ECN 481/581, Winter 2006
Prof. Bruce Blonigen

NAME: ANSWER KEY
ID#: _____

MIDTERM – Version A

Wednesday, February 15, 2006

Multiple choice - each worth 3 points

1) In which way can many of today's politicians be considered to have a Mercantilist view of trade?

a) They want a return to a currency system that is based on gold.
b) They support policies to lower costs for merchants.
c) They support policies to reduce imports and encourage exports.
d) They believe in the "fair trade" movement to help raise wages in third world countries.

2) In the Ricardian model of trade with two countries and two goods, an increase in labor for one country

a) may change the pattern of trade; that is, which product the country exports to the other country.
b) will have no impact on trade volumes.
c) will raise wages in that country by the Stolper-Samuleson Theorem.
d) None of the above.

3) In the Heckscher-Ohlin model with two factors of production (capital and labor) and clothing the capital-intensive good, an increase in the price of clothing will

a) increase wages and decrease returns to capital.
b) increase both wages and returns to capital.
c) decrease wages and increase returns to capital.
d) decrease both wages and returns to capital.

4) The Leontief paradox is the finding that, in the period after World War II,

a) the U.S. engaged in mainly intra-industry trade, not inter-industry trade.
b) the capital embodied in U.S. imports relative to embodied labor was greater than for U.S. exports, even though the U.S. was considered relatively capital abundant.
c) the U.S. saw a large increase in production of capital-intensive products, even though it was experiencing a large wave of immigration.
d) the U.S. was importing products from the United Kingdom in which the U.S. had a relative productivity advantage.

5) Most economists expected the gains from the North American Free Trade Agreement to be fairly small for the United States because

a) so many U.S. jobs would move to Mexico to access lower wages.
b) the Mexican economy is quite small relative to the U.S. economy.
c) the Mexican currency suffered a significant devaluation called the "Peso crisis".
d) with the U.S. so much more productive than Mexico, there are no incentives to trade.

6) Comparative advantage in the neoclassical model is determined by

a) differences across countries in preferences.
b) differences across countries in preferences and technologies.
c) differences across countries in preferences, technologies, and endowments.
d) differences across countries in technologies.

7) Which theorem from the Heckscher-Ohlin model suggests output will fall in an industry when there is an increase in the endowment that the industry uses least intensively?

a) Stolper-Samuelson theorem.
b) Rybczynski theorem.
c) Factor price equalization.
d) The Leontief paradox

8) A country's welfare gains when moving from autarky to trade will be lower

a) the more the terms of trade (international price) differs from a country's autarky prices.
b) if the country must specialize production into one good more than the other.
c) if factor price equalization occurs.
d) if trade causes unemployment.

