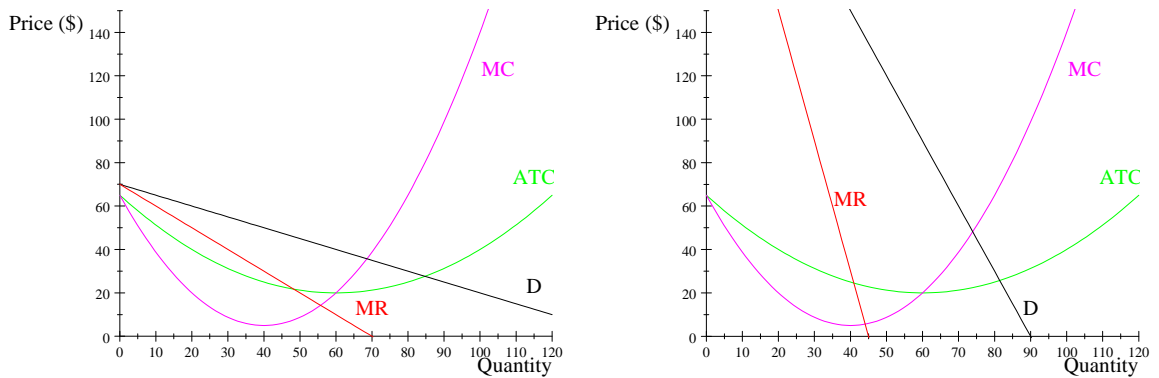


PPOL 8640 Assignment 2

Due: September 27, 2022 at beginning of class

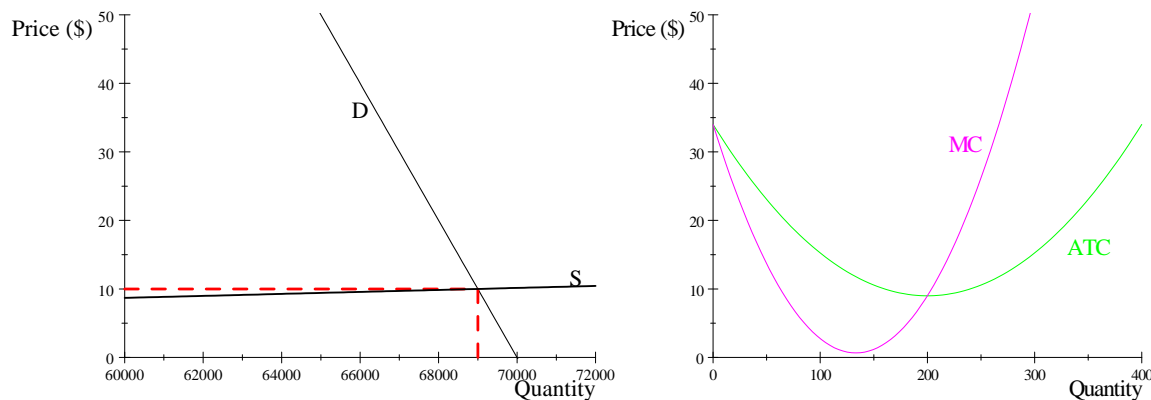
- (20 points) The pictures below show monopolists that face two different market demand curves and their associated marginal revenue curves. The monopolists have the same cost curves, and the average total cost and marginal cost are shown. The graphs are scaled identically so you can compare results by looking at the pictures.



Monopolist 1 on left; Monopolist 2 on right

- Identify the profit-maximizing quantity and price for each monopolist on their respective graphs. Which monopolist charges the higher price?
 - Identify the consumer surplus, producer surplus, and deadweight loss for each monopolist on their respective graphs. Under which monopolist is deadweight loss the greatest?
 - The demand curve for Monopolist 2 is much steeper than the demand curve for Monopolist 1. Assuming the cost curves remain the same, as the demand for a monopolist's product shifts from nearly horizontal to nearly vertical, how would we expect the total deadweight loss in the market to change? Use your answer to part **b** as a guide.
- (25 points) Suppose there are two consumers, J and K , in an Edgeworth box economy. There are two goods, Good 1 and Good 2. There are 40 units of Good 1 and 20 units of Good 2. Consumer J begins with 25 units of Good 1 and 5 units of Good 2.
 - How many units of Good 1 and Good 2 does consumer K have?
 - Draw an Edgeworth box for these two consumers. Assume the consumers have standard shaped indifference curves and that the initial endowment point is *not* a Pareto optimal point.
 - Based on your Edgeworth box in part **b**, identify the set of Pareto improving points.
 - Choose one of those Pareto improving points to be a Pareto optimal point. Explain what conditions need to hold at a Pareto optimal point.
 - (10 points) Explain why the key result for firm cost minimization, that the ratio of marginal products of inputs to their respective prices, or $\frac{MP_L}{P_L} = \frac{MP_K}{P_K}$ needs to hold at interior solutions. What similarities and differences are there between the process of firm cost minimization and consumer utility maximization?

4. (25 points) Consider an individual who is faced with the lottery of receiving \$8,100 with 15% probability, \$900 with 25% probability, \$64 with 30% probability, or \$0 with 30% probability.
- Calculate the expected value of the lottery.
 - Suppose that individual A has a utility function for sure amounts of money of $u_A(x) = \sqrt{x}$. Suppose that individual B has a utility function for sure amounts of money of $u_B(x) = 6 + \sqrt{x}$. What is the expected utility of the lottery for each individual? Are these individuals risk loving, risk neutral, or risk averse? Explain how you know.
 - Find the certainty equivalent for this lottery for each individual.
 - In our standard consumer choice model of utility maximization, in which individuals have utility over goods, individuals with utility functions of $u(x_1, x_2)$ or $u(x_1, x_2) + 6$ or $u(x_1, x_2) - 6$ will make the same choices assuming they have the same budget constraints and face the same prices for goods. Does that result of individuals making the same choices for a utility function that has ± 6 hold for individuals A and B in this example of *expected utility*? Explain referencing the certainty equivalents you found in part c.
 - Suppose there is a third individual, C, who has utility function $u_C(x) = x$. We know this individual is risk neutral, but it is also true that $u_C(x) = (u_A(x))^2$. Will individual C and individual A make the same choices? Explain.
5. (20 points) Consider the market supply and market demand model for a perfectly competitive industry below and a representative firm in the perfectly competitive industry. The equilibrium price and quantity for the market are \$10 and 69,000 units sold. Note that the minimum of the firm's ATC is \$9.



Market on the left; representative firm on the right.

- What is the price that the representative firm will face? Explain.
- Identify the firm's profit maximizing quantity and price on the graph using the price you found in part a.
- Is the representative firm in long-run equilibrium? Explain how you know, and if the firm is not in long-run equilibrium explain what would happen in the market to push the firm towards being in long-run equilibrium.
- Suppose that a policy change has increased the amount of spendable income consumers have. Explain how this change affects the representative firm's choice of profit-maximizing quantity and price, referencing both the market picture and the representative firm picture.