Week 4: Market Analysis

HPM 6503
Spring 2026
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Announcements

- Grading policy change
  - Only your top two exam grades will be weighted, and will make up 75% of your grade
- Exam 1 will be 6pm-8:20pm next week in this room

- I will hold a review session on Zoom on Monday 02/16 6-7:30pm
- Problem Set 2 will be assigned after class today
  - Due 03/25
  - We will review PS2 during the review session on Monday

- Changes we are implementing to class thanks to your feedback:
  - ~Half of class will be problem-set based
  - ~Half of class will be lectures
  - I will hold an office hour every Friday 9-10am starting 2/20
  - Please do email me to set up separate office hours should you need them

Today’s Outline

- HW 1 Review
- Last Class Review & Example Problems
- Market Analysis

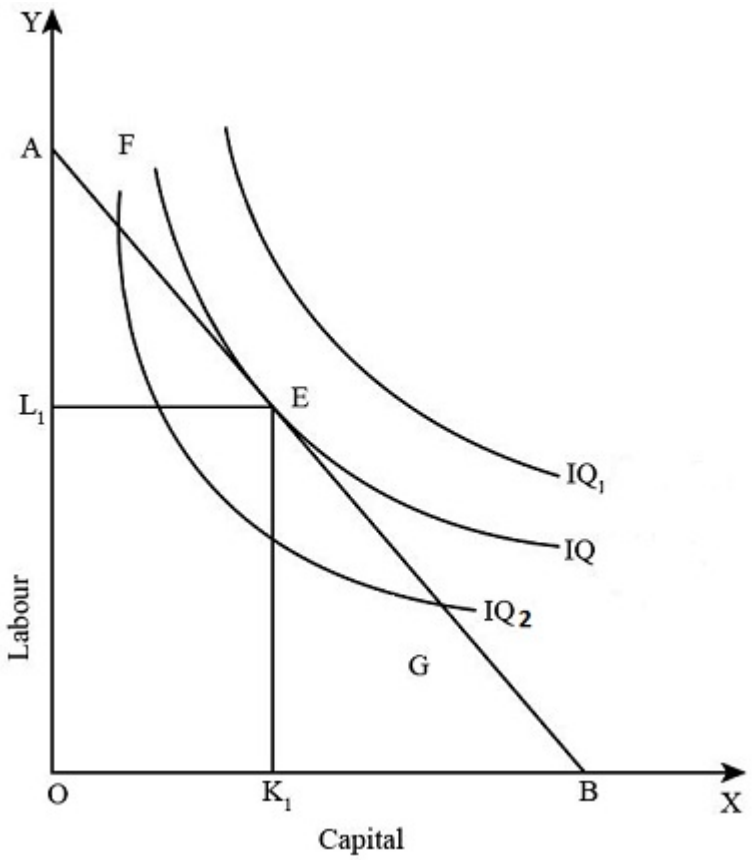
HW 1 Review

Last Class Review

- Isocost & Isoquant Curves
- Supply Curve & Marginal Cost
- Cost Structures
- Marginal Productivity

Last Class Review

- Isocost & Isoquant Curves



Last Class Review

- Supply Curve: Marginal Cost Curve

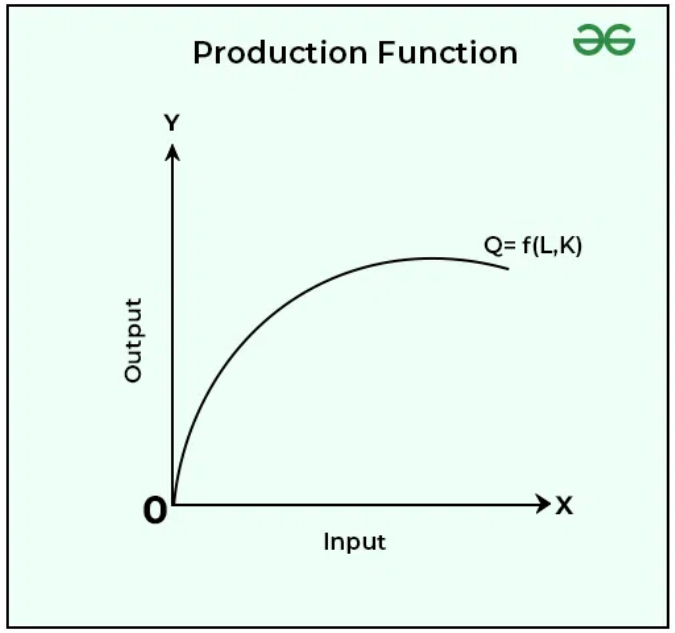
Last Class Review

- Cost Structures
  - Fixed Costs
  - Variable Costs
  - Total Costs

- Marginal Costs
  - $MC = (\Delta\, TC)/(\Delta\, Q) \;=\; (TC_2 - TC_1)/(Q_2 - Q_1)$
  - MC = Supply Curve

Last Class Review

- Marginal Productivity → What creates costs?
- Production function $Y = f(K, L)$



Last Class Review

- Marginal Product $MP = \frac{\Delta Y}{\Delta F}$
  - How much does output change with a given change in input F?

- **Law of Diminishing Returns:** Ceteris paribus (holding everything else constant), if we increase only factor F (L or K), then the corresponding increase in Y will get smaller with each additional unit of F employed.

