

14.27 Problem Set 2

Due 10/1

Question 1: Biased Beliefs

Recall the model of auctions vs. posted prices from class. We have N consumers who each have a valuation that is independent and identically distributed from a Uniform distribution. The seller has 1 product to sell. We will compare the effects of using either a posted price mechanism, and a second price auction in the case where the seller has biased beliefs.

a) Assume that buyers valuations are iid $F = U[0, 0.5]$, but the seller falsely believes that they are iid $\sim F' = U[0, 1]$. Calculate the following:

- $P^*(F')$: The optimal price the firm will charge under biased beliefs.
- $P^*(F)$: The optimal price to charge under correct beliefs.
- $E_{F'}[\pi_{Posted}(F')]$: The expected profits of the posted price under biased beliefs from the point of view of the firm.
- $E_F[\pi_{Posted}(F')]$: The expected profits of the posted price under biased beliefs but from the point of view of what will actually happen.
- $E_{F'}[\pi_{Auction}]$: The expected profits from the auction from the point of view of the firm.
- $E_F[\pi_{Auction}]$: The actual expected profits from the auction.

Analyze the relation between all of these expected profits as a function of N , the number of bidders. It may be useful to create a table as we did in class plotting the value for different values of N . Identify when the firm chooses to use a posted price vs. an auction: does that always work out well for the firm?

b) Repeat the exercise above using $F' = U[0, 2]$.

Question 2: Market Leaders

Note: You are encouraged, but not required, to use the same companies as in PS1, Question 3, for this problem.

a) Pick a firm that was an early pioneer or market leader in a market, but which has now lost its leadership position. See what you can find out about the firm and why it lost its lead. How does your explanation relate to explanations given in class for why pioneers may tend to fall behind?

b) Now repeat the above but with a firm that was an early pioneer or market leader that has kept its leadership position. How does it maintain its position? Is it getting farther out in front or are new entrants catching up? Do you think it will be able to continue to maintain its position for the long term in this industry?

Question 3: Online Auctions

Pick two very well-defined products that you could buy on an online auction site, e.g. a 1989 Upper Deck complete factory sealed set of baseball cards. (But don't pick this one, I want to see the results for a number of different products.) Look for the products on Ebay. Estimate the number of times the product is available for purchase in a month, the fraction of the listings that result in sales, and the average selling price conditional on a sale occurring. Can you find another auction website that also sells this item? Which auction site seems more attractive for sellers? Would this be true of all sellers? Do you think this other website has a legitimate chance of keeping or gaining market share on ebay for this class of product?

(Note: Ebay's search of closed auctions lets you do this easily by looking at all products sold in the recent past. To do so, search for the item, click on "Advanced", and select include closed auctions.)

What is the variance of the sales prices? Does this amount of dispersion seem reasonable for selling identical goods? Pick one product of the two (or pick a third product) for which you can gather prices for at least 30 sales from completed Ebay auctions. Use a regression (or other formal statistical test) to examine whether sellers with higher reputation ratings sell their goods at higher prices and whether buyers who are more experienced buy at lower prices.

Question 4: Google Trends

Think of a few online companies that compete with one another and compare them using both the "searches" and the "website" features. What can you infer from the data? Can you find any interesting or surprising results? For example, I looked at Kayak.com, Orbitz.com and Travelocity.com etc. I was interested to see the relative popularity of the websites through time, and was surprised to find variation in the ranking of these websites based on geography as well as significant differences in which competitors individuals substituted to.

Question 5: Annual Reports

Pick a brick and mortar retailer with an online presence, and using their annual report, find what percentage of their revenues come from the online sales channel. How has this percentage evolved over time? Find their largest online-only competitor, and compare the market shares of the two, both for online sales and for all sales. How has this evolved over time? Did the online-only store exist before the brick and mortar retailer established a web presence? Discuss to what extent you expect brick and mortar retailers to have an advantage or disadvantage relative to online-only stores, using intuitions from models (the last problem set should come to mind) and other effects that have been assumed away in the models.

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