

Suppose a small country is able to buy or sell petroleum at a world price of \$60. The domestic supply function (measured in millions of barrels per month) is approximately:

$$Q_S = 2.5 P$$

The domestic demand function is:

$$Q_D = 675 - 1.25 P$$

In addition, there is a negative consumption externality from pollution. Each barrel of oil consumed creates an additional spillover cost of \$40 (in truth, this is probably a gross underestimate).

- a) Solve for the autarky price, and graph the free trade equilibrium.
- b) Show the effect of a \$20 import tariff on price, quantity-supplied, and quantity-demanded.
- c) Calculate the distributional effects (changes in producer surplus, consumer surplus, the government budget, and the reduction in the external social cost) of a \$20 import tariff. Is the country better or worse off?
- d) Calculate the distributional effects (changes in producer surplus, consumer surplus, the government budget, and the reduction in the external social cost) of a \$20 domestic consumption tax. Is the country better or worse off?
- e) Comparing the \$20 import tariff and consumption tax, which is the optimal policy? Which collects more revenue?
- f) For optimal policy in (e), what is the optimal amount of the import tariff or consumption tax? For your choice, calculate the net change in the small country's welfare, relative to the free trade equilibrium.