Example problems

- Get into groups of 4-5

Example problems

- Assume the price of blueberries is 6 and the price of labor is 100. Fill in the table. Here, **profits = total revenue minus total labor costs.** What is the profit-maximizing amount of labor to hire?

Example problem 1

# of Workers	Total Output, pounds	Total revenue (P x Q), dollars	Marginal revenue, dollars	Total labor costs, dollars	Marginal labor cost, dollars	Profits
0						
1						
2						
3						
4						
5						
6						

Example problem 1

# of Workers	Total Output, pounds	Total revenue (P x Q), dollars	Marginal revenue, dollars	Total labor costs, dollars	Marginal labor cost, dollars	Profits
0	0	0	NA	NA	NA	0
1	70	420	420	100	100	320
2	130	780	360	200	100	580
3	180	1080	300	300	100	780
4	220	1320	240	400	100	920
5	250	1500	180	500	100	1000
6	260	1560	60	600	100	960

One step further

- We compare the marginal revenue from labor to the marginal cost of labor to answer the question:

"How much more money do we make from investing in another unit of some factor of production?"

- To maximize profits, we want the marginal revenue (MR) from employing an extra unit of factor to be greater than the marginal cost (MC)

$$\frac{\boldsymbol{MR}}{\boldsymbol{MC}} > 1$$

Example Problem 2

- Consider a firm maximizing profits. We will use isoquants and isocost curves to model firm decisions. Consider a production function Q, such that $Q=K^{0.4}L^{0.6}$.

1. Sketch the isoquant for Q=100

2. If w=1 and r=1, draw the isocost curve for a budget of 200. Remember, the isocost curve represents the all combinations of input that have the same cost such that: $\boldsymbol{C = wL + rK}$

3. Find the optimal choice of K and L for the firm using the isoquant and isocost curve.

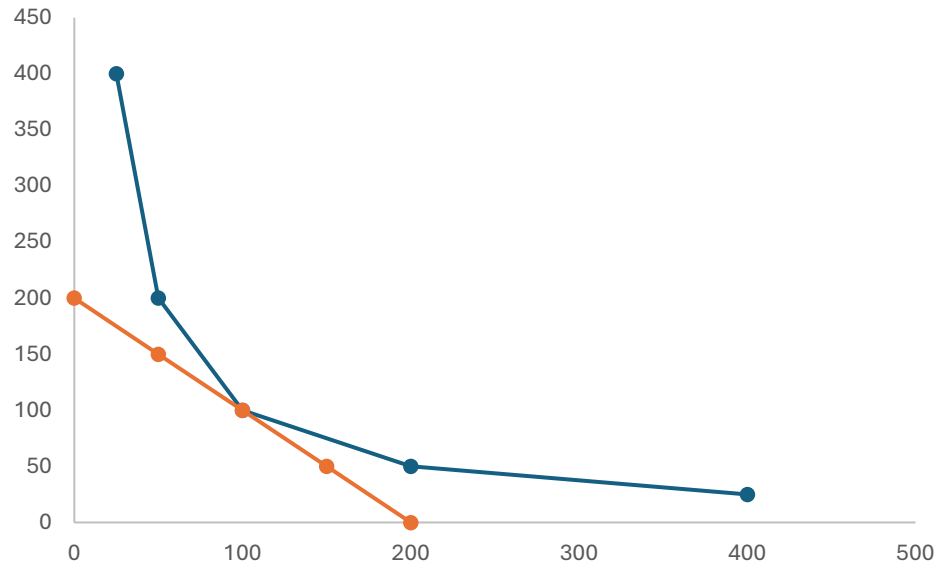
Example Problem 2

Isoquant for Q=100 (blue line)

K	L	Q
25	400	100
50	200	100
100	100	100
200	50	100
400	25	100

IC curve for r=1, w=1 (orange line)

K	L	B
200	0	200
150	50	200
100	100	200
50	150	200
0	200	200



Example problem 3

- An urgent care clinic employs an ER physician who works a 10-hour shift and uses an MRI machine purchased for $50,000. The ER physician can treat 20 patients per shift and earns $100 per hour. The ER physician exhibits diminishing marginal productivity throughout the course of her shift. For simplicity, assume that all patients are identical.

Example Problem 3

1. What is the average product for this doctor?
2. What is the average variable cost of ER physician visit per patient?
3. What is the average total cost of the ER physician visit per patient?
4. Based only on the information above, it can be assumed that the ER doctor will spend more than _____ minutes treating their final patient of the day.

Example Problem 3

1. **What is the average product for this doctor?**

AP = Q/L

Q= 20 patients, L = 10 hours → AP = 20/10 = 2

This doctor can see 2 patients per hour.

Example Problem 3

2. What is the average variable cost of the ER physician per patient?

AVC per patient = wage per hour / patients per hour = 100/2 = $50

AVC per patient = total wage / total patients = 100*10/20 = $50

Example Problem 3

3. What is the average total cost of the ER physician per patient?

ATC per patient = (total wage + fixed cost) / total patients

ATC per patient = (50,000+100*10)/20 = $2,550 per patient

Example Problem 3

4. Based only on the information above, it can be assumed that the ER doctor will spend more than _____ minutes treating their final patient of the day.

