

Thanks to Wicksell, we are all acquainted with the concept of a "natural" rate of interest and the possibility of a discrepancy between the "natural" and the "market" rate. The preceding analysis of interest rates can be translated fairly directly into Wicksellian terms. The monetary authority can make the market rate less than the natural rate only by inflation. It can make the market rate higher than the natural rate only by deflation. We have added only one wrinkle to Wicksell—the Irving Fisher distinction between the nominal and the real rate of interest. Let the monetary authority keep the nominal market rate for a time below the natural rate by inflation. That in turn will raise the nominal natural rate itself, once anticipations of inflation become widespread, thus requiring still more rapid inflation to hold down the market rate. Similarly, because of the Fisher effect, it will require not merely deflation but more and more rapid deflation to hold the market rate above the initial "natural" rate.

This analysis has its close counterpart in the employment market. At any moment of time, there is some level of unemployment which has the property that it is consistent with equilibrium in the structure of *real* wage rates. At that level of unemployment, real wage rates are tending on the average to rise at a "normal" secular rate, i.e., at a rate that can be indefinitely maintained so long as capital formation, technological improvements, etc., remain on their long-run trends. A lower level of unemployment is an indication that there is an excess demand for labor that will produce upward pressure on real wage rates. A higher level of unemployment is an indication that there is an excess supply of labor that will produce downward pressure on real wage rates. The "natural rate of unemployment," in other words, is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on.<sup>3</sup>

You will recognize the close similarity between this statement and the celebrated Phillips Curve. The similarity is no coincidental. Phillips' analysis of the relation between unemployment and wage change is deservedly celebrated as an important and original contribution. But, unfortunately, it contains a basic defect—the failure to distinguish between *nominal* wages and *real* wages—just as Wicksell's analysis failed to distinguish between *nominal* interest rates and *real* interest rates. Implicitly, Phillips wrote his article for a world in which everyone anticipated that nominal prices would be stable and in which that anticipation remained unshaken and immutable whatever happened to actual prices and wages. Suppose, by contrast, that everyone anticipates that prices will rise at a rate of more 75 per cent a year—as, for example, Brazilians did a few years ago. Then wages must rise at that rate simply to keep real wages unchanged. An excess supply of labor will be reflected in a less rapid rise in nominal wages than in anticipated prices,<sup>4</sup> not in an absolute decline in wages. When Brazil embarked on a policy to bring down the rate of price rise, and succeeded in bringing the price rise down to about 45 per cent a year, there was a sharp initial rise in unemployment because under the influence of earlier anticipations, wages kept rising at a pace that was higher than the new rate of price rise, though lower than earlier. This is the result experienced, and to be expected, of all attempts to reduce the rate of inflation below that widely anticipated.<sup>5</sup>

<sup>3</sup>It is perhaps worth noting that this "natural" rate need not correspond to equality between the number unemployed and the number of job vacancies. For any given structure of the labor market, there will be some equilibrium relation between these two magnitudes, but there is no reason why it should be one of equality.

<sup>4</sup>Strictly speaking, the rise in nominal wages will be less rapid than the rise in anticipated nominal wages to make allowances for any secular changes in real wages.

<sup>5</sup>Stated in terms of the rate of change of nominal wages, the Phillips Curve can be expected to be reasonably stable and well defined for any period for which the *average* rate of change of prices, and hence the anticipated rate, has been relatively stable. For such periods, nominal wages and "real" wages move together. Curves computed for different periods or different countries for each of which this condition has been satisfied will differ in level, the level of the curve depending on what the average rate of price change was. The higher the average rate of price change, the higher will tend to be the level of the curve. For periods or countries for which the rate of change of prices varies considerably, the Phillips Curve will not be well defined. My impression is that these statements accord reasonably well with the experience of the economists who have explored empirical Phillips Curve.

Restate Phillips' analysis in terms of the rate of change of real wages—and even more precisely, anticipated real wages—and it all falls into place. That is why students of empirical Phillips Curves have found that it helps to include the rate of change of the price level as an independent variable.