



STUDY MATERIAL

**VIVEKANANDA COLLEGE
THAKURPUKUR
NAAC ACCREDITED GRADE—'A'**

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SUBJECT: ECONOMICS
TOPIC: PHILLIPS CURVE

THE PHILLIPS CURVE

PART-1

- ✘ When the Neo-Keynesians decided to incorporate labor market dynamics into their IS-LM model, the empirical Phillips Curve provided the excuse and the troublesome money wage left hanging in Chapter 19 of Keynes's *General Theory* (1936) provided the incentive. The Phillips Curve relates money wage inflation to unemployment in the following general fashion:
 - ✘ $(dw/dt)/w = h(U)$
 - ✘ where $h' < 0$ so that as unemployment increases, then wage inflation declines. Tying price movements one-for-one to wage movements, then this could be rewritten:
 - ✘ $= (dp/dt)/p = h(U)$
 - ✘ so that price inflation was negatively correlated with unemployment. The Phillips Curve is shown in Figure 1.

- ✘ The theoretical argument provided by Richard Lipsey (1960) was based largely on Neoclassical micro theory transferred to macroeconomics and formulated in the tradition of the "demand-pull" theories. Effectively, Lipsey argued that if labor markets for a *particular* industry were in disequilibrium, then the speed at which (nominal) wages adjust depends on the ratio of the difference between labor demand and supply to the supply of labor, i.e.

$$(dw/dt)/w = f [(L^d - L^s)/L^s]$$

- ✘ where $f' > 0$ so, thus, the larger the excess demand for labor in this industry, the faster the rate of adjustment of the money wage. As $(L^d - L^s)/L^s = -U$, then the rate of growth of money wages in this industry is negatively related to unemployment in this industry. If there is no productivity growth, then for profit-maximizing firms, the real wage should be constant, so that $(dw/dt)/w = (d /dt)/$ thus inflation, π , is negatively related to the unemployment rate - the Phillips Curve relationship, $\pi = h(U)$ (we can translate $f = -h$). The non-linearity of the Phillips Curve is justified by appeals to frictional unemployment and institutional difficulties at the extremes.