Average time per patient = 10 hours / 20 patients = **30 min / patient**

Example Problem 3

4. Based only on the information above, it can be assumed that the ER doctor will spend more than _____ minutes treating their final patient of the day.

Average time per patient = 10 hours / 20 patients = **30 min / patient**

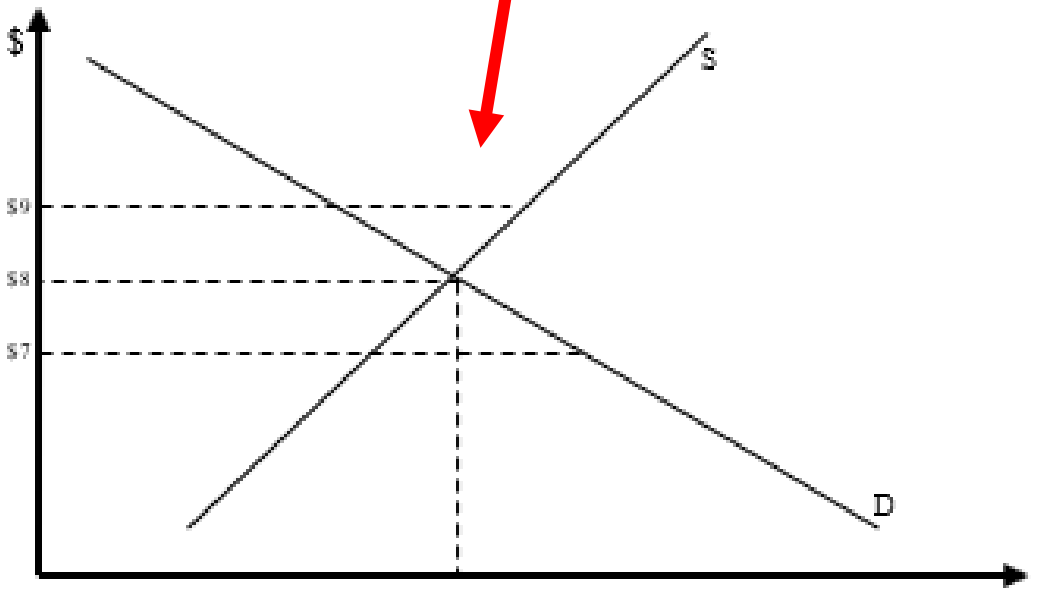
Due to diminishing marginal returns, the marginal product should exceed the average time.

