Problem 1. *True or False?* Many retailers are either scaling down their businesses or totally going out of business (examples: bookstores or Toys-R-Us). Obviously, the workers in these firms lose their jobs. The resulting unemployment can be classified as frictional unemployment.

Answer 1. *True.* Frictional unemployment arises for two reasons. First, it takes time to find a job. Second, some firms shrink or go out of business and others thrive or enter a market. Therefore there are always people who lose their jobs and start looking for new ones. The former is called **search unemployment**; the latter called **sectoral shift**.

Problem 2. *True or False?* Brad and his wife Monica live comfortably in San Francisco. Monica got a lucrative job offer from a financial firm in New York and, so, they decided to sell the house and move to New York. This also meant that Brad had to quit his San Francisco job and look for a new one in New York. During the time he was looking for a job, Brad would be classified as structurally unemployed.

Answer 2. *False.* This is search unemployment, a type of frictional unemployment. Structural unemployment occurs when, for various reasons, the real wage is generally above the equilibrium real wage.

Problem 3. *True or False?* A recession comes and household reduce their demands for such non-vital goods and services as restaurant meals, movies, or theme parks. As a result, many workers in these businesses lose their jobs. These workers are classified as cyclically unemployed.

Answer 3. *True.* Cyclical unemployment occurs when actual GDP falls below potential GDP, which can be caused by a recession.

Problem 4. In a country, the overall rate of unemployment is 9 percent. The frictional rate of unemployment is 2 percent and the structural rate of unemployment is 3 percent. The potential GDP in this country equal $Y_P = 100,000$ units. Moreover, economists have estimated the Okun's alpha to be $\alpha = 2$.

In this country, then, the cyclical rate of unemployment is _____ percent.

Answer 4. Remember the equation for total unemployment:

$$u = u_c + u_n = u_c + (u_f + u_s) \quad \Longrightarrow \quad 9 = u_c + (2 + 3) \quad \Longrightarrow \quad u_c = 4\%.$$

Problem 5. The overall rate of unemployment is 9 percent. The frictional rate of unemployment is 2 percent and the structural rate of unemployment is 3 percent. The potential GDP in this country equal $Y_P = 100,000$ units. Moreover, economists have estimated the Okun's alpha to be $\alpha = 2$. Then real GDP equals _____ units.

Answer 5. Use Okun's formula:

$$\frac{Y_p - Y}{Y_p} = \alpha \times u_c \quad \Longrightarrow \quad \frac{100,000 - Y}{100,000} = 2 \times 0.04 \quad \Longrightarrow \quad Y = 92,000.$$

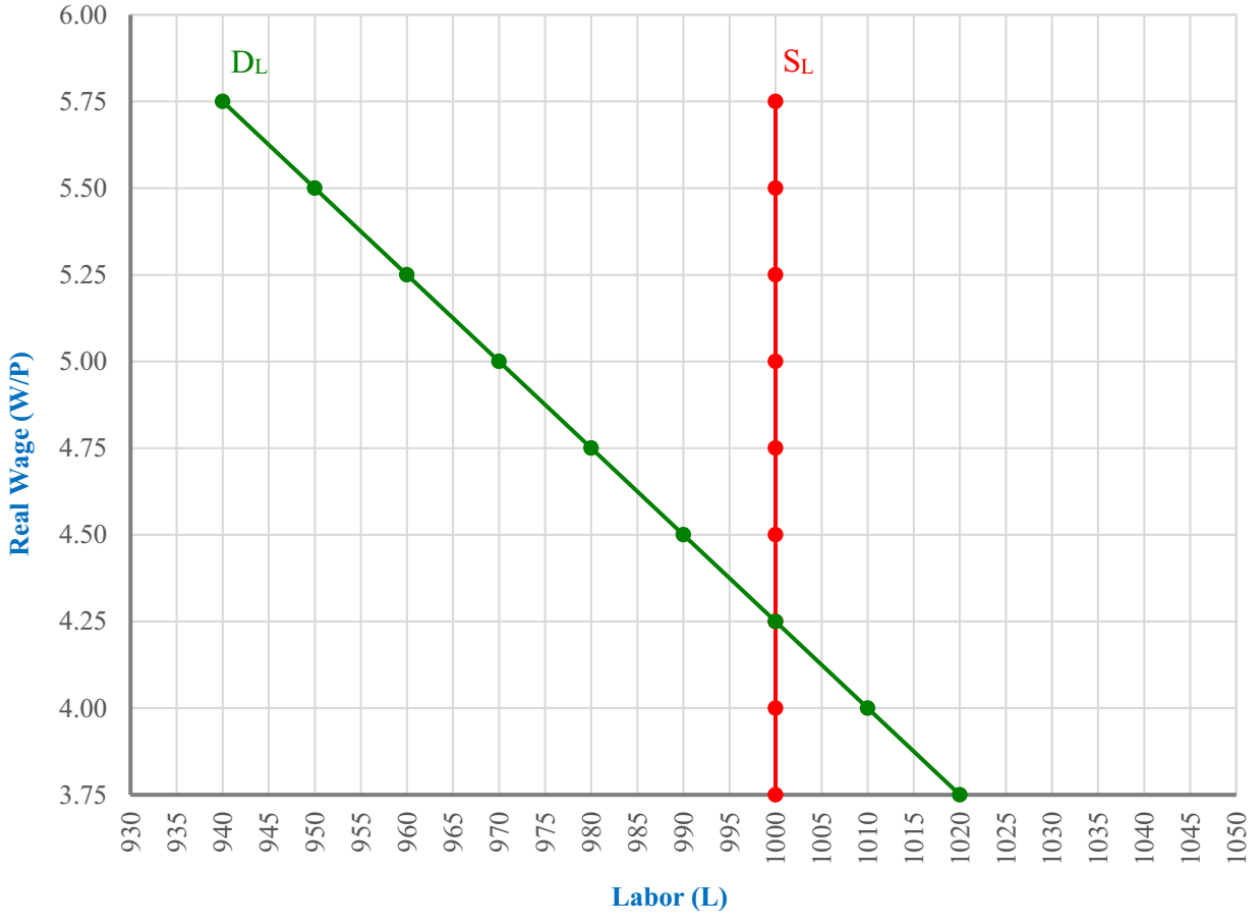
Notice that I plugged in $u_c = 0.04$ and not 4.

Problem 6. The overall rate of unemployment is 3 percent, frictional rate of unemployment is 1 percent, structural rate of unemployment is 4 percent. Potential GDP is $Y_P = 100,000$ units. Okun's alpha is $\alpha = 1.50$. The cyclical rate of unemployment equals _____ percent and the real GDP equals _____ units.

Answer 6. Same thing as before, really. $3 = u_c + (1 + 4) \quad \Longrightarrow \quad u_c = -2\%$, so

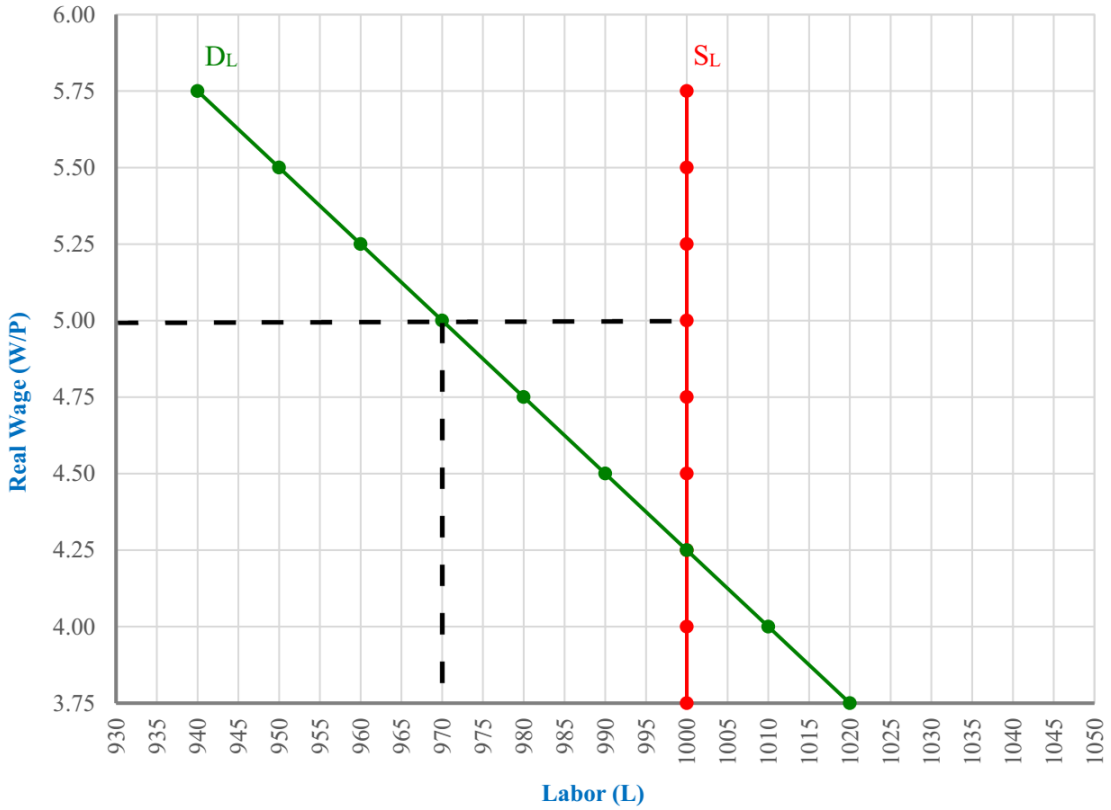
$$\frac{100,000 - Y}{100,000} = 1.5 \times -0.02 \quad \Longrightarrow \quad Y = 103,000.$$

Problem 7. The nominal wage equals $W = \$500$ and the general price level equals $P = \$100$. Suppose $Y_p = 100,000$, Okun's alpha is $\alpha = 2$, $u_f = 2\%$, and $u_n = 5\%$.



This must mean that in this country the cyclical rate of unemployment equals _____ percent and the real GDP equals _____ units.

Answer 7. The real wage is $500/100 = 5$. Applying this to the market graph gives

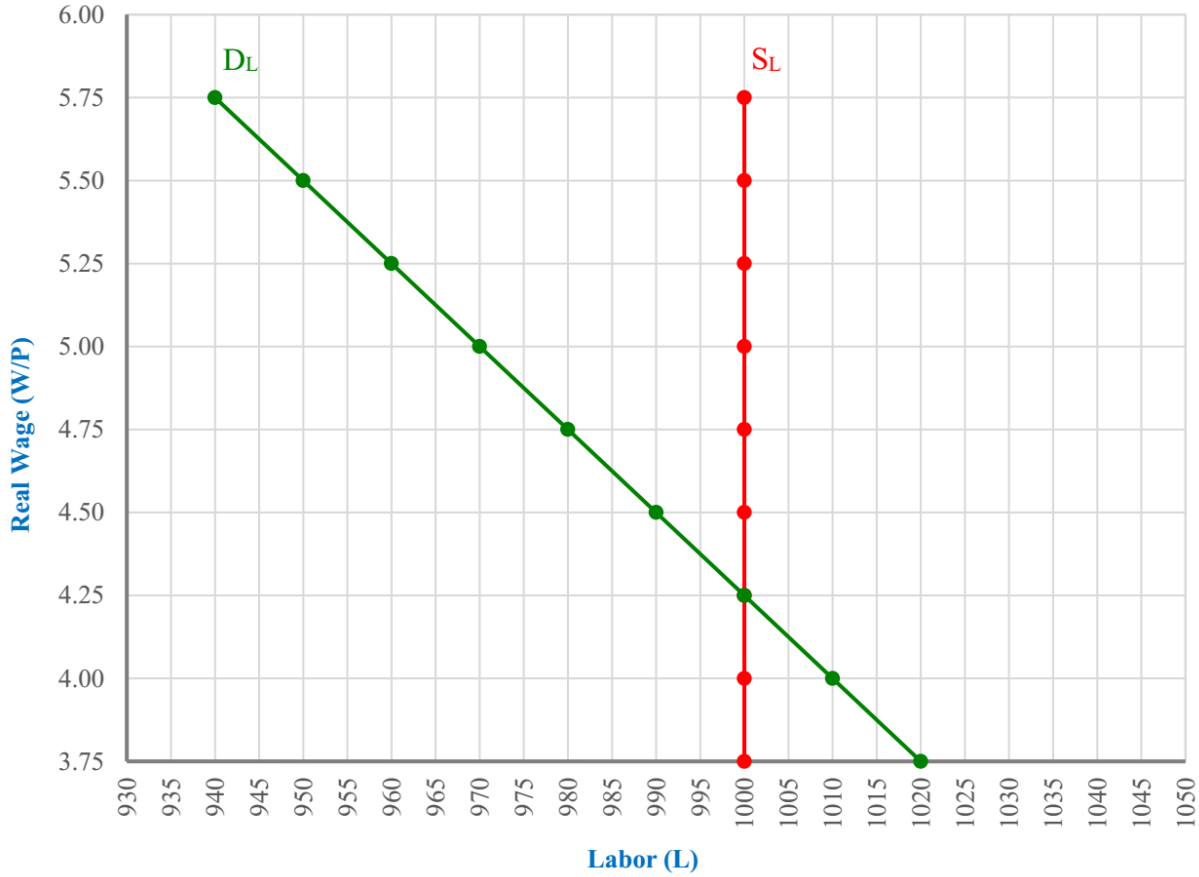


Firms are willing to hire 970 units of labor, even though at the real wage of 5 there are 1000 people who want to work. This is a form of *structural unemployment* – there was no mention made of a recession or anything. Hence $u_c = 0$.

Then by applying Okun's law, we get

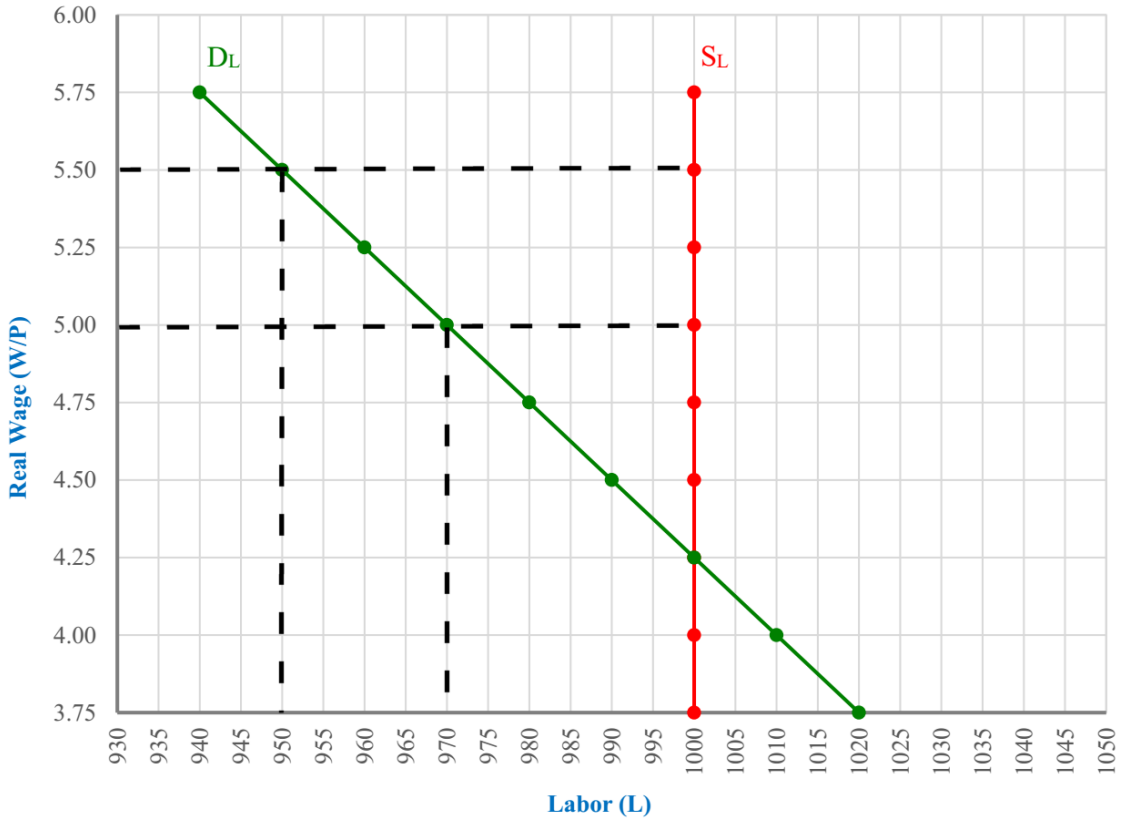
$$\frac{100,000 - Y}{100,000} = 2 \times 0 \quad \Longrightarrow \quad Y = 100,000.$$

Problem 8. $Y_p = 100,000$, Okun's alpha is $\alpha = 2$, and $u_f = 2\%$, and $u_n = 5\%$. Households and firms are pessimistic about the future state of the economy and reduce purchases of goods and services. This reduction in demand for goods and services affects the labor market in two ways – firms lay off workers so the nominal wage decreases by 1 percent; and the general price level decreases by 10 percent.



As a result the cyclical rate of unemployment increases to _____ percent and the real GDP equals _____ units.

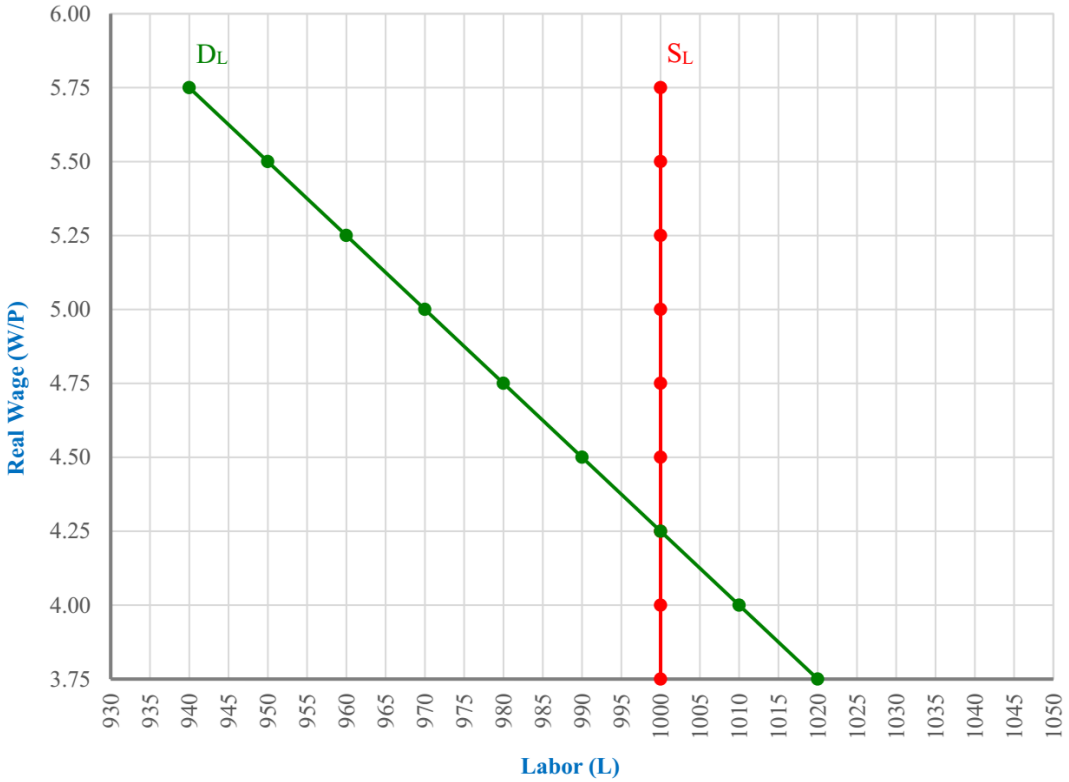
Answer 8. The nominal wage will decrease by $0.01 \times 500 = 5$ to 495, and the price level will decrease by $0.10 \times 100 = 10$ to 90. Hence the new real wage is $495/90 = 5.50$.



At the real wage of 5.50, there is excess supply of labor of $1000 - 950 = 50$. Of those 50, 30 of them are structurally unemployed $(1000 - 970)$, hence the remaining 20 are cyclically unemployed. Thus we can conclude that $u_c = 20/1000 = 2\%$. Then by applying Okun's law, we get

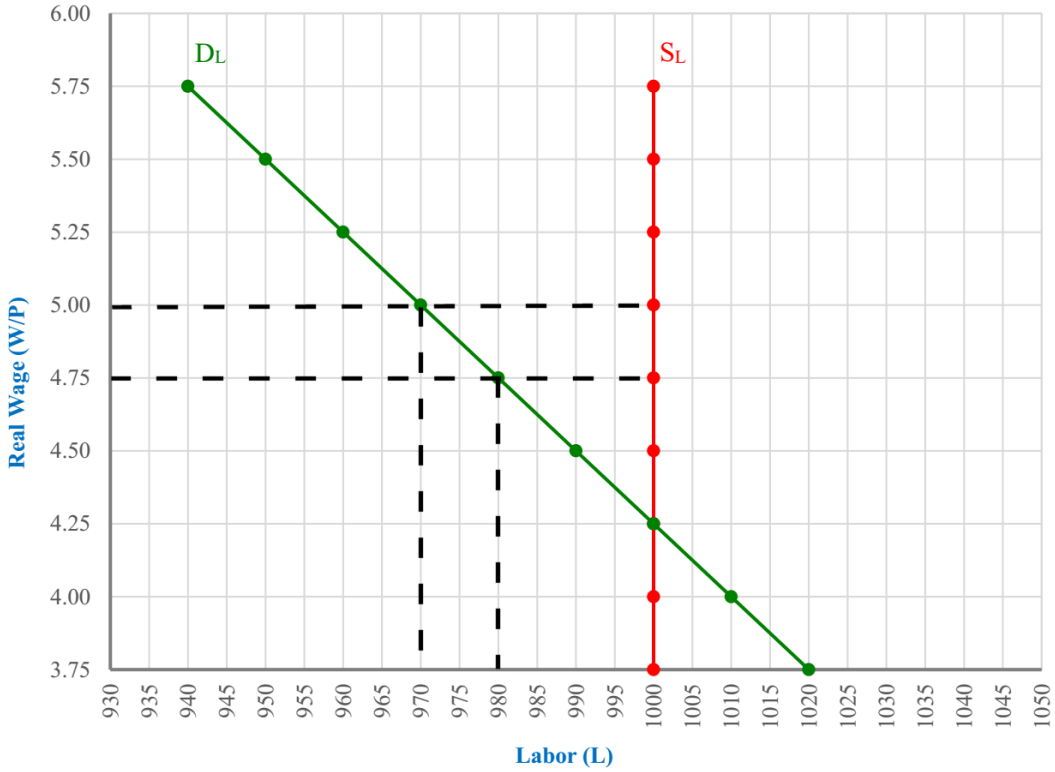
$$\frac{100,000 - Y}{100,000} = 2 \times 0.02 \quad \Longrightarrow \quad Y = 96,000.$$

Problem 9. Ignore what happened in Question 8 above and start from the base case as presented in Question 7. $Y_p = 100,000$, Okun's alpha is $\alpha = 2$, and $u_f = 2\%$, and $u_n = 5\%$. Suppose now that households and firms become overly optimistic about the future state of the economy and unexpectedly increase their purchase of goods and services. This increase in demand for goods and services affects the labor market in two ways. First, as firms try to hire new workers, the nominal wage increases by 1 percent. Second, the general price level increases by 6.31 percent.



As a result the cyclical rate of unemployment equals _____ percent and the real GDP equals _____ units.

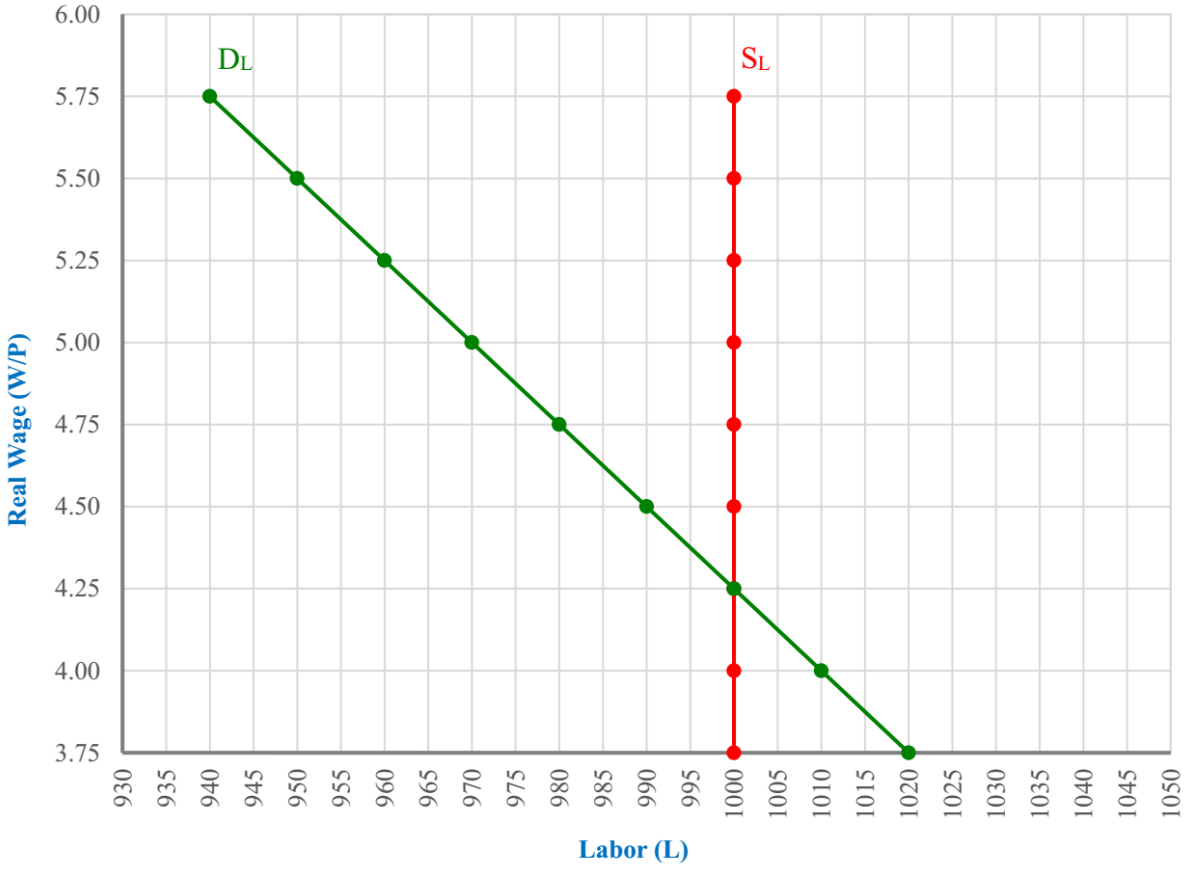
Answer 9. The nominal wage increases to \$505, and the price level increases to $100 \times 1.0631 = 106.31$. Thus the real wage is $505/106.31 \approx 4.75$.



There are still 30 structurally unemployed workers, but excess labor is only $1000 - 980 = 20$. Thus there must be -10 cyclically unemployed workers. Hence the cyclical unemployment rate is $-10/1000 = -1\%$. Okun's law then gives

$$\frac{100,000 - Y}{100,000} = 2 \times -0.01 \quad \Longrightarrow \quad Y = 102,000.$$

Problem 10. $Y_p = 100,000$, Okun's alpha is $\alpha = 2$, and $u_f = 2\%$. Suppose that in this country there are no minimum wage laws, no efficiency wages, and no labor contracts so that wages and prices are fully flexible. In that case, the overall unemployment rate in the long run equals _____ percent.



Answer 10. In the long run, $u_c = 0$. We are being told here that $u_s = 0$. Thus the only form of unemployment is frictional. Therefore $u = u_f = 2\%$.