AS.180.102 (04): Elements of Microeconomics

Chapter 7 - Consumers, Producers, and the Efficiency of Markets

Kieran Allsop

September 27, 2024

Reminders

- Assignment 2 due tonight at 11:59pm
- First midterm is next Thursday, October 3rd
- My office hours are Wednesdays at 2:30pm
- No section next Friday, October 4th

Questions from last week?

Outline

- So far we have tried to understand **how** markets work: a *positive* rather than *normative* project.
- Now we will start to look at **welfare economics**: how well-being is effected by different market outcomes.

Main Takeaway

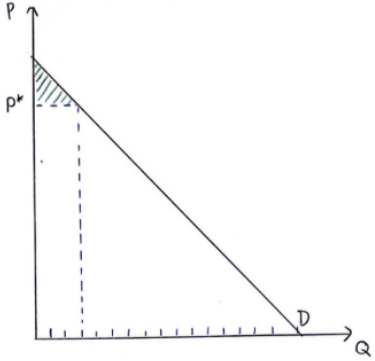
An allocation of resources that maximizes **total surplus** is said to be efficient and is the type of efficiency policymakers are often concerned with.

Willingness to pay

- Each consumer will have a different **willingness to pay** for a good.
- There is a maximum amount they will spend; at any price below this they purchase the good, and at any price above they do not.
- The difference between the amount they *actually* spend and the amount they are *willing* to spend is their **consumer surplus**.
- Consumer surplus measures the benefit consumers' receive from a good, "as they themselves perceive it".

Consumer surplus

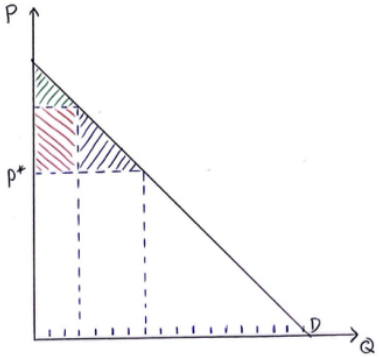
Consumer surplus is the area below the demand curve and above the market price.



What happens to consumer surplus when the price moves below P^*?

Consumer surplus

Key: Some benefit accrues to already participating consumers and some to new consumers.



Producer surplus

- Producer surplus is essentially the same.
- Depends on *cost*: the value of everything a seller must give up to produce a good.
- Given by the area above the supply curve and below the market price.

Efficiency

- A market outcome is **efficient** if it maximizes the **total surplus** of producers and Consumers

$$\text{Total surplus} = \text{consumer surplus} + \text{producer surplus} = \text{value to buyers} - \text{cost to sellers}$$

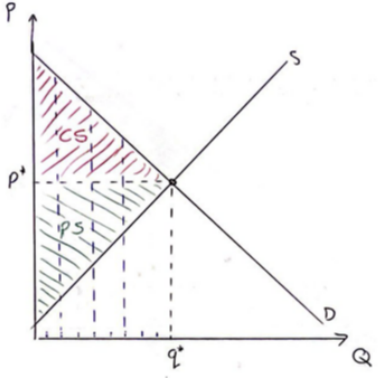
- We might also care about **equality**, or the distribution of surplus between producers and consumers

Graphical Example

Consider the market for coffee. How would we draw the total surplus at the market equilibrium, identifying consumer surplus and producer surplus?

Graphical Example

Consider the market for coffee. How would we draw the total surplus at the market equilibrium, identifying consumer surplus and producer surplus?



Numeric Example

- Frank values his time at \$70 per hour. He agrees to spend 4 hours helping Shane with his gardening. Shane has a total willingness to pay of \$400 for Frank to do his gardening. They settle on a price of \$350.
  1. What is the value of the consumer surplus?
  2. What is the value of the producer surplus?
  3. Can any other price increase or decrease total surplus in the market?

Numeric Example

- Frank values his time at \$70 per hour. He agrees to spend 4 hours helping Shane with his gardening. Shane has a total willingness to pay of \$400 for Frank to do his gardening. They settle on a price of \$350.
  1. What is the value of the consumer surplus?
  2. What is the value of the producer surplus?
  3. Can any other price increase or decrease total surplus in the market?

1. $\$400 - \$350 = \$50$

Numeric Example

- Frank values his time at \$70 per hour. He agrees to spend 4 hours helping Shane with his gardening. Shane has a total willingness to pay of \$400 for Frank to do his gardening. They settle on a price of \$350.
  1. What is the value of the consumer surplus?
  2. What is the value of the producer surplus?
  3. Can any other price increase or decrease total surplus in the market?

