Elements of Microeconomics: TA Session

Pinda Wang

Johns Hopkins University

September 27, 2024

Important Dates

Today at 11:59pm: assignment 2 due

October 3: midterm exam 1

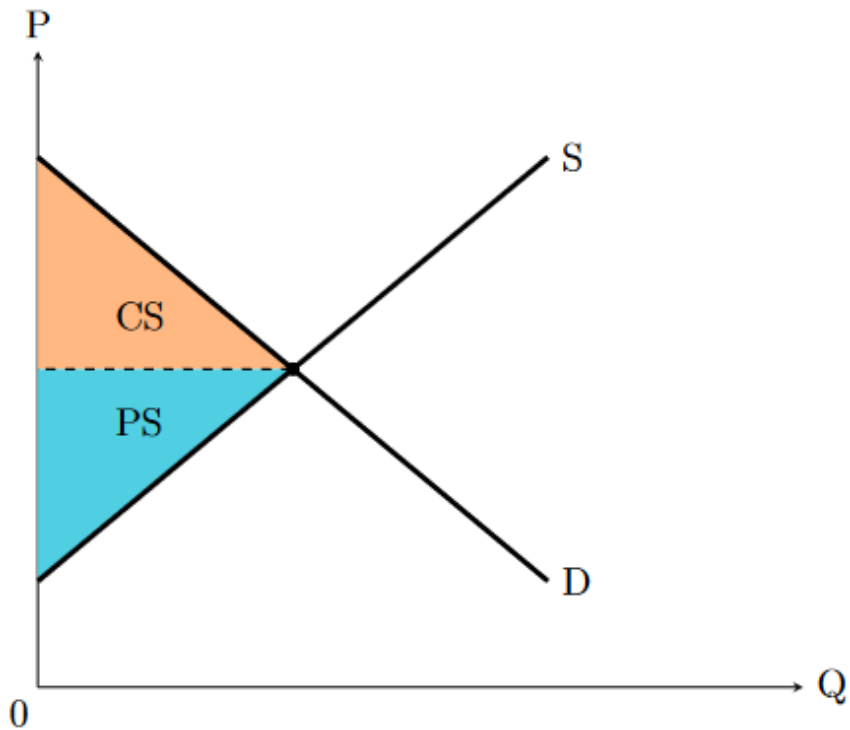
No TA session next Friday, October 4

My office hours: Wednesdays, 14:30-15:30, Wyman Park W601A

Consumer and producer surplus

The demand curve illustrates the willingness to pay of each marginal buyer; the supply curve illustrates the cost of each marginal seller

- **Consumer surplus:** a buyer's willingness to pay minus the price he actually pays
- **Producer surplus:** the price that a seller is paid minus his cost of production



Government policies

Price control:

- A binding price ceiling (e.g. rent control) results in shortages
- A binding price floor (e.g. minimum wage) results in surplus
  - Real world is more complex!

Taxation:

- Taxes on sellers and taxes on buyers are equivalent
- Taxation reduces equilibrium quantity
- The division of tax burden depends on elasticity: tax burden falls more heavily on the relatively inelastic side

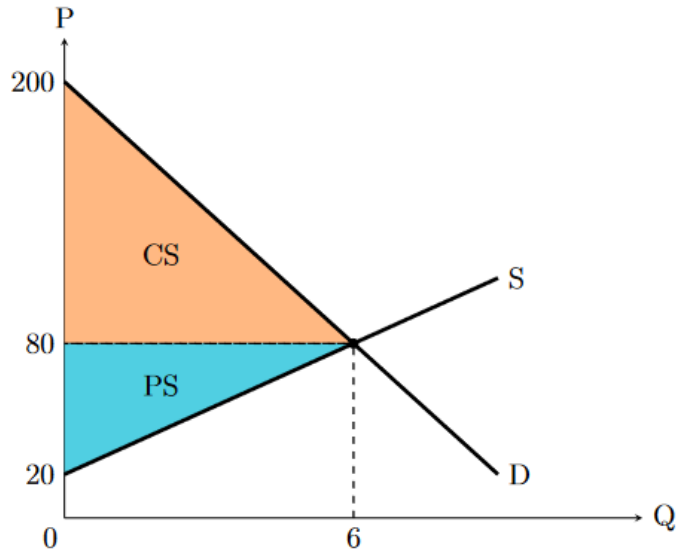
Government policies

Suppose a good's demand curve is given by $P = 200 - 20Q$, its supply curve is given by $P = 20 + 10Q$.