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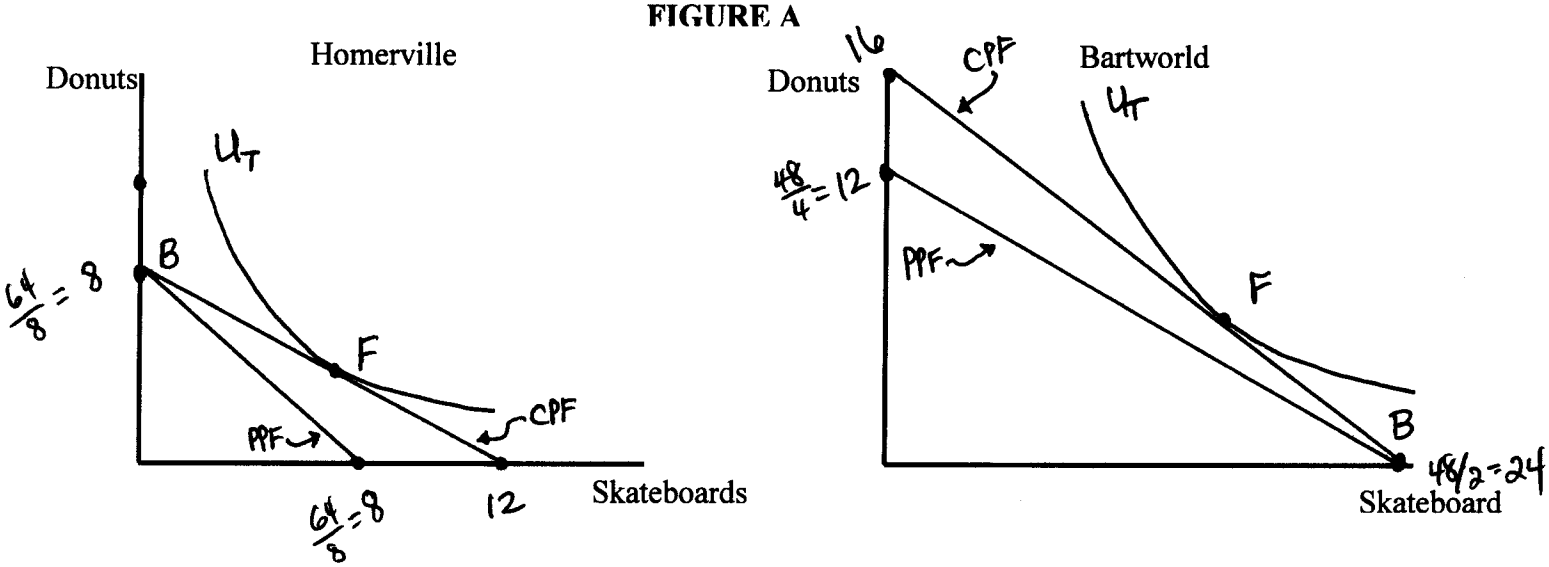
<u>RICARDIAN TRADE MODEL AND PRODUCTIVITY CHANGES</u> Assume that we have a Ricardian world with two countries, Homerville and Bartworld, and two products, Donuts and Skateboards. In Homerville it takes 8 units of labor to make 1 unit of Donuts ($a_{LD} = 8$) and 8 units of labor to make 1 unit of Skateboards ($a_{LS} = 8$). In Bartworld, it takes 4 units of labor to make 1 unit of Donuts ($a^*_{LD} = 4$) and 2 units of labor to make 1 unit of Skateboards ($a^*_{LS} = 2$). Homerville has 64 units of labor (L=64), and Bartworld has 48 units of labor (L*=48). Use this information for questions 9-12.

9) On the axis below and using the information above, draw each country's production possibility frontier (PPF), labeling the intercepts for each axis. (6 points)

FIGURE A



10) Which country has the comparative advantage in Donuts and why? Which country has the comparative advantage in Skateboards and why? (6 points)

Homerville has comparative advantage in Donuts because the opportunity cost in autarky for 1 Donut is 1 skateboard (i.e., use 8 units of labor for either a Donut or a Skateboard), whereas the autarky opportunity cost in Bartworld for 1 Donut is 2 skateboards (4 units of labor could have been used to produce 2 skateboards instead). Analogously, Bartworld has comparative advantage in Skateboards as the autarky opportunity cost is 1/2 Donut, whereas in Homerville it is much more costly - 1 Donut.

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RICARDIAN TRADE MODEL AND PRODUCTIVITY CHANGES continued from previous page

11) Now suppose the international terms of trade is 1.5 Skateboards for 1 Donut. Draw in each country's consumption possibility frontier (CPF) in Figure A on the previous page assuming both countries completely specialize in production with trade. Label both intercepts of this CPF. Also draw in and label the trade equilibrium for each country, denoting the production point as B, the consumption point as F, and the level of utility with trade as U_T. (10 points)

12) Suppose that technology changed so that it now only takes 2 units of labor to produce donuts in Bartworld, instead of 4. Which country would have the comparative advantage in donuts and export donuts to the other country? Explain your answer to get credit. (6 points)

