Intuition Questions for Midterm

Econ 50 - Stanford University - Winter Quarter 2015/16

February 8, 2016

Thanks to all the students who submitted potential midterm questions. They were great! One of these will be used in Part I of the midterm. Note that I have edited the original submissions, and sometimes heavily...so if you see your question here and it's not quite what you wrote, that's why!

1. **Fantastic Elastics**

   (a) What does it mean if a good displays the following relationships:

   $$\frac{\partial Q_x^D(P_x, P_y, I)}{\partial P_y} > 0$$

   $$\frac{\partial Q_x^D(P_x, P_y, I)}{\partial I} < 0$$

   (b) True or false: "Supply elasticity is the slope of the supply curve." Explain, and support your explanation with an example.

2. **Join the Mile High Club?**

   A new company is offering subscription-based travel: for a fixed fee of F, you can purchase airline tickets (good X) at a deep discount: you'll pay P_x^D rather than P_x^R (where D indicates discounted price, and R indicates the retail price).

   Suppose you have a travel budget of I which can be spent on airline tickets or other goods (good Y, measured in dollars so $P_y = 1$).

   (a) Write down your constrained optimization problems for a generic utility function $u(x, y)$, with and without the subscription.

   (b) On a budget line / indifference curve diagram, show your two possible budget lines if you buy the subscription and get the discount (BL^D) or if you don't buy the subscription and pay retail (BL^R).

   (c) Suppose the discounted and non-discounted prices are such that you are indifferent between joining the club and not joining the club. To your diagram above, add two points and one or more indifference curves illustrating this situation. Provide a brief intuitive explanation of how your diagram now illustrates the case of someone who is indifferent between joining the club and not.

   (d) Sarah and her friend are arguing about the answer to (c). Her friend says that if you're indifferent between the two budget lines, you must be consuming at the point where they cross. Sarah convincingly explains why that's impossible. Her friend admits Sarah is right in general, but provides a counterexample to show an exception to Sarah's logic. What is Sarah's logic, and what is the counterexample?

3. **Taxing cigarettes**

Suppose the government wants to reduce the quantity of cigarette smoking in the United States. For simplicity, assume that each consumer has an income I which he or she spends on packs of cigarettes (good X) and other goods (good Y). The government believes that if it spends c dollars per consumer on an anti-smoking campaign, the average smoker's utility will be

$$u(x, y, c) = (a - c) \ln x + y$$

The government is deciding between levying a lump-sum tax on income (so people's income would be $I - c$) or levying a tax of τ per pack of cigarettes (so the price of a pack of cigarettes would be $P + \tau$). You can ignore any market equilibrium effects of either policy on the price of cigarettes, P.

(a) Write down the consumer's constrained optimization problem. What do consumers take as exogenous, and what is endogenous?

(b) Suppose the government's "social welfare function" is some generic $V(x, y)$, where x and y are the consumption bundle chosen by each consumer. Draw a set of representative indifference curves for such a function, indicating the direction of increasing social welfare.

(c) Write down the government's constrained optimization problem. What does the government take as exogenous, and what is endogenous?

(d) For a given target spend c, which funding approach (a tax on income or a tax on cigarettes) do you think would be more effective at reducing smoking? Explain why, using the term "marginal rate of substitution" at least once in your explanation.

4. **Qrazy for Quasilinear**

Suppose a consumer faces a quasilinear utility function, $u(x, y) = y + v(x)$, where $v'(x) > 0$ and $v''(x) < 0$.

(a) Sketch an indifference curve and derive an expression for the marginal rate of substitution.

(b) What kind of situation is best represented by a quasilinear utility function like this one? Please provide a real-world example.

(c) Explain why the indifference curves for a quasilinear utility function are parallel shifts of each other.

(d) Describe and explain the shape of the income-consumption curve (ICC) for a utility function of this type.

(e) Suppose a consumer has this utility function, and also has a kinked budget constraint. In particular, the consumer has a gift card that can only be spent on good X, and not on other goods. In three graphs, illustrate the three possible budget-line/indifference-curve diagrams that might characterize his optimal consumption choice.