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**Economics 39F**
Problem Set 1

(First 6 problems from Caves, Frankel and Jones, 1990)

1.      With reference to the home country's trade triangle illustrated in Figure 2.3, suppose that the world relative price of clothing stays at the slope shown by line CFD.   How would the home country's volume of imports and exports be altered if (a) a fire destroyed ten percent of its clothing endowments or (b) a bumper harvest expanded its food production by ten percent?

2.      Referring to the previous exercise, if a fire destroyed quantity GE of clothing in Figure 2.3, would the home country cease to trade if the world relative price of clothing is shown (again) by the slope of line CFD?

3.      In figure 2.6, a positively sloped curve is drawn to show the foreign supply of exports of food rising as the price of food rises.   How can this response be reconciled with the assumption that each nation's endowment supply of commodities is fixed with respect to price?

4.      The individual whose tastes are shown by the indifference curves in Figure 2.9 is a net seller of food at autarky home prices shown by line 1.   This individual loses if trade with the rest of the world is allowed and food prices are lower there, shown by line 2.   Show how this same individual might gain if the world price of food is even much lower than that shown by line 2.

5.      The relative price that clears the world's food market is shown by OT in Figures 2.5 and 2.6.   Using the assumed balance in each country between total expenditures and total income, prove that the world's clothing market must be cleared as well.   Would this mutual clearing of markets take place if one country tried to "live beyond its means"?

6.      For the individual portrayed in Figure 2.9, describe the trade pattern after the compensation scheme is in effect.   How does this compare with the trade pattern of others in the country?

7.     Country A is endowed with 18 units of good x and 1 unit of good y, while country B is endowed with 2 units of good x and 7 units of good y.   Both countries consume x and y in fixed and equal proportions (e.g., x is a left shoe, y is a right shoe).

     a). Construct an Edgeworth box for the two countries.

     b). Identify the contract curve.

     c). Solve for the free-trade equilibrium relative price.

     d). How are the gains from trade allocated across the two countries?

     e). What explains the peculiar allocation of the gains from trade across these countries?

     f). What is the direction of trade between the two countries.   Show that it is balanced.


8.     Suppose that country A is endowed with two goods, tuna and milk, and composed of two citizens, one a tuna fisherman and the other a dairy farmer.   The tuna fisherman is endowed with 3 units of tuna and 1 unit of milk.   The dairy farmer is endowed with 3 units of milk and 1unit of tuna.   Both citizens share the same set of (homothetic) preferences: they only consume tuna and milk in fixed and equal proportions (e.g., 1 unit of tuna with 1 unit of milk, 2 units of tuna with 2 units of milk, etc.).

     a). Show that the autarky relative price for country A is not uniquely determined, and in fact can lie anywhere in the interval between zero and infinity.

     b). What happens if country A opens its borders to trade with the rest of the world?

## FIGURE 2.3 The Trade Triangle for the Home Country

The home country originally consumes its endowment bundle, $E$, at relative prices shown by line $AB$. If it could trade at prices shown by line $CD$, it could export $GE$ units of clothing to obtain $FG$ units of food, thus consuming the bundle shown by $F$ and improving its real income to the level indicated by the $y_1$ indifference curve.
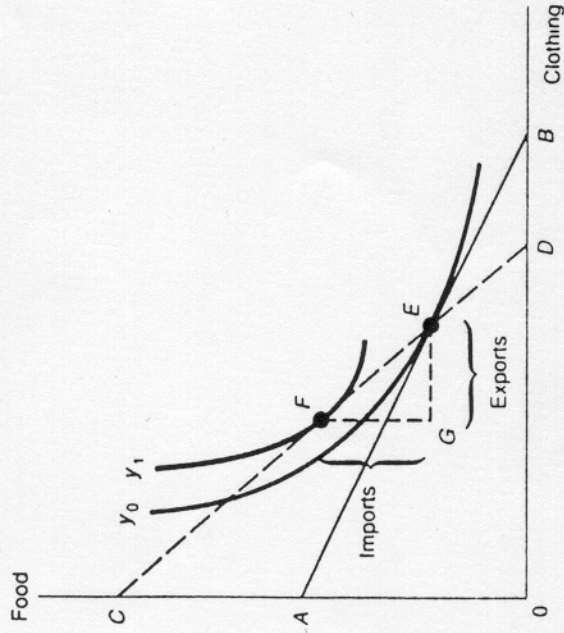


## FIGURE 2.5 World Demand and Supply

The terms of trade, $OT$, are determined by the equilibrium between the world's demand for food $(D_F + D_F^*)$ and the supply of food $(S_F + S_F^*)$.
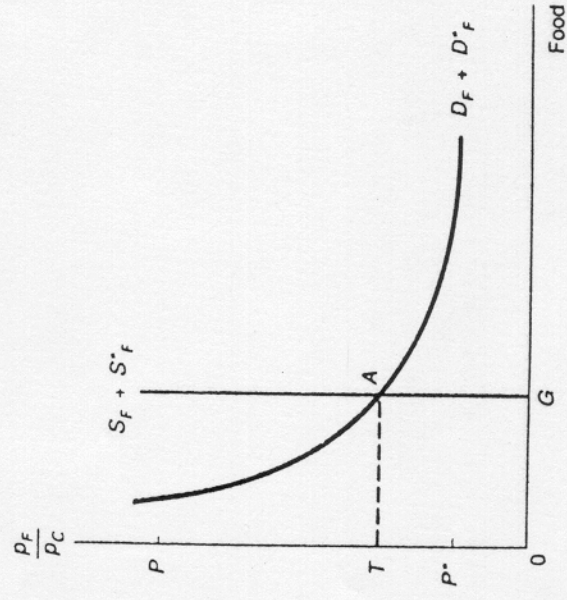


## FIGURE 2.6 Excess Demand and Supply

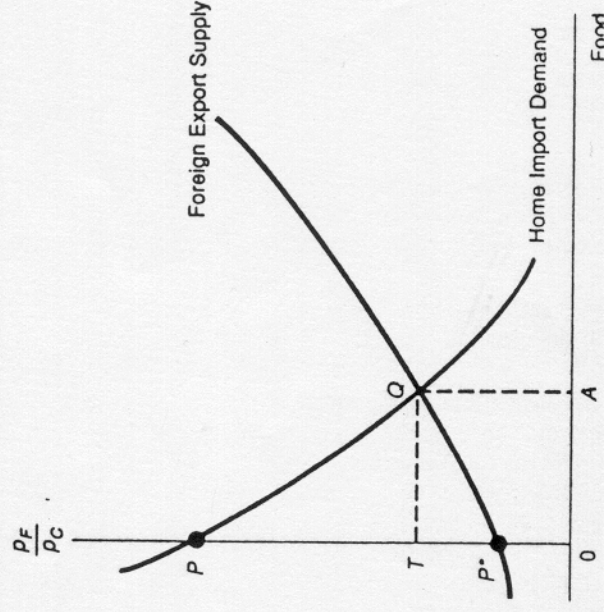Equilibrium quantity $OA$ shows free-trade imports of food by the home country at the equilibrium price ratio, $OT$.



## FIGURE 2.9 International Trade Can Hurt

This individual is a net seller of food (amount $EA$) at home, with home prices shown by line 1. With food relatively cheaper on world markets (line 2), the individual's consumption is reduced from $G$ to $H$. The individual is hurt by international trade.