GLOBAL EDITION

Macroeconomics

SIXTH EDITION

Stephen D. Williamson

Pearson

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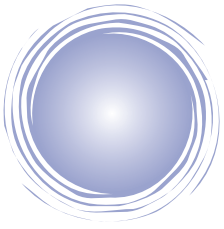

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job and becoming unemployed. This makes employment less attractive, and the welfare from being employed at any wage must fall.

Now, we want to consider the welfare of an unemployed worker, which we denote by V_u. The key determinant of V_u is the size of the unemployment insurance (UI) benefit that an unemployed worker receives. For simplicity, we will assume that the UI benefit is a constant real amount, b, that does not depend on the wage the unemployed worker earned when he or she was employed. Another important determinant of V_u is the frequency with which the unemployed worker receives job offers, and we will denote this frequency by p. That is, each period a fraction, p, of all the unemployed workers will receive job offers. Two important facts are the following:

- V_u increases when b increases. An increase in the UI benefit increases an unemployed worker's welfare.
- V_u increases when p increases. With a higher p the chances are better for the unemployed worker of receiving a job offer he or she will take, and this will increase welfare.

The Reservation Wage

LO 6.3 In the one-sided search model, explain how the reservation wage is determined.

Now that we know how a worker's welfare is determined when employed and unemployed, we can work out how the unemployed worker will make choices. When an unemployed worker receives a job offer, it will be a job offer at a particular wage, w. The key decision for the unemployed worker on receiving a job offer is whether to take the offer or continue searching for work. If a low-wage job is turned down, there is some possibility of receiving a higher-wage offer in the future, but the worker must bear a period of unemployment and uncertainty before such an offer is received. Therefore, if a bad job is turned down, this involves a trade-off between the short-run losses from unemployment and the uncertain long-run benefits from a good job. Clearly, some wage offer will be sufficiently high that the unemployed worker will accept it, and he or she would also accept any wage offer that was higher than this amount. We call this the **reservation wage** and denote it by w^*.

When a wage offer, w, is received, this implies a level of welfare for the job, $V_e(w)$. The unemployed worker will accept the job if the welfare from taking it is higher than the welfare of being unemployed, and will decline it otherwise. That is, the worker will accept the job if $V_e(w) \geq V_u$ and will turn it down if $V_e(w) < \text{Vu}$. In Figure 6.10 we have $V_e(w) \geq V_u$ if $w \geq w^*$ and $V_e(w) < V_u$ if $w < w^*$, and so w^* is the reservation wage that determines acceptance or rejection of job offers.

The reservation wage will change if there are shifts in either $V_e(w)$ or V_u. For example, suppose that the unemployment benefit increases. This causes an increase in V_u from V_u^1 to V_u^2 in Figure 6.11. As a result, the reservation wage increases from w_1^* to w_2^* Therefore, with an increase in the unemployment benefit, there is a smaller cost to turning down a job to hold out for a higher wage offer, and an unemployed worker will then become more picky concerning the jobs that he or she will take.

Figure 6.10 The Reservation Wage

The reservation wage, w^*, is determined by the intersection of the $V_e(w)$ curve (the welfare from employment) and the V_u curve (the welfare from unemployment).

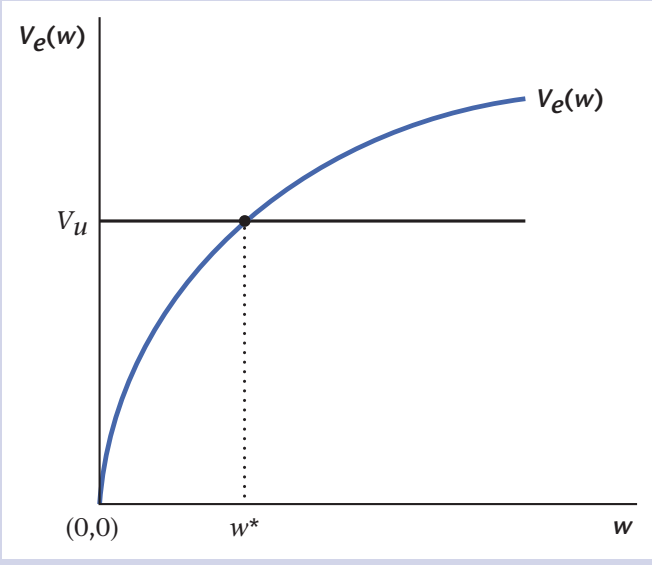
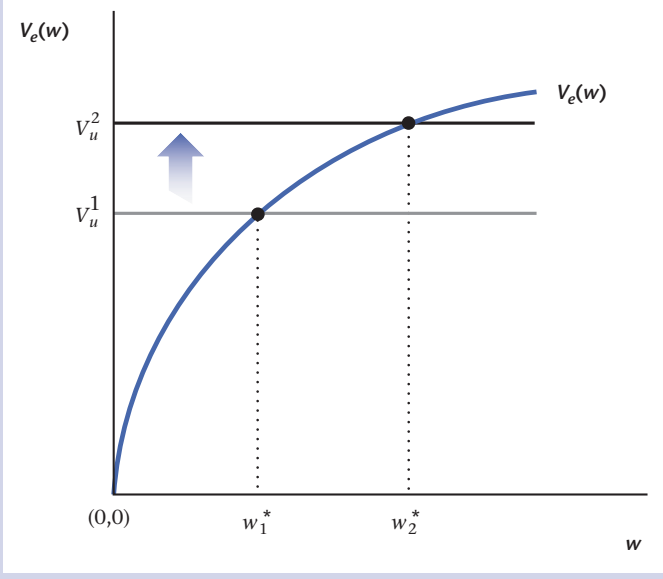