1. Calculate the consumer surplus in equilibrium
2. Calculate the producer surplus in equilibrium
3. What would happen if a price ceiling of \$70 was imposed?
4. What would happen if a price floor of \$90 was imposed?
5. If the government imposes a tax of \$30 per unit, calculate each side's tax burden

Government policies - explained

Answer: We can draw these curves in a diagram, like below:



1. Consumer surplus equals the area of the "CS" triangle: $CS = 6 \times 120/2 = 360$.
2. Producer surplus equals the area of the "PS" triangle: $PS = 6 \times 60/2 = 180$.

Government policies - explained

3. With a price ceiling of \$70, quantity demanded is 6.5, quantity supplied is 5. There is a shortage of 1.5 units of the good.
4. With a price floor os \$90, quantity demanded is 5.5, quantity supplied is 7. There is a surplus of 1.5 units of the good.
5. With a tax of \$30 per unit, the amount the seller actually gets is \$70, the amount the buyer actually pays is \$100, and the equilibrium quantity is 5. Seller's tax burden is $80 - 70 = \$10$ per unit; buyer's tax burden is $100 - 80 = \$20$ per unit.

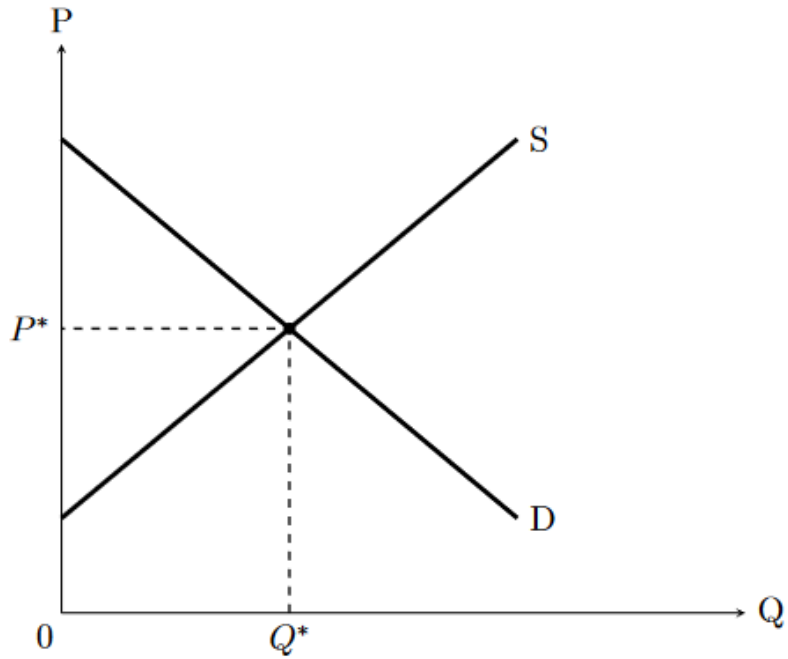
Subsidies

Suppose the demand curve of a good is downward sloping, and the supply curve of the good is upward sloping.

1. Draw the supply and demand curves in a diagram
2. Suppose the government subsidizes producers \$5 for producing each unit of the good. Draw the new supply and/or demand curves in the same diagram. What happens to the equilibrium quantity and price?
3. Suppose the government subsidizes consumers \$5 for buying each unit of the good. Draw the new supply and/or demand curves in the same diagram. What happens to the equilibrium quantity and price?
4. Does the equivalence of taxes on buyer and sellers hold for subsidies?

