This induces employers to demand more labor, workers to supply more, and unemployment to go down.

Friedman's argument that inflation can make real wages appear to go both down and up is simple although, on further consideration, it is a deep insight into the purpose and power of the price mechanism and the costs of inflation in obscuring and degrading the signals provided by prices.

When an employer experiences a rise in the price of his output he will take this, at least partly, as a rise in the real price of his output. Again, Friedman says it best (from his 1976 Nobel address):

In an environment in which changes are always occurring in the relative demand for different goods, he [the employer] will not know whether this change is special to him or pervasive. It will be rational for him to interpret it as at least partly special and react to it, by seeking to produce more to sell at what he now perceives to be a higher than expected market price for future output. He will be willing to pay higher nominal wages than he had been willing to pay before. ... A higher nominal wage can therefore mean a lower real wage as perceived by him.

...

To workers the situation is different: what matters to them is the purchasing power of wages ... over all goods in general. ... A rise in nominal wages may be perceived by workers as a rise in real wages and hence call forth an increased supply, at the same time that it is perceived by employers as a fall in real wages and hence calls for an increased offer of jobs.

When prices change because of unexpected inflation, employers and workers cannot easily and quickly determine whether the change is a change in relative prices or absolute prices. Indeed, by its very definition unexpected inflation is not anticipated and employers and workers will tend to interpret (incorrectly) the change in the price level as a change in relative prices (real wages in this case) in

just the way to increase employment above the equilibrium level and push unemployment below the equilibrium rate (the natural rate).

But employers and workers will not be fooled forever, probably not even for long. They will learn that the change in product prices and wages is not a change in real prices and wages but only due to inflation. We should expect the unemployment level to temporarily fall below the natural rate in response to unexpected inflation but then rise back. There will be a Phillips curve (unemployment goes down when inflation goes up) but it will be only a short-run effect.

If the inflation were fully anticipated, in fact, we should not expect any response of unemployment to inflation. This is why Friedman argued that any policy-maker attempting to exploit the short-run Phillips curve would have to generate not a steady level of inflation, but ever-accelerating and unexpected inflation.

Friedman's analysis is as relevant today as it was in the 1960s. There is still discussion of the relation between price changes (inflation) and growth. There is a widely-held presumption that high growth (and low unemployment) are related to or cause inflation, while slow growth and high unemployment inhibit inflation because of "deficient demand" or "slack in the economy". As for the original Phillips curve the argument is superficially appealing since it relates higher demand to increases in prices. Like the original Phillips curve, however, there is a tendency to conflate nominal prices and real price changes.