

## **1 Problems**

1. Incidence
2. Incidence Part 2
3. Efficiency

## 1.1 Incidence

**The demand for rutabagas is  $Q = 2,000 - 100P$  and the supply of rutabagas is  $Q = -100 + 200P$ . Who bears the *statutory* incidence of a \$2 per unit tax on the sale of rutabagas? Who bears the *economic* incidence of this tax?**

If the tax is on the sale of rutabagas, the buyer bears the statutory incidence, since the “sticker price” of rutabagas does not include the tax. Economic incidence is determined by relative elasticities. In this case, the quantity supplied is more responsive to a change in price, so the less elastic consumers will bear most of the economic incidence.

To calculate the relative burdens, solve the equilibrium condition with and without the tax. Without the tax:  $2,000 - 100P = -100 + 200P$ . Price = \$7.00. With the tax, the price the supplier receives is reduced by \$2.00. The equilibrium condition is

$$2,000 - 100P = 200(P - 2) - 100$$

$$2,000 - 100P = 200P - 500$$

$$2,500 = 300P, \text{ Price} = \$8.33.$$

The consumers' tax burden = (posttax price – pretax price) + tax payments by consumers, here  $\$8.33 - \$7.00 + 0 \approx \$1.33$ .

The producers' tax burden = (pretax price – posttax price) + tax payments by producers, here  $\$7.00 - \$8.33 + \$2.00 \approx \$0.67$ . In this case the consumer bears a larger share of the tax burden than the producer.

**The demand for rutabagas is still  $Q = 2,000 - 100P$  and the supply is still  $Q = -100 + 200P$ , as in Question 2. Governor Sloop decides that instead of imposing the \$2 sales tax described in Question 2, the government will instead force stores to pay the tax directly. What will happen to the “sticker price” on rutabagas? How will the size of the consumer tax burden change?**

As in Question 2, the sticker price for consumers when they bear the statutory burden of the \$2 tax is  $P \approx \$6.33$ . (As in question 2, this is the solution to  $2,000 - 100(P + 2) = -100 + 200P$ .) The sticker price for consumers when firms pay the tax is the solution to  $2,000 - 100(P') = -100 + 200(P' + 2)$ , so the new sticker price is  $P' \approx \$8.33$ , or \$2.00 more than the sticker price before. Consumers pay exactly the same net amount as before: before, they paid

the \$6.33 sticker price plus a \$2 tax, and now they pay \$8.33 directly. The economic incidence of the tax is unchanged.

## 1.2 Efficiency

**The government of Washlovia wants to impose a tax on clothes dryers. In East Washlovia the demand elasticity for clothes dryers is  $-2.4$  while in West Washlovia the demand elasticity is  $-1.7$ . Where will the tax inefficiency be greater? Explain.**

The more elastic the demand, the more inefficient the tax; therefore, the tax will be less efficient in East Washlovia. Tax inefficiency is measured by the area of deadweight loss it generates. The height of the deadweight loss triangle will be the same in both areas, as it is the dollar amount of the tax. The base of the deadweight loss triangle, though, will differ, because it is the quantity change, or the quantity response, to the tax. Elasticity is a measure of quantity response to a price change: the higher the elasticity, the greater the quantity change

for a given price change. When demand is elastic, a price change will distort quantity demanded by relatively more than when it is inelastic, and it is this quantity distortion that causes inefficiency.