Figure 6.11 An Increase in the Unemployment Insurance Benefit, b

The increase in benefits increases the welfare from unemployment from V_u^1 to V_u^2. The reservation wage then increases from w_1^* to w_2^*



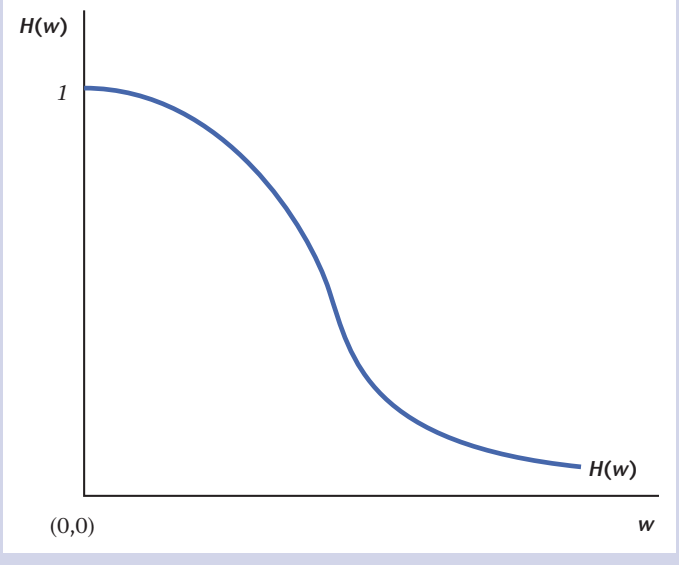
The Determination of the Unemployment Rate

LO 6.4 Show how the one-sided search model determines the unemployment rate.

Having shown how an unemployed worker chooses his or her reservation wage, we can complete our search model of unemployment and show how it determines the long-run rate of unemployment. In the model, there will be flows between the pool of employed workers and the pool of unemployed workers each period. Some employed workers will be separated from their jobs and become unemployed, while some unemployed workers will receive job offers that are sufficiently attractive to accept. If U is the unemployment rate—that is, the fraction of the labor force that is unemployed—then given that the separation rate is s, the flow of workers from employment to unemployment will be $s(1 - U)$. Now, let $H(w)$ denote the fraction of unemployed workers receiving a wage offer whose offer is greater than w, where $H(w)$ is depicted in Figure 6.12. Note that $H(w)$ is decreasing in w. Now, if unemployed workers choose a reservation wage, w^*, then, given that a fraction, p, of the unemployed receive a job offer and that a fraction, $H(w^*)$, of those receiving an offer are offered a wage greater than w^*, the portion of the unemployed who will be employed next period will be the fraction who receive a wage offer at or above their reservation wage. Therefore, the flow of workers from unemployment to employment will be $UpH(w^*)$.

Figure 6.12 The Fraction of Unemployed Workers Receiving a Wage Offer Greater Than w

As w increases, the fraction of unemployed workers, $H(w)$, who will receive a wage offer greater than w falls.



In a long-run equilibrium, the flow of workers from employment to unemployment must be equal to the flow of workers from unemployment to employment, and so we must have

$$s(1 - U) = UpH(w^*). \tag{6-1}$$

This equation determines the unemployment rate, U, given s, p, and the reservation wage, w^*. In Figure 6.13 we depict the left-hand and right-hand sides of Equation (6-1), with the intersection of these two curves determining the long-run equilibrium unemployment rate, denoted by U^*.

