Chapter 8 – Demand and Supply of Health Insurance

1. He pays the $100 deductible plus 20% of the remaining $900, or $180. Total out-of-pocket expenditures will be $280, or 28% of his total expenses.

2. \( E = \frac{2}{3} \times 1 + \frac{1}{3} \times 0 = \frac{2}{3} \) of a dollar.

3. Expected return for red bet or black bet is \( \frac{18}{38} = 0.474 \). The sum of these two probabilities equals 0.947. The green pockets (where everyone loses) provide the “house” with a 5.3% edge.

4. 

5. a. no gains from insurance for those who are not risk averse.
   
   b. if one does an expected utility diagram the, expected utility line provides more utility than certainty. So insurance (certainty) “costs” the consumer.

6. a. For \( U = 20 \ Y \), marginal utility = 20 irrespective of income.

   Edward is unlikely to insure, at actuarially fair rates, because the loss of utility due to the premium is at least as large as the expected loss of utility due to loss of income.

   b. Marginal utility at \( y = 1000 \) is 3.16.

   
   Marginal utility at \( y = 2000 \) is 2.24.

   Here, he is likely to insure, because the loss of utility due to the premium, at actuarially fair rates, will be less than the expected loss of utility due to loss of income.

7. \( Q = 10 \).

   The fair price is probability, multiplied by expected expenditures, or \( 0.25 \times (10 \times 20) = $50 \).

8. If they pay his entire expenses, this is equivalent to a price of 0. Hence Fred would buy \( Q = 50 \), incurring $1000 in expenditures. The company could not continue to offer him insurance at the rate of $50, as before, unless it limited the number of visits to 10, because of the increased quantity demanded, due to moral hazard. They may choose to offer him insurance at the new actuarially fair rate of $250.
9. a. Equilibrium price = 20; Equilibrium quantity = 60.

b. Equilibrium price = 33.33; Equilibrium quantity = 86.66.

c. Deadweight loss = \( \frac{1}{2} \times 26.66 \times 26.66 = 355.56 \)

10. a. Equilibrium price = 20; Equilibrium quantity = 60.

b. Equilibrium price = 26.66; Equilibrium quantity = 73.33.

c. Deadweight loss = \( \frac{1}{2} \times 13.33 \times 13.33 = 88.89 \). It is \( \frac{1}{4} \) the deadweight loss of the previous problem. Higher coinsurance \( \rightarrow \) lower DW loss due to moral hazard.

11. Using Figure 8-9, calculate the net welfare benefits if \( m_u = 20,000 \), \( m_c = 40,000 \), and \( m_i = 44000 \). To aid in the calculations assume that point G has a value of 2 and point F has a value of 3.
Solution: Area $ABFG$ is easily calculated as the difference between two triangles. That is triangle FB1 – triangle GA1. 
Triangle FB1 – triangle GA1 = ($\frac{1}{2} \times 40,000 \times 2) – (\frac{1}{2} \times 20,000 \times 1) = $30,000
Area $BJZ = \frac{1}{2} \times 4000 \times 1 = $2,000
Net welfare benefit = $28,000.
Chapter 9 - Consumer Choice and Demand

1. Let \( X \) = health care visits, and \( Y \) = groceries. The X intercept is 500 visits. The Y intercept is 400 bags.

The indifference curve is tangent at 300 bags, 125 visits (somewhat unrealistic, but a problem that occurs in a 2-good model).

2. Budget constraint shifts out. Equilibrium visits increase to 130.

Income elasticity is \((\% \text{ Change in Quantity})/\text{(\% Change in Income)})\), or \(4\%/5\% = +0.8\).

3. Before insurance, Alfred will consume 6 visits at \( P = \$30 \). After insurance Alfred will consume 9 visits, up to a price of \( \$37.50 \); \((0.4 \times \$37.50 = 15)\). Above \( \$37.50 \), he will reduce quantity. For example, at \( P = \$50 \), Alfred's cost is \$20, so that he will make 8 visits.

4. Number of visits declines by 4%. Total expenditures will increase, because the decrease in quantity is not sufficient to make up for the increase in price.

5. A 2% decrease in decrease in quantity, and approximately an 8% increase in health expenditures.

7. We would expect it to be higher for higher income people assuming that the higher income is related to higher wages. This would suggest that for higher income people the money price would be a smaller portion of the full price.
Chapter 10 - Asymmetric Information and Agency

1. At a price of $10,000, all 8 cars will be offered, but buyers are willing to pay up to $8,437.50 ($7,500 times the average quality of 1.125). However, if the auctioneer calls out a market price of $8,437.50, the two best cars, with 2 and 1.75 quality levels, are withdrawn.

Nevertheless, unlike the example in the chapter, there will be an equilibrium. Start at a price of $1,500. One car will be offered and buyers are willing to pay $7,500 (per unit of quality) \( \times 0.25 \) units of quality = $1,875. Thus the market will clear at 1 car at any price between $1,250 and $1,875. But this is not the only possibility. At a price of $2,500, two cars will be offered, and buyers would be willing to pay up to $2,812.50 (i.e. $7,500 times the average quality of 0.375). Hence the market will clear at 2 cars for prices of $2,500 to $5,812.50. There is also another equilibrium at a price of $3,750. Here, 3 cars are offered at an average quality of 0.5, so that buyers are willing to pay up to $750. Any price greater than $3,750 will no longer clear the market.

If the auctioneer works down from a starting price of $10,000, or if we are searching for an equilibrium with the largest quantity (to make as many people as happy as possible), the solution is at a price of $3,750 and a quantity of 3 cars.

2. The client would want her attorney to increase the time and resources spent on the case until the marginal benefits are zero. The attorney, on the other hand, has to consider the opportunity cost of his time and other resources devoted to the case. He will optimize when the marginal benefits to him, 1/3 of any additional award, equals the marginal cost of his time and other resources.

4. Recall that in the “lemons” problem a market ceases to exist because nonowners only bid for average quality. In the case of risk “avoiding” buyers, the bids would be even less because people would need to be compensated for risk. Once again, in this case, the market would cease to exist.

Interestingly enough, if some buyers are “risk loving,” a market may develop. Some buyers, possibly acting on the possibility that some cars are valuable antiques, may bid above the average value. Owners of top quality cars may stay in the market. The extent to which the market evolves depends on the relative number of “risk-lovers” in the market.
Chapter 11 – The Organization of Health Insurance Markets

1. Hangnails and “bad hair” days would provide small expected gains, less than the marginal cost of getting insurance. Broken arms, and meningitis would provide expected gains greater than the marginal cost of getting insurance.

2. a. The original labor market equilibrium is at employment level L_1 and wage rate W_1.
   b. Demand shifts down more than supply. The new equilibrium is at employment level L_2. The net wage to the workers will be at W_3, and the gross wage to the employer will be at W_3 + z.
   c. Supply shifts down more than demand. The new equilibrium is at employment level L_3 which exceeds L_1. The net wage to the workers will be less than W_2, and the gross wage to the employer will be less than W_1.

3. The demand curve shifts downward, and the supply curve does not shift at all.

4. Using the diagram above, the supply curve shifts to S_2. The new labor market equilibrium is at L_3 and W_4. The answers differ because the worker’s valuations of the benefits differ.

5. Note error in supply equation. It should be \( L_s = -200 + 40W \).

Solutions

<table>
<thead>
<tr>
<th>Equilibrium values</th>
</tr>
</thead>
<tbody>
<tr>
<td>( w )</td>
</tr>
<tr>
<td>5a   20.00</td>
</tr>
<tr>
<td>5b   18.67</td>
</tr>
<tr>
<td>5c   17.33</td>
</tr>
</tbody>
</table>

6. Steve would seek more insurance. At a 28 percent marginal tax rate, the relative cost of insurance to him is lower.
   \[= 120 - 80 - 40 = 0.\]

   b. Elasticity = \[\frac{\frac{\Delta L}{L}}{\frac{\Delta W}{W}} = \frac{-1}{9.5} + \frac{1}{8.5} = -8.5/9.5 = -0.895.\]

   c. New profits = 120 – (9 x 9 workers) – 45 = -6.

   d. Charlie’s long run decision would be not to offer the insurance. If he does, he cannot make enough profits to stay in business.

8. A vertical rise in the \(\Delta h\) curve would leave \(\Delta m\) unchanged.

Cost cutting changes will shift the curve to the left, leaving an equilibrium at a lower level of \(\Delta m\) and a higher level of \(\Delta h\).
Chapter 12 - Managed Care and Health Maintenance Organizations (HMOs)

1. \( Q^* = 30 \)
   \( P^* = 35 \)
   Profits = 1050 - 600 = 450.

2. \( Q^* = 60 \)
   \( P^* = 20 \).
   Profits = 0.

3. a. Total expenditures fall from $800 per year to $560 per year.
   b. Demand is lower.

4. a. See figure above. Lines intersect at \( s^* = $450 \). Below $450, client chooses HMO. Above $450, client chooses FFS.
   b. At \( s = $250 \), client chooses HMO
   c. Client is indifferent at \( s = $450 \).
   d. \( s^* \) rises to $562.50. Clients who previously spent between $450 and $562.50 who were in FFS, now use HMO. See dashed line

5. Short run profits would become negative.

6. In long run equilibrium in a market as depicted in Figure 12-74 (text), the demand curve \( D \) would be tangent to the AC curve (not shown although implied in the exercise). This would imply that economic profits equaled 0.

7. a. In Period 2, total costs per period would rise from $1600 per person to \( 0.7 \times 2000 + 0.3 \times 1000 = $1700 \) per person, because of the shift from managed care to FFS, not because costs in either sector were rising. They would rise by another 10\%, to $1870 per person in Period 3.
   b. They reverse the discussion in the book, because the movement is to more expensive care rather than less expensive care.