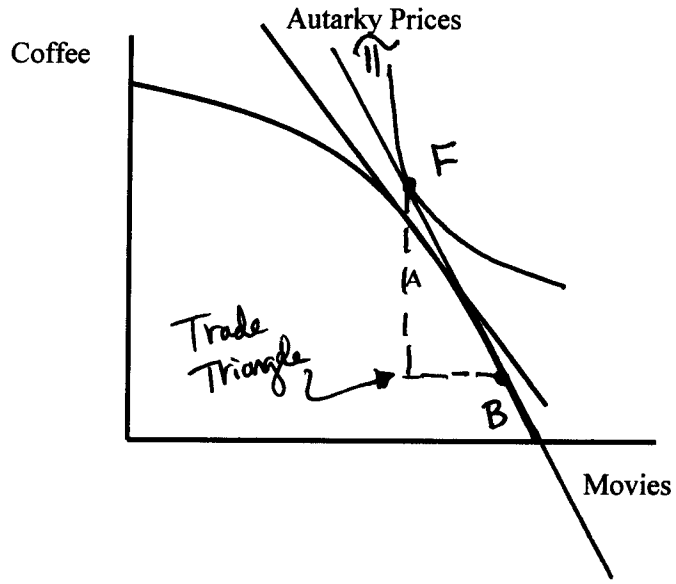
Now the autarky opportunity costs for both products is 1-to-1 for both countries. Therefore, neither country has a comparative advantage in either good.

HECKSCHER-OHLIN MODEL: Suppose there are two countries, the U.S. and Colombia, and two goods, Coffee and Movies. In the U.S., it takes 2 units of labor and 1 unit of capital to produce a unit of Coffee ($a_{LC} = 2$, $a_{KC}=1$), whereas it takes 1 unit of labor and 5 units of capital to produce a Movie ($a_{LM}=1$, $a_{KM}=5$). The U.S. is endowed with 50 units of labor and 40 units of capital, while Colombia has 40 units of labor and 20 units of capital. Use this information for questions 13-16.

13) By the Heckscher-Ohlin Theorem, who will export Coffee and why? (6 points)

Colombia will export the labor-intensive good, Coffee $\left(\frac{a_{LC}}{a_{KC}} = \frac{2}{1} > \frac{a_{LM}}{a_{KM}} = \frac{1}{5}\right)$, since it is the labor-abundant country $\left(\frac{L_C}{K_C} = \frac{40}{20} > \frac{L_{US}}{K_{US}} = \frac{50}{40}\right)$

14) The figure to the right shows the autarky situation for the U.S. Graph the situation for the U.S. after it begins trading with Colombia, given your answer in the previous question. Make sure to label the new production point B, the new consumption point F, the international price π, and the trade triangle that results from trade. (8 points)



HECKSCHER-OHLIN MODEL continued from previous page

15) Suppose that the price of Coffee is $15 and the price of Movies is $21 in the U.S. Solve for the wage and price of capital in the United States. Show your work to get credit. (8 points)

$$\boxed{\begin{array}{l}\text{Coffee: } a_{Lc}\cdot w + a_{Kc}\cdot r = P_c \\ \text{Movies: } a_{Lm}\cdot w + a_{Km}\cdot r = P_m\end{array}}$$

Substitute in numbers to get:

$$2w + r = 15 \quad (1)$$
$$w + 5r = 21 \quad (2)$$

rewrite (1) as $r = 15 - 2w$ and substitute into (2)

$$w + 5(15-2w) = 21$$
$$\Leftrightarrow w + 75 - 10w = 21$$
$$\Leftrightarrow -9w = -54$$
$$w = 6$$

Now substitute $w=6$ into (1):

$$2\cdot(6) + r = 15$$
$$12 + r = 15$$
$$r = 3$$

16) Suppose the price of Movies goes up to $30 in the U.S., while the price of Coffee remains at $15. Calculate what happens to wages and the price of capital. Which theorem predicts this result? (6 points)

