

### A Cruise Around the Phillips Curve

IN 1958 Bill Phillips, a New Zealand economist, published "The Relation Between Unemployment and the Rate of Change of Money Wages in the United Kingdom, 1861-1957." This paper secured its author's immortality. Phillips had spotted a striking regularity: there appeared to be a stable trade-off between inflation and unemployment--the more you had of the one, the less you had of the other.

For Britain, during the long period Phillips studied, an unemployment rate of about 2.5% was associated with a rise in wages of about 2% each year. Allowing for productivity growth, that was roughly consistent with stable prices. By and large, higher rates of unemployment were observed when prices were falling; lower rates were observed when prices were rising. The lower the rate of joblessness, the higher the rate of inflation.

Chart 1 plots inflation (looking directly at prices, not wages) and unemployment in America during the 1960s. The points fall on a fairly neat, downward-sloping line. Here too the "Phillips curve" seems to work. And its implication is clear: governments can cut unemployment by tolerating a higher rate of inflation. It follows that the challenge for macroeconomic policy is to strike the right balance between those two evils. Governments may disagree about how to do so, according to moral and political judgments about which parts of society should carry how much of a burden. But as far as the economics is concerned, the choice that lies before policymakers is fairly straightforward.

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#### Think again

Until the end of the 1960s, few would have disagreed with this view. That changed because the simple Phillips curve faced two separate, but equally withering, attacks: one from economic theory, the other from the real world. The theoretical attack was all the more impressive because it came first--at a time when the statistics appeared to say that the Phillips curve still worked. In 1968, in separate

articles, Milton Friedman and Edmund Phelps pointed out that the theory underlying the Phillips curve made no sense. The crucial point is that it is real wages, not money wages, that matter both to workers and to employers.

Suppose that inflation -- in both prices and wages -- rises by five percentage points. Instead of going up by 5% this year, prices rise by 10%; instead of going up by 7% this year, wages rise by 12%. In real terms, however, nothing whatever is different. The real wage is the same as it would have been otherwise. The demand for labour and the supply of labour both depend on real wages, not money wages, so they too will be the same. That being so, there is no reason to expect the level of employment to change. The Phillips curve cannot be right.

But there is a complication. This fixity of real wages and employment is the position "in equilibrium" -- a term which, in this branch of economics, means "when workers' expectations about inflation turn out to be correct". For instance, if prices are stable year after year, and workers expect them to carry on being stable, those expectations will keep on being right. That is an equilibrium. If prices rise reliably by 10% year after year, and are expected to continue doing so, that too is an equilibrium. In both cases, prices and other money-denominated things (eg, money wages) are changing, but real things (eg, real wages and employment) aren't. So unemployment will be no lower than in the zero-inflation case. In equilibrium, unemployment is the same, regardless of inflation.

However, as Messrs. Friedman and Phelps accepted, in moving from one equilibrium to another the Phillips-curve relationship can be briefly true. Suppose prices rise unexpectedly -- and, in the first instance, wages do not. In other words, wages fall in real terms. The demand for labour will rise. Further suppose that workers, whose expectations are in a twist, are slow to realise that their wages have fallen in real terms -- that is, they suffer from "money illusion". They will not reduce their supply of labour. As a result, the increase in the demand for

labour will cause employment to expand. More workers will have jobs than before, but they will be paid less in real terms.

In this way, an unexpected rise in inflation can cut unemployment. But consider what happens if inflation now holds steady at its new, higher rate. Workers realise that their wages have fallen in real terms. They bid for higher pay, to catch up. And as they succeed, and real wages return to their initial level, the demand for labour falls back, likewise to its initial level. Once the money illusion has dissipated--once the economy is back in "equilibrium"--everything "real" (notably real wages and employment) is as before. Only the rate of inflation is different: it is permanently higher.

The Friedman-Phelps critique looked watertight. Almost before other economists had finished thinking it through, conclusive evidence in support of it began to arrive. Chart 2 extends the inflation and unemployment figures of chart 1 into the 1970s and 1980s. Unemployment is anything but constant: it moves around a lot. So does inflation. But chart 2 looks nothing like chart 1. Inflation and unemployment, the two great evils, are no longer linked in such a way as to suggest an exploitable trade-off.

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Why did the Phillips curve work so well in earlier years? The most likely answer is that the relationship was an accident that depended on special circumstances prevailing before the 1970s. Inflation was low and relatively stable; expectations of future inflation were similar. After 1970 inflation in America and other industrial countries became more volatile--and much higher on average than before. Expectations were subject to frequent shocks. In this new world, the appearance of a stable relationship between inflation and unemployment vanished.

Go forth and multiply

The simple Phillips curve may be dead--but its offspring are thriving. Today, thanks to Messrs Friedman and Phelps, economists talk not of one curve, but two: the short-run Phillips curve and the

long-run Phillips curve -- and both are, in the jargon, "expectations augmented". The analysis that follows is one which almost all mainstream economists would nowadays accept.