Figure 6.14 shows how the reservation wage and the unemployment rate are determined in equilibrium. In Figure 6.14(a), the reservation wage w^* is determined by the intersection of the V_u and $V_e(w)$ curves, while Figure 6.14(b) determines the unemployment rate given the reservation wage, w^*.

Now that we have a complete model that determines the reservation wage and the long-run unemployment rate, we can use this model to analyze the effects on these two variables of changes in the economic environment.

Figure 6.13 The Determination of the Unemployment Rate, U^*, in the One-Sided Search Model
In the figure, $s(1 - U)$ is the flow of workers from employment to unemployment, and $UpH(w^*)$ is the flow of workers from unemployment to employment. The long-run unemployment rate, U^*, is determined by the intersection of the two lines.

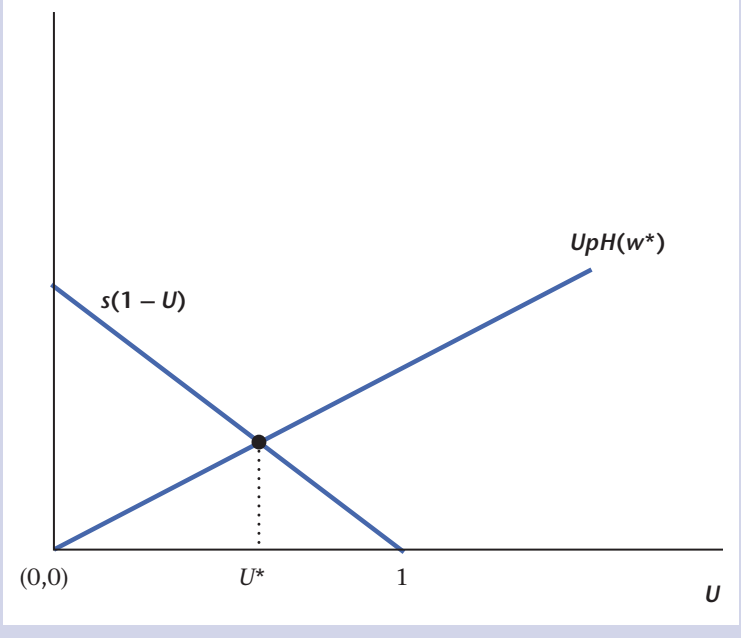
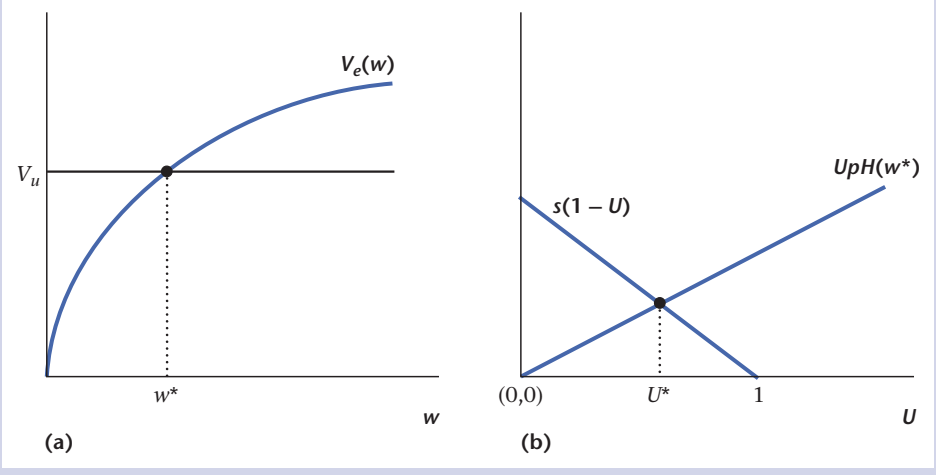


Figure 6.14 The Determination of the Reservation Wage and the Unemployment Rate in the One-Sided Search Model

The reservation wage, w^*, is determined in panel (a) by the intersection of the curves $V_e(w)$ and V_u. Then, given the reservation wage, the long-run unemployment rate is determined in panel (b).



An Increase in Unemployment Insurance Benefits

LO 6.5 Use the one-sided search model to determine the effects of changes in the labor market on the reservation wage and the unemployment rate.

