ECON 321, Professor Hogendorn, Spring 2013
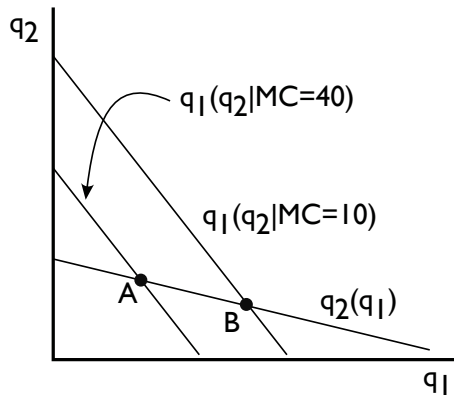
Midterm Exam Answers

1. In an address model, each consumer's ideal product is located at their "address" or location in a product space. When consumers "travel" to the locations of other products, they incur a transport cost.

   In a non-address model, there is some positive cross-price elasticity of demand, but it is just assumed to be there without explanation for where it comes from. Differentiated Bertrand is a non-address model; there is just a parameter giving the demand response of one firm's quantity to the other firm's price.

   One could argue that Android versus iOS is a nice choice between just two alternatives and there is relative unanimity about the relevant features (Android more customizable, iOS more user-friendly). If you buy this argument, then a simple address model like the Hotelling line would be a good choice. My opinion is that this is the better choice for a theoretical model because it is more intuitive and will have similar-enough properties to actual real-world demand.

   However, it's true that the products are very complex and that a spatial model imposes a lot of constraints on consumer preferences. In that case, it might be better to estimate the cross-price elasticity of demand and just put it in a simple demand system model. I believe this is a better choice for an empirical model.

2. *TwoTechs_a.* The firm 1 reaction function is shifted further to the right when it has a lower cost. The Cournot equilibrium is at point A when $MC_1 = 40$ and at point B if $MC_1 = 10$.

The diagram shows axes q_2 (vertical) and q_1 (horizontal), with curves labeled $q_1(q_2|MC=40)$, $q_1(q_2|MC=10)$, and $q_2(q_1)$, and points A and B.

3. *Contestability_a.*

   (a) The monopoly solves

   $$\underset{q}{max}\,\pi(q) = p(q)q - \mathrm{TVC}(q) = (100 - q)q - q^2$$
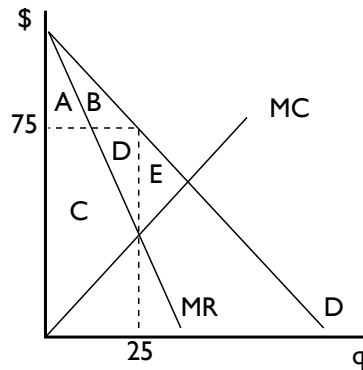
   The first order condition is

 $$\frac{\partial \pi}{\partial q} = 100 - q - q - 2q = 0$$

   Thus,

   $$4q = 100 \Rightarrow q_m = 25 \Rightarrow p_m = 75$$

   (b) The diagram shows the operating profit (C+D), consumer surplus (A+B), and deadweight loss (E). Note that the operating profit includes all of area C down to the origin because the marginal cost curve is not linear.

An additional source of social loss from monopoly is **rent seeking.** Some of the operating profit will not go to shareholder dividends or productive investment. Instead, some will be spent on lobbying, non-informational advertising, and non-productive investment designed to maintain the monopoly.

(c) The game tree looks like this:
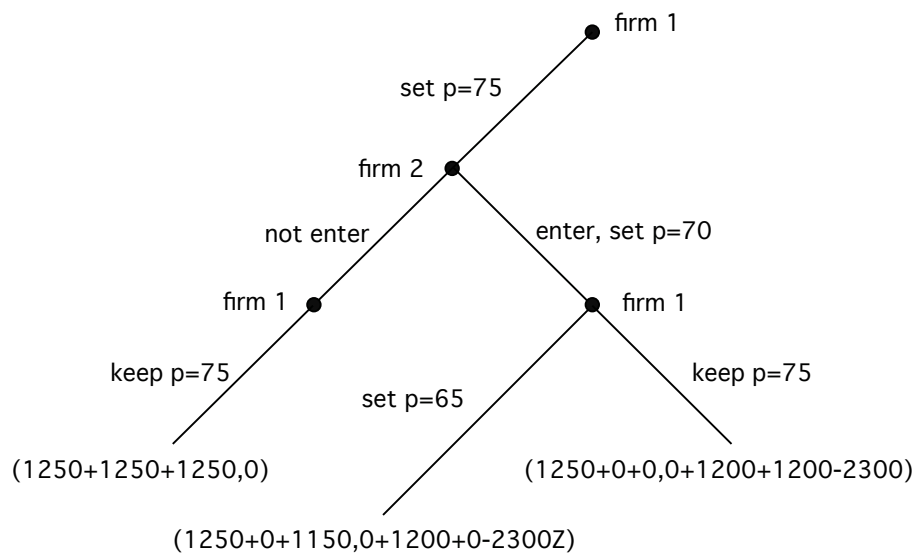
(d) Working up from the bottom of the tree, it is clear that firm 1 will reduce price to p=65 at the right node, since 1250+1150>1250. Thus, if firm 2 enters, it anticipates a payoff of 1200-2300Z. It will enter if 1200-2300Z > 0, or Z<52%. This demonstrates how important the residual value or salvage value of a potential entrant's investment can be to disciplining a monopolist.