Chart 3 shows a short-run Phillips curve and a long-run curve. Suppose the economy starts at a point such as A, with unemployment of U1 and an inflation rate of P1. Next suppose that the government pushes up the inflation rate to P2. In the short run, unemployment falls, to U2; the economy moves to point B on the short-run Phillips curve. Gradually, however, expectations adjust, the economy moves back towards equilibrium, and unemployment starts to rise again. The economy moves to point C, on the long-run Phillips curve. Inflation is still P2 but now unemployment has risen to U3.

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When expectations have adjusted fully and the economy is back in equilibrium, the long-run Phillips curve is actually vertical, as shown in chart 4. With inflation still at P2, the economy has moved to point D. Unemployment has returned to U1, leaving the economy unambiguously worse off: as many people are out of work as before, and the inflation rate is higher.

Great expectations

Is there nothing that the government can do to hold unemployment at U2 in chart 3? Yes there is, at least for a while. It could push the inflation rate higher again--moving the economy to a point like B on a new, higher short-run Phillips curve. Another rise in inflation might be enough, as it were, to offset the process by which expectations catch up to the previous rise.

But even this could not go on for long. Inflation would have to keep rising unexpectedly, so that expectations continued to lag behind and the economy was kept out of equilibrium. This means, in the best case, that lower unemployment would be bought at the price of perpetually accelerating inflation. In the worst case, the short-run curve would snap to the vertical, as workers cottoned on to the government's inflationary approach to

job-creation. The economy would endure ever-accelerating inflation without even a temporary gain in jobs.

So when economists (and some, but unfortunately not all, politicians) say that there is no trade-off between inflation and unemployment, this is what they mean – or should mean. In the long run, regardless of the inflation rate, the economy returns to its underlying rate of unemployment – U1 in charts 3 and 4.

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This underlying rate goes by a confusing variety of names. An accurate, if horribly inelegant, term is the "non-accelerating-inflation rate of unemployment", or NAIRU for short. Why such a messy bit of jargon? The theory encapsulated in charts 3 and 4 says that at lower rates of unemployment than U1, inflation tends to rise. (Note the distinction between rising prices and rising inflation.) Similarly, at higher rates of unemployment than U1, inflation tends to fall. At U1, inflation may be high or low, but it is stable. Hence, NAIRU.

Other names, a bit easier on the tongue, for this special rate of unemployment are "equilibrium unemployment", the "natural rate of unemployment" and "structural unemployment". The trouble is, all of these may mean slightly different things to different economists.

A further word of caution: some of these labels imply that the NAIRU is somehow preordained, beyond the reach of economic policy. That is wrong--as next week's brief in this series will show. The Friedman-Phelps view of unemployment says merely that policies intended to raise inflation will cause no lasting reduction in unemployment. But the NAIRU is itself an economic variable, not an unalterable constant.

Economies with unduly generous unemployment benefits, misguided minimum-wage rules, poor education and training, obstacles to labour mobility (which may in turn be caused by such things as ill-designed pension schemes, disincentives to the supply of rented housing or lack of information for

job-seekers) are likely to have a higher NAIRU than they need to.

A gross, but not uncommon, caricature of the Friedman-Phelps approach is to say that nothing can be done about unemployment. Much can be done, on their view--but governments should concentrate on measures to improve the flexibility of the labour market rather than on traditional reflationary cures. The emphasis, in other words, should be on microeconomic not macroeconomic policy.

#### A different trade-off

However, a big macroeconomic issue remains. It is possible to look at charts 3 and 4 in another way--and if you do, another sort of trade-off between inflation and unemployment appears. Instead of asking whether the unemployment rate can be permanently reduced by governments accepting a higher rate of inflation (the charts say it cannot), ask how much of a temporary rise in unemployment is necessary to bring down inflation.

Chart 4 shows that, in the long run, inflation can be brought down from P2 to P1 with no rise in unemployment. But chart 3 shows that, in the short run, reducing inflation from P2 to P1 would require a temporary rise in unemployment, equivalent to the difference between U2 and U1. Suppose Britain's NAIRU is 7%. It might be worth two years of unemployment at 10% (ie, six point-years of "excess" unemployment) to reduce inflation from 15% to 5%. But would it be worth that price to reduce inflation from 5% to 0%?

Clearly, a great deal turns on the relevant parameters. One question is whether any given cut in inflation is harder to achieve when inflation is already low. Another is the amount of excess unemployment needed to bring inflation down to any given extent: the ratio between these two things is for obvious reasons called "the sacrifice ratio". Its value will vary from country to country, and according to circumstances.

