HUL 211: Introduction to Economics
Practice Problems

Indian Institute of Technology Delhi

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Practice Problems

1. A small country can import a good at a world price of 10 per unit. The domestic supply schedule of the good is $S = 50 + 5P$ and the demand curve is $D = 400 - 10P$. In addition, each unit of production yields a marginal social benefit of 10.
    1. Calculate the total effect on welfare of a tariff of 5 per unit levied on imports.
    2. Calculate the total effect of a production subsidy of 5 per unit.
    3. Why does the production subsidy produce a greater gain in welfare than the tariff?
    4. What would be the optimal production subsidy be?

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The U.S. Department of Agriculture is interested in analyzing the domestic market for corn. The USDA's staff economists estimate the following linear equations for the demand and supply curves (in the neighborhood of equilibrium): $Q_d = 1600 - 125P$ and $Q_s = 440 + 165P$. Quantities are measured in millions of bushels; prices are measured in dollars per bushel.

1. Calculate the price and quantity that will prevail in competitive equilibrium. Graph the curves and show the equilibrium.
2. Suppose that the government imposes a $4.50 per bushel support price (in other words, it does not allow sales at a price below $4.50) and commits to buying any surplus that might arise at that price.
    1. What impact will this price floor have on the market?
    2. Will the government be forced to purchase corn in order to support the price floor? If so, how much and what will be the cost to the Treasury?
    3. How much (if any) additional corn (relative to equilibrium) will be produced as a result of the price support? How much (if any) less corn will be consumed?

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1. Now suppose that a new corn hybrid is developed that increases yields so that the quantity supplied increases by 145 million bushels at each level of the corn price. What is the new equation for the supply curve? How will your answers to parts (a) and (b) be different after the new hybrid is introduced?

2. Returning to the original values, suppose that instead of a price floor, the government pays corn growers 0.50 for each bushel produced.

    1. Explain why the supply curve with the subsidy would become $Q_s = 440 + 165(P + 0.50)$.
    2. Calculate the new market equilibrium quantity and price.
    3. Graph the new supply curve and show the new equilibrium.
    4. How does the outcome under the subsidy compare to the outcome under the price support in terms of quantity bought by consumers, quantity produced by farmers, and cost to the government? Are there any other differences in the outcomes?

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1. Alice and Barbara are considering planting flowers in their garden. Their demand curves, describing their marginal willingness to pay for an extra unit, are given respectively by $p_A = max\{10 - Q, 0\}$ and $p_B = max\{8 - \frac{Q}{2}, 0\}$ where Q is the number of flowers planted in their garden.
    1. Assume Alice and Barbara have their own separate gardens and so for each, flowers are a private good. Derive and draw their aggregate demand $Q^{agg}(p)$ for flowers.
    2. Assume the market is willing to supply any number of flowers at a market price of $p = 4$. Represent the market Equilibrium on a diagram. Is the market Equilibrium efficient?
    3. Now suppose that Alice and Barbara share a communal garden. So in the demand equations above $Q = q_A + q_B$. Derive and draw their "aggregate demand", displaying for each level of quantity, their joint marginal benefit for an extra unit of flowers.

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