Retake Exam "International Trade"

April 20, 2011

Question 1 (30%)

a) On what grounds does the Krugman/Obstfeld textbook object to the following statement:

"Free trade is beneficial only if your country is strong enough to stand up to foreign competition."

Discuss.

b) What do the offer curves of the standard trade model express, and what explains their peculiar curvature?

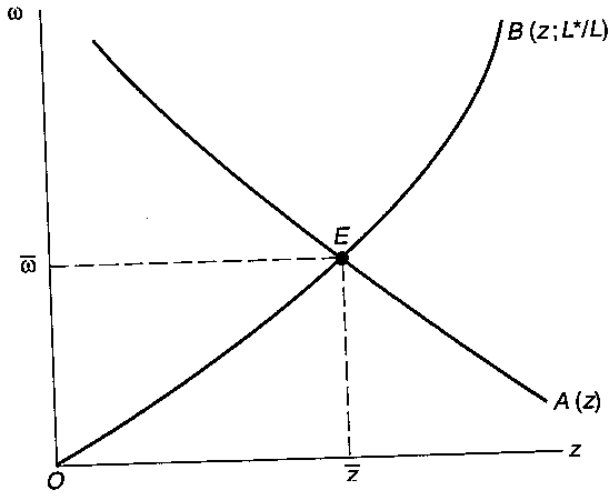
c) What is a Rybczynski line? What is its slope and what explains that slope?

Question 2 (30%)

a) In the diagram below, what are the variables on the two axes, and what is expressed by the $A(z)$ schedule? Why does this schedule slope down?

b) What is expressed by the $B(z;L^*/L)$ schedule? Why is this schedule upward sloping?

c) How does the equilibrium of this model change if labor productivity, while unchanged in the home economy, increases by 10% for all goods in the foreign economy? What is implied for the real income of the home economy?



Question 3 (15%)

A small open economy is engaged in international trade. Perfect competition prevails and world market prices (p_x, p_y) are exogenous. The country produces two goods (X,Y) according to the following Cobb-Douglas production functions: $X = K_X^{\alpha} \cdot L_X^{1-\alpha}$ and $Y = K_Y^{\beta} \cdot L_Y^{1-\beta}$ ($0 < \beta < \alpha < 1$). The economy is endowed with both exogenous capital $K = K_X + K_Y$ and exogenous labor $L = L_X + L_Y$. Capital and labor are completely mobile between sectors.

a) Show how the capital-intensity of each sector depends on the factor price ratio.

b) Answer the following question, without explicitly calculation the factor price ratio: How do p_x and p_y influence the factor price ratio?

Question 4 (25%)

Consider Paul Krugman's model of incomplete competition and intra-industry trade.

a) Does the model assume internal or external returns to scale? Explain.

b) What are the endogenous variables of the model and how are they influenced
   ba) by the size of the market?
   bb) by the size of fixed costs on the firm level?

(*A formal derivation of the model is not required. Intuitive and/or graphical arguments will suffice.*)

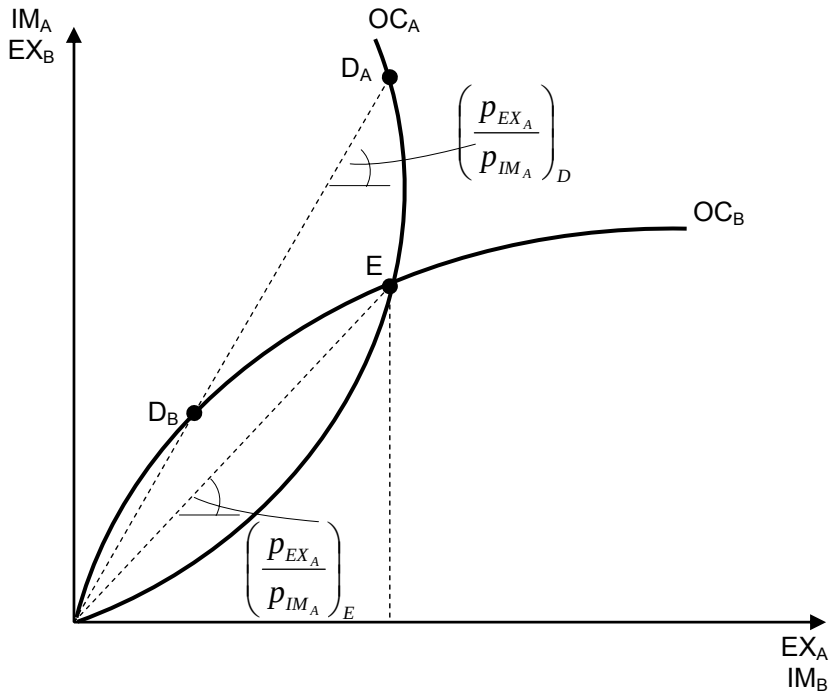
International Trade: Re-Exam
Outline of solutions

Question 1

a) Krugman/Obstfeld object to the statement on the grounds that it attributes gains from free trade to absolute advantages between countries. Yet the relevant concept for gains from trade is comparative advantage. The argument in detail is given in Ch. 2 of the book (English version, 5th ed., pp. 23; German version, 6 ed., p. 54).