For instance, between 1980 and 1984, under the influence of tight monetary policy, America's inflation rate fell from more than 10% to just over

3%--that is, by seven percentage points. How much employment had to be sacrificed? In the 1980s America's NAIRU was generally estimated to be about 6%. Adding up, year by year, the amounts by which the unemployment rate exceeded 6% during 1980-84, you get a figure of roughly 11 percentage points. The implied sacrifice-ratio is therefore 11 divided by seven: say 1.5. Every (permanent) fall of one percentage point in inflation requires 1.5 point-years of excess unemployment (eg, one year of unemployment 1.5 percentage points in excess of the NAIRU).

Needless to say, it is not for economists to judge whether this is a price worth paying. That is a political choice. However, economists can point out something else that is extremely important. Like the NAIRU itself, the sacrifice ratio can be influenced by economic policy. As can be seen in charts 3 and 4, the sacrifice ratio is closely connected to the slope of the short-run Phillips curve. The steeper the curve, the smaller the (temporary) rise in unemployment needed to bring inflation down. What would make the curve steeper? Remembering the importance of expectations in the derivation of

the Phillips curves, one answer is an increase in the credibility of government policy.

Suppose a government announced that it would reduce inflation from 10% to 5% over the coming year. If this promise was fully believed by firms and workers, it could be kept without any rise whatever in unemployment--because the conditions for the "equilibrium" shown in chart 4 would be met. If the government is not believed, some temporary rise in unemployment will be the price of getting inflation down--and the lower the government's credibility, the higher this price will be.

It is not for nothing that economists now regard credibility as one of the most valuable assets an economic policy-maker can possess. The debate begun by Bill Phillips has lasted 36 years; of the economic insights that have emerged so far, this may be the most important. Aptly enough, it is one that Phillips would not have expected.

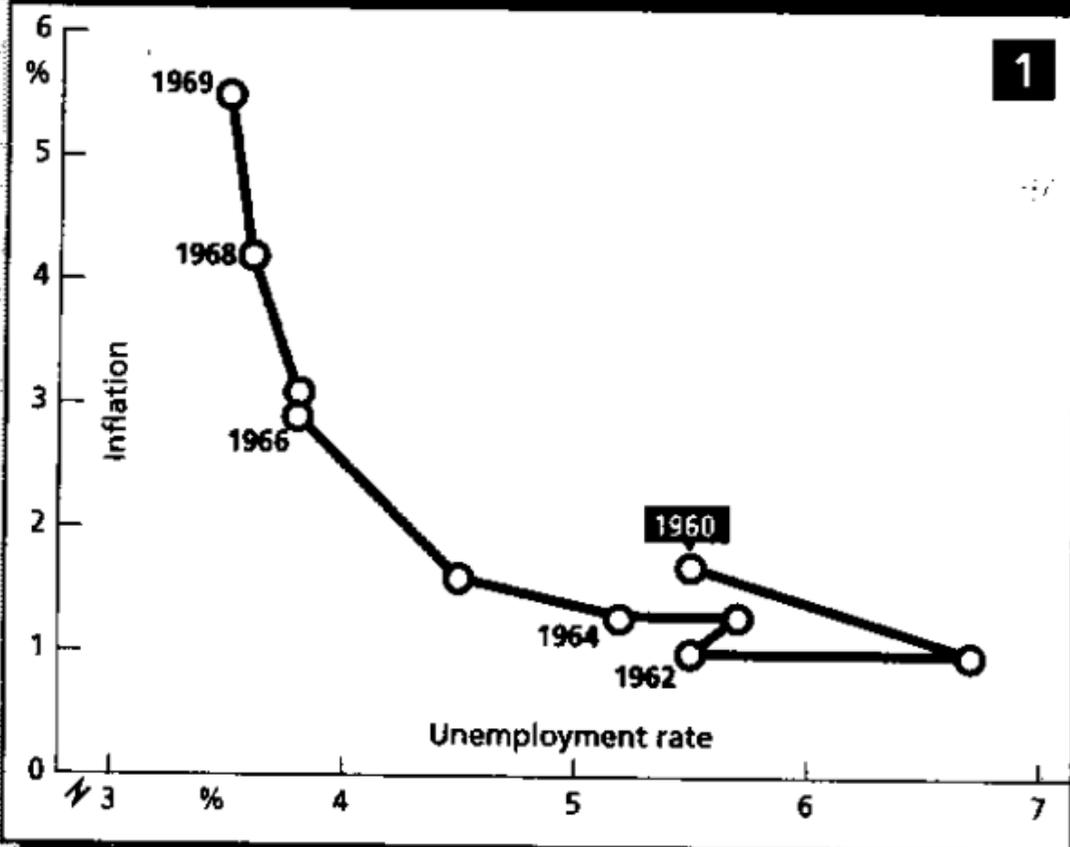
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# The vanishing Phillips curve

American unemployment against inflation, annual averages

1960-69



1970-93

