

## Problem Set 3

***Answer the following questions:***

1) What are the three categories into which the central statistical office divides everyone? How does it compute the labor force, the unemployment rate, and the labor force participation rate?

***Answer:*** The CSO categorizes each adult (16 years of age and older) as employed, unemployed, or not in the labor force. The labor force consists of the sum of the employed and the unemployed. The unemployment rate is the percentage of the labor force that is unemployed. The labor-force participation rate is the percentage of the total adult population that is in the labor force.

2) Why is frictional unemployment inevitable? How might the government reduce the amount of frictional unemployment?

***Answer:*** Frictional unemployment is inevitable because the economy is always changing. Some firms are shrinking while others are expanding. Some regions are experiencing faster growth than in other regions. Transitions of workers between firms and between regions are accompanied by temporary unemployment.

3) How would an increase in the world price of oil affect the amount of frictional unemployment? Is this unemployment undesirable? What public policies might affect the amount of unemployment caused by this price change?

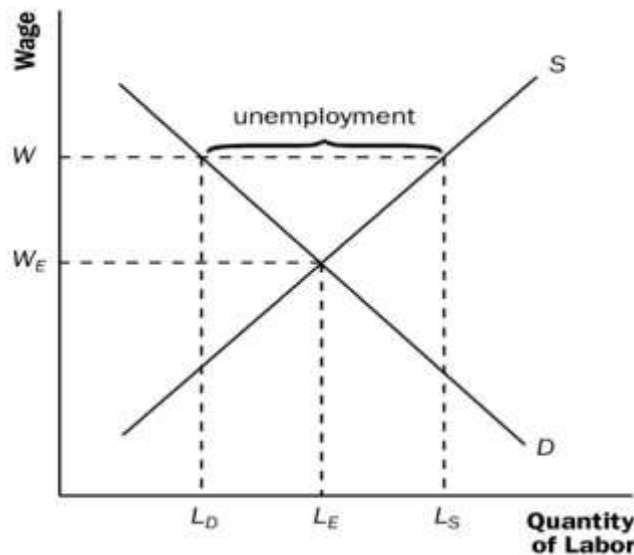
***Answer:*** An increase in the world price of oil increases the amount of frictional unemployment as oil-producing firms increase output and employment, but other firms, such as those in the auto industry, reduce output and employment. The sectoral shift from the auto industry to oil firms causes higher frictional unemployment for a time until workers have shifted from the auto industry to the oil industry. Although no increase in unemployment is really desirable, this type of frictional unemployment is a natural outcome of the reallocation of resources between different sectors. Public policies that might affect the unemployment caused by this change in the price of oil include government-run employment agencies, which can help autoworkers move into the oil industry, job-training programs to help workers adapt to a new industry, and unemployment insurance, which keeps workers from suffering economic hardship while changing from one industry to another.

4) What claims do advocates of unions make to argue that unions are good for the economy?

**Answer:** Advocates of unions claim that unions are good for the economy because they are an antidote to the market power of the firms that hire workers and they are important for helping firms respond efficiently to workers' concerns.

5) Draw the supply curve and the demand curve for a labor market in which the wage is fixed above the equilibrium level. Show the quantity of labor supplied, the quantity demanded, and the amount of unemployment.

**Answer:** Figure below shows the supply curve (S) and the demand curve (D) for labor. The wage (W) is above the equilibrium wage ( $W_E$ ). The result is unemployment, equal to the amount by which the quantity of labor supplied ( $L_S$ ) exceeds the quantity of labor demanded ( $L_D$ ).



6) Are the following workers more likely to experience short-term or long-term unemployment? Explain.

a. a construction worker laid off because of bad weather.

**Answer:** A construction worker who is laid off because of bad weather is likely to experience short-term unemployment, because the worker will be back to work as soon as the weather clears up.

b. a manufacturing worker who loses her job at a plant in an isolated area.

**Answer:** A manufacturing worker who loses his job at a plant in an isolated area is likely to experience long-term unemployment, because there are probably few other employment opportunities in the area. He may need to move somewhere else to find a suitable job, which means he will be out of work for some time.

c. a coach-industry worker laid off because of competition from railroads.

**Answer:** A worker in the coach industry who was laid off because of the growth of railroads is likely to be unemployed for a long time. The worker will have a lot of trouble finding another job because his entire industry is shrinking. He will probably need to gain additional training or skills to get a job in a different industry.

d. a short-order cook who loses his job when a new restaurant opens across the street.

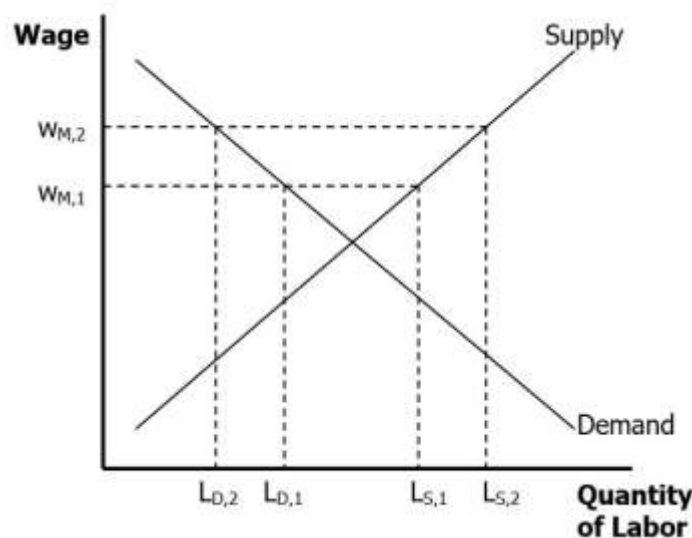
**Answer:** A short-order cook who loses his job when a new restaurant opens is likely to find another job fairly quickly, perhaps even at the new restaurant, and thus will probably have only a short spell of unemployment.

e. an expert welder with little formal education who loses her job when the company installs automatic welding machinery.

**Answer:** An expert welder with little education who loses his job when the company installs automatic welding machinery is likely to be without a job for a long time, because he lacks the technological skills to keep up with the latest equipment. To remain in the welding industry, he may need to go back to school and learn the newest techniques.

7) Using a diagram of the labor market, show the effect of an increase in the minimum wage on the wage paid to workers, the number of workers supplied, the number of workers demanded, and the amount of unemployment.

**Answer:** Figure below shows a diagram of the labor market with a binding minimum wage. At the initial minimum wage ( $w_{M,1}$ ), the quantity of labor supplied  $L_{S,1}$  is greater than the quantity of labor demanded  $L_{D,1}$ , and unemployment is equal to  $L_{S,1} - L_{D,1}$ . An increase in the minimum wage to  $w_{M,2}$  leads to an increase in the quantity of labor supplied to  $L_{S,2}$  and a decrease in the quantity of labor demanded to  $L_{D,2}$ . As a result, unemployment increases as the minimum wage rises.



8) Suppose that Congress passes a law requiring employers to provide employees some benefit (such as health care) that raises the cost of an employee by \$4 per hour.

a. What effect does this employer mandate have on the demand for labor? (In answering this and the following questions, be quantitative when you can.)

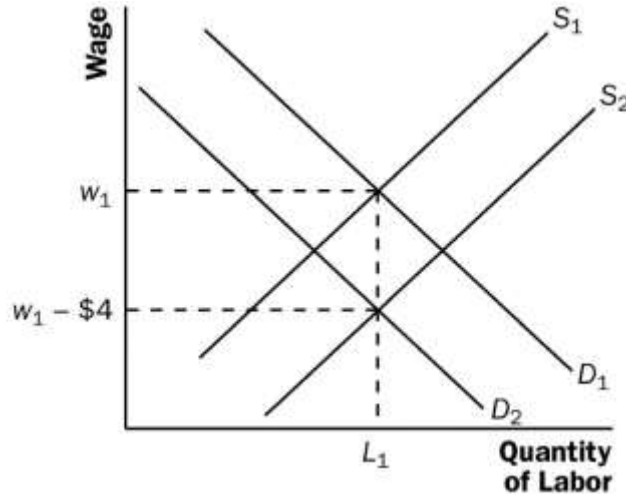
**Answer:** If a firm was not providing such benefits prior to the legislation, the curve showing the demand for labor would shift to the left by exactly \$4 at each quantity of labor, because the firm would not be willing to pay as high a wage given the increased cost of the benefits.

b. If employees place a value on this benefit exactly equal to its cost, what effect does this employer mandate have on the supply of labor?

**Answer:** If employees value the benefit by exactly \$4 per hour, they would be willing to work the same amount for a wage that is \$4 less per hour, so the supply curve of labor shifts to the right by exactly \$4.

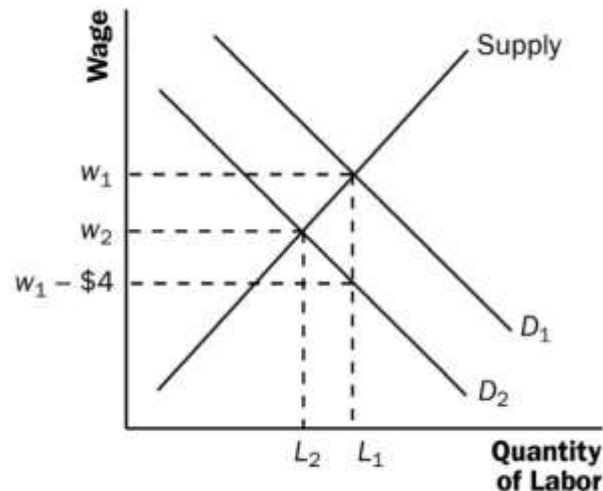
c. If the wage is free to balance supply and demand, how does this law affect the wage and the level of employment? Are employers better or worse off? Are employees better or worse off?

**Answer:** Figure below shows the equilibrium in the labor market. Because the demand and supply curves of labor both shift by \$4, the equilibrium quantity of labor is unchanged and the wage declines by \$4. Both employees and employers are just as well off as before.



d. Now suppose that workers do not value the mandated benefit at all. How does this alternative assumption change your answers to parts (b) and (c) above?

**Answer:** If the workers do not value the mandated benefit at all, the supply curve of labor does not shift. As a result, the wage rate will decline by less than \$4 and the equilibrium quantity of labor will decline, as shown in the figure below. Employers are worse off, because they now pay a greater total wage plus benefits for fewer workers. Employees are worse off, because they get a lower wage and fewer are employed.



9) What distinguishes money from other assets in the economy?

**Answer:** Money is different from other assets in the economy because it is the most liquid asset available. Other assets vary widely in their liquidity.

10) Why don't banks hold 100 percent reserves? How is the amount of reserves banks hold related to the amount of money the banking system creates?

**Answer:** Banks do not hold 100% reserves because it is more profitable to use the reserves to make loans, which earn interest, instead of leaving the money as reserves. The amount of reserves banks hold is related to the amount of money the banking system creates through the money multiplier. The smaller the fraction of reserves banks hold, the larger the money multiplier, because each dollar of reserves is used to create more money.

11) What are the reserve requirements? What happens to the money supply when the Fed raises reserve requirements?

**Answer:** Reserve requirements are regulations on the minimum amount of reserves that banks must hold against deposits. An increase in reserve requirements raises the reserve ratio, lowers the money multiplier, and decreases the money supply.

12) Assume that the banking system has total reserves of \$100 billion. Assume also that required reserves are 10 percent of checking deposits, and that banks hold no excess reserves and households hold no currency.

a. What is the money multiplier? What is the money supply?

**Answer:** With banks holding only required reserves of 10%, the money multiplier is  $1/0.10 = 10$ . Because reserves are \$100 billion, the money supply is  $10 \times \$100 \text{ billion} = \$1,000 \text{ billion}$  or \$1 trillion.

b. If the Fed now raises required reserves to 20 % of deposits, what is the change in reserves and the change in the money supply?

**Answer:** If the required reserve ratio is raised to 20%, the money multiplier declines to  $1/0.20 = 5$ . With reserves of \$100 billion, the money supply would decline to \$500 billion, a decline of \$500 billion. Reserves would be unchanged.