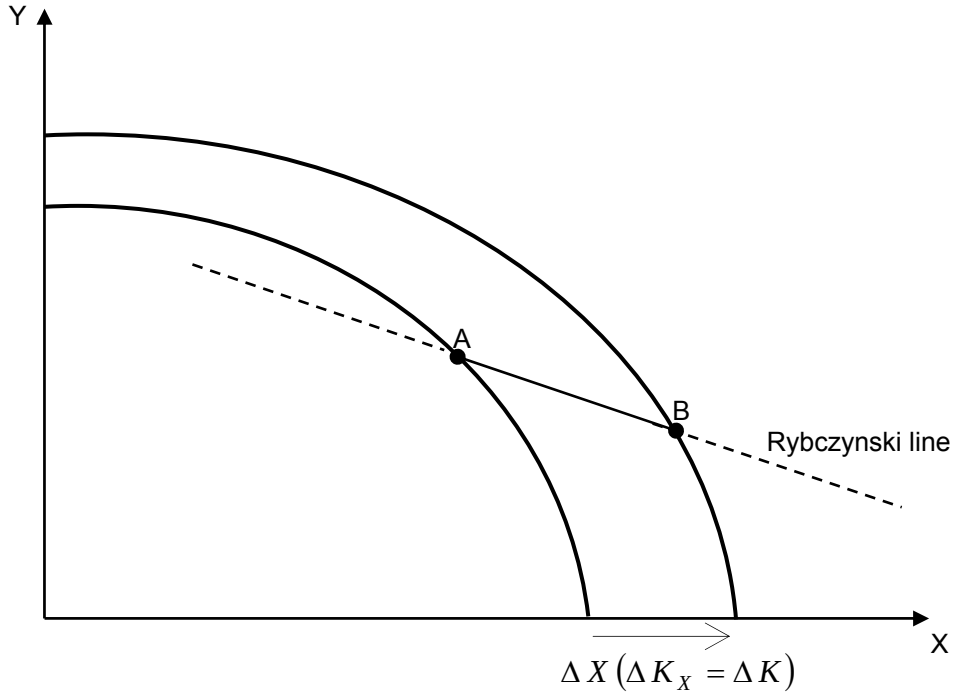
b) Given relative prices, supply and demand can be determined for each good of a country. This in turn determines excess demand (import demand) and excess supply of each good (export supply). Offer curves depict these patterns for varying relative prices.

As the terms of trade of country A improve, the export supply as well as the import demand will increase, as long as the income effect is not strong enough to reduce export supply. In this case import demand may still increase with increasing terms of trade, while export supply contracts.



[Offer curves for countries A and B; Equilibrium point E]

c) The Rybczynski line indicates the shift of the production points of a 2x2-economy as one factor of production increases.
The shift of the production possibility frontier favors the sector that uses the expanding factor of production more intensively. At an unchanged relative price, this sector will expand whereas the competing sector will contract.



[With capital expanding; Sector X using capital more intensively than sector Y]

