

HW#8 Due March 1, 2022

9. At Fenway Park, home of the Boston Red Sox, seating is limited to about 38,000. Hence, the number of tickets issued is fixed at that figure. Seeing a golden opportunity to raise revenue, the City of Boston levies a per ticket tax of \$5 to be paid by the ticket buyer. Boston sports fans, a famously civic-minded lot, dutifully send in the \$5 per ticket. Draw a well-labeled graph showing the impact of the tax. On whom does the tax burden fall—the team's owners, the fans, or both? Why?
10. A market is described by the following supply and demand curves:

$$Q^S = 2P$$

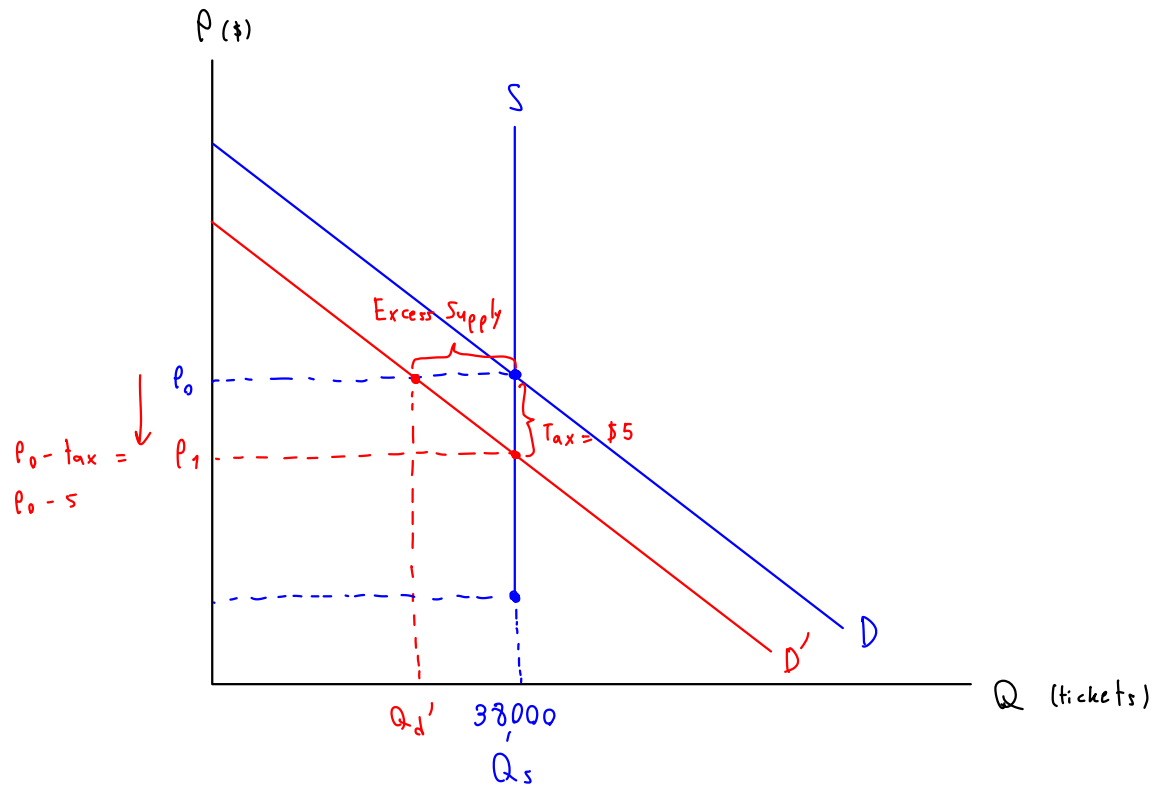
$$Q^D = 300 - P$$

- Solve for the equilibrium price and quantity.
- If the government imposes a price ceiling of \$90, does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?
- If the government imposes a price floor of \$90, does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?
- Instead of a price control, the government levies a tax on producers of \$30. As a result, the new supply curve is:

$$Q^S = 2(P - 30).$$

Does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?

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The buyers are taxed at \$5 per ticket causing a decrease in demand (D shifts left to D'). At P_0 , there is an excess supply $= 38,000 - Q_d' > 0$, so the price decreases from P_0 to P_1 . So, the new equilibrium price is P_1 while equilibrium quantity remains the same at 38,000 tickets.

Before tax, the sellers receive money at P_0 , but after the tax, the sellers can only receive $P_1 = P_0 - 5$. For the buyers, they had to pay P_0 before tax, but after the tax, they paid at price $P_1 = P_0 - 5$ together with \$5 tax. Meaning that the total amount paid by buyers is $P_1 + 5 = P_0 - 5 + 5 = P_0$.

Therefore, the tax burden falls to the sellers because they receive \$5 lower than they normally receive before tax.

From the elasticity, $\frac{\eta_s}{|\eta_d|} = \frac{\text{tax burden on the buyers}}{\text{tax burden on the sellers}}$

$$\begin{aligned} \text{Since slope of } S \text{ is } \infty, \eta_s &= \frac{1}{\text{slope}} \cdot \frac{P_1}{Q_1} \\ &= \frac{1}{\infty} \cdot \frac{P_1}{Q_1} \\ &= 0 \end{aligned}$$

so $\eta_s = 0$ (perfectly inelastic), the buyers bears no tax burden at all.