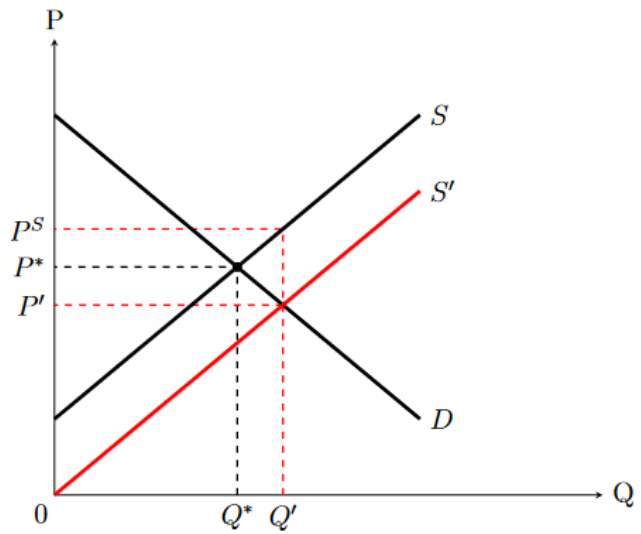
Subsidies - Explained

1. See the diagram below.



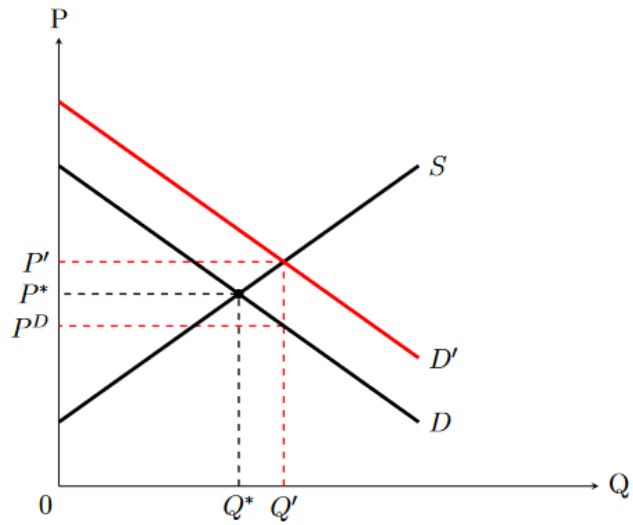
Subsidies - Explained

2. See the diagram below. With a producer subsidy of \$5 per unit of good, producer's revenue per unit is \$5 higher than the price he charges buyers. Therefore, the supply curve shifts downwards by \$5. In the diagram below, P' is the new price that sellers charge buyers, and P^S is the amount that sellers actually get. The tax amount is $P^S - P' = \$5$. Equilibrium quantity increases and price falls.



Subsidies - Explained

3. See the diagram below. With a consumer subsidy of \$5 per unit of good, the amount that the consumer pays is \$5 lower than the price that he's charged by the seller. The demand curve shifts upwards by \$5. In the diagram below, P' is the new price that buyers are charged by sellers, and P^D is the price that buyers *actually* faces. The tax amount is $P' - P^D = \$5$. Equilibrium quantity and price both increases.



Subsidies - Explained

4. Like taxes, subsidies on buyers and sellers are equivalent. In fact, the analysis of subsidies is exactly the reverse of taxes: e.g. regardless of whether the subsidies are doled out to buyers or sellers, both sides share the benefit of the subsidies.

Subsidies in a famine

A famine is raging in the Republic of Sordland. Bill, a rich philanthropist, decides to help the poor to get food. He purchases grain from merchants, and resells it to the poor at half the price.

1. Is grain supply relatively elastic or inelastic in a famine? Why?
2. In the following, assume that grain supply in the famine is perfectly inelastic. Draw the supply and demand curves of grain in a diagram before Bill's intervention. Label the equilibrium price and quantity in the diagram as P^* and Q^*

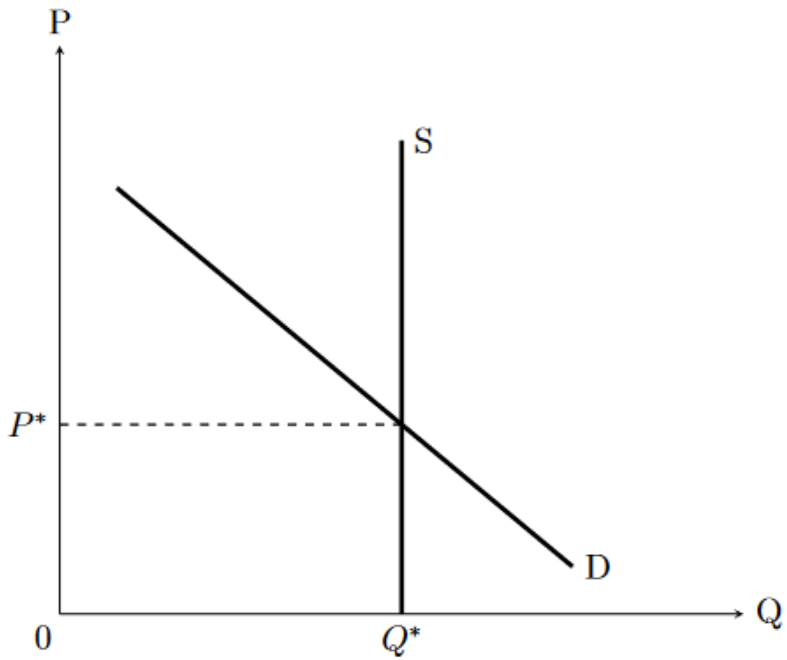
Subsidies in a famine

A famine is raging in the Republic of Sordland. Bill, a rich philanthropist, decides to help the poor to get food. He purchases grain from merchants, and resells it to the poor at half the price.

3. After Bill's intervention, can the new equilibrium market price (i.e. the price Bill pays to merchants) still be P^*? Why?
4. What is the new equilibrium market price that Bill pays to the merchants?
5. Is the poor better off from Bill's intervention?
6. Who is better off from his intervention?
7. How would the above answers change if the country is not in a famine?

