

Brigham Young University Department of Economics
Economics 458 - International Trade
Dr. Phillips (section 1) Fall Semester 2002

Midterm Exam key
Oct. 31- Nov. 1, 2002

This exam is closed book and closed notes, though you may use a calculator. Read all questions carefully before answering. Write your answers legibly in the space provided. Keep your answers concise and correct. Points will be deducted for answers which are irrelevant to the question.

Section I – Short Answer (10 pts. each)

1. Explain what “homothetic” preferences are and why they are a useful in trade models.

Homothetic means that the relative quantities consumed are determined solely by relative prices, not total income. Alternatively, it means that all indifference curves have the same shape and differ only in size. Finally, it means that indifference curves will all cross any given ray from the origin, with the same slope.

The assumption is useful in pinning down consumption behavior, as it rules out income inferior goods.

2. Restate the Stolper-Samuelson Theorem.

All else equal, an increase in the price of a good will cause the price of the factor used intensively in the production of that good to rise proportionally more, and the price of the other factor to fall.

3. Restate the Factor-Price Equalization Theorem. Under what conditions will it apply?

Under the right conditions, free trade in goods will cause the prices of factors in both countries to be the same.

It must be the case that both goods are produced before and after trade is opened up for this to be true. Also the goods need to be produced with fixed coefficients technology.

4. What is the “Leontieff Paradox”. What does it say about the Heckscher-Ohlin model?

Leontieff found that the US tended to export goods which were more labor intensive than the goods it imported, despite the fact that the US is a capital abundant country.

This is counter to the Heckscher-Ohlin model. So, the model’s assumptions must be wrong. Possible wrong assumptions are: constant returns to scale, no transport costs, no factor intensity reversal, only two goods and two factors.

Section II – Essay (20 pts. each)

5. Discuss the differences between the Ricardian model, the Heckscher-Ohlin model & the Specific Factors model. Discuss assumptions about production technology, number of goods, number of factors, preferences, etc.

The Ricardian model assumes only one factor, the Heckscher-Ohlin assumes two, and the Specific Factors model assumes three, though it differentiates between the one mobile factor and the two specific factors.

The Ricardian model is forced to use linear technology since it assumes constant returns to scale. The Heckscher-Ohlin and Specific Factors models cannot assume such simple technology. Often the Heckscher-Ohlin model uses Leontieff or right-angle isoquant production technology.

The Ricardian model assumes that productivity varies between countries, while the other two models assume the same productivity for all countries, and focus instead on factor endowments as a root cause of trade.

All the models assume: no transport costs, no tariffs, constant returns to scale, perfectly competitive markets, two goods, and two countries.

6. Discuss the following statement in light of what you have learned in the class so far. “Countries with identical factor endowments and technology will never gain from trading with each other.”

This is false. There are at least two ways countries with identical endowments and technology can gain from trade.

First, preferences could differ. One country could have a strong preference for good X and the other a strong preference for Y. In this case both countries would produce identical amounts of both goods, but the first would export Y and import X and the second would do the opposite. Both would be better off after this trade.

Second, there could be increasing returns to scale. In this case it would be more efficient for one country to specialize in X and the other to specialize in Y than it would be for both countries to produce both X and Y. Again, both parties gain from trade.

7. List the problems and conditions that must be met for a country to be in “general equilibrium”. What are the possible market clearing conditions one might impose when modeling countries that trade?

Illustrate these problems & conditions (but do not solve) for the following assumptions.

Only two goods (X, Y)
 PPF is given by: $Y_p = f(X_p)$
 Utility is given by: $U = U(X_c, Y_c)$

First, firm’s must maximize profits. This is equivalent to maximizing the value of the production bundle.

This is illustrated by the tangency of the household budget constraint with the PPF.

$$\text{Max}_{X_p} V = X_p + Pf(X_p)$$

first-order condition is: $1 + Pf'(X_p) = 0$

Second, given production, households must maximize utility.

This is illustrated by the tangency of the household budget constraint with the highest possible indifference curve.

$$\text{Max}_{X_c, Y_c} U(X_c, Y_c) \text{ s.t. } X_p + PY_p \geq X_c + PY_c$$

first-order conditions are:

$$U_X(X_c, Y_c) - \lambda = 0$$

$$U_Y(X_c, Y_c) - \lambda P = 0$$

$$X_p + PY_p - X_c - PY_c = 0$$

Finally, the markets must all clear. This can happen under three different assumptions: autarky, small open economy, and large open economy. By Walras Law we need only look at market clearing conditions in the X market and if this market clears, the Y market will also clear.

Under autarky there is no trade, relative prices adjust to this. This is illustrated by the production and consumption points being the same.

$$X_I \{P_a\} \equiv X_c \{P_a\} - X_p \{P_a\} = 0$$

Under a Small Open Economy assumption, the world price is fixed and imports adjust accordingly. This is illustrated by the trade triangle having a slope determined by the world relative price.

$$X_I = X_c \{P_w\} - X_p \{P_w\}$$

Under a Large Open Economy assumption, we need a second country (also large). The world price adjusts so that one country’s imports are the same as the other’s exports. This is illustrated by the trade triangles in the two countries being the same shape and size.

$$X_I \{P_t\} + X_I^* \{P_t\} = 0$$