3) Recall problem 2 from Assignment 5 in which a country imposes an import fee on the crude oil it imports. Imagine that all the crude oil imports to the country are made by ships owned by its nationals. The Association of Petroleum Shippers argues that the reduction in imports resulting from the import fee will drive down the price of shipping services and thereby inflict a loss on them. The Committee for Energy Independence, which favors the import fee, argues the reduction in shipping prices will benefit consumers of shipping services. Which argument is correct? In preparing an answer, make the following assumptions: The import fee will reduce the quantity of imported crude oil from 3 billion to 2.5 billion barrels per year; the reduction in barrels shipped will drive per barrel shipping costs down from $4 per barrel to $3.25 per barrel; and the elasticity of demand in the shipping market at the new equilibrium ($3.25, 2.5 billion barrels) is -0.3. Assume the shipping market is undistorted and the prices of other goods, including shipping services, were held constant in estimating the demand schedule for crude.

Answer

Although there are gains in consumer surplus in the secondary market for shipping, any changes in net social surplus will be negative. It is likely, however, that the Association of Petroleum Shippers will argue that their entire loss in producer surplus should be deducted from the benefits estimated in the crude oil market. This will substantially overstate the adjustment in net social surplus, which should be the lost producer surplus minus the gain in consumer surplus measured relative to the shifted demand schedule.

The reduction in producer surplus can be measured as follows:

$$(.5)(\$4-\$3)(.5 \text{ billion}) + (\$4-\$3)(2.5 \text{ billion}) = \$2.75 \text{ billion/year}$$

To measure the gain in consumer surplus, we must first estimate the change in quantity demanded due to the reduction in price once the demand schedule shifts:

$$-.3 = (\Delta q/\Delta p)(p/q)$$

$$\Delta q = (-.3)(\Delta p)(q/p)$$

$$\Delta q = (-.3)(-\$1)(2.5 \text{ billion})/(\$3)$$

$$\Delta q = 0.25 \text{ billion/year}$$

The gain in consumer surplus is thus:

$$(.5)(\$4-\$3)(.0.25 \text{ billion})+(\$4-\$3)(2.5 \text{ billion}-0.25 \text{ billion}) = \$2.375 \text{ billion/year}$$

The annual loss in social surplus in this secondary market is $2.75b - $2.375b = $0.375 billion. This amount would be counted as a net cost in the CBA of the import fee. Note that it is substantially smaller than the loss in producer surplus. Also notice that this amount is extremely small relative to the producer and consumer surplus and revenue impacts in the primary market.