Break, Questions

Market Analysis

- So far, we've seen
  - Demand
  - Supply

Today's Focus: Equilibrium



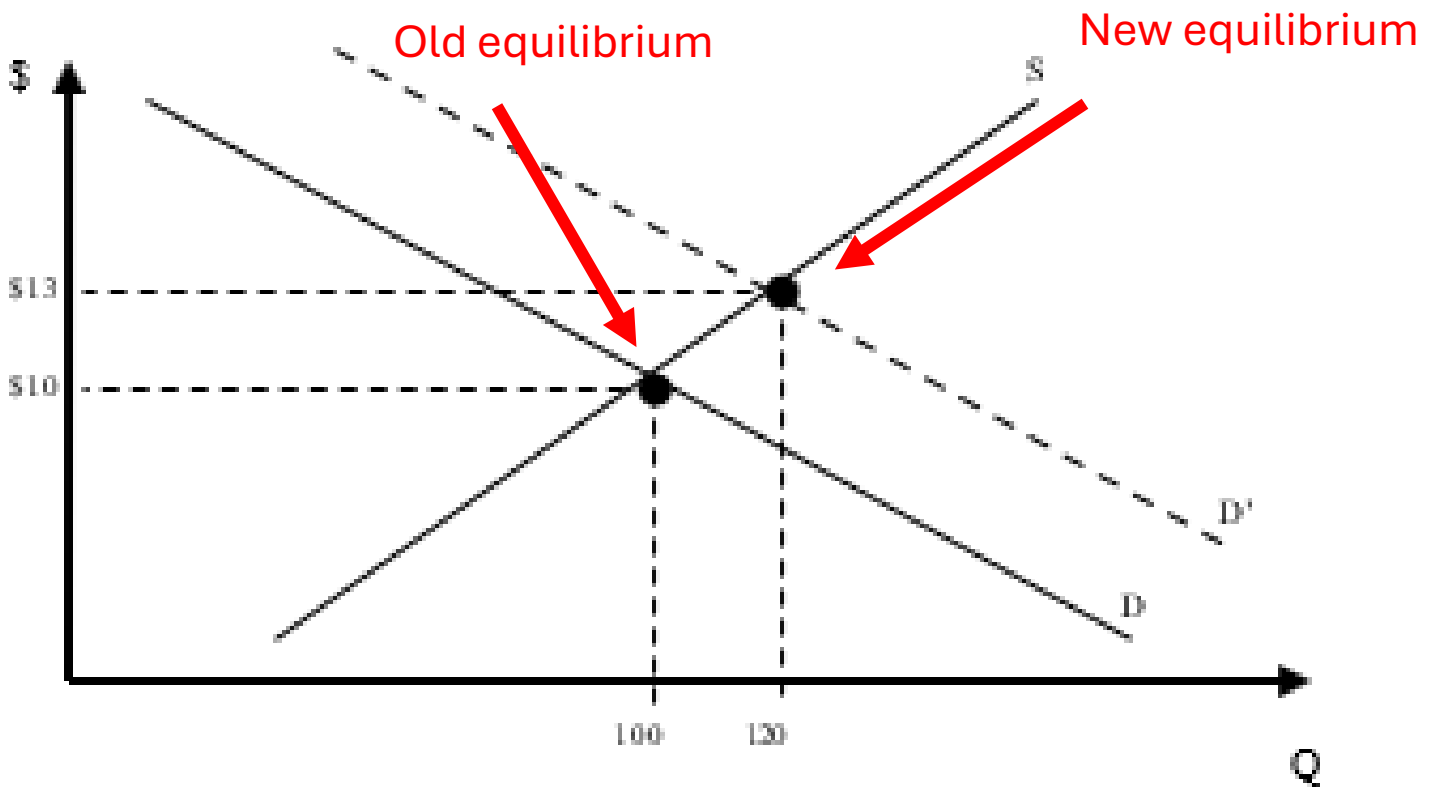
Physician services

Attendance Form Health Econ

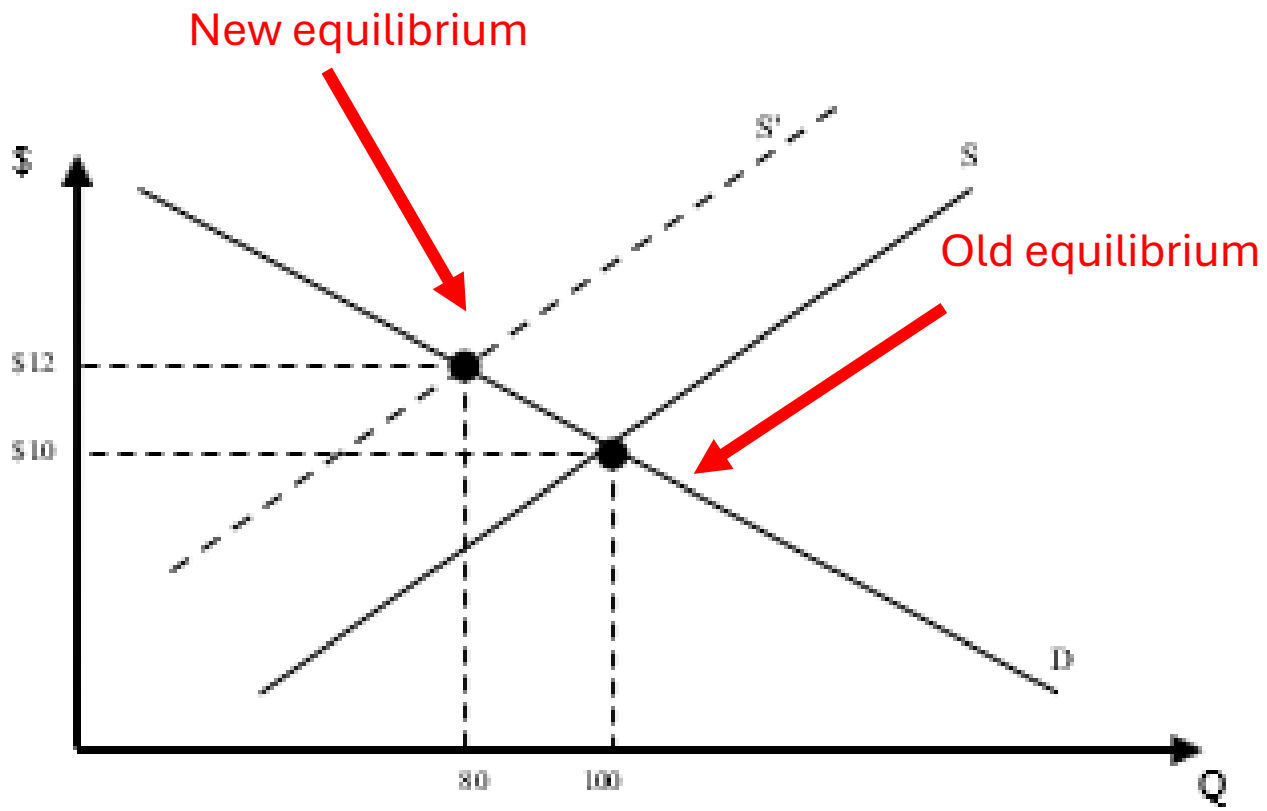
Comparative Statics

What happens to the equilibrium if something outside of the model changes?

Comparative Statics – French report example



Comparative Statics – El Niño example

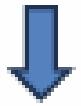


Price conveys information

- So far, we assume everyone is a **price taker**

- Why price goes up may not always be clear
- But the fact that price went up → something changed

Market Structures



	Degree of Market Power			
	0%	←		100%
Characteristics	**Perfect Competition**	**Monopolistic Competition**	**Oligopoly**	**Pure Monopoly**
Number of sellers	Many	Many	Few, dominant	One
Individual firm's market share	Tiny	Small	Large	100%
Type of product	Homogeneous	Differentiated	Homogeneous or differentiated	Homogeneous by definition
Barriers to entry	None	None	Substantial	Complete
Buyer information	Perfect	Slightly imperfect	Perfect or imperfect	Perfect or imperfect

Market Power

Definition

Market Power: The ability of a seller/supplier to influence price, rather than just accept market prices.

