Economics 101 — Fall 2003

International Trade

Problem Set 2

October 20, 2003

Due:	**Wed, November 5, 12:00pm**
Instructor:	Marc-Andreas Muendler
E-mail:	muendler@ucsd.edu

1 Standard Trade Theory and Specialization

Home and Foreign produce machines and food. The relative price of machinery P_M/P_F is 1 in the initial world-trade equilibrium.

- Suppose Home exports machinery and imports food. Draw the trade line (isovalue curve) and according indifference curves for Home. Depict a point of optimal consumption for Home.
- Now suppose Home imports machinery and exports food. Draw the according indifference curves for Home and depict a point of optimal consumption for Home.
- Return to the case of Home being a machinery exporter. The relative world-market price of machinery P_M/P_F rises to 2. How do production and consumption change? Is an increase in the terms of trade unambiguously beneficial? Would your answer be different if Home were a machinery importer so that its terms of trade fell?
- Home is a machinery exporter. Machinery production is capital-intensive and Home's capital endowment increases. Use a relative-supply-relative-demand diagram to show how Home's terms of trade respond.

2 Standard Trade Theory and the Effect of Tariffs

Home and all foreign trading partners produce machinery and food. Home is a small open economy and has a comparative advantage in machinery production.

- Home subsidizes its machinery exports. How are Home's terms of trade affected if Home is a small open economy? How is Home's welfare affected?
- Foreign also subsidizes its imports so that internal (domestic) relative prices are the same as world-market relative prices. How are Home's terms of trade affected? Does it matter whether Home is a small or large economy? What is the effect on Home welfare?

3 Monopolistic Competition and Intraindustry Trade

Monopolistic chair makers produce with a total cost function

$$\mathrm{TC} = F + c \cdot Q_C,$$

where $F = 500,000$ and $c = 100$.

- What are the average and marginal cost functions of a chair maker?

Each of n chair makers faces residual demand of

$$Q_C^d = S \cdot [1/n - b \cdot (P_C - \bar{P}_C)],$$

where $S = 50,000$, $b = 1/1,000$ and $\bar{P}_C$ is average equilibrium price.

- What are marginal revenues? [*Hint*: You may use the formula in the textbook. Otherwise, reformulate demand so that $P_M = P_M(Q_M^d)$ and derive total revenue; differentiate total revenue with respect to quantity.]
- Graph the average-cost-variety (CC) and the price-variety (PP) schedules for this industry in a diagram that shows price, average cost and the number of firms (varieties).
- Find the number of firms (varieties) in this industry in the absence of trade. What is price in a symmetric autarky equilibrium?
- Chairs can be traded with other countries at not cost. Using the average-cost-variety (CC) and the price-variety (PP) schedules above, show how equilibrium price and the equilibrium number of firms change after trade.
- How could you measure the gains from trade? Explain briefly.

4 Monopolistic Competition and Dumping

A machinery monopolist produces with a total cost function

$$\mathrm{TC} = F + \tfrac{c}{2} \cdot (Q_M)^2,$$

where $c = 1/150$. You may suppose that $F = 0$.

- What are the monopolist's average and marginal cost functions?

Demand for machines at Home is

$$Q_M^d = S - Sb \cdot P_M,$$

where $S = 50,000$ and $b = 1/1,000$. World demand is perfectly elastic at a world-market price of $P_M^* = 500$.

- What are the monopolist's marginal revenues? [*Hint*: You may use the formula in the textbook. Otherwise, reformulate demand so that $P_M = P_M(Q_M^d)$ and derive total revenue; differentiate total revenue with respect to quantity.]

- The monopolist chooses to export at the world-market price $P_M^* = 500$. Determine total output, domestic sales and exports in a suitable graph and show that the monopolist's best strategy is dumping on the world market.
- Use the graph to show that domestic consumers suffer from high monopoly price. [*Hint*: Consumer surplus is the area below the demand curve. Draw it before and after dumping.]
- Free trade in machinery exposes the domestic monopolist to perfect competition at $P_M^* = 500$. Show that Home consumers are better off after trade, while the monopolist is worse off. [*Hint*: Consumer surplus is the area below the demand curve. Identify consumer rents before and after free trade.]
- Can the monopolist remain in business if $F > 0$.

5 International Labor Mobility

Home and Foreign produce output from labor and capital. In the absence of labor mobility, the equilibrium wage in Home exceeds the wage in Foreign.

- Graph the labor demand curves for Home and Foreign in a suitable diagram and show that labor mobility increases Home's total labor supply, while reducing Home's wage. Graph the converse effects for Foreign.
- Show how rents to capital owners change in Home and Foreign with migration.
- Does labor mobility increase overall welfare in Home? In Foreign?