Elements of Microeconomics: TA Session

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Fall break next week

There will be no TA session next Friday, October 18 due to the fall break

Mid-term exam, Question 5B

Two answers are possible:

- **True**. The firm is in the inelastic region of the demand curve, so the price effect will dominate the quantity effect and total revenue will increase.
- **False**. Counterexample: a linear demand curve has an elastic portion at high prices and an inelastic portion at low prices. Although the firm is currently in the inelastic portion of the curve, if it raises price high enough, it could become deeply inside the elastic portion, making the effect on total revenue of the elastic portion dominate. Therefore, the firm cannot always increase total revenue by raising prices.

Mid-term exam, Question 2A

Demand: $Q = 100 - 4P$; Supply: $Q = -20 + 2P$
If consumers want to purchase 60 more bottles at any given price, what are the new equilibrium price and quantity?

At any given price P, the consumer originally wants to purchase $100 - 4P$ bottles; now he wants to purchase 60 more:
$100 - 4P + 60 = 160 - 4P$. This is the new demand curve:
$Q = 160 - 4P$.

Mid-term exam, Question 3A

The demand curve is $P = -2Q_d + 15$
How to calculate elasticity?

$$|E_D| = |\frac{\%\Delta Q_d}{\%\Delta P}| = |\frac{\Delta Q_d}{\Delta P}| \cdot \frac{P}{Q_d}$$

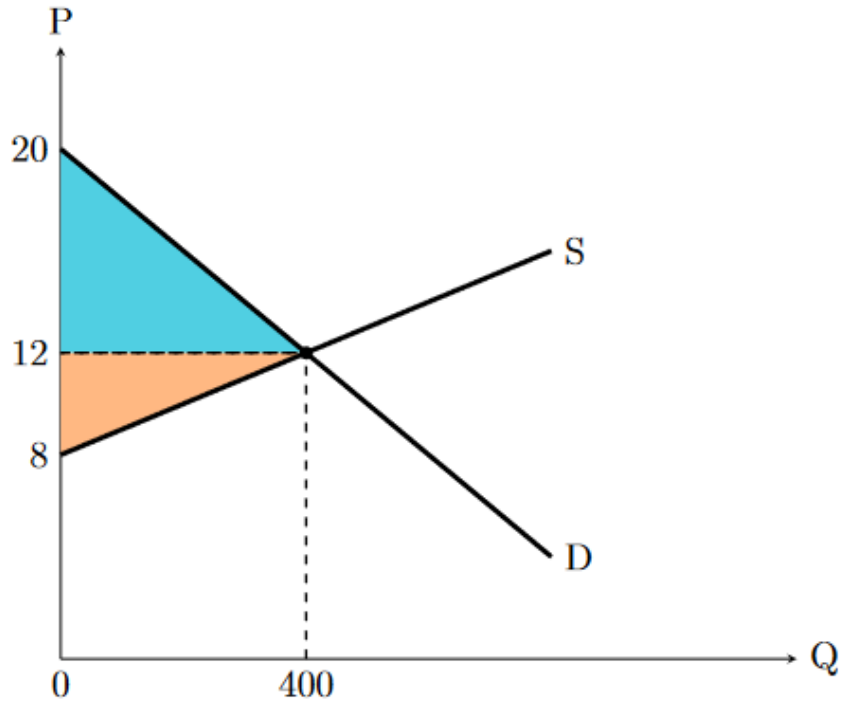
$\frac{\Delta Q_d}{\Delta P}$ is $\frac{1}{2}$ here, not 2!
Draw it on a graph if you get confused in exam

Q is expressed in thousands of units; does it matter for elasticity?

- No! You multiply ΔQ_d by 1,000 and multiply Q_d also by 1,000; the scales cancel each other out

