

Economics 101: International Trade

Fall 2008

Problem Set 2a

Instructor: Christopher Nekarda
Email: cnekarda@ucsd.edu
Office: 103 Marshall College
Office hours: Wed 9:00–11:00a

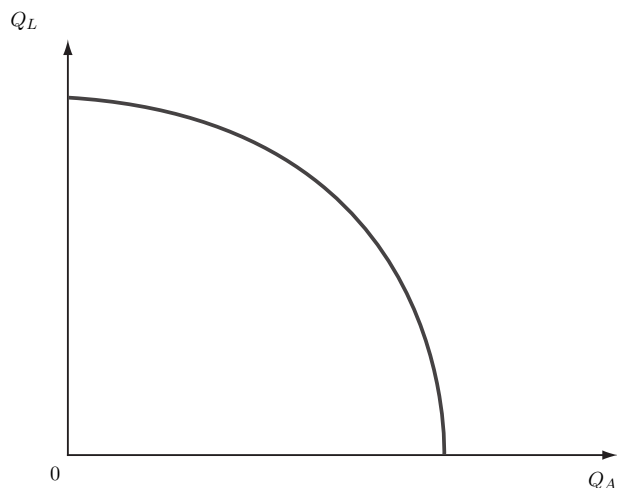
Teaching assistants:	Oana Hirakawa	Li Zhou
Email:	otocoian@ucsd.edu	lzhou@ucsd.edu
Office:	127 Economics	227 Sequoyah Hall
Office hours:	Mon 9:30–11:30a	Wed 3:30–5:30p

1 Imperfect Competition and Price Setting

- Under perfect competition, firms set price equal to marginal cost. What happens if they charge a higher price? What is the slope of the firm's marginal revenue function?
- Does a profit-maximizing firm set price equal to marginal cost under imperfect competition? Explain why or why not.
- What is the marginal revenue function for a monopolist facing demand function $Q(P) = 4 - 1/4P$? What is the marginal revenue function if demand is given instead by $Q(P) = 20 - P$? Which demand function is more elastic?
- Extra Credit.* What is the marginal revenue function for general demand function $Q(P)$?

2 Standard Trade Theory

Canada produces automobiles (A) and lumber (L) with many factors of production. Canada's production possibilities frontier is graphed below.



- When compared to the United States, its main trading partner, Canada has a lower opportunity cost of lumber. What is the pattern of trade between Canada and the United States? Depict a trade equilibrium consistent with these set of assumptions. [Hint: Draw the trade line (isovalue line) and the indifference curves under autarky and under trade.]
- Suppose the world relative price of lumber (P_L/P_A) increases. What happens to Canada's terms of trade? Explain. What happens to the terms of trade for the United States? Explain.
- Depict a new trade equilibrium for Canada resulting from the terms of trade change. What happens to relative production of lumber (Q_L/Q_A) in Canada?
- What happens to relative demand for lumber (D_L/D_A) in Canada? Describe and label the substitution effect and the income effect.
- How has the welfare of the representative consumer in Canada changed with the increase in world relative prices?
- Suppose, instead, the world relative price of lumber (P_L/P_A) had decreased. How would your answers to parts b and e change?

3 Intraindustry Trade

Automobiles are produced by monopolistically competitive firms in the United States and Europe. Each firm has total cost function

$$TC = F + cQ,$$

where $F = \$500$ billion and $c = \$17,000$.

- a. What are the average cost (AC) and marginal cost (MC) functions of a typical firm?

Each of the n car makers faces a demand of

$$Q_i = S[1/n - b(P_i - \bar{P})],$$

where S is market size, $b = 1/150$ and \bar{P} is the industry's average price.

- c. What is the marginal revenue function of a typical firm?
- d. The U.S. market has $S = 300$ million consumers and the European market size has $S^* = 533$ million. Derive and graph the average cost–variety (CC) and the price–variety (PP) schedules for the U.S. automobile industry under autarky.
- e. Find the number of firms (varieties) in the United States under autarky. What is autarky price? Find the autarky price and number of firms in Europe.
- f. Cars can be traded between the United States and Europe at no cost. Find the free-trade equilibrium price and number of firms under trade. Show this equilibrium on your graph.
- g. Why are prices in the United States different in part e and part f? Are consumers better off with free trade? In what ways?
- h. Does the model of monopolistic competition seem appropriate to describe this industry? Why or why not?

4 Increasing Returns and International Conflict

It is often argued that the existence of increasing returns is a source of conflict between countries, since each country is better off if it can increase its production in those industries characterized by economies of scale. Evaluate this view in terms of both the monopolistic competition model and the external scale economies model.

5 Dumping

Consider a domestic monopolist with marginal cost $MC(Q) = 0.5Q$. The monopolist faces domestic demand for its product given by $Q(P) = 20 - P$.

- What is the monopolist's marginal revenue function $MR(Q)$?
- In a diagram of quantity against price, graph the monopolist's demand, marginal revenue, and marginal cost functions.
- Find the domestic monopoly quantity Q_M^A and price P_M^A if the monopolist serves only its domestic market. Show this equilibrium in the diagram.
- The monopolist can now export as much of its product as it wants at world price $P^* = 9$. What is the demand function the monopolist faces abroad? What is its marginal revenue function abroad?
- Find the total quantity produced under trade Q_M . How much does the monopolist now sell in the domestic market (Q_D) and the foreign market (Q_F). What price (P_D) does the monopolist charge its domestic consumers?
- Depict the trading equilibrium in the diagram. Is the monopolist dumping? How do you know?
- Do domestic consumers support the domestic monopolist's dumping practice abroad? Why or why not?

6 External Economies of Scale

For each of the following goods or services, evaluate the importance of (1) external economies of scale and (2) dynamic increasing returns.

- a. Software and tech-support services
- b. Production of concrete
- c. Motion pictures
- d. Cancer research
- e. Timber harvesting