

M.A. Economics (Semester-II)
Macroeconomics-II: ECON4007

UNEMPLOYMENT

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EMPLOYMENT, UNEMPLOYMENT AND INACTIVITY*

The population of working age is divided into three labour market states :
employed, unemployed and inactive.

The unemployed are those individuals who do not currently have a job but who are **actively** looking for work. Individuals who looked for work in the past but who are not looking currently are not counted as unemployed.

Thus

$$\begin{aligned} \mathbf{Pop} &= \mathbf{U} + \mathbf{E} + \mathbf{I} \\ &= \mathbf{LF} + \mathbf{I} \end{aligned}$$

Where Pop is the population of the working age, U is the number of Unemployed, E is the number of Employed, I is the number of inactive, and LF is the Labour Force.

The **unemployment rate, u**, is defined in terms of the labour force:

$$\mathbf{u} = \mathbf{U/LF} = \mathbf{U/(E+U)}$$

*Source: Carlin, W. & D. Soskice (2009). Macroeconomics: Imperfections, Institutions & Policies, OUP, New Delhi.

Employment rate, e , is normally defined in terms of the working age population:

$$e = E/Pop$$

Labour Force Participation Rate (PR) shows the proportion of the working age population active in the labour market:

$$PR = LF/Pop$$

$$PR = (U+E)/(U+E+I)$$

$$PR = \{(U+E)/E\} \{E/(U+E+I)\}$$

$$PR = \{(U+E)/(E+U-U)\} (e)$$

$$PR = [1/\{(E+U-U)/(U+E)\}] (e)$$

$$PR = [1/\{(E+U)/(U+E)\} - U/(U+E)] (e)$$

$$PR = \{1/(1-u)\} (e)$$

$$PR = e/(1-u)$$

$$e = PR(1-u)$$

$$u = 1 - (e/PR)$$

- A rise in the employment rate will only be reflected in a fall in the unemployment rate to the extent that it is not offset by a rise in participation as the economically inactive are brought back into the labour force.
- The Participation rate is not fixed. During a recession, when unemployment rises, participation rates tend to fall. The opposite happens in upswings.

Measurement of Unemployment in India

In India unemployment is measured under the following criteria:

- Usual Status (US): The reference period is one year. A person is classified as unemployed if he could not find work for the major part of the year.
- Current Weekly Status (CWS): The reference period is one week. A person is classified as unemployed if he was unable to find work even for one hour during the week.
- Current Daily Status (CDS): It measures all the days of unemployment of the unemployed as well as of the underemployed during the reference week.

CDS is the most inclusive as it covers open as well as partial unemployment.

Categories of Unemployment

- **Cyclical Unemployment:** It refers to the unemployment that occurs during fluctuations in real GDP. Cyclical unemployment rises during periods when real GDP falls or grows at a slower-than-normal rate and decreases when the economy improves.
- **Frictional Unemployment:** It refers to the unemployment that occurs with the normal workings of the economy, such as workers taking time to search for suitable jobs and firms taking time to search for qualified employees.
- **Structural Unemployment:** It refers to the unemployment that occurs when there is a mismatch of skills and jobs. It occurs when different sectors give way to other sectors or certain jobs are eliminated while new types of jobs are created.

The Natural Rate of Unemployment

Total unemployment in an economy is composed of all three types of unemployment: cyclical, frictional, and structural. The level of unemployment at which there is **no cyclical unemployment** is called the natural rate of unemployment. Thus natural rate of unemployment consists of only frictional and structural unemployment. It is economist's notion of what the rate of unemployment should be when there is full employment.

Okun's Law: Relating Output and Unemployment

Okun's law measures the quantitative impact of a change in the unemployment rate on aggregate output.

According to Okun's law. The gap between an economy's full-employment output and its actual level of output increases by 2.5 percentage points for each percentage point the unemployment rate increases.

Algebraically,

$$\frac{\bar{Y} - Y}{\bar{Y}} = 2.5(u - \bar{u})$$

Here, left side of the above equation equals the amount by which actual output, Y , falls short of full-employment output, \bar{Y} , expressed as a percentage of full-employment output. \bar{u} is the natural rate of unemployment, and $u - \bar{u}$ the cyclical unemployment rate.

Unemployment and Inflation trade-off: The Phillips Curve*

The idea of Phillips curve is that, to reduce inflation, the economy must tolerate high unemployment, or alternatively that, to reduce unemployment, more inflation must be accepted.

The origin of the idea of a trade-off between inflation and unemployment was a 1958 article by economist A. W. Phillips. He examined 97 years of British data on unemployment and nominal wage growth. Later Paul Samuelson and Robert Solow converted wage change to price change by applying a simple formula: prices are a mark-up over wages, so price changes (\dot{P}) must be a function of wage changes and, therefore, also the rate of unemployment (U). Thus

$$\dot{P} = \alpha + \beta \dot{W}(U)$$

This relationship between inflation and unemployment came to be known as the Phillips Curve.

For the specific case where $\dot{W}(U) = 1/U$,

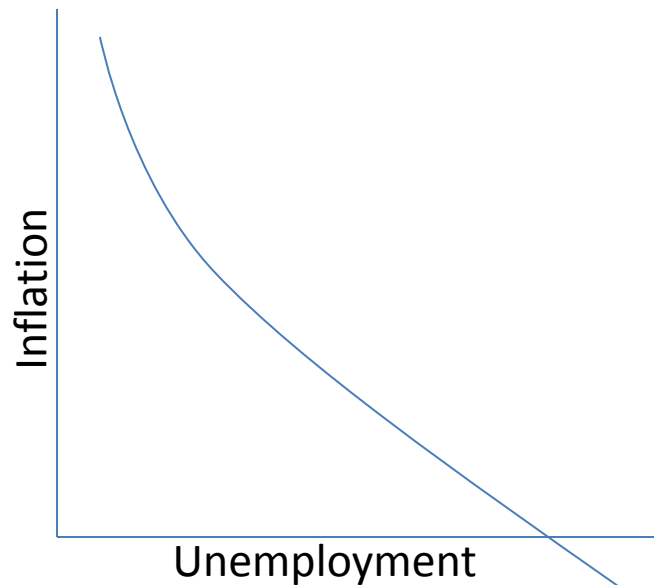
$$\dot{P} = \alpha + \beta(1/U)$$

It makes the rate of inflation a linear function of the reciprocal of the rate of unemployment. The coefficient α has a simple interpretation: It is the negative of the rate of labour productivity growth, z .

*Galbraith (1994), Macroeconomics, Houghton Mifflin Company, USA.

As average output per worker rises, the total output level in the economy is rising. If wages for each worker are unchanged, prices must necessarily decline or this extra output could not be purchased. If wage changes are just equal to the rate of productivity growth, then all the output can be purchased at unchanged prices, and prices will be stable. In general, the rate of price inflation must equal the rate of wage inflation minus the rate of labour productivity growth. Thus, we can write

$$\dot{P} = \beta \dot{W}(U) - z$$



The Expectations-augmented Phillips Curve*

Friedman and Phelps questioned the logic of the Phillips curve and argued that there should not be a stable negative relationship between inflation and unemployment.

According to Friedman and Phelps, a negative relationship should exist between **unanticipated inflation** and **cyclical unemployment**.

Unanticipated inflation refers to the difference between the actual and expected inflation rates and cyclical unemployment is the difference between the actual and natural unemployment rates.

When the public correctly predicts aggregate demand growth and inflation, unanticipated inflation is zero, actual unemployment equals the natural rate, and so, cyclical unemployment is zero. The economy remains in full-employment equilibrium in each time period, i.e. unemployment remains at the natural rate of unemployment. This means in case of fully anticipated inflation, there is no trade-off between inflation and unemployment.

*Source: Abel, A. B. & Bernanke, B. S. (2006). Macroeconomics, Pearson Education, New Delhi.

However, if aggregate demand growth unexpectedly speeds up, the AD curve rises faster than expected. The economy faces a period of positive unanticipated inflation (actual inflation more than expected) and negative cyclical unemployment (actual unemployment lesser than the natural rate).

In case of an unexpected slowdown in aggregate demand growth the AD curve will rise more slowly than expected. For a time unanticipated inflation would be negative (actual inflation less than expected) and cyclical unemployment would be positive (actual unemployment greater than the natural rate).

This relationship between unanticipated inflation and cyclical unemployment is given by

$$\pi - \pi^e = -h(u - \bar{u})$$

where

$\pi - \pi^e$ = unanticipated inflation (here π is actual inflation and π^e is expected inflation)

$u - \bar{u}$ = cyclical unemployment (here u = actual unemployment and \bar{u} = natural unemployment)

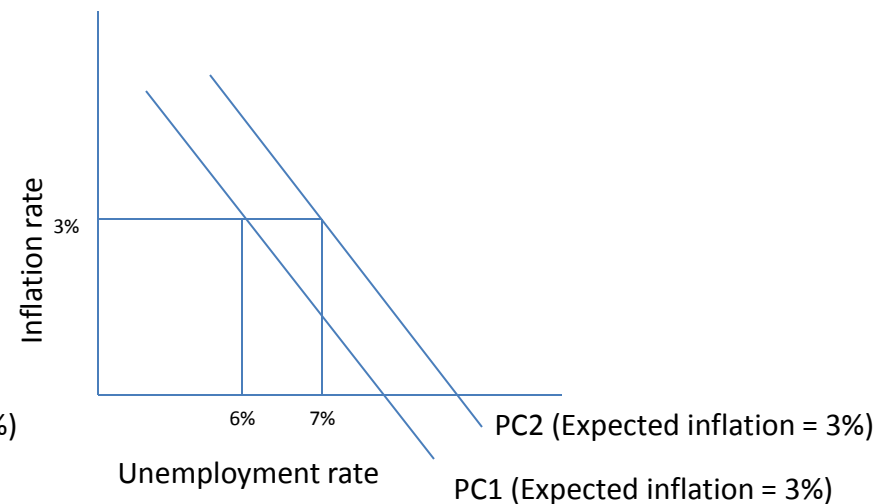
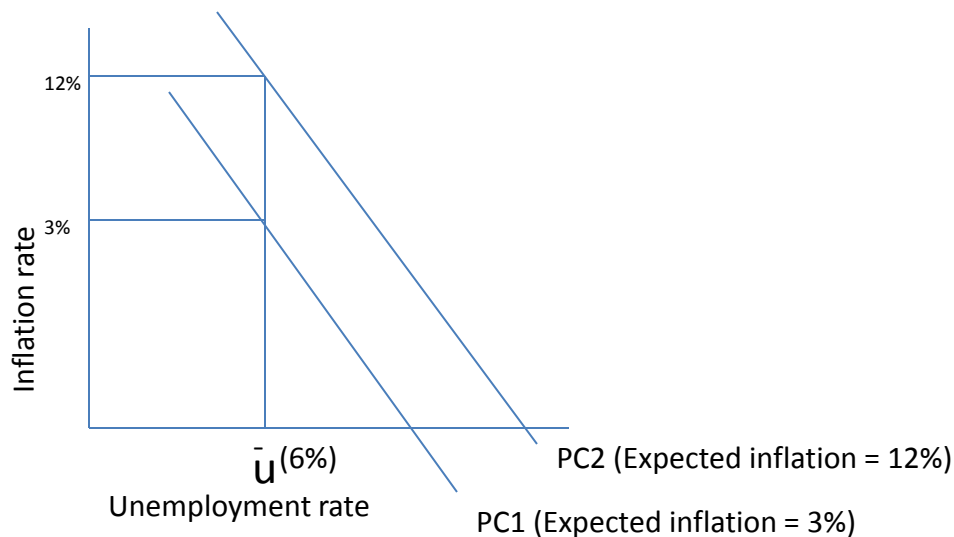
h = a positive number that measures the strength of the relationship between unanticipated inflation and cyclical unemployment.

The expectations-augmented Phillips curve is given by the following equation:

$$\pi = \pi^e - h(u - \bar{u})$$

According to this equation, actual inflation (π) exceeds expected inflation (π^e), if the actual unemployment rate is less than the natural unemployment rate. Similarly, actual inflation is less than expected inflation if the actual unemployment exceeds the natural unemployment rate.

The Friedman-Phelps theory implies that there is a different Phillips curve for every expected inflation rate (Fig. 1). Similarly, an increase in the natural unemployment rate shifts the Phillips curve up and to the right (Fig. 2).



Adaptive Expectations and The long-run Phillips Curve

People would not permanently overestimate or underestimate the rate of inflation. In the long run, expectations regarding inflation are adaptive rather than naïve.

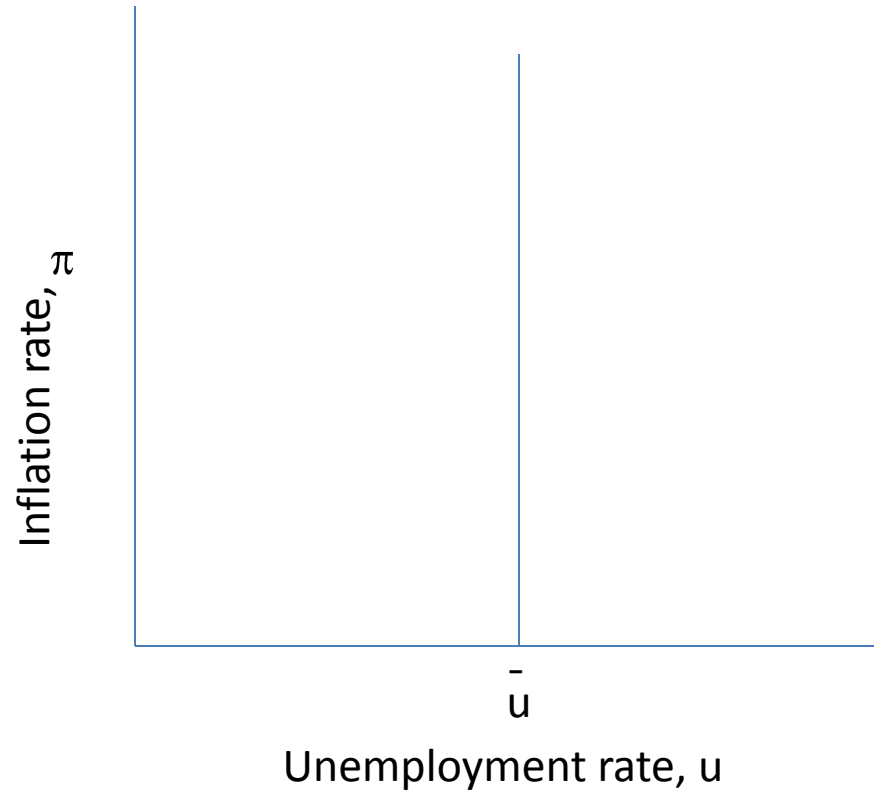
In the long run expectations about inflation eventually will adjust so that the expected and actual inflation rates are equal.

when $\pi = \pi^e$, the expectations-augmented Phillips curve implies that the natural unemployment rate equals the natural unemployment rate. Thus the actual unemployment rate equals the natural rate in the long run regardless of the inflation rate maintained.

The policy implication is that policymakers can not keep the unemployment rate permanently below the natural rate by maintaining a high rate of inflation.

Because in the long run actual unemployment equals the natural rate regardless of the inflation rate, the long-run Phillips curve is vertical.

The Long-run Phillips Curve



Reading List

- i. Abel, A. B. & B. S. Bernanke (2006). Macroeconomics, Pearson, Delhi.
- ii. Begg, D., S. Fisher & R. Dornbusch (1994). Economics, McGraw-Hill, Berkshire.
- iii. Shapiro, E. (2005). Macroeconomic Analysis, Galgotia, New Delhi.