Lecture 3: Cost Side & Information Goods

1. Production and Costs

Two sources of costs – Total costs (TC) = Fixed costs (FC) + variable costs (VC); when there is choice over alternating production methods, TC of producing amount Q is minimum $ it would cost to produce Q. Different production methods can have different FC and VC. (FC different from "lumpy" VC)

Example – designing a web-page; choice over software packages (free vs. priced packages) and programmer quality (holding end-product quantity & quality constant); consider numbers.

Returns to scale: definition; example (contd.) – CRS = any level of web-page production can be scaled up or down; IRS = easier to produce twice as many pages than to produce two sets of pages, etc.

Connection with Marginal costs (MC) and average costs (AC). CRS implies constant MC, IRS implies decreasing MC and DRS implies increasing MC.

A Numerical Example: $Q = K^{0.5} L^{0.5}$ where Q = number of pages, K = number of researcher hours (or server space) and L = number of programmer hours. If K given implies short-run, if not long-run. Wage for researcher = 10/hr and programmer = 50/hr

SR cost function (K=25) = $250+2Q^2$
AC = ..
LR ,, = $100Q/5^{0.5}$
AC = MC = $100/5^{0.5}$

2. Information Goods

a. *For information goods, very low (essentially zero) marginal cost of reproduction – although fixed costs of producing information may be quite high*; e.g., browser, server software, investment advice. There may be a substantial fixed costs but need not be. Examples – Netscape, YellowPages, Whispers, Motley Fool, etc. Some physical goods and services also have near zero MC. Examples?

Questions: Is it profitable to give away information for free (note role of MC as well as the anticipated advertising volume? What incentives does the producer of information have (why should I stay up all night producing these notes – or why should Columbia invest in me to do that – if Student U can simply copy the idea? Will universities disappear (and stock analysts, and R&D labs etc.) **Free Information**

Idea of patents. Who polices "copying" on Internet?

b. *For non-information goods, production costs may be no different than they would be without the internet;* in particular, same issues of inventory management, returns to scale, distribution network arise. However, lower selling and advertising costs.

Questions: Can the sellers simply sub-contract with producers? What is the difference in costs when goods are sold online versus traditionally in stores? Why is it particularly important to build the best distribution network for e-commerce? **Cost Advantage**

3. Perfect Competition - Demand

Appropriate market structure when there are many many firms, and hence each firm has little effect on market price. Implies price-taking behavior.

Examples – bagel stores, web-design, auctioneers on Ebay, computer retailers online, …
Examples not – ISPs, Browsers, Catalog merchants, bookstores online, …
Questions – financial brokerages online, travel agencies, …

Demand curve implication – horizontal

4. Profit Maximization and Profits

Profits maximized when MC = price; implication for profits – intra-marginal firms can make profits but need DRS or CRS. Note with IRS, loss.

Price determination through market supply

Numerical example (SR cost function) – P = 4Q implying Q = ¼ P is supply curve. Hence aggregate supply curve is N/4 P if there are N firms in the market (e.g., 5P if N = 20)
If demand curve is 1000 – 5P then market equilibrium is at P = 100 (and aggregate quantity is 50).
Profits = Revenues – Costs = 2500 – 250 – 1250 = 1000

Note with CRS (and long-run) no firm optimum possible.