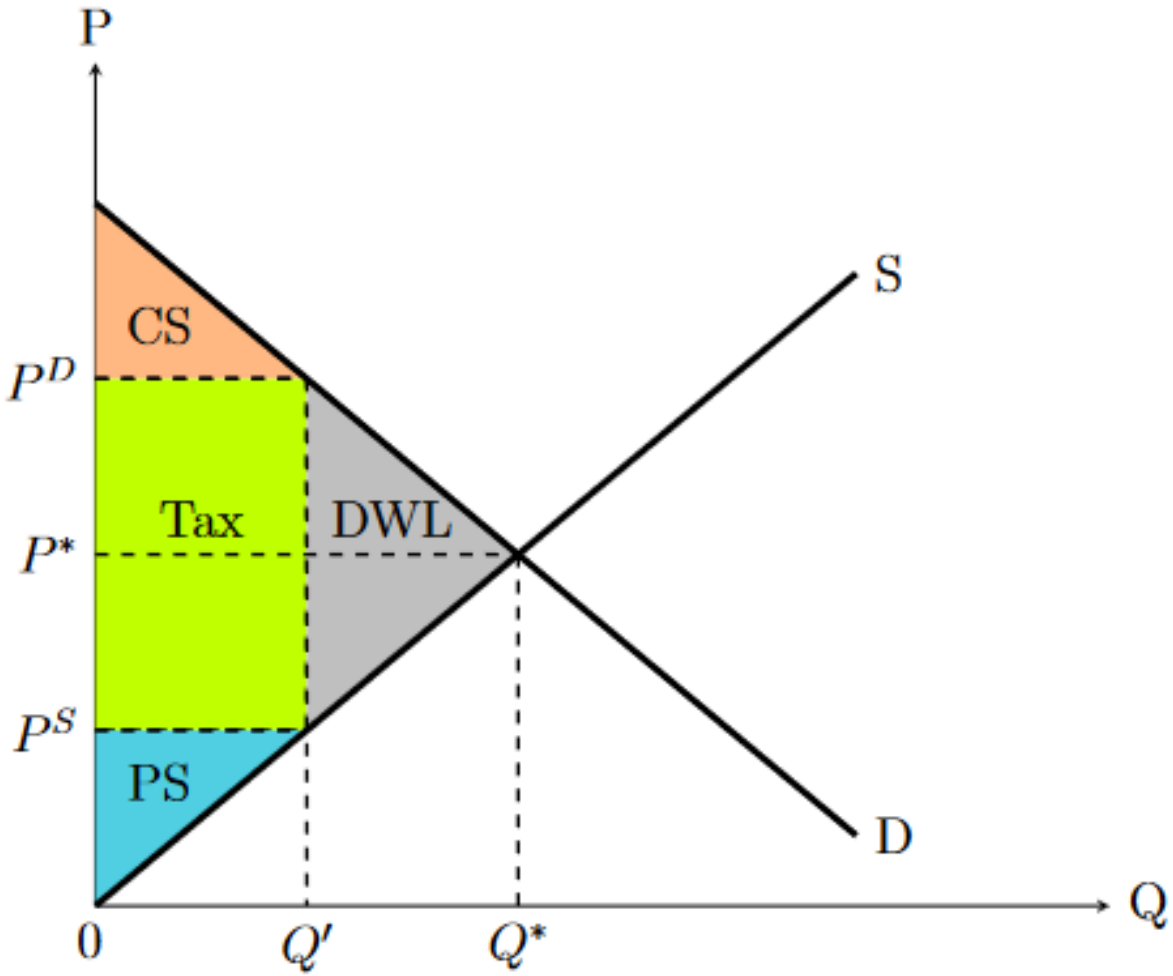
Mid-term exam, Question 4A

Supply curves don't automatically pass (0,0)!



The supply curve $Q_S = 100w - 800$ passes through (0,8). You don't need to draw the graphs exactly in proportion, but the supply curve has to intersect the P-axis somewhere above (0,0)