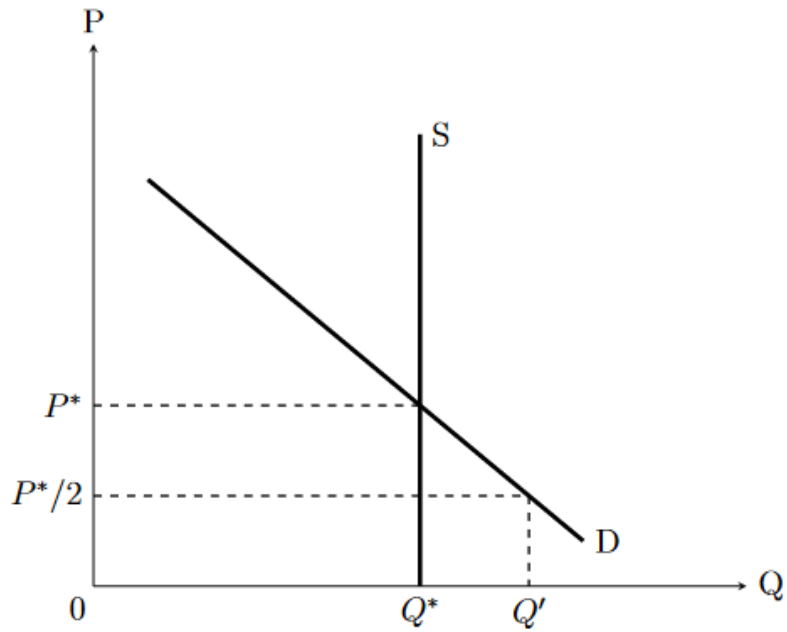
Subsidies in a famine - Explained

1. Grain supply is relatively inelastic in a famine, because the supply is extremely limited: even if price rises by a lot, grain merchants are unlikely to come up with any additional grain.
2. See the diagram below.



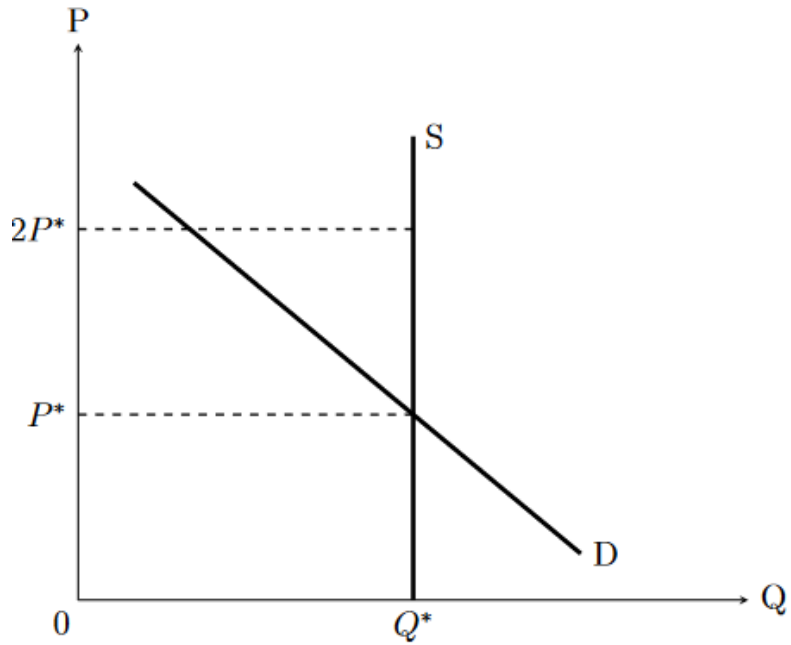
Subsidies in a famine - Explained

3. No. If the equilibrium price that Bill pays is still P^*, then the price that poor people pays would be $P*/2$. But at this price, there will be $(Q' - Q^*)$ units of excess demand (see diagram below). This cannot be an equilibrium.



Subsidies in a famine - Explained

4. The new equilibrium price that Bill pays is $2P^*$. With this, the price that the poor pays is P^*, under which the market is in equilibrium.



Subsidies in a famine - Explained

5. The poor is not better off from Bill's intervention. The price they pay for grain is still P^*, the same as before.
6. The grain merchants are better off. The sell the same grain as before Bill's intervention, but at double the price.
7. Without a famine, the supply of grain becomes more elastic. Then, the poor would be better off from Bill's intervention: Bill can purchase grain at a price between P^* and $2P^*$, where the grain merchant can supply more grain because the supply is now elastic. The price that the poor faces would be below P^*; the quantity demanded would be greater than before. But there is more supply to meet this demand, so at the right price, there wouldn't be excess demand.