Week 8 Discussion Section – Solutions

Part 1: International Trade

Consider the following domestic demand and supply schedules for raw steel in the United States. The current world price of raw steel is $P_W = \$800$ per ton. Assume the United States is a small economy.

Price (per ton of raw steel)	Domestic Demand per day (in thousands of tons)	Domestic Supply per day (in thousands of tons)
500	52	16
600	48	18
700	44	20
800	40	22
900	36	24
1000	32	26
1100	28	28
1200	24	30
1300	20	32

Suppose that the United States chose not to engage in trade in the raw steel market.

1. What would the equilibrium price and quantity be?

$$\mathrm{P} = 1100, \qquad \mathrm{Q} = 28$$

Suppose the United States chose to engage in free trade in the raw steel market.

2. Would the United States be an importer or exporter of raw steel? Explain why.

   U.S. would be an importer because their price is above the world price.

3. How many units of raw steel would be imported or exported?

   18 thousand tons per day would be imported.

4. Who benefits from free trade in this scenario? Who is hurt by free trade?

   Consumers benefits because of the lower price, and producers are hurt, some of them are forced out of the market by foreign competitors.

Suppose that the United States decides to implement a tariff of 25% of the price of raw steel to protect the "losers" from free trade.

5. Given that the world price is $800 per ton, how big is the tariff per ton of raw steel?

   Tariff $= 0.25 \times 800 = \$200$

6. Under this tariff, what would the price of raw steel be in the United States?

   Price$= P_W + tariff = 800 + 200 = 1000$

7. Determine the total deadweight loss from the tariff. **Hint: a sketch maybe helpful here.*

   a. How much of this deadweight loss comes from overproduction by domestic producers?

      Region A in the picture

$$= \frac{1}{2} \times (tariff) \times increase\ in\ production$$

$$= \frac{1}{2} \times 200 \times 4{,}000 = \$400{,}000$$

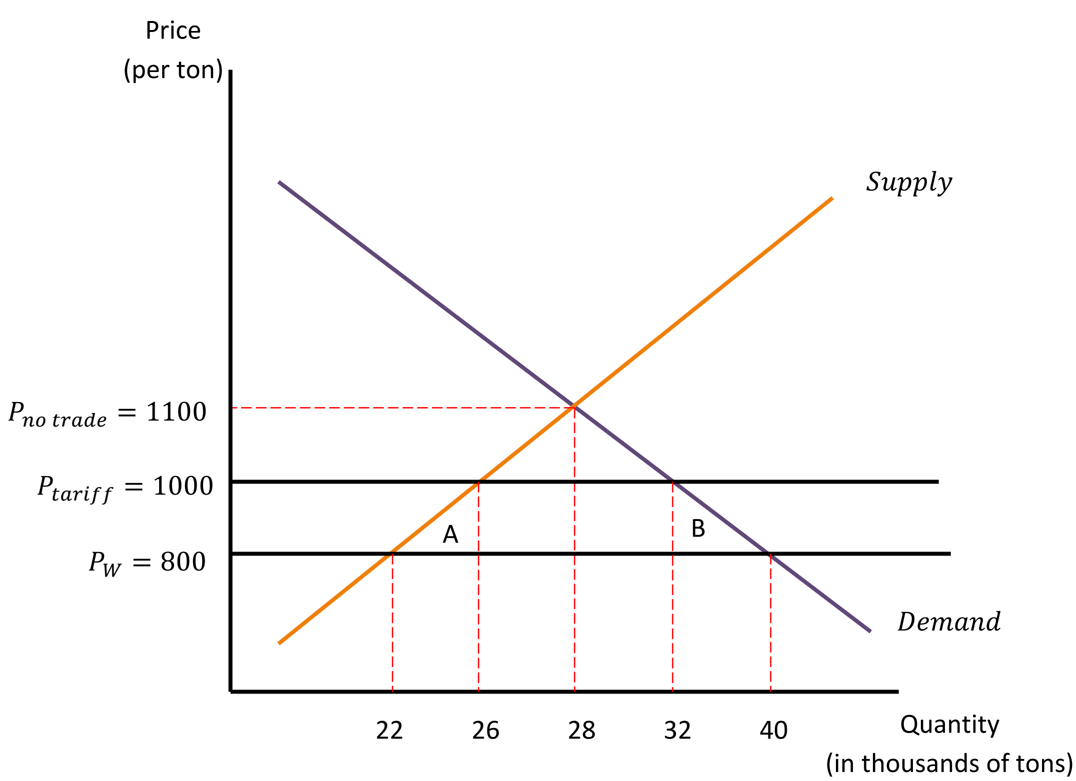
   b. How much of this deadweight loss comes from underconsumption by domestic consumers?

      Region B in the picture

$$= \frac{1}{2} \times (tariff) \times \text{decrease in consumption}$$

$$= \frac{1}{2} \times 200 \times 8{,}000 = \$800{,}000$$

Total DWL $= \mathbf{\$1,200,000}$



Part 2: Externalities with Algebra

The inverse demand in a market is given by $P = 120 - \left(\frac{1}{5}\right)Q^d$, where Q^d is the quantity demanded and P is the price. The inverse supply curve in the same market is $P = \left(\frac{1}{10}\right)Q^s$, where Q^s is the quantity supplied. The equilibrium in this market is $P = \$40,\ Q = 400$.

Suppose there is an **external cost of $12 per-unit** associated with the production of the good.

8. What is the equation of the social-cost curve?

$$Social\ cost\ =\ supply\ +external\ cost$$

$$= \frac{1}{10}\mathrm{Q_S} + 12$$

9. Determine the socially optimal quantity. How does it compare to the equilibrium quantity?

Set demand equal to social cost curve to find where the two curves intersect:

$$120 - \frac{1}{5}\mathrm{Q} = \frac{1}{10}\mathrm{Q} + 12 \rightarrow 120 - 12 = \frac{1}{10}\mathrm{Q} + \frac{1}{5}\mathrm{Q}$$

$$108 = \frac{3}{10}\mathrm{Q} \rightarrow \mathrm{Q_{SO}} = \frac{10}{3}(108) = 360$$

10. Explain why a negative externality leads to overproduction relative to the socially optimal output level.

Sellers of this good only consider their private costs when making supply decisions, as a result too much is supplied at each price level.

Part 3: The Coase Theorem and its Limitations

Consider the ongoing SARS-CoV-2 pandemic.

11. Use the theory of externalities to explain why, in the absence of government restrictions, a young and healthy person might choose to engage in more social activity than is socially optimal.

SARS-CoV-2 is really one giant negative externality problem. A young and healthy person will consider the private costs (risk of infection, long-term health impacts, etc…) and benefits of social activities but take insufficient consideration of the external costs (risk of infecting others when socializing). The result is too much social activity which has the potential to increase infections and deaths as well as overwhelm the hospital system.

12. Why is the private market unlikely to solve this externality problem on its own?

There are too many affected parties, so there is likely to be a coordination problem. Politicization had clouded people's decision making (stubbornness).