

Brigham Young University Department of Economics  
**Economics 458 - International Trade**  
Dr. Phillips (section 1) Fall Semester 2003

Midterm Exam key  
(points in parentheses)  
Oct. 30- Nov. 1, 2003

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. Restate the Heckscher-Ohlin Theorem and give a brief intuition why it holds.

**(5) Countries will tend to export the good that intensively uses the factor with which they are abundantly endowed.**

**(5) An abundance of an intensive factor will make the good relatively cheap in autarky and hence the good will be exported when trade is allowed.**

2. Restate the Rybczynski Theorem and give a brief intuition why it holds.

**(5) An increase in the endowment of a given factor will cause a more than proportional increase in the production of the good that intensively uses that factor, and a reduction in the production of the other good.**

**(5) If more of a factor becomes available, the only way to exhaust it is to match it up with some of the other factor. The only way to net more of the 2<sup>nd</sup> factor is by reducing production of the other good.**

3. State the important assumptions of the Ricardian Model, and briefly give some of the model's shortcomings.

**(5) Only one factor of production**  
**Different technologies across countries and goods**  
**Identical preferences**  
**Constant returns to scale**  
**Perfect competition**

**(5) Implies complete specialization**  
**No distributional issues for the gains within countries**

4. State the important assumptions of the Specific Factors Model, and briefly explain why it is a logical next step beyond the Ricardian Model.

**(5) Three factors of production**  
**Two are used only in production of one good, One is mobile**  
**Same technology across countries**  
**Identical preferences**  
**Constant returns to scale**  
**Perfect competition**  
**No transport/transaction costs**

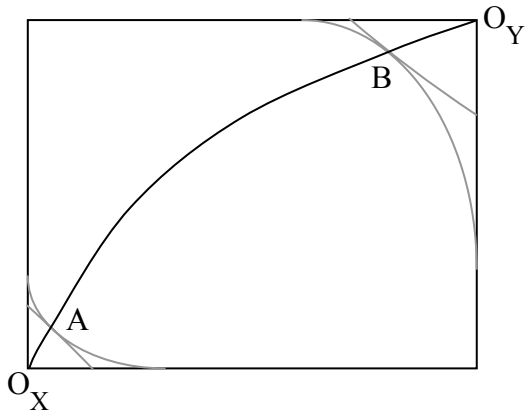
**(5) The Ricardian model implies constant marginal product for labor. One way to get diminishing marginal product of labor is to add a second fixed factor. This is what the specific factors do.**

Section II – Essay (20 pts. each)

5. Discuss the relation between the Edgeworth-Bowley Box and the Production Possibilities Frontier. Discuss what this implies in the case of identical countries producing using increasing returns-to-scale technology.

**(10) Every point on the efficiency locus in the Edgeworth-Bowley Box corresponds to a point on the PPF. The efficiency locus is the set of points where it is impossible to increase production of one good without reducing production of the other, and this corresponds to the frontier of the PPF.**

**(10) With increasing returns to scale a movement along the efficiency locus has two effects. One involves returns to scale, and the other involves changes in factor ratios. The scale effects say that the increase in production of one good and reduction in production of the other will be proportionally greater than the change in the scale. The changes in factor proportions will reinforce the change for one good and mitigate the change for the other. [For example, in the diagram below, as we move from A to B, more L is used in X, but the capital to labor ratio falls. Hence, K rises less than L does and this means output rises less than it would if we simply changed scale, meaning the factor ratio effect offsets the IRS effect. Moving from B to A, the capital labor ratio in Y rises, and this reinforces the IRS effect.] These two effects will cause the PPF to be less convex (bowed out) and may even be strong enough to make it concave (bowed in).**



6. Discuss the following statement in light of what you have learned in the class so far. “The act of moving to freer trade will cause aggregate welfare to increase or at least not decrease.”

**(10) This is true as long as the only distortion away from the first-best is a restriction of trade. Trade is voluntary and the worst that could happen is one or both parties refuse to trade and end up no worse off than autarky. There are distributional issues, in that owners of some factors may gain while others lose. In aggregate, however, the winners gain more than the losers lose, so the statement is true.**

**(10) If there are other distortions such as taxes or subsidies, then the elimination of trade barriers need not improve welfare. This is the Theory of the Second Best. For example, in class, we showed that in the presence of a tax or subsidy, the country imposing the tax/subsidy can actually be worse off when they open up to trade. In this case, the country may collectively choose not to trade, but this still makes the above statement false.**

7. Consider a Heckscher-Ohlin model with fixed coefficients. Assume the unit factor requirements are 5 units of labor and 5 units of capital per unit of good X and 2 units of labor and 10 units of capital per units of good Y.

Now suppose that in autarky the price of good X is \$10 per unit and the price of Y is \$15 per unit in the home country. In the foreign country they are ¥1400 for X and ¥800 for Y. What are factor prices in the two countries in autarky?

|   |   |
|---|---|
| <p><b>Home</b><br/> <math>10 = 5w + 5r</math><br/> <math>15 = 2w + 10r</math><br/> <b>Solving for w &amp; r gives:</b><br/> <math>w = \frac{5}{8} = \\$0.625</math><br/> <math>r = \frac{11}{8} = \\$1.375</math> (3 pts)</p> | <p><b>Foreign</b><br/> <math>1400 = 5w + 5r</math><br/> <math>800 = 2w + 10r</math><br/> <b>Solving for w &amp; r gives:</b><br/> <math>w = ¥250</math><br/> <math>r = ¥30</math> (3 pts)</p> |
|---|---|

Next, suppose that trade results in prices of \$12 for X and \$12 for Y in the home country. If the exchange rate is fixed at ¥100 per \$ what are foreign goods prices with free trade?

**(3) ¥1200 for X and ¥1200 for Y**

Calculate the prices of capital and labor for both countries with these new goods prices.

**As above...**

|  |  |
|--|--|
| <p><b>Home</b><br/> <math>w = \\$1.50</math><br/> <math>r = \\$0.90</math> (3 pts)</p> | <p><b>Foreign</b><br/> <math>w = ¥150</math><br/> <math>r = ¥90</math> (3 pts)</p> |
|--|--|

Does factor price equalization hold?

**(1) Yes**

Who favors opening to trade in the home & foreign countries?

**(2) Owners of labor in home and owners of capital in foreign**

Who opposes it?

**(2) Owners of capital in home and owners of labor in foreign**

# Econ 458 Midterm