- Ability of a firm to restrict output and restrict output to raise prices

Perfectly Competitive Market

- **Buyers and sellers**

Price takers – market sets the price/sellers face perfectly elastic demand curve

- **Buyers – maximize utility**

Buy up to the point where marginal private benefit, MPB – represented by their demand curve -- equals market price

- **Firms – maximize profit**

Produce and sell – up to the point where market price equals marginal private cost, MPC represented by their supply curve

Perfectly Competitive Market

Definition

- Private Cost: cost borne directly by the individual consumer or firm involved in the transaction.

Definition

- Social Cost: cost to all in society, including those who do not consume the good in question.

Social Cost = Private cost + External Cost

Perfectly Competitive Market

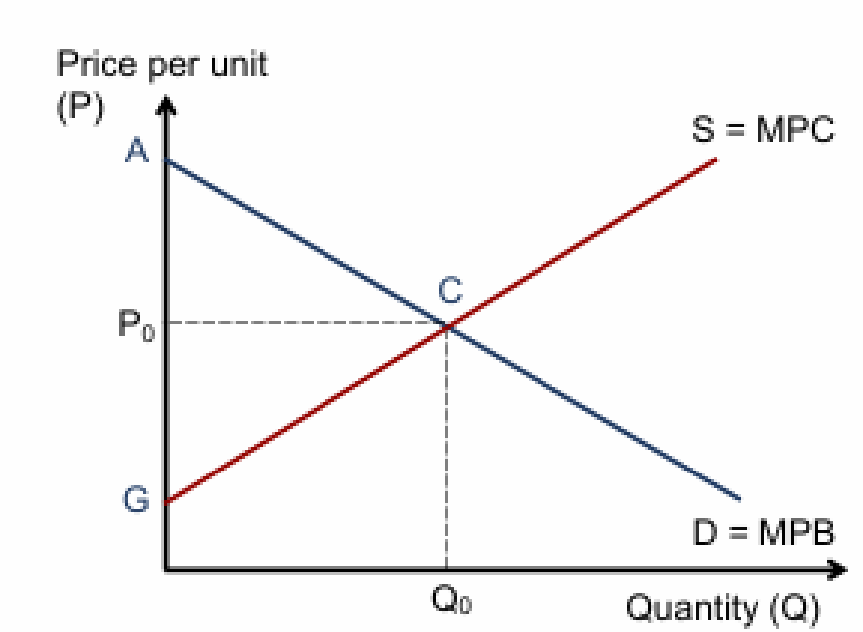
- Perfectly competitive market clears at the level of output where marginal private benefit to buyers equal the marginal private costs to producers

