Economics 464
Fall 2005
University of Wisconsin-Madison

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Problem Set 2

Due ***in Lecture*** on Monday, ***February 28.***

1. Explain why the Leontief paradox and the more recent Bowen, Leamer, and Sveikauskus (1987) contradict the factor proportions theory. Use one sentence to describe the predictions of the factor proportions theory, one sentence to describe the Leontiev paradox, and one sentence to describe the predictions of Bowen et al.

2. Suppose the personal computer industry operates in the home country, such that each firm's sales of personal computers is given by:

$$X = S\left[\frac{1}{n} - b(P - \overline{P})\right] \qquad (1)$$

where X is firm sales, S is total sales, n is the number of firms. P is the price charged by the firm and $\overline{P}$ is the average industry price. Note that if all firms charge the same price, then $X=S/n$.

2.1 Suppose the pricing rule is:

$$P = c + \frac{X}{Sb} \qquad (2)$$

and the average cost is given by:

$$AC = n \times \left(\frac{F}{S}\right) + c \qquad (3)$$

where c is marginal cost. Solve for the equilibrium number of firms (call it n_0), if S_0 is the level of industry sales.

2.2 Show the equilibrium, in a graph with P, AC on the vertical axis and n on the horizontal axis.

2.3 Show what happens, graphically, if trade restrictions are implemented that reduces total industry sales to half of the original amount.

2.4 Show what happens, algebraically, to the industry price if trade restrictions are implemented that reduces total industry sales to half of the original amount.

3. Consider a situation where the widget industry is characterized external economies of scale. However, instead of the cost configuration discussed in lecture (where the average cost curve of Thailand was below that of Switzerland), the average cost curves are identical.

3.1 What would you expect to be the pattern of international specialization and trade. What would determine who produces the good?

3.2 What are the benefits of international trade in this case? Do they accrue only the country that gets the industry?

4. Consider the following diagram of the home steel market. Assume the home country is small, and the home steel industry is competitive.

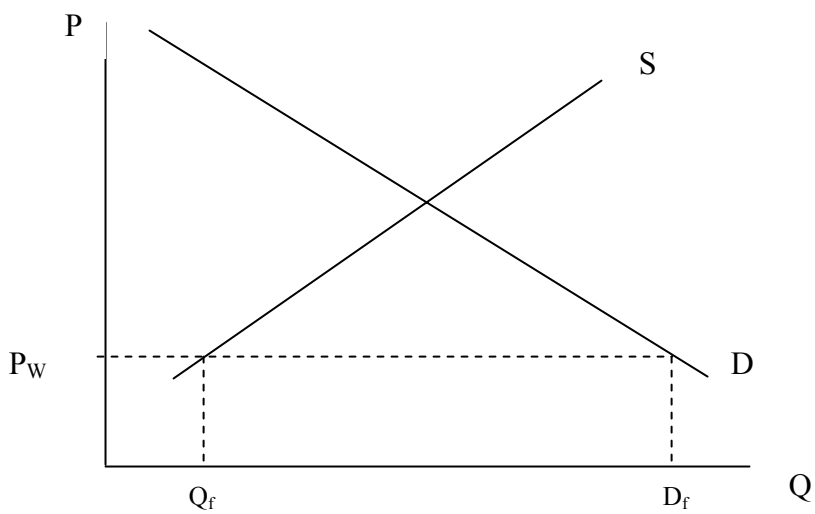

Figure 1

Draw a diagram based upon Figure 1 above.
4.1 Indicate the extent of imports under free trade.
4.2 Show what happens if a specific tariff of amount *t* is imposed. Indicate the new quantities produced and demanded at home (Q_τ and D_τ, respectively), and the amount of imports.
4.3 What is the amount of tariff revenue?
4.4 What is the change in consumer surplus?
4.5 What is the change in producer surplus?
4.6 What is the net effect on welfare?

5. Consider the following diagram of a small country that exports shirts. (The home shirt industry is competitive.)

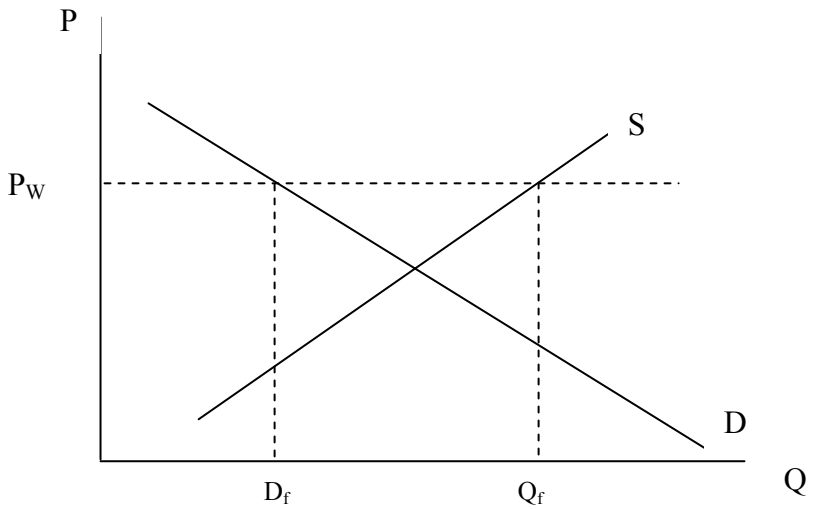

Figure 2

5.1 Indicate the extent of exports under free trade.
5.2 Show what happens if an *ad valorem* export subsidy of amount *s*. Indicate the new quantities produced and demanded at home (Q_s and D_s, respectively), and the amount of exports. Also show the price at which shirts sell at home (P_s)
5.3 What is the expense to the nation's treasury?
5.4 What is consumption side dead weight loss?
5.5 What is the production side dead weight loss?
5.6 What is the overall effect on national welfare?

6. Now reconsider the home steel market with an alternative assumption that the home country has only one steel producer (i.e. monopolist). No other assumptions change.
6.1 Draw the equivalent to Figure 1, with each of the curves clearly indicated. Indicate the quantities produced and demanded at home (Q_{ff} and D_{ff}, respectively), and the amount of imports under free trade.
6.2 Suppose that the same tariff as one in question 4 is introduced. Indicate the new quantities produced and demanded at home (Q_τ and D_τ, respectively), and the amount of imports.
6.3 Let the amount of imports in the previous question be *X*. Now suppose that the government use a quota of *X* amount of steel in stead of the tariff. Indicate the quantities produced and demanded at home (Q_{qm} and D_{qm}, respectively), and the amount of imports. In addition, indicate the price at which steel will be priced at, P_{qm}.