

Exam 1
Economics and Ecommerce
14.27, Fall 2012

Instructions: This exam is closed-book and closed-notes. You have approximately 85 minutes in which to complete the exam. (Note that the exam is out of 85 points to help you budget your time.) Keep your explanations to all questions **very brief**. Good luck!

1. (20 pts.) T,F,U with explanation: (Be as specific as possible but keep explanations to **one or two sentences** or you will receive no credit):

a) The “Bertrand Paradox” refers to the situation where firms with higher fixed costs charge lower prices.

b) Monopoly prices are a function solely of marginal cost and demand elasticity.

c) eBay’s “buy-it-now” option has always been the dominant choice for sellers with inexpensive goods because of the lower transactions costs.

d) The Diamond search model helps us understand why there is a lot of price dispersion among products whose prices are costly to find.

e) According to models we have seen, firms who can differentiate themselves from their competitors can charge prices above marginal cost, and perhaps even high enough to more than cover their fixed costs, if there are barriers or delays to entry.

2. (20 pts.) Suppose that two firms selling identical products at marginal cost c are located at opposite ends of a “linear city”—call those locations 0 and 1. Also suppose that potential customers, each buying at most one unit, all value the good at V , are distributed uniformly between the two firms, and incur a travel cost to purchase from one of the two firms. Specifically, a customer located at $x \in [0, 1]$ enjoys utility $V - xt - P_0$ if he purchases from firm 0. Assuming that V , c , and t are values such that both firms make positive sales and the market is covered, we saw in class that $P_0^* = P_1^* = c + t$.

a) If the firms incur no costs other than their marginal cost, what are the firms' profits?

b) If firms could choose their locations in the "linear city," their choice would involve a tradeoff between two effects. What are those two effects? (Think of this problem as a two-stage game where firms simultaneously choose location in the first stage knowing what second stage competition will look like, and then compete in the second stage. You do not need to solve for the equilibrium, though.)

Suppose, now, that firms had to choose their locations in the first stage but that prices were fixed at some value $P > c$, so there was no price competition in the second stage. Note that customers visit the firm closest to them, and if firms co-locate, one firm gets the customers to the left and the other gets the customers to the right. (This could be a model of websites differentiated along some dimension like the political spectrum, trying to attract visitors, but not actually selling anything or charging prices.) In this case, the conditions for a Nash equilibrium for N firms are

1) No firm's market length is less than half of any other firm's half market length (where a half market length is the part of a firm's market on one side).

2) The left-most and right-most firms will co-locate with the closest interior firms.

c) Indicate briefly why the NE must have these conditions. If there are two firms, where will they locate?

d) Could this model help explain Mitt Romney's move towards a more moderate platform?

3. (25 pts.) Suppose a seller has one item that she wants to sell and faces a market with N potential buyers whose valuations for the product are random draws from a Uniform $[0, 1]$ distribution. She is considering selling the item at a fixed (posted) price or auctioning it.

a) If she posts a price, what is her optimal price and expected profit as a function of N ? (You may use the fact that the CDF of the N th order statistic from a standard uniform distribution evaluated at $x \in [0, 1]$ is x^N .)

b) If she auctions the item using an ascending bid auction, what is her expected profit as a function of N ? (You may use the fact that the PDF of the $(N-1)$ st order statistic from a standard uniform distribution evaluated at $x \in [0, 1]$ is $N(N-1)(1-x)x^{N-2}$.)

Suppose that instead of a simple ascending bid auction, she runs an ascending bid auction where there's a minimum bid of P_r .¹

c) Show that choosing P_r to be P^* from part a) gives the seller higher expected profit for all N than posting a price.

d) What is the best value for P_r that the seller can choose?

e) In its early days, eBay charged sellers an additional fee for using a minimum bid. Speculate on why eBay may have thought this was a desirable policy.

4. (20 pts.) Attached you will find an article from 2010 where the author is essentially giving advice to Groupon about how to use their group purchasing power more effectively. In a short essay, touch on two issues: 1) whether Groupon followed this author's advice, and 2) whether the advice seems useful. In 2), please refer to specific statements in the article and make reference, where necessary, to the related economics literature.

Tobin, Jim. "Group Purchasing: The Next Big Idea in Social Commerce Has to Be More Than a Deal a Day." Ignite Social Media. April 27, 2010.

¹This minimum bid is called a "reserve price." Note that it still is optimal for bidders to bid their valuations if they are bigger than P_r . Otherwise, they do not bid.

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