$$\boldsymbol{MPB = MPC}$$

- Equilibrium is where the demand curve intersects with the supply curve

Perfectly Competitive Market

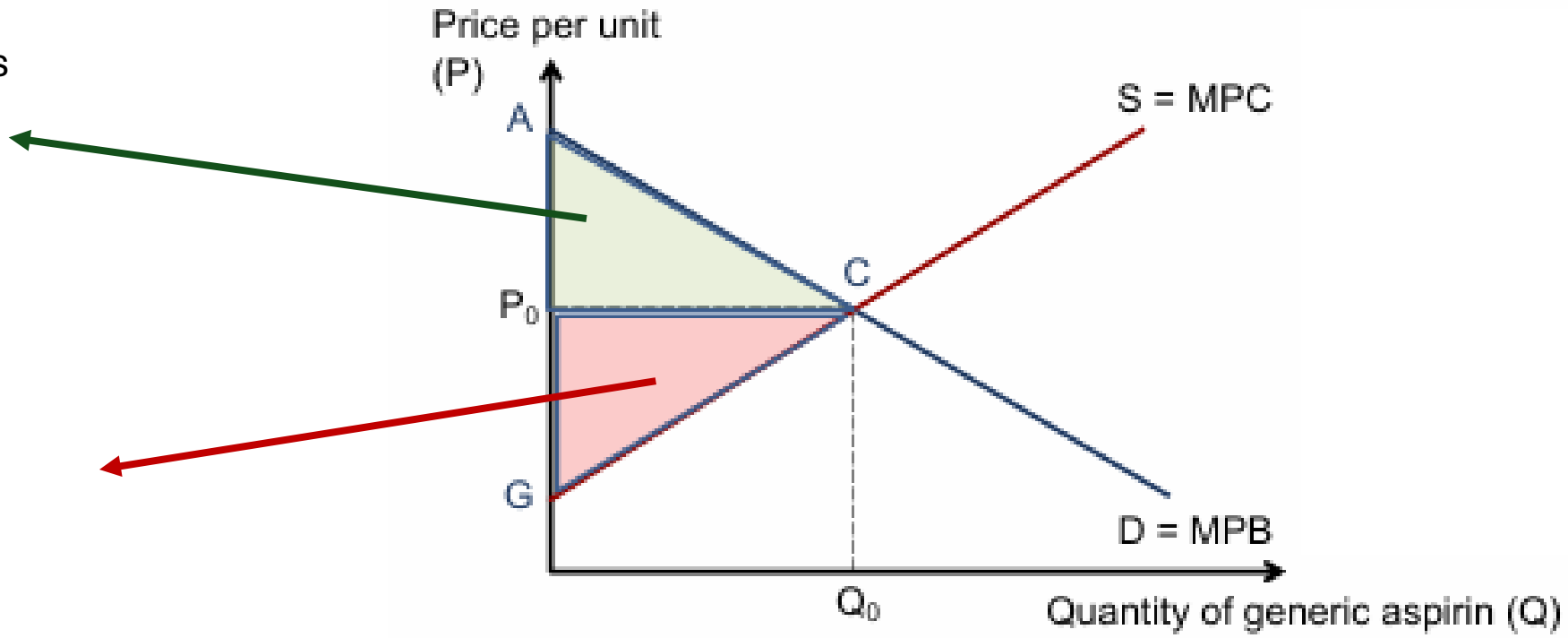
$$\boldsymbol{MPB = MPC}$$



Perfectly Competitive Market

Consumer Surplus

Provider Surplus



Who benefits in a perfectly competitive market?

Definition

- Consumer Surplus: Net benefit to consumers from engaging in free exchange.
  - Difference between what the consumer would be willing to pay and what the consumer actually has to pay
  - Area under the demand curve but above price

Definition

- Producer Surplus: Net benefit to producers from participating in free trade
  - Difference between the actual revenue received by the seller and the amount needed to cover the marginal costs of production
  - Area below market price but above the supply curve

Total societal surplus (net gains from trade) = consumer + producer surplus

Who benefits in a perfectly competitive market?

- At equilibrium, total societal surplus is maximized
  - Efficient outcome
  - Demand is determined by value of good and ability to pay

- What does this say about equity?

Who benefits in a perfectly competitive market?

- At equilibrium, total societal surplus is maximized
  - Efficient outcome
  - Demand is determined by value of good and ability to pay

- What does this say about equity? Nothing

Example problems

- Get into groups of 4-5

Government interventions in free market

- How many of you live in rent-controlled apartments?
  - Rent control is a government intervention setting a **price ceiling**

Government interventions in free market

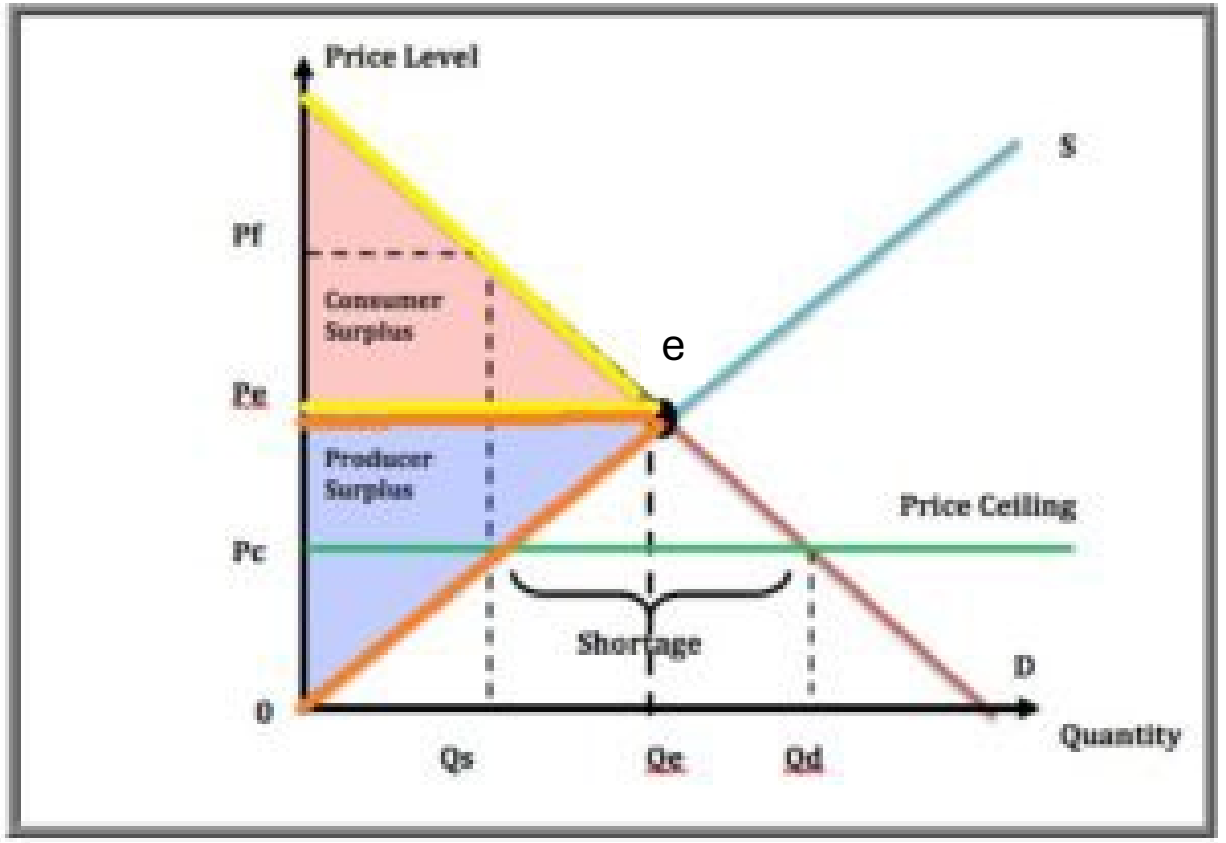
- What happens to the supply and demand graph if the government introduces a price ceiling for rents?

