

Distortions, Imperfect Competition, and Trade

1. Suppose that an economy has a production tax on good Y in autarky. Show the general equilibrium in autarky on a PPF diagram. Be careful to distinguish consumer and producer prices. In what sense is this tax on Y equivalent to a subsidy on X? NOTE: IF YOU PREFER TO DO THIS IN PARTIAL EQUILIBRIUM THAT'S BETTER THAN NOT DOING IT AT ALL.
2. Suppose a small open economy (SOE) has an undistorted relative autarky price equal to a world free-trade price ratio p^* . Now suppose this economy imposes a production tax on good Y. Determine the direction of international trade (what the small economy exports and imports) and whether the economy is better off or worse off than without the tax in place. What is the deadweight loss in this case?
3. Do the same analysis if the SOE has a production subsidy on Y rather than a tax.
4. Suppose there are two identical economies but h has a production tax on X and f does not. Use a PPF diagram to show what happens if these countries trade with each other. What happens to welfare in both countries?
5. Suppose that in country H there is pollution imposed by the Y sector on the X sector, such that production costs rise in X as Y output rises. Draw the partial-equilibrium supply and demand curves for Y, showing that market equilibrium involves too much output of Y and too low a price. Draw the associated general-equilibrium PPF and autarky equilibrium, noting the loss in welfare autarky due to the pollution. Now suppose that H is a small country that trade internationally at a fixed price ratio p^* . Show that H could be better off or worse off from international trade. Why is it possible for H to lose? What is the best policy for country H to pursue?
NOTE: THIS IS THE SAME ISSUE THAT YOU'LL FIND IN YOUR NOTES EXCEPT IT WAS X CAUSING THE POLLUTION. THIS PROBLEM SIMPLY TRIES TO SEE IF YOU CAN DO THE SAME ANALYSIS IN REVERSE.
6. Consider the case of two identical economies except that country H has a monopoly in X in autarky. Good Y is produced competitively in both countries. Suppose that free trade does not eliminate the monopoly. Show that country H could be better off or worse off in free trade while F gains welfare. Explain carefully why H could gain or lose welfare in free trade.
7. Consider a small open economy facing fixed world prices. There is a single domestic producer of X. Define and illustrate the concept of pro-competitive gains from trade.
8. Consider two identical economies, each with a monopoly producer of X. Discuss the notion of Cournot-Nash competition between these firms when the countries engage in free trade. What happens to each firm's perceived demand elasticity, its output, and price of good X in free trade? Define pro-competitive gains from trade and illustrate how these arise in free trade.
9. Suppose good X is produced by a domestic monopolist in a small country in autarky. Demonstrate how free trade creates a gain from trade and a gain from eliminating the monopoly (a "procompetitive gain"). Explain.

Increasing Returns to Scale

10. Suppose a firm has a total cost function, $TC = F + mc \cdot X$, where F is fixed costs and mc is (constant) marginal cost. Prove that either this firm must charge a price in excess of marginal cost, or it will make losses.
11. With internal increasing returns to scale, there are several sources of gains from trade, even for two identical economies. Using the cost function in problem 10 to motivate the PPF you use, demonstrate the following gains from trade.
- A. Each country has a monopoly in autarky and trade establishes a duopoly. Show PC gains and gains from reduced average costs.
- B. There is free entry and 2 countries are identical. Show gains from reduced average costs, rationalization of firms, and gains from variety.

Monopolistic Competition

12. What is meant by a “pure variety gain from trade”? Demonstrate this in a simple diagrammatic model where consumers prefer variety but each variety (call them X and Y) has IRS as in problem 10 above. What does the PPF look like in this case?

Trade Costs and Gravity Model

13. Show that if 2 countries have autarky price ratios that are fairly close to one another, that the existence of proportional (“iceberg”) trade costs can eliminate trade altogether (hint: focus on Figure 13. 1).
14. Define price discrimination and “reciprocal dumping”. Write a brief essay explaining intuitively why the existence of trade costs in a two-country duopoly model where both X firms have market power can cause each firm to sell abroad at a price below the price it receives in its home market. How is it possible that such trade can reduce welfare?
15. What is the gravity model and where does the term come from? How can it be explained in terms of consumer preferences for differentiated varieties (“Dixit-Stiglitz” preferences)?