Question 2

a) ω : Wage differential between home and foreign w/w^*

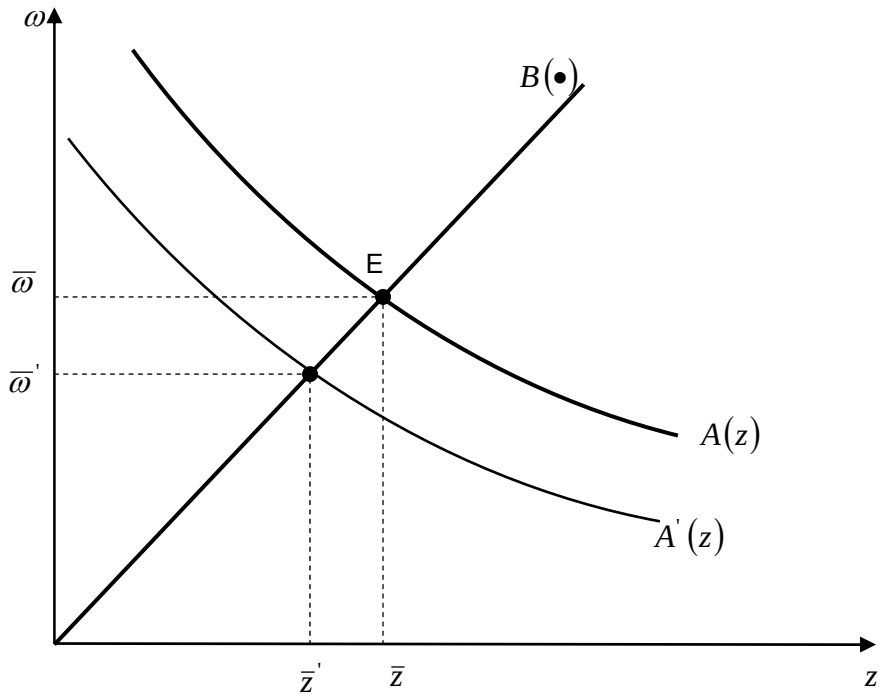
z : Continuum of goods in the interval [0,1]; $\bar{z}$ indicates the threshold between goods produced in the home country and the goods produced in the foreign country.

A(z) : Productivity differential $A(z) = a^*(z)/a(z)$ between home and foreign in the production of good *z*. $A'(z) < 0$ reflects the alignment of the goods along the z axis according to their relative productivity.

b) $B(z; L^*/L)$: Equilibrium condition; sum of home and foreign expenditures on home produced goods must equal the supply of home goods.
The schedule is upward sloping because an increase in the range of goods produced in the home country increases demand for labor in home country, thus - for labor market clearance - inducing an increase in ω.
Alternatively, B(·) can be interpreted as an equilibrium condition for the trade balances between home and foreign.

c) An increase of foreign productivity implies falling $a^*(z)$ for all goods [0,1]. At any given wage differential, the foreign county will have a comparative advantage in more goods than before.

The *A(z)* schedule moves inwards, giving us a new equilibrium with a lower $\bar{z}$ and a lower wage differential. The real income of the home economy goes up due to cheaper imports.



Question 3

a) Under perfect competition, factor prices must be equal to marginal products in each industry:

$$\frac{w}{p_x} = MPL_X \; ; \; \frac{w}{p_Y} = MPL_Y \; ; \; \frac{r}{p_x} = MPK_X \; ; \; \frac{w}{p_Y} = MPK_Y$$

With the production functions specified as $Y = K_Y^{\beta} \cdot L_Y^{1-\beta}$ and $X = K_X^{\alpha} \cdot L_X^{1-\alpha}$, the factor price ratios w/r in each industry are given by:

$$\frac{w}{r} = \frac{\partial Y/\partial L}{\partial Y/\partial K} = \frac{(1-\beta)}{\beta} \frac{K_Y^{\beta} \cdot L_Y^{-\beta}}{K_Y^{\beta-1} \cdot L_Y^{1-\beta}} = \frac{(1-\beta)}{\beta} k_Y$$

$$\frac{w}{r} = \frac{\partial X/\partial L}{\partial X/\partial K} = \frac{(1-\alpha)}{\alpha} \frac{K_X^{\alpha} \cdot L_X^{-\alpha}}{K_X^{\alpha-1} \cdot L_X^{1-\alpha}} = \frac{(1-\alpha)}{\alpha} k_X$$

b) In a Heckscher-Ohlin model the factor price ratio is directly linked to the goods price ratio, which in the case of a small open economy is exogenous.
The factor used more intensively in an industry benefiting from a price increase will profit from this increase. Since X is the capital intensive good ($\alpha > \beta$), an increase in p_X/p_Y translates into a decrease of the factor price ratio *w/r*. The change in the factor price ratio will be bigger than the initial change in the price ratio (magnification effect).

Question 4

a) The labor requirement $l_i = \alpha + \beta \cdot x_i$ indicates internal returns to scale. In the case of external economies of scale, firm-level costs depend on the size of the industry.

b) The most important endogenous variable of the model are:
n : number of firms
x_i : output of each individual firm

ba) To illustrate the effect of the size of the market on the endogenous variables consider an increase in the labor force L:
As the size of the market increases, total sales increase. Production of each firm will increase. This will reduce average costs of every firm.
As average cost decreases, profits will be earned and more firms will enter the market, until price equals average cost again and profits are wiped out.
In the end both n and x will be higher than in the initial equilibrium.

bb) To illustrate the effect of fix costs on the endogenous variables consider an increase the fixed labor requirement α :
An increase in fixed costs will increase average cost. This will drive firms out of the market and force the remaining firms to produce more so as to avoid losses.
The bottom line is that n falls and x rises.