

Phillips Curve confusion

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During the past three months, a salient topic of debate has been whether the so-called Phillips Curve is relevant in today's disinflationary environment. The debate is important to investors because a strong belief in the Phillips Curve explains the resolve of the Fed over the past two years to tighten monetary policy.

The concept of the Phillips Curve originated in a landmark 1958 paper by the economist A. W. Phillips. He postulated a strong inverse relationship between the rate of inflation and the level of unemployment – the lower the unemployment rate, the higher the inflation rate. Extensive data-testing vindicated Phillips' theory until the decade of the 1970s. The "stagflation" experience of that decade eroded confidence in the theory because despite a stagnating economy, inflation soared. Confidence in the Phillips Curve was restored in the decade of the 1980s and thereafter. Higher unemployment once again correlated with lower inflation.

During the current decade, however, confidence in the curve has yet again ebbed. Inflation has remained stagnant – it has even dropped – despite a nine-year recovery during which the US unemployment rate fell from 11.4% to 4.1%.

What is the underlying truth here about the relationship between unemployment and inflation? How can a relationship so appealing as that of the Phillips Curve be sometimes right and sometimes wrong?

RESOLVING THE CONFUSION

Confusion about the Phillips Curve stems from failing to understand what the Phillips Curve actually means. It is best understood as saying that, during periods of declining unemployment, the inflation rate will rise because a growing scarcity of workers will drive up wages. As such, Phillips' concept is absolutely correct. It always holds true – *other things being equal*. It is a corollary of the law of supply and demand in the labor market.

The point, of course, is that other things are *not* equal, and this is often the source of confusion. The point to be made here can be understood mathematically. Consider the function:

$$I = F (w, c)$$

This says that the inflation rate "I" is a function of changes in wage rates "w" and also of changes in non-wage costs "c" - e.g., the costs of materials, of spare parts, of

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communication and marketing costs, etc. In this context, the Phillips Curve represents a *partial derivative* representing the increase in inflation due to an increase in wages – *all other costs "c" being constant.* By extension, we could consider a "Brock Curve" that represents the rate of inflation of all non-labor costs **"c"**, *the cost of labor being held constant.* More formally, the actual change in inflation will be given by the *total derivative* of **"I"** with respect both to **"w"** and **"c"**.

The failure to make this elementary point is widespread, and is responsible for much of the confusion about today's disinflation.

The Experience of the 1970s

In the 1970s, for example, the "guns and butter" fiscal policies during the Vietnam War were followed by the twin OPEC oil price shocks of 1973 and 1979. These events caused two developments. First, inflation exploded from 4% to 14%. This increase was driven by sharp increases in both **"w"** and **"c"**. Second, soaring inflation impaired economic growth for many different reasons. This in turn caused the unemployment rate to rise. As a result, we experienced an *inverted* Phillips Curve – that is, inflation rose while unemployment increased.

The Current Decade

To explain the behavior of inflation as a whole (not merely wage inflation) in the current decade, we have argued that the Digital Revolution has been causing an accelerating decline in cost inflation **"c"**, independent of the behavior of wages **"w"**.¹ That is, the advent of ever cheaper ways of manufacturing goods, of providing services, of delivering goods and services, and of "human interactions" has caused widespread deflation.

More analytically, these myriad increases in efficiency have served to "push out" what economists call the Production Possibilities Frontier of the economy. This is equivalent to pushing outward the nation's supply curve, and at an above-average rate. The combination of these outward shifts in **"S"** along with relatively stagnant growth in demand **"D"** axiomatically implies disinflation, assuming the growth in the money supply (properly measured) is constant. We have demonstrated this point in recent reports.

But what about the behavior of the Phillips Curve proper during the current decade? Did wages **"w"** rise as the unemployment rate fell, as the Phillips Curve says it should have done? The answer is that wages have risen, albeit very modestly, and very late during the recovery. That is, the Phillips Curve in its narrow sense has been vindicated, even if it has flattened.

