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**Lecture 06: Taxes and Subsidies**

1. Supply and demand
   1. We know that where supply and demand intersect, that’s where society would like to produce.
   2. We illustrate this with two curves: QD = QD(P) and QS = QS(P). And setting QD = QS.
      1. Suppose QD = 50 – 5P and QS = 2 + P. Then P = 8 and Q = 10.
   3. What if we impose a tax or subsidy?
2. Excise (or Specific) Taxes
   1. An excise (or specific) tax is a tax the government collects on a unit of a commodity sold within the boundaries of a country. Gasoline, for example, has an excise tax on it as does alcohol and cigarettes.
   2. Illustrating an excise tax in a supply and demand graph begins with knowing how much the tax is. Then find that distance between the supply and demand curves in the range it normally produces. At that point is the new government-influenced quantity, QG. Excise taxes will create deadweight loss (by effectively restricting supply) and reduce consumer and producer surplus.
   3. Below illustrates a tax of $0.20, creating a revenue of $0.20 times QG. For example, if QG was 15, total tax revenue would be $3.00. Consumers pay $1.00, producers receive $0.80, and the government keeps the rest.

Quantity

Price

S

D

Tax Revenue

DWL

QG

0.80

1.00

* 1. Mathematically, we make a distinction between the price consumers pay (PD) and the price producers (PS) receive. Let there be a difference between the two equal to the tax, T. Or, let PD – PS = T.
     1. In our previous example, if T = 6, then PS = PD – 6. PD = 9 and thus PS = 3. We now produce at QG = 5. Since Q\* falls by 5 and the tax is 6, we can calculate the deadweight loss using the formula for a triangle. The deadweight loss is 15. Tax revenue is 30 (QG times T).
  2. Note that supply and demand did not share the tax equally. Consumers had to pay $1 more while producers received $5 less. Why?
  3. Consider the market for cigarettes. It’s pretty easy to get into the industry (elastic supply) but pretty hard to quit (inelastic demand). Thus smokers typically bear the cost of a cigarette excise tax. (PD is the price the demand side pays; PS is the revenue the supply side receives.)

Quantity

Price

S

D

Tax Revenue

DWL

QG

PD

PS

* 1. To determine how much falls to supply and how much to demand, use the “pass-through” formula. This tells us what portion the *buyer* pay.
     1. So if the elasticity of supply is 0.5 and the elasticity of demand is -2, then demand bears 0.20 share of the tax, or 20%.

1. Subsidy
   1. This works exactly the same way except now there is a difference between the prices equal to the subsidy, S, such that PS – PD = T. This means QG > Q\*, our deadweight loss will derive from producing *too* much, and our pass through formula tells us how much of the subsidy the buyer *receives*.