Introductory Microeconomics for Public Policy
Fall 2016

Lecture 2: In-Class Problem

Problem:

$Q^S = 2000P - 10000$, $Q^D = 20000 - 1000P$, price ceiling of \$8

1. In market equilibrium, find
   (a) equilibrium price
   (b) producer surplus
   (c) consumer surplus
2. After the price ceiling, find
   (a) producer surplus
   (b) consumer surplus
   (c) transfer
   (d) deadweight loss
   (e) deadweight loss as a share of the transfer

Answer:

See also pdf of graph posted on webpage.

1. Market Equilibrium
   (a) Set $Q^S = Q^D$, and find $P = 10$, and $Q = 10,000$
   (b) To find PS, you also need to to find the point at which the supply curve intersects the y axis. Find this point by plugging $Q^S = 0$ into $Q^S = 2000P - 10000$. This gives a triangle with a width of 10,000, and a height of 3 ($= 8 - 5$). Then $PS = (0.5)(10,000)(10 - 5) = 25,000$
   (c) To find CS, you also need to find the point at which the demand curve intersects the y axis. Find this point by plugging $Q^D = 0$ into $Q^D = 20000 - 1000P$. This yields $P = 20$. Therefore, CS is a triangle such that $CS = (0.5)(10,000)(20 - 10) = 50,000$.
2. After Price Ceiling

(a) New PS. To find this, you need to know the quantity producers make when $P = 8$. Plug $P = 8$ into the supply curve to find $Q^S = 6,000$. You already know that the P intercept for this curve is 5. So $PS = (0.5)(6000)(8 - 5) = 9,000$.

(b) New CS. To find this, you need to know the price at which consumers demand 6,000 units. This P at $Q = 6,000$ is $P = 14$. Therefore, add up a the area of a rectangle and a triangle to get CS: $CS = (14-8)(6,000)+(0.5)(6,000)(20-14) = 36,000 + 18,000 = 44,000$.

(c) Transfers is from producers to consumers. The transfer is the rectangle below the price and above the price ceiling, and the width of the regulated quantity: $T = (10 - 8)(6,000) = 12,000$

(d) DWL is the loss for units that are not consumed due to this policy. The width of this triangle is $10,000 - 6,000$. The height is $14 - 8$. $DWL = (0.5)(4000)(6) = 12,000$

(e) DWL as a share of the transfer: $DWL/T = 12,000/12,000 = 1$