What explains today's weak relationship between falling unemployment and rising wage inflation?

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First, the "unemployment buffer" was very large throughout the first six years of the recovery. This reflected the sky high 11.4% "starting point" of unemployment back in 2010 when the recovery began. This delayed any increase in wages.

Next, there was an additional and novel labor market buffer – specifically, the large number of eligible workers who chose to opt out of the labor force entirely, at least during the past decade. They have recently been re-entering the workforce, thus adding to the supply of workers. In our view, no one has properly explained this strange development. But it certainly flattens the Phillips Curve.

Finally, the labor markets have faced additional headwinds from increasing automation, Asian competition, and weakness in the unionisation of workers in the private sector.

All in all, the Phillips Curve proper is alive and well, if much flatter (weaker) than in the past.

New econometric analysis supports this view, and reveals that the impact of falling unemployment on wage rates is negligible until the unemployment rate falls below 4.3%. In today's nine-year recovery, the unemployment rate dropped to 4.3% only a month ago. Moreover, this new evidence suggests that a further fall of unemployment from 4.3% to 3.5% would only increase the core inflation rate from 1.50% to 1.66%.²

CONFUSION ABOUT DISINFLATION AT THE ST. LOUIS FED

Over the last five years, we have been quite critical of the efforts of central bankers and monetary economists to explain the ongoing disinflation that has perplexed them. To add to what we have said in the past, consider the following appraisal of the situation by James Bullard, President and CEO of the Federal Reserve Bank of St. Louis. We quote from his "Presidential Message" appearing in the third quarter 2017 edition of the bank's publication, *The Regional Economist*. President Bullard concludes:

> There seems to be little risk – at least according to these econometric estimates –that inflation would pick up appreciably from its current level solely because unemployment is low. The results shown here call into question the idea that employment outcomes are a major factor in driving inflation outcomes in the US economy. <u>Inflation expectations, for instance, are probably a more important determinant of inflation outcomes than unemployment.</u>

Nonsense about changes in inflationary expectations

The last sentence here beautifully sums up today's confusion about the sources of disinflation. To begin with, the strategy of explaining a host of economic developments as due to "changes in expectations" is a canard that has emerged within economics. To wit, "since we don't know what we are talking about, let's blame changes in expectations". The

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present example carries this strategy to a *reductio ad absurdum*. One is left wondering – how can disinflationary changes such as a 98% collapse in the cost of mailing a letter or making a phone call be explained by "changes in expectations?: Doesn't this put the cart before the horse? Isn't it 50 times more likely that today's ongoing technological revolution is responsible for disinflation?

We are not suggesting that inflationary expectations do not matter. In certain circumstances, they certainly do. For example, changing expectations about future inflation can materially impact bond prices. But bonds are an asset – not a good – and thus their price changes have nothing to do with inflation proper as captured by the CPI or the PPI. Confusion about Main Street versus Wall Street inflation has been widespread during and after the Global Financial Crisis.

Bullard's comment reflects the abject failure of the monetary policy establishment worldwide to grasp the central role of technological progress in explaining decreases in the rate of inflation. Yet one of central banks' fundamental goals is to understand and predict the course of inflation. Their lack of such understanding has led to years of misleading diagnoses and erroneous predictions of future inflation.

Charles Evans, the President of the Federal Reserve Board of Chicago, has recently signaled agreement with our view here. He recently stated that the Fed has probably been barking up the wrong tree in understanding the sources of disinflation, and should have paid much more attention to technological developments than it has.

ENDNOTES

1. Of course, a reduction in the growth of "c" will usually imply a reduction in the growth of "w" over the longer run. The explanation for this is that wages represent a constant share of national income (GDP) – on average. Since an ongoing reduction in "c" will decrease growth in nominal national income (GDP), the fixed share of national income going to labor must also decrease. This is an "on average" relationship.

2. See for example Olivier Blanchard, "The US Phillips Curve", Peterson Institute for International Economics, Policy Brief No. PB 16-1, January 2016.



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