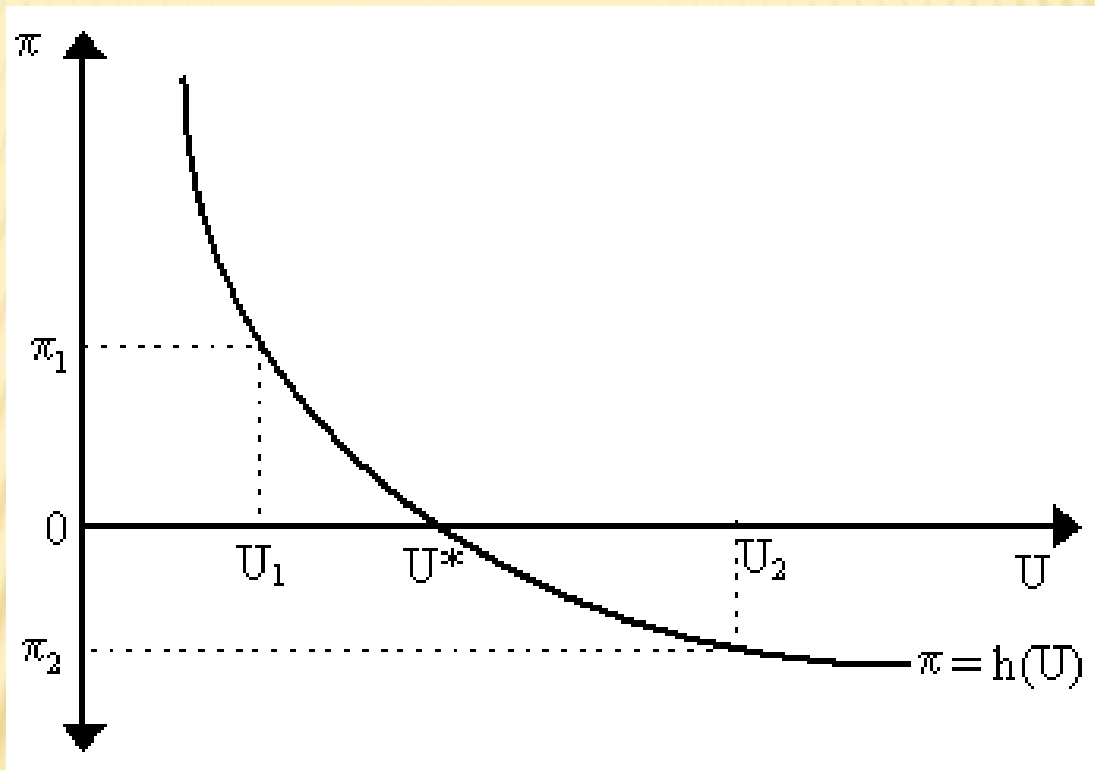


Figure 1 - The Phillips Curve

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- ✘ However, what is not satisfactory in this explanation is how a level of inflation and unemployment can be sustained at positive amounts. The microeconomic theory, after all, suggests that *eventually* equilibrium will be reached and unemployment eliminated. Positive unemployment can possibly be justified on the basis of frictional issues (workers changing jobs, etc.), but positive inflation, as the equation above indicates, relies on a *persistent* excess demand for labor.

- ✘ The solution for the Neo-Keynesians was actually quite simple: aggregate the Lipsey micro story and then trace out the implied macro constraints. Effectively, by aggregating the industry-level Phillips Curves, we obtain an aggregate or "average" Phillips Curve of effectively the same shape. However, relative to the industry-level Phillips curve, the average Phillips Curve will actually be shifted upwards to the right. The reason is due to the distribution of unemployment across industries and the non-linearity of the underlying industry-level curves. Suppose there are two industries with identical Phillips Curves (thus both have industry-level Phillips Curves as in Figure 1) and suppose that one faces unemployment U_1 and the second faces unemployment U_2 and suppose, for the sake of argument, that $(U_1 + U_2)/2 = U^*$ so that average unemployment coincides with U^* . For any *individual* industry, being at U^* implies that $\pi = 0$. However, in the *average*, being at U^* implies that $\pi > 0$. The reason is that, because of the non-linearity, $\pi_1 > -\pi_2$, so that the average inflation rate is positive, $(\pi_1 + \pi_2)/2 > 0$ when the average unemployment is at U^* . Thus, the average Phillips Curve is actually to the right of the individual Phillips Curve even if all industry-level curves are identical. In short, the zero-inflation unemployment rate for the average is greater than the zero-inflation unemployment rate for the individual industry. Thus, actual inflation is not only a function of the unemployment level in the economy, it is also a function of the distribution of that unemployment across industries.

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- ✘ However, we still have not answered our question: how do we obtain persistent excess demand and thus persistent inflation? The logic, at the individual level, is that if there is excess demand in a particular industry, wages rise to attract workers from other industries. As these workers arrive, the adjustment will be towards equilibrium and thus industrial-level excess demand is eliminated. In the aggregate economy, however, there is no pool of workers forthcoming as we are above full employment. Thus, excess demand *persists* in the aggregate and is not eliminated by the wage adjustment process. The next question imposes itself: if wage rises do not eliminate excess demand, why posit such a process at all? Again, this resolves itself by disentangling individual-aggregate reasoning: in particular, firms *will* raise wages when there is excess aggregate demand in order to poach workers from *other* industries, and the other industries will raise wages to avoid their workers being lured away. Thus, although the economy *as a whole* will not call forth more laborers in the aggregate by raising wages (although some of the voluntarily unemployed might be tempted to join the labor market), individual firms have a rationale to raise wages regardless. Thus, in aggregate, persistent inflation can occur.

- ✘ Lipsey's (1960) theoretical justification of the Phillips Curve seemed to make its integration in macro theory amenable to the Neo-Keynesians. Not only was the issue of money wages finally hung on a peg, but inflation was brought into the Keynesian apparatus.
- ✘ What made the whole enterprise all the sweeter was the nice policy conclusions that could be derived. As emphasized by Paul Samuelson and Robert Solow (1960), if the Phillips Curve were seen as a *stable* empirical relationship between unemployment and inflation, then a policy-maker could find the particular rate of unemployment (U^*) needed for price stability ($\pi = 0$). Alternatively, if the policy-maker wanted to achieve a higher level of employment (thus lower unemployment, say at U_1 in Figure 1), then he would have to allow for inflation at π_1 . (the converse case of deflation and high unemployment are seen at U_2, π_2). In short, Samuelson and Solow (1960) argued that there was a definite inflation-unemployment trade-off which could be manipulated by policy-makers. So, from Phillips' simple 1958 results, not only was Neo-Keynesian theory "completed" but also impressive policy conclusions were derived to boot.

Thank You