10. A market is described by the following supply and demand curves:

$$Q^S = 2P \longrightarrow P = \frac{1}{2} Q_s$$

$$Q^D = 300 - P \longrightarrow P = 300 - Q_D$$

- Solve for the equilibrium price and quantity.
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$$Q^S = 2(P - 30).$$

$$2P - 60 = Q_s$$

$$P = \frac{1}{2} Q_s + 30$$

Does a shortage or surplus (or neither) develop? What are the price, quantity supplied, quantity demanded, and size of the shortage or surplus?

a)

$$2P = 300 - P$$

$$3P = 300$$

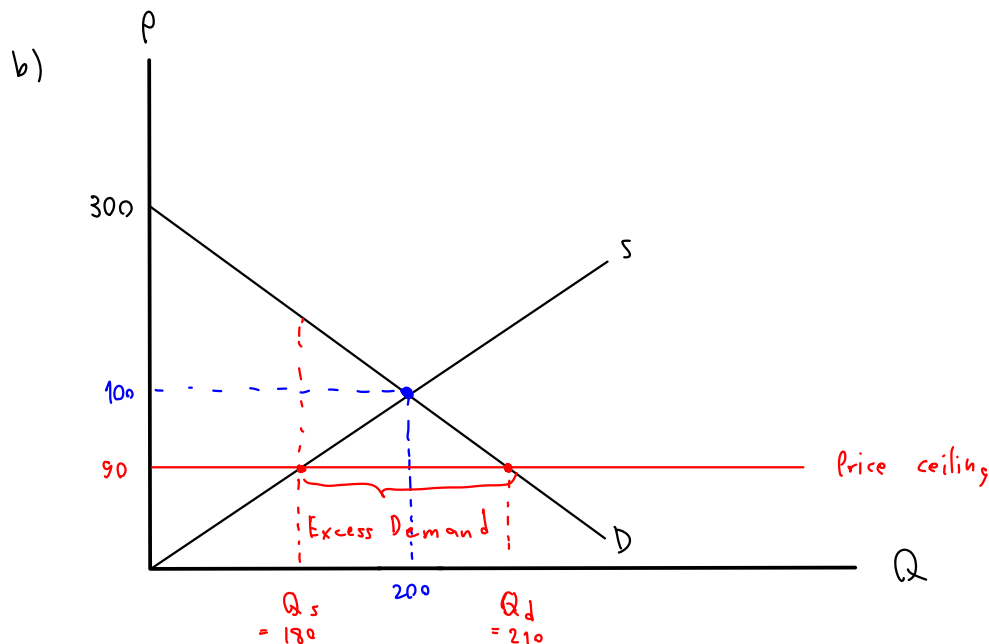
$$P = 100$$

$$Q = 2P$$

$$Q = 2(100)$$

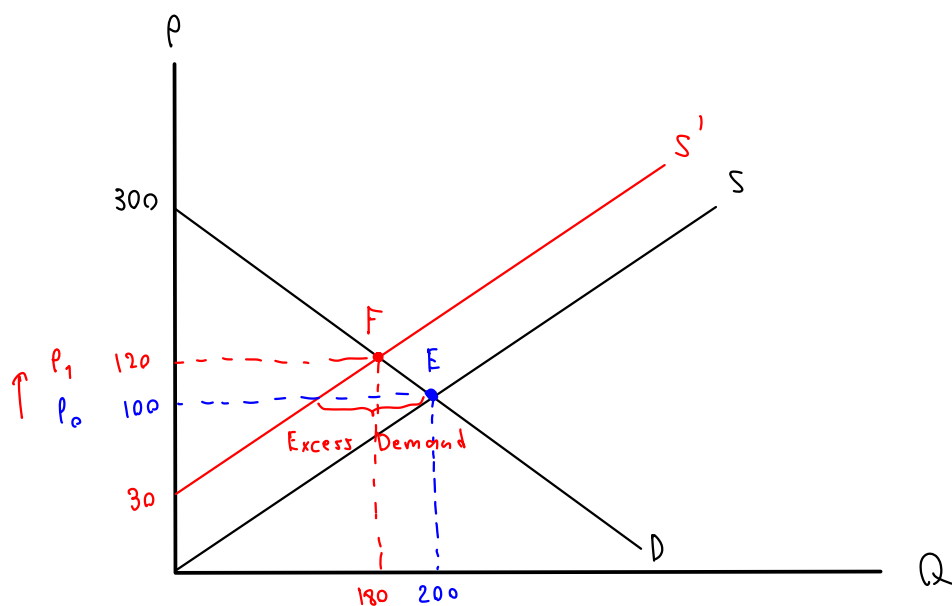
$$Q = 200$$

$\therefore$ Equilibrium point = $(P, Q) = (100, 200)$



C. If the govt set price floor at \$90 which is lower than the equilibrium price, there will be no effect because price floor is the minimum price traded in the market which means that it is normally traded.
 $\therefore$ Neither shortage or surplus.

d.



$$\begin{aligned}
 \text{New equilibrium point} &= 2(P-30) = 300-P & Q &= 300-120 \\
 &= (P, Q) = (120, 180) & &= 180 \\
 & & 2P-60 &= 300-P \\
 & & 3P &= 360 \\
 & & P &= 120
 \end{aligned}$$

$$\text{At } P_0 = 100, Q_s = 2(100-30) = 140 \text{ while } Q_d = 300-100 = 200$$

$$\text{There is an excess demand} = Q_d - Q_s = 200 - 140 = 60.$$

$\therefore$ Price tends to increase until there is no excess demand at point F.