Deadweight loss of taxation



Deadweight loss of taxation

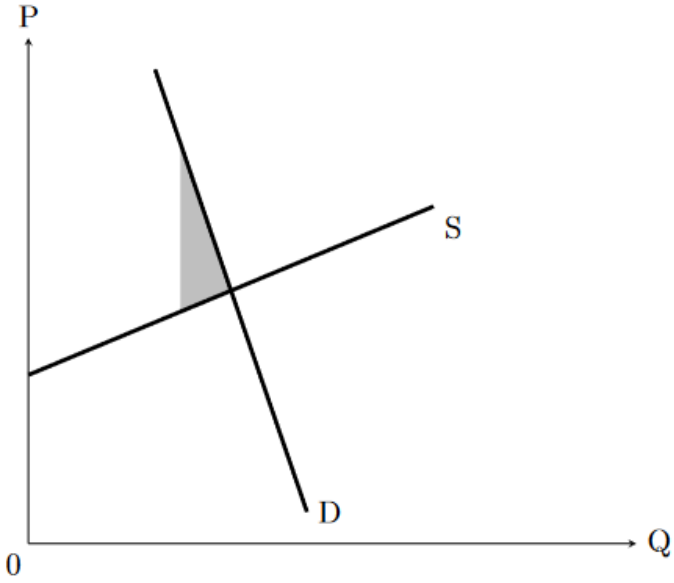


Figure: Inelastic demand

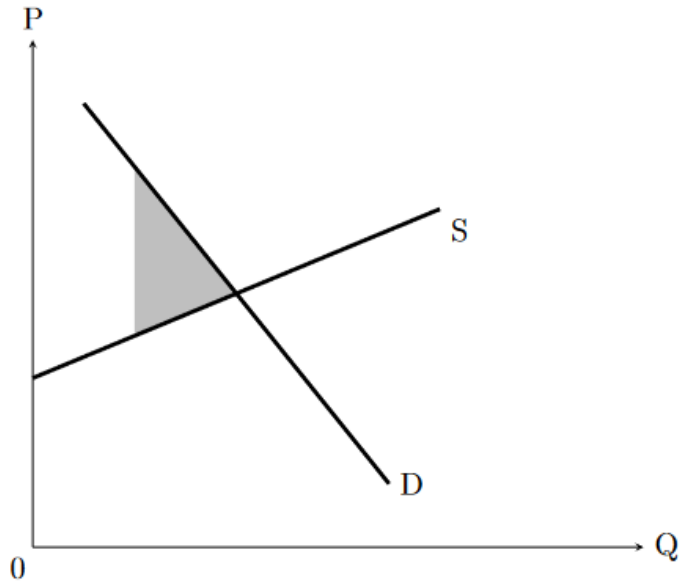


Figure: Elastic demand

Holding other things constant, the more elastic the demand (or supply) curve, the greater the deadweight loss from taxation

Recall from Mankiw Chapter 7 that the market equilibrium maximizes total surplus. The further away we move from equilibrium, the greater the deadweight loss

- Elastic means that market participants respond more to price changes, i.e. moving further away from equilibrium

Tax revenue and the Laffer curve

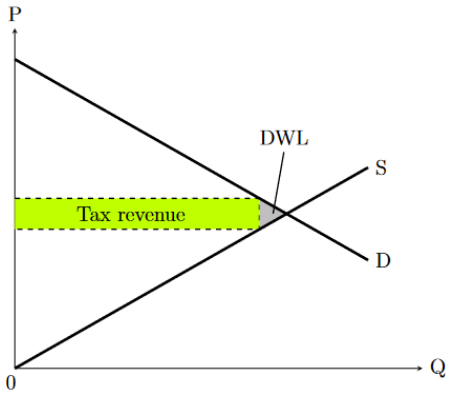


Figure: Small tax

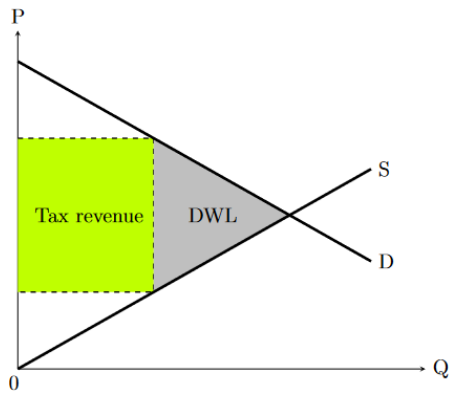


Figure: Medium tax

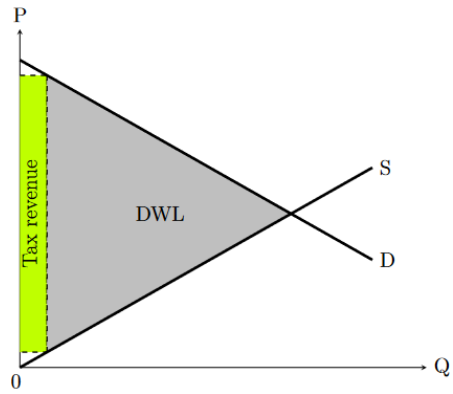


Figure: Large tax

As tax size increases, the tax revenue that the government collects first goes up, and then goes down. This relationship can be shown by the **Laffer curve** (see next slide)