Y = price (rent)

X = number of apartments available for rent in NYC

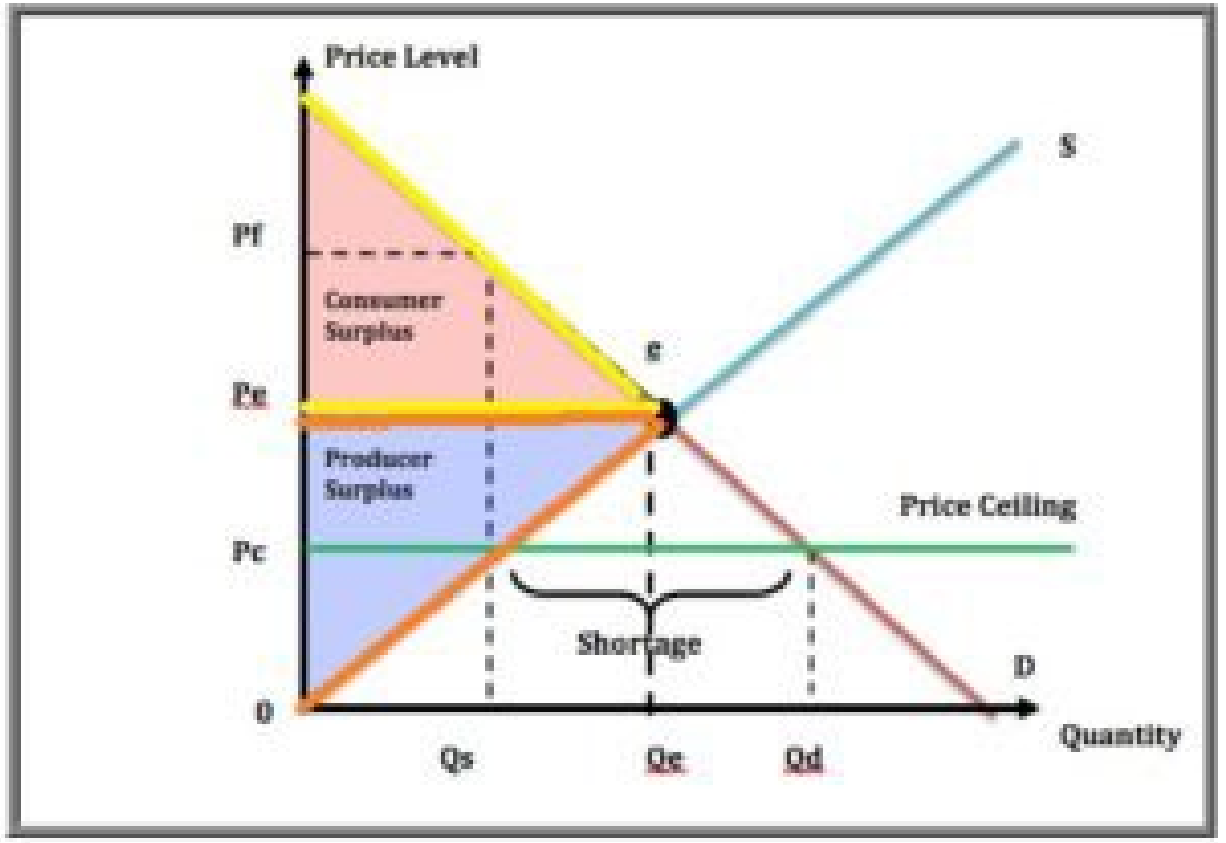
Government interventions in free market

- If there is no price ceiling, the market equilibrium will be at (e) and the maximum surplus would be realized
- Yellow triangle is the consumer surplus
- Orange triangle is the producer