1. $\$400 - \$350 = \$50$
2. $\$350 - \$280 = \$70$

Numeric Example

- Frank values his time at \$70 per hour. He agrees to spend 4 hours helping Shane with his gardening. Shane has a total willingness to pay of \$400 for Frank to do his gardening. They settle on a price of \$350.
  1. What is the value of the consumer surplus?
  2. What is the value of the producer surplus?
  3. Can any other price increase or decrease total surplus in the market?

1. $\$400 - \$350 = \$50$
2. $\$350 - \$280 = \$70$
3. No. Check for yourself that any price will produce \$120 of surplus which is also the difference between the two valuations of the consumer and producer.

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What is the quantity demanded and quantity supplied at the prices \$9, \$6, and \$3?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$13	\$1
2nd bottle	\$10	\$3
3rd bottle	\$7	\$5
4th bottle	\$4	\$7
5th bottle	\$1	\$9

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What is the quantity demanded and quantity supplied at the prices \$9, \$6, and \$3?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$13	\$1
2nd bottle	\$10	\$3
3rd bottle	\$7	\$5
4th bottle	\$4	\$7
5th bottle	\$1	\$9

Price	Q_D	Q_S
\$9	2	5
\$6	3	3
\$3	4	2

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - At which of these prices is there an equilibrium?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$13	\$1
2nd bottle	\$10	\$3
3rd bottle	\$7	\$5
4th bottle	\$4	\$7
5th bottle	\$1	\$9

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - At which of these prices is there an equilibrium?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$13	\$1
2nd bottle	\$10	\$3
3rd bottle	\$7	\$5
4th bottle	\$4	\$7
5th bottle	\$1	\$9

- \$6

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What are the consumer surplus, producer surplus, and total surplus in equilibrium?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$13	\$1
2nd bottle	\$10	\$3
3rd bottle	\$7	\$5
4th bottle	\$4	\$7
5th bottle	\$1	\$9

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What are the consumer surplus, producer surplus, and total surplus in equilibrium?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$13	\$1
2nd bottle	\$10	\$3
3rd bottle	\$7	\$5
4th bottle	\$4	\$7
5th bottle	\$1	\$9

- Consumer surplus $= (\$13 - \$6) + (\$10 - \$6) + (\$7 - \$6) = \$12$
- Producer surplus $= (\$6 - \$1) + (\$6 - \$3) + (\$6 - \$5) = \$9$
- Total surplus = Consumer surplus + Producer surplus $= \$12 + \$9 = \$21$

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What would be the change to consumer, producer, and total surplus at the original equilibrium price if Victoria's preferences for bottles of water increases such that shes willing to spend an additional $4 on every bottle of water?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	$13	$1
2nd bottle	$10	$3
3rd bottle	$7	$5
4th bottle	$4	$7
5th bottle	$1	$9

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What would be the change to consumer, producer, and total surplus at the original equilibrium price if Victoria's preferences for bottles of water increases such that shes willing to spend an additional $4 on every bottle of water?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	$17	$1
2nd bottle	$14	$3
3rd bottle	$11	$5
4th bottle	$8	$7
5th bottle	$5	$9

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What would be the change to consumer, producer, and total surplus at the original equilibrium price if Victoria's preferences for bottles of water increases such that shes willing to spend an additional \$4 on every bottle of water?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$17	\$1
2nd bottle	\$14	\$3
3rd bottle	\$11	\$5
4th bottle	\$8	\$7
5th bottle	\$5	\$9

- Producer surplus would not change as, at the original equilibrium price, Gerri will still only produce 3 bottles.
- Consumer surplus $= (\$17 - \$6) + (\$14 - \$6) + (\$14 - \$6) = \$24$.
- Therefore, total surplus is now \$33.

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What would the new equilibrium price and quantity be?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$17	\$1
2nd bottle	\$14	\$3
3rd bottle	\$11	\$5
4th bottle	\$8	\$7
5th bottle	\$5	\$9

Application

- Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.
  - What would the new equilibrium price and quantity be?

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	\$17	\$1
2nd bottle	\$14	\$3
3rd bottle	\$11	\$5
4th bottle	\$8	\$7
5th bottle	\$5	\$9

- Any price between \$7 and \$8, and 4 bottles is the new equilibrium.
- Given a price of \$7, now consumer surplus = \$22, producer surplus = \$12, and total surplus = \$34.