Tax revenue and the Laffer curve

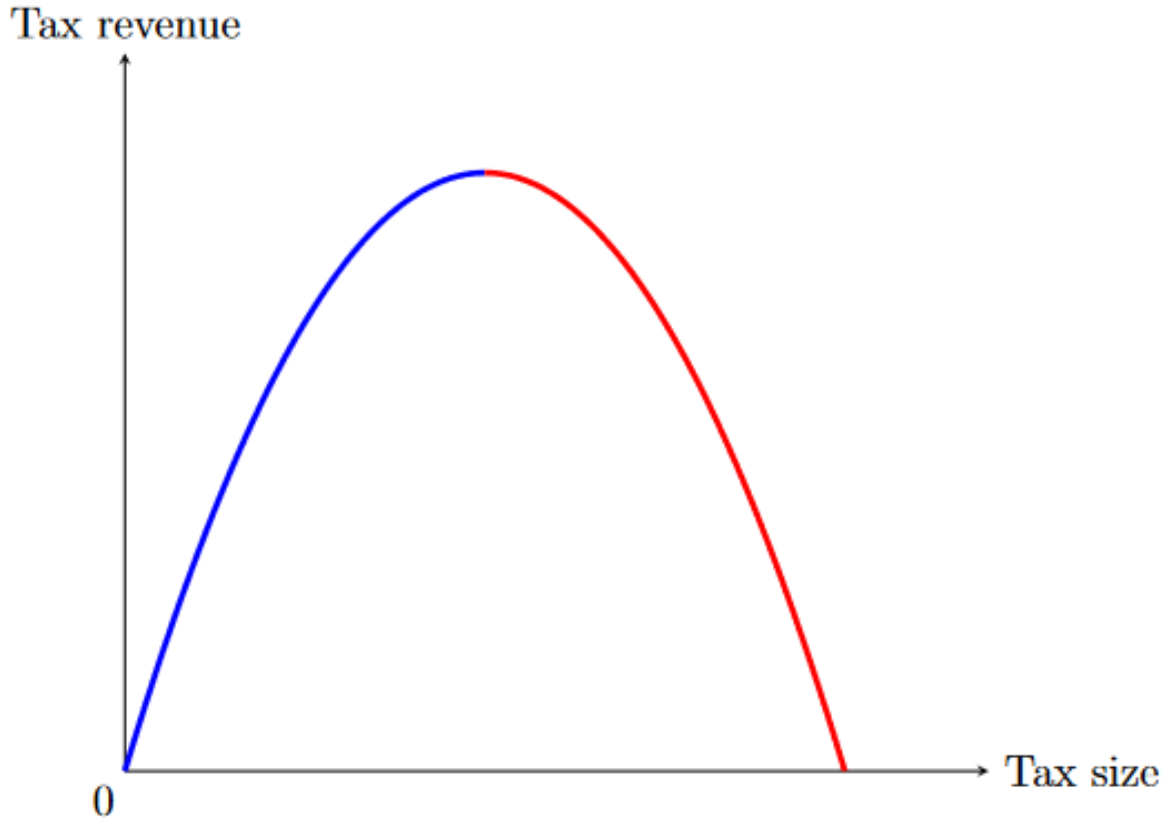


Figure: Laffer Curve

Deadweight loss of taxation - exercise

The supply equation of liquor is $P = 10 + 2Q$, and the demand equation is $P = 40 - Q$.

1. Suppose that the government levies a sales tax of t dollars per unit. What is the quantity sold?
2. Calculate the government's tax revenue in terms of t.
3. Calculate the size of deadweight loss in terms of t.
4. For which value of t is the government's tax revenue highest? What is the highest tax revenue?
5. For which value of t is the deadweight loss lowest? What is the lowest deadweight loss?

Deadweight loss of taxation - explained

1. With a sales tax of t dollars per unit, the price that buyers face is t dollars higher than the price that sellers face. We have: $(40 - Q) - (10 + 2Q) = t \Rightarrow Q = \frac{30-t}{3}$.
2. Government's tax revenue $= tQ = \frac{t(30-t)}{3} = \frac{30t-t^2}{3}$.
3. The base of the deadweight loss triangle is the tax size t; the height is original equilibrium quantity minus actual quantity: $10 - \frac{30-t}{3} = \frac{t}{3}$. We have DWL $= \frac{t(t/3)}{2} = \frac{t^2}{6}$.
4. Tax revenue $= \frac{30t-t^2}{3}$ is maximized at $t = 15$, where the tax revenue is 75.
5. Deadweight loss $\frac{t^2}{6}$ is minimized at $t = 0$, where the deadweight loss is 0.