The first experiment we will carry out is to look at the effects of a change in UI benefits. In Figure 6.15(a), an increase in benefits, b, increases the welfare of the unemployed, V_u, from V_u^1 to V_u^2. The effect of this is to increase the reservation wage from w_1^* to w_2^*. This then implies that the fraction of unemployed workers receiving an acceptable wage offer is smaller. That is, since $H(w)$ is decreasing in w, we have $H(w_2^*) < H(w_1^*)$. In Figure 6.15(b), this implies that the line $Up\,H(w_1^*)$ shifts down to $Up\,H(w_2^*)$ As a result, the unemployment rate increases from U_1 to U_2 in the long run.

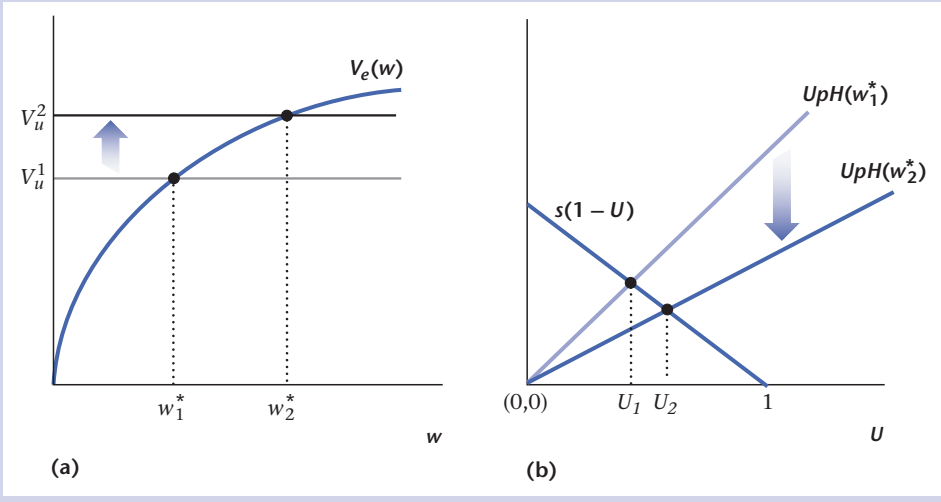
The intuition behind this result is that more generous UI benefits imply that unemployed workers can afford to be more picky about the jobs they accept. On average, then, spells of unemployment will tend to be longer, and the long-run unemployment rate must increase. Relatively higher unemployment insurance benefits in part explain higher average unemployment rates in Europe and Canada than in the United States.

An Increase in the Job Offer Rate

LO 6.5 Use the one-sided search model to determine the effects of changes in the labor market on the efficiency wage and the unemployment rate.

A second experiment is to look at the effects of an increase in the job offer rate, p, on the reservation wage and the long-run unemployment rate. Suppose the job offer rate, p,

Figure 6.15 An Increase in the Unemployment Insurance Benefit, *b*
The rise in UI benefit increases the value of unemployment from V_u^1 to V_u^2 in panel (a), causing the reservation wage to increase. This decreases the flow of workers from unemployment to employment in panel (b), and the unemployment rate rises in the long run.



increases. Such a change would result from an increase in the efficiency with which firms and unemployed workers are matched. This could occur for two reasons. First, there might be technological change, such as better information technology, which could increase the likelihood of matches between unemployed workers and firms with vacancies. For example, the Internet greatly increases an unemployed worker's ability to find work at low cost. Second, p could increase because of government intervention. In many countries, the government plays an active role in finding work for unemployed workers, through government-run employment centers and the like.

In Figure 6.16 we show the long-run equilibrium effects of an increase in p. Here, when p increases, this raises the welfare of the unemployed from V_u^1 to V_u^2 in Figure 6.16(a). As a result, the reservation wage increases from w_1^* to w_2^*, since unemployed workers can now afford to be more picky, as they will not have to wait as long for another wage offer if the current offer is turned down. In Figure 6.16(b), there are two effects on the flow of workers from unemployment to employment. The direct effect is that an increase in p from p_1 to p_2 increases the flow of workers from unemployment to employment, since job offers are now received at a higher rate. This shifts the line $UpH(w^*)$ up. The indirect effect is that the reservation wage rises, reducing $H(w^*)$, the fraction of workers receiving a job offer who accept the offer. On net, it is not clear whether $UpH(w^*)$ will rise or fall, but in Figure 6.16 we show it increasing from $Up_1H(w_1^*)$ to $Up_2H(w_2^*)$, which implies that the unemployment rate falls in