Now, we have the following equations:

$$2w + r = 15 \quad (1)$$
$$w + 5r = 30 \quad (2)$$

Rewrite (1) as $r = 15 - 2w$ and substitute into (2)

$$w + 5(15-2w) = 30$$
$$\Leftrightarrow w + 75 - 10w = 30$$
$$\Leftrightarrow -9w = -45$$
$$w = 5$$

Substitute $w=5$ into (1):

$$2(5) + r = 15$$
$$10 + r = 15$$
$$r = 5$$

Wages fall and the price of capital increases when the price of the capital-intensive good increases, just as predicted by the Stolper-Samuelson Theorem.

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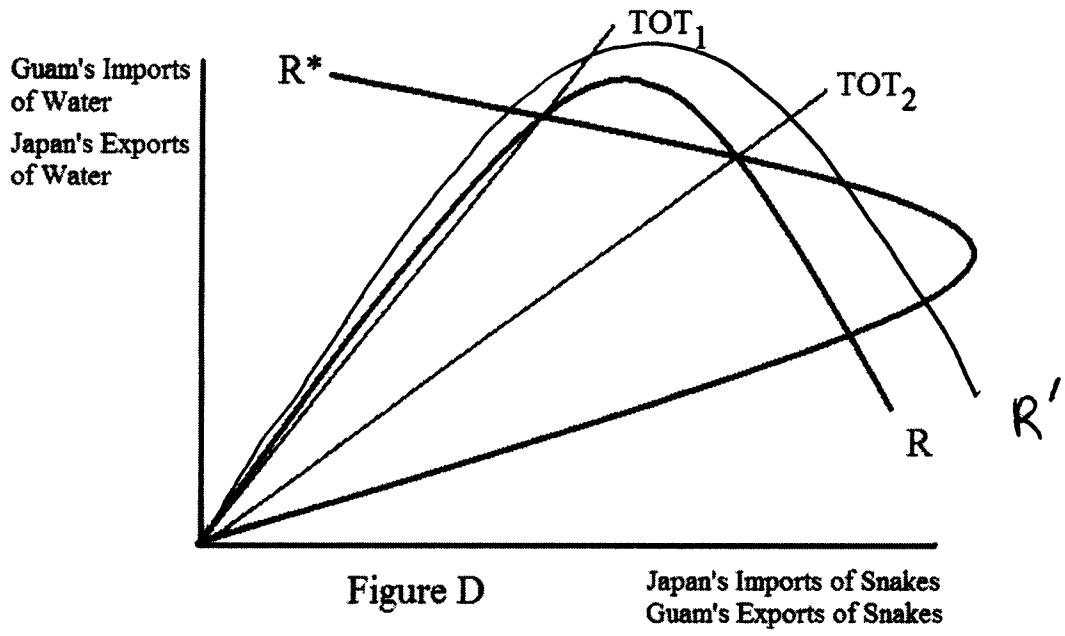

Figure D

<u>OFFER CURVE ANALYSIS</u>: Use Figure D to answer questions 17-20. (5 points per question)

17) In figure D, which country corresponds to which offer curve (R or R*)?

Japan: R Guam: R*

18) TOT_1 is closer to which country's autarky prices? Japan's

19) Using the definition of "equilibrium", explain whether TOT_2 is an equilibrium terms-of-trade or not.

TOT_2 is NOT an equilibrium price. One way to see this using the definition of equilibrium is suppose we call out an alternative TOT that is slightly flatter than TOT_2 (relatively cheaper price of snakes). At this price, Guam would want to export more snakes than Japan would like to import. This excess supply would put pressure on the price of snakes to fall (or get even flatter). This would mean pressure to move away from TOT_2, so it cannot be an equilibrium.

