

The Phillips Curve

Introduction :

- A. W. Phillips published a paper based on empirical relationship between unemployment and wage. in Great Britain 1861-1957.
- His findings concluded that periods of high unemployment were associated with low growth in wages ($\uparrow U \downarrow W$) and the opposite was true ($\downarrow U, \uparrow W$)
- Other economists find same results
- Known as Phillips Curve.
- There was a long-run trade-off between inflation and unemployment during this empirical period.

The Friedman - Phelps Phillips Curve Analysis.

- points out a flaw in the original analysis.
 - Workers and firms care about real wages, not nominal wages.
 - If workers expect higher prices, they will adjust their wage demand so that the real wage ($\frac{W}{P}$) does not change.
 - In other words, wages and actual inflation will rise by the same proportion as expected inflation.
 - In the long run, the unemployment rate will reach a level consistent with fully flexible wages and price, that is U_n .

F-P suggest the following Phillips curve -

$$\pi_U = \pi^e - \omega (U - U_n)$$

π_U = actual inflation.

π^e = expected inflation.

U = actual unemployment rate

U_n = natural rate of unemployment

ω = slope of the Phillips curve or a parameter measuring the responsiveness of inflation to cyclical unemployment.

$U - U_n$ = cyclical unemployment, measured by the deviation of the actual rate of unemployment from the natural rate.

- The actual rate of inflation (π) will vary directly with the rate of inflation which is expected to occur in the current period (π^e).
- This equation is also known as the expectations-augmented Phillips curve.
- It also suggests that actual inflation (π_U) will vary inversely with the amount of cyclical unemployment rate ($U - U_n$)

- = This is an indicator of the tightness in the labor market called the unemployment gap.
- The F-P version of the Phillips curve indicates no long-run trade-off between inflation and unemployment.
 1. Start on PC_1 . Note: each PC is drawn for a given π^e
 2. At point 1, $\pi_U = \pi^e = 2\%$, $U = U_n = 5\%$.
slope is $-w$.
 3. Suppose a gov policy to stimulate the economy
cause $U = 4\%$.
 4. We move up and left along PC_1 to Point 2
 5. Why move along the curve?
 - Unemployment has changed but π^e not
 6. Once people recognize the higher π_U , they change their expectations and that shifts the PC up to PC_2 and Point 3.

7. As long as policies to stimulate the economy exists, π_U and π^e will continue to rise and the PC will continue to shift upward.
8. when will the PC stop? Only when $U = U_n = 5\%$.
9. Let's suppose $U = U_n$ when $\pi_U = 10\%$. Then $\pi^e = 10\%$ and the economy will settle at Point 4.
10. In the long run, when the PC has stopped shifting, the economy will be at a point like Point 1 or 4.
11. Connecting these points with a line is how we derive the LRPC
12. It clearly shows there is no long-run trade-off between inflation and unemployment. Higher π_U is not associated with lower unemployment.

The Phillips curve After 1960s .

- The F-P Phillips curve shows how the inverse relationship between inflation and unemployment . Breaks down if $U < U_n$ for an extended period of time .
- the empirical data demonstrate the F-P prediction was correct .
- the inverse ~~for~~ relationship is not visible .

The modern Phillips Curve.

- Events in the 1970s made it clear that another feature needed to be added to the Phillips curve.
- The oil price shocks in 1973 and 1979, resulted in higher costs of production and higher prices, that were independent of the cyclical unemployment.
- the modern equation is.

$$\pi = \pi^e - \omega(u - u_n) + \rho$$

Supply shock

Supply shock - shocks to supply that change the amount of output an economy can produce from the same amount of capital and labor.

- a supply shock is an event that suddenly increases or decreases the supply of a commodity or service, or of commodity and services in general. This sudden change affects the equilibrium price of the good or service or the economy's general price level.

Summary:

The modern Phillips Curve differs from the original one in 3 ways.

1. Phillips used wage inflation, Today we use price inflation
2. Today we add expected inflation, the importance of π^e was determined by Friedman and Phelps.
3. An exogenous supply shock variable was added in the aftermath of the OPEC oil shocks.