Government interventions in free market

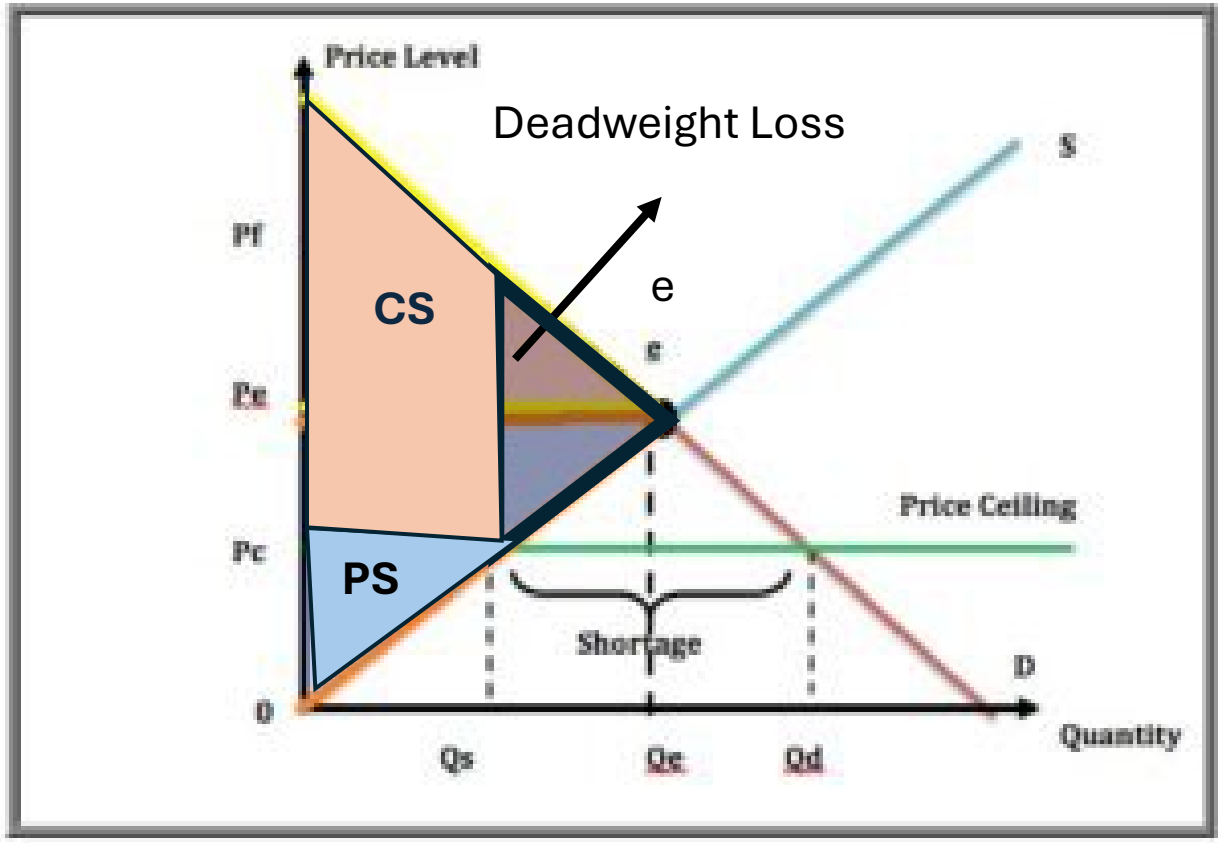
- If a **binding price ceiling** is set, then:
- Qd > Qs
- → Shortage of apartments



Government interventions in free market

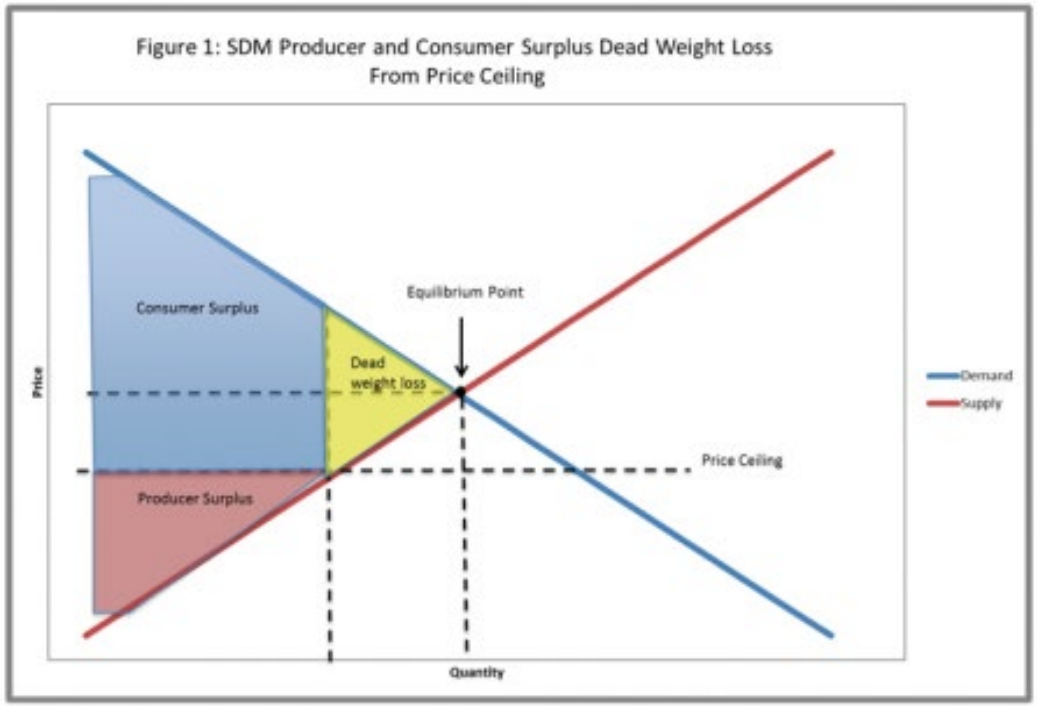
Definition

Deadweight Loss: loss of total that occurs when a market is prevented from reaching the efficient equilibrium quantity



Government interventions in free market

- These policies have good intentions, but they create **winners** and **losers**.



Example Problem

Mugabe's government in Zimbabwe sets a price ceiling on basic food items so that "everyone can afford food."

- Draw a standard supply and demand diagram for food.
  - Label the equilibrium price P^* and quantity Q^*.
  - Draw a binding price ceiling P_c below P^*.
  - At P_c ,mark the quantity supplied Q_s) on the supply curve and the quantity demanded Q_d) on the demand curve.
  - Clearly label the shortage as the horizontal gap between Q_s and Q_d.
  - Show CS, PS, and DWL
- In one sentence, explain why this policy can lead to empty shelves, even though the official price of food is now lower.