20) Suppose TOT_1 is the initial equilibrium terms-of-trade between Japan and Guam. Now consider what will happen if Japan's economy experiences a big expansion of its economy and thus has an increased demand (or capacity) for trade. Show the change in Japan's offer curve in Figure D, making sure the shift is not too big so that the offer curves still intersect three times. Will Japan experience a terms-of-trade gain or loss from this event? What happens to trade volumes for both goods from this event?

JAPAN experiences a TOT loss as the new equilibrium price is a relatively higher price of Japan's import good, Snakes. Trade volumes in Snakes goes down, but trade volumes in Water goes up.

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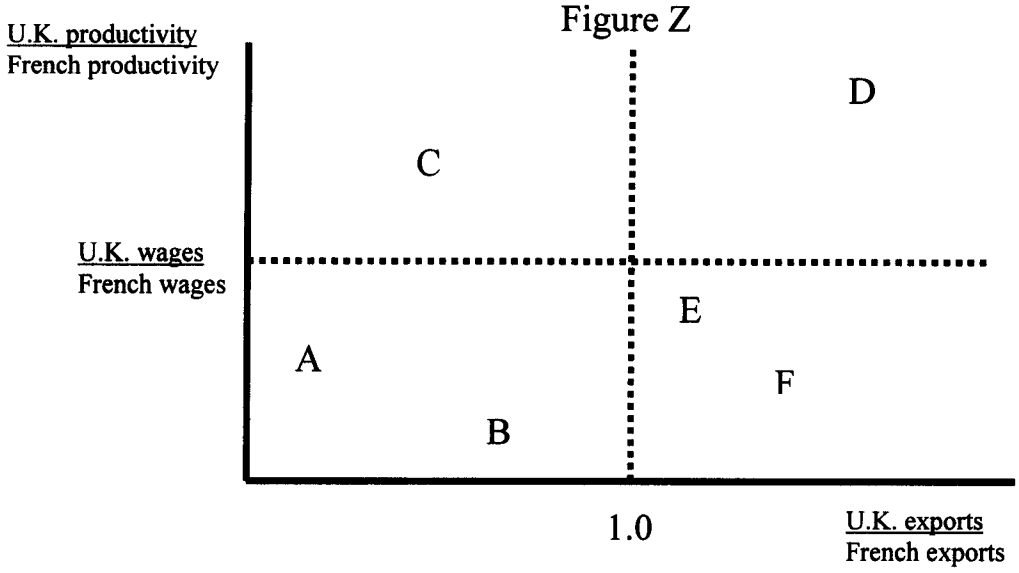
Figure Z



<u>EMPIRICAL EVIDENCE FOR RICARDIAN MODEL</u>: Figure Z depicts a diagram for which relative productivities and relative export volumes are plotted for various industries for France and the U.K. – denoted by letters, A B, C, D, E, and F. Use this information to answer questions 21-24. (6 points per question)

21) In which industry does the U.K. have the greatest comparative advantage according to the Ricardian model? __D__ In which industry does France have the greatest comparative advantage according to the Ricardian model? __B__ (List the correct letters)

22) According to MacDougall's reasoning, which points are consistent with empirical confirmation of the Ricardian model of comparative advantage: __A, B, & D__ (List the correct letters).

23) Explain why none of these points is consistent with a strict version of the Ricardian model and its prediction for trade volumes between the two countries.

A strict version of the Ricardian model predicts that trade flows only go one way (both countries cannot export the same good to each other) In the diagram, this would mean that the only values the variable on the horizontal axis can take are "0" or "∞".

24) Thinking about a Ricardian world with many products, which of these products would be less likely to be traded by either country if there were significant transportation costs? Explain why.

Industry E. For this industry, the productivity ratio is very close to the wage ratio, suggesting that neither country has a very strong comparative advantage in this product. Once one adds in the cost of transportation, the exporter of this product is less likely to get a higher price for their good than they can at home.