Lecture 4:
Surplus and Consumer Choice

September 16, 2025

Course Administration 1 of 2 – Feedback

PS 2

1. graded! in your folders now
2. I drop the lowest scoring three problem sets from your grade
3. Look for an after-class email with any PS changes
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5. Put your name on the assignment

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2. many good explanations for demand and supply
3. without sharp changes in price, we are hard-pressed to identify causes
4. sharp changes are almost always **either** demand or supply
5. price indices are not prices
6. Answer all questions
7. Note which answer is which
8. Submit a pdf
9. Put your name on the assignment

Course Administration 2 of 2 – Course Progress

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2. Likely not to cover material in lecture 12
3. Edit Piazza to send you email updates – see here
4. UN #2 due next week (Lecture 5) and we will discuss in class

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2. Likely not to cover material in lecture 12
3. Edit Piazza to send you email updates – see here
4. UN #2 due next week (Lecture 5) and we will discuss in class
5. Happy to see you in office hours – use scheduler
6. 2023 midterm posted at very bottom of lectures page
   - will not post answers, but happy to discuss
7. Any questions or outstanding issues?

How What You're Learning is Policy-Relevant

Ripped from Headlines presentation(s)

As a reminder, next week

	Afternoon	
	Finder	Presenter
Evening	Jacob	George

Finder	Presenter
Cara	Eric

Note: Afternoon: Preston and Grace, I moved your dates slightly. Evening: Change in weeks 6 and 7.

This Week's Ripped From the Headlines

Afternoon

Finder	Presenters
Ahnah	Leo

Evening

Finder	Presenters
Magaly	Damen

Plan for Today

Using Surplus to Measure Welfare from Policy Changes

1. (complete, reminder) Price floor
2. Price ceiling
3. Quotas
4. Example problem

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Consumer Behavior

1. Why we do this
2. Utility

Tariffs and Cross-Price Elasticity

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- Starting in 2012
- Probably much larger now, but hard to figure out
- How does this impact production of solar energy in US?

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- then $Q^S_{\text{power}} \downarrow$

Price Regulations

Surplus Review

For the picture you have

1. Shade consumer surplus
2. Calculate consumer surplus
3. Shade producer surplus
4. Calculate producer surplus

As you work, as yourself

1. What is consumer surplus?
2. What is producer surplus?

Price Regulations

Two Flavors

1. Price Ceiling $\equiv$ a regulated "highest lawful price for a good or service"
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Two Flavors

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Price regulations distort market outcomes. Some trades that would occur in equilibrium do not occur.

Impact of Price Floors

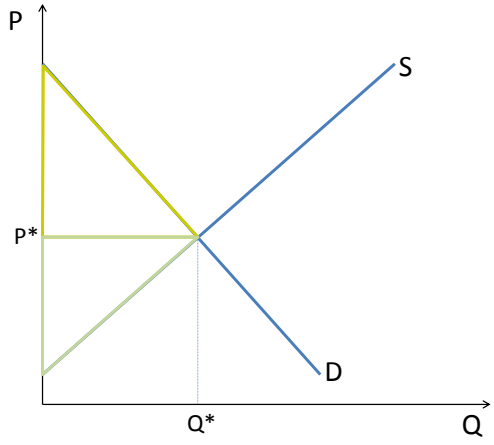
- Price floor $\equiv$ regulated "lowest lawful price for good or service"
- Generally rarer than price ceilings
- Examples?

Impact of Price Floors

- Price floor $\equiv$ regulated "lowest lawful price for good or service"
- Generally rarer than price ceilings
- Examples?
  - minimum wage
  - quite hard to come up with other good examples!

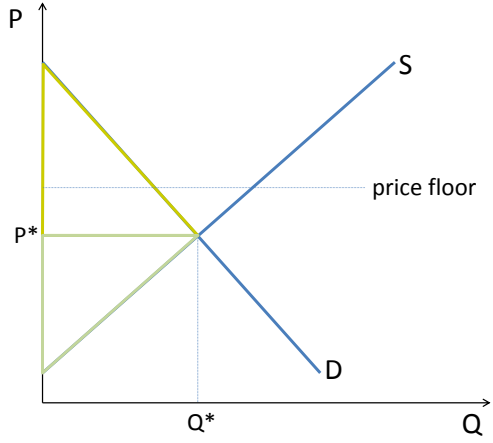
Graphing Impact of a Price Floor

Initial Equilibrium, No Floor: Where Does Price Floor Go?



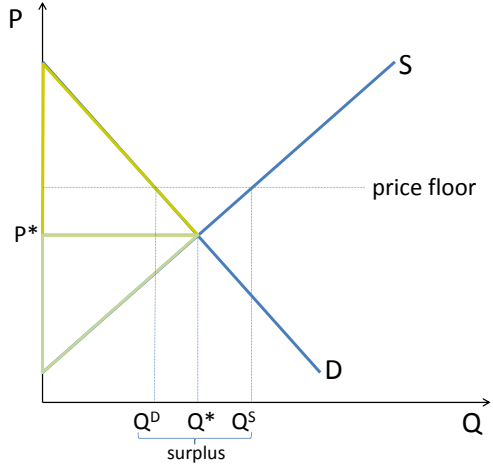
Graphing Impact of a Price Floor

What Are Q^S and Q^D?



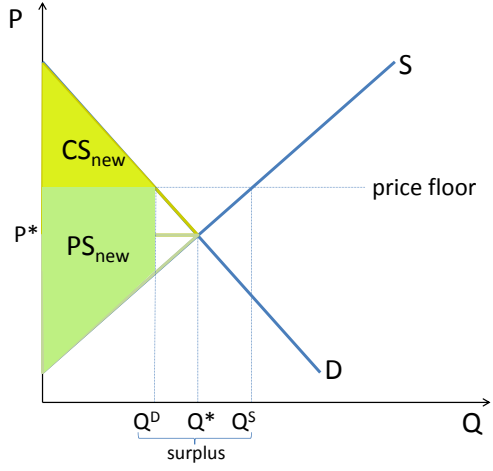
Graphing Impact of a Price Floor

Where are New PS and CS?

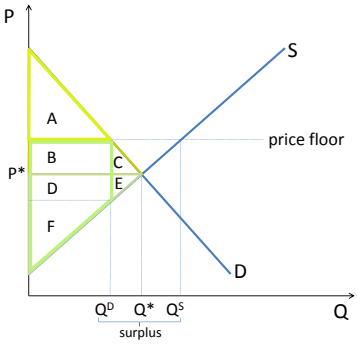


Graphing Impact of a Price Floor

Now, Compare to Old CS and PS



Figuring Out the Difