

EC387 PS 1 Health Economics Ellis

1. For each of the contractual pairs shown in Figure 1.3 of HEMA 1, think of an example in which each agent may have better information than the other (e.g., in which there is asymmetric information.) This should result in twelve examples in total, two for each of the six contracting relationships.

2. Imagine that your local supermarket offered a “food insurance plan” so that by paying \$100 per month you could reduce the cost of your food purchases to 50% of their posted price. Assume food is not transferrable. Describe in a few words how you expect joining this food insurance plan would change each of the following.

- Quantity of food purchased
- Quality of food purchased
- Choice between perishable and storable foods
- Willingness to go to other stores
- Prices at the supermarket
- Variety of goods offered by the supermarket
- Willingness to introduce new foods

3. Parallel to health care markets, in many countries publicly-funded universities also have four classes of agents: students, professors, public universities, and governments. Create a diagram similar to Figure 1.3 showing how these four agents interact in a country of your choice. Do consumers pay suppliers in this market directly for their services? Why or why not? How are payment flows made?

4. In class we drew a variety of indifference curves, not all of which are monotonically increasing. We also considered the case where the consumer uses a subset of all income allocated to a sector to decide on how to allocate spending between two commodities. This example asks you to consider the indifference curves for the case where one good is always a positive utility, while the other good has positive marginal utility for $T < \bar{T}$, and negative marginal utility for $T > \bar{T}$. Assume there is no storage, goods are non-transferrable and there is no free disposal, i.e, the consumer cannot costlessly ignore an excess quantity.

Assume two goods, $Y = \text{AOG}$ (all other goods) and $X = \text{Hot peppers}$. Assume that the utility function can be written as

$$U = Y - (X-10)^2$$

- Calculate the marginal utility of X and Y and show that they are both positive for all Y . For what value is the marginal utility positive for X ?
- Interpret this result: for what values of Y is Y a good and for what values is it a bad? For what values of X is X a good and for what values is it a bad? For what value(s) of X and Y is a consumer at their bliss point?
- Draw a sketch of a few indifference curves and find at least three points on the indifference curves for $U=0$, $U=1$, and $U=2$. (Hint: either solve the utility function for the set of points for these values, or use Excel to do a grid search over the ranges of $0 \leq X \leq 20$ and $0 \leq Y \leq 20$. It can also be used to find the utility isoquants for this function.)

d. For the previous utility function, show graphically or solve numerically for the optimal choices of X and Y for $I=10$, $P_x=P_y=1$. Solve again for $I=20$. Comment on how the consumption of X and Y change with income.

5. Suppose that when Michael is healthy he does not demand any doctor's visits. When he is sick his demand function for physician visits is summarized by the demand curve $Q = 10 - P^D/10$ where Q is the quantity of visits and P^D is the demand price of a visit. Assume that doctor's visits are the only type of medical care Michael uses, and this illness is the only risk facing him. Michael's probability of becoming sick is $\delta = .5$

- a) How many visits will Michael consume when sick if he has no insurance and the price of a visit is \$50? How much does he spend on medical care when sick?
- b) What is Michael's expected spending on physician visits when he has no insurance?
- c) Explain whether an insurance company will be able to make a profit by offering full insurance coverage for all physician visits and charging a premium of \$125.
- d) How many visits will Michael consume when he has full insurance when sick, so that the demand price is zero? If the supply price of a visit remains at \$50, what is the total cost to the insurer when Michael is sick? What is the actuarially fair premium for the insurance company to offer Michael?