Midterm - Part I - Questions 1-4 - 55 Points

Econ 50 - Stanford University - Winter Quarter 2014/15

February 9, 2015

The exam is divided into two parts, Part I and Part II.
When you are done, please put each part in the appropriate box in the lobby outside Cubberley Auditorium.

Write your name and your TA's name (**Rui** Xu, **Michael** Zhang, or **Connor** Scherer), and sign the statements on the covers of Part I and Part II of the exam.

You will have a total of 110 minutes to complete this exam. You can work on Part I and Part II in any order. The exam is worth a total of 100 points, so you should allocate approximately one minute per point. Pace yourself carefully, and provide clear, concise answers – lengthy explanations are not necessary! If you finish early, there is an extra credit question worth 5 points (truly extra credit – it won't be used in normalizing scores!) if you want to show off. :)

Write all of your answers in the space provided. If you need extra room, please use the back of each sheet. Your numerical answers should be as precise as possible. If you're pressed for time, don't worry about simplifying your answers perfectly. Make sure you show your work.

If you must make any additional assumptions in order to answer a question, please state what those assumptions are. At least one member of the Econ 50 staff will be available in the lobby outside Cubberley Auditorium at all times. We usually cannot answer questions, but please notify us if you feel you've found a mistake in the exam or if you observe a classmate engaging in suspicious behavior.

Remember that the only aid you may use for this exam is a simple four-function calculator (not a graphing calculator, programmable calculator, etc). No notes, books, headphones, cell phones, etc. may be used to help you.

"The answers written on these pages are entirely my own. I attest that in taking this exam, I am fully complying with all provisions of Stanford's Fundamental Standard and Honor Code."

Signature:

Printed Name:

TA's Name:

Please do not open this exam until it is time to begin. Good luck!

Question 1: How elastic are those sweatpants? [15 points]

Suppose the market demand for sweatpants (good X) is given by $Q_x = 20 + I - P_x - \frac{1}{2}P_y$, where I is the average income of consumers, P_x is the price of sweatpants, and P_y is the price of T-shirts.

(a) Compute the **own-price** elasticity of demand for sweatpants (ϵ_{Q_x,P_x}), the **cross-price** elasticity of demand for sweatpants with respect to T-shirts (ϵ_{Q_x,P_y}), and the **income** elasticity of demand for sweatpants ($\epsilon_{Q_x,I}$). [6 points]

(b) On a carefully drawn diagram of the demand for sweatpants, show where the demand for sweatpants is elastic, unit elastic, and inelastic. [6 points]

(c) According to this demand function, are sweatpants and T-shirts complements, substitutes, or neither? How do you know? [3 points]

Question 2: Thinking on the margin [15 points]

(a) What does it mean if $MRS_{x,y} < \frac{P_x}{P_y}$ at a point along a consumer's budget constraint? [5 points]

(b) If a consumer is in a position where that is true, can they always improve their utility by changing their consumption bundle? Why or why not? Illustrate your answer with one or two carefully drawn budget-line/indifference-curve diagrams. [5 points]

(c) If they could improve their utility by changing their consumption bundle, would it involve consuming more X and less Y, more Y and less X, or would it depend upon the exact form of the utility function in question? Carefully state the assumptions underlying your answer. [5 points]

Question 3: It's all the same to me [15 points]

Nick cannot for the life of him tell the difference between Coke and Pepsi; he views them as perfect substitutes for one another.

(a) Clearly draw his demand curve for Coke on a carefully labeled diagram. [5 points]

(b) Pick any point on the demand curve above, and label it point A. Use a budget-line/indifference curve diagram to explain what's going on at that point. [8 points]

(c) Explain what would happen if the price of Coke dropped a little bit (say, a penny) from the point you chose in part (b). [2 points]

Question 4: An unusually sweet deal [10 points]

Schmidt expects to earn $100,000 this year and $110,000 next year. He has a very unusual bank: it offers a *higher* interest rate on savings than it charges on loans. Specifically, it charges 10% annual interest on loans, but offers 15% interest on savings.

(a) Draw a precise diagram of Schmidt's intertemporal budget constraint for his decision of how much to consume this year and next. [5 points]

(b) If Schmidt has smooth (i.e., continuously differentiable) indifference curves, is there any way that he will choose to neither borrow nor save? Explain your answer, drawing some additional curves if necessary. [5 points]