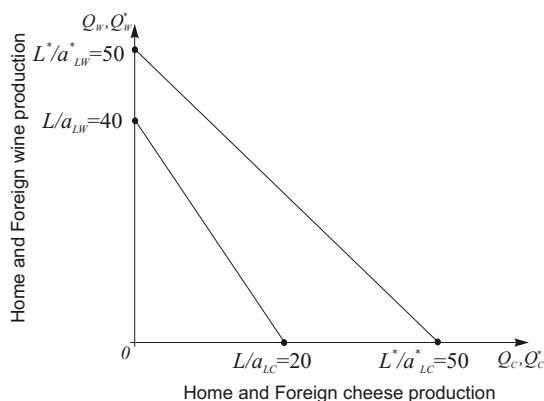Economics 101 — Fall 2003

International Trade
# Mock Midterm Exam 1
October 13, 2003

**Time:**          **50 minutes**
**Total score:**   **50 points**

## 1 Productivity Differences and Trade: 10 minutes

The production possibility frontiers for Home (no asterisk) and Foreign (asterisk) are depicted in the graph below. Both countries' labor forces are equally large, $L = L^*$.



- Calculate the opportunity cost of cheese in terms of wine for Home and Foreign. Which country has an absolute advantage in cheese production? Which country has a comparative advantage in cheese production?

- Home and Foreign are trading. Each country completely specializes in one good. What is the possible range of the relative equilibrium price of cheese $P_C/P_W$?

- Choose one possible relative equilibrium price $P_C/P_W$. Is trade beneficial to both countries? You may explain briefly in words or illustrate your answer graphically.

## 2 Productivity Differences and Trade of Multiple Goods: 10 minutes

Home and Foreign can produce cheese, wine, and tools with the following unit labor requirements.

|        | Home          | Foreign          |
| ------ | ------------- | ---------------- |
| Cheese | $a_{LC} = 4$  | $a_{LC}^* = 2$   |
| Wine   | $a_{LW} = 2$  | $a_{LW}^* = 4$   |
| Tools  | $a_{LN} = 2$  | $a_{LN}^* = 3$   |

- In world trade equilibrium, wages are the same in Home and Foreign, $w = w^*$. What good(s) will Home produce? What good(s) will Foreign produce?

- In your preceding answer, transport costs were taken to be zero. Now suppose transport costs are 100% so that an imported good in Home sells at double its production costs in Foreign. What good(s) will Home produce now? What good(s) will Home import?

# 3   Endowment Changes, Trade and Incomes: 10 minutes

Home and Foreign produce two goods each, cars and food, and draw on three factors. Cars are produced using capital $K$ and labor $L_C$, but no land. Food is produced from land $T$ and labor $L_F$, but without capital. Labor is completely mobile between sectors ($L_C + L_F = \bar{L}$). No factor can cross borders. Consider the Home country.

- Draw a diagram that shows labor demand, the wage rate and the labor allocation between sectors for Home. [You may assume any relative world price $P_C/P_F$ for cars.]

- Prolonged droughts in Home reduce the amount of available land to half its size. How does this affect the labor allocation to the food sector?

- How does a loss of land affect the rent of capital owners?

# 4   Endowments, Factor Intensities and Trade: 10 minutes

Home and Foreign produce two goods each, machines and cloths, and draw on two factors, capital $K$ and labor $L$. In equilibrium, a change in the relative cloths price $P_C/P_M$ changes the wage-rental ratio with

$$P_C/P_M = \sqrt{w/r}.$$

The optimal capital-labor ratio in machinery production is $K_M/L_M = 5w/r$, and $K_C/L_C = .5w/r$ in cloths production. In autarky, the relative price ratios were $P_C/P_M = 4$ in Home and $P_C^*/P_M^* = 2$ in Foreign.

- Which country is relatively more capital-abundant? Explain briefly.

- In world trade equilibrium, a relative cloth price of $P_C/P_M = 3$ prevails. Consider the Home country. Draw a goods-prices-to-input-choice diagram to show how trade affects the capital-labor ratios $K_M/L_M$ and $K_C/L_C$ in Home. [You do not need to draw the diagram to exact scale.]

- When relative price changes, will the land-labor ratios move in the same direction in both sectors? Explain briefly why or why not.

# 5   Endowment Changes and Trade Patterns: 10 minutes

Home and Foreign produce two goods each, machines and food, and draw on two factors, capital $K$ and labor $L$. At current goods and thus factor prices, machines are produced using 4 hours of labor for each unit of capital goods, while food is produced using only 10 units of labor per unit of capital goods.

- The economy's total resources are 400 units of labor and 100 units of capital. Use an Edgeworth box to determine the allocation of resources. [You do not need to draw the box to exact scale.]

- Home accumulates more capital, and doubles the available units to 200. At given world-market goods prices, how is production of machines and food affected? Use the Edgeworth box from your preceding answer to illustrate your answer graphically. [You do not need to draw the changes to exact scale.]