

Problem set 9

16.4

Suppose demand for labor is given by

$$l = -50w + 450$$

and supply is given by

$$l = 100w,$$

where l represents the number of people employed and w is the real wage rate per hour.

- What will be the equilibrium levels for w and l in this market?
- Suppose the government wishes to increase the equilibrium wage to \$4 per hour by offering a subsidy to employers for each person hired. How much will this subsidy have to be? What will the new equilibrium level of employment be? How much total subsidy will be paid?
- Suppose instead that the government declared a minimum wage of \$4 per hour. How much labor would be demanded at this price? How much unemployment would there be?
- Graph your results.

16.5

Carl the clothier owns a large garment factory on an isolated island. Carl's factory is the only source of employment for most of the islanders, and thus Carl acts as a monopsonist. The supply curve for garment workers is given by

$$l = 80w,$$

where l is the number of workers hired and w is their hourly wage. Assume also that Carl's labor demand (marginal revenue product) curve is given by

$$l = 400 - 40MRP_l.$$

- How many workers will Carl hire to maximize his profits, and what wage will he pay?
- Assume now that the government implements a minimum wage law covering all garment workers. How many workers will Carl now hire, and how much unemployment will there be if the minimum wage is set at \$4 per hour?

17.3

As scotch whiskey ages, its value increases. One dollar of scotch at year 0 is worth $V(t) = \exp\{2\sqrt{t} - 0.15t\}$ dollars at time t . If the interest rate is 5 percent, after how many years should a person sell scotch in order to maximize the *PDV* of this sale?

4) Paul is endowed by a capital of 10000 euro that can spend in the next 10 months. Every amount that is not spent increases by 10% in the following month, i.e. suppose that in month 1 he spend 1000 (and save 9000), then in month 2 he has an endowment of 9900. Every amount that is not spent after the 10 months is lost. Assuming that his instantaneous utility function is $u(x) = \ln(x)$ and that his discounted utility function is $U = \sum_{t=1}^{10} 0.8^t u(c)$ compute the optimal consumption profil

5) Paul has to choose between two following payment streams:

Stream A: \$80 paid for ever starting from now.

Stream B: \$100 paid for ever starting 2 years from now

Assume that Paul discount rate is 10% and his instantaneous utility function is $u(c) = \ln c$
Which payment stream would Paolo prefer?

Find the discount rate that makes Paul indifferent between the two streams?

Suppose the discount rate is above the value you found in the previous point. What Paul prefer? And what if the discount rate is below?

6) Suppose a machine is producing 1.000 units of a good every year. Each year this machine can go destroyed by a probability of 0.1. In case it is destroyed, it is not recovered and a new machine must be bought. Assume:

1. Assuming that this good is sold at a price of 10 per units and price remains constant in the coming years and that the interest rate is 5%, compute the present discounted value of the machine.

2. based on the result of previous point for which price you are willing to buy this machine.

3. Compute the point 1 assuming that in each year the probability to be destroyed is 5%, but after 10 years the machine must be replaced.