

The first point to note about this equation is that in steady state, when the unemployment rate equals its natural rate, the left-hand side of this expression equals zero. This tells us that, as we found in the text, the natural rate of unemployment $(U/L)^n$ equals $s/(s + f)$. We can now rewrite the above expression, substituting $(U/L)^n$ for $s/(s + f)$, to get an equation that is easier to interpret:

$$\Delta[U/L]_{t+1} = (s + f)[(U/L)^n - U/L].$$

This expression shows the following:

- If $U/L > (U/L)^n$ (that is, the unemployment rate is above its natural rate), then $\Delta[U/L]_{t+1}$ is negative: the unemployment rate falls.
- If $U/L < (U/L)^n$ (that is, the unemployment rate is below its natural rate), then $\Delta[U/L]_{t+1}$ is positive: the unemployment rate rises.

This process continues until the unemployment rate U/L reaches the steady-state rate $(U/L)^n$.

3. Call the number of residents of the dorm who are involved I , the number who are uninvolved U , and the total number of students $T = I + U$. In steady state the total number of involved students is constant. For this to happen we need the number of newly uninvolved students, $(0.10)I$, to be equal to the number of students who just became involved, $(0.05)U$. Following a few substitutions:

$$\begin{aligned}(0.05)U &= (0.10)I \\ &= (0.10)(T - U),\end{aligned}$$

so

$$\begin{aligned}\frac{U}{T} &= \frac{0.10}{0.10 + 0.05} \\ &= \frac{2}{3}.\end{aligned}$$

We find that two-thirds of the students are uninvolved.

4. Consider the formula for the natural rate of unemployment,

$$\frac{U}{L} = \frac{s}{s + f}.$$

If the new law lowers the chance of separation s , but has no effect on the rate of job finding f , then the natural rate of unemployment falls.

For several reasons, however, the new law might tend to reduce f . First, raising the cost of firing might make firms more careful about hiring workers, since firms have a harder time firing workers who turn out to be a poor match. Second, if searchers think that the new legislation will lead them to spend a longer period of time on a particular job, then they might weigh more carefully whether or not to take that job. If the reduction in f is large enough, then the new policy may even increase the natural rate of unemployment.

5. a. The demand for labor is determined by the amount of labor that a profit-maximizing firm wants to hire at a given real wage. The profit-maximizing condition is that the firm hire labor until the marginal product of labor equals the real wage,

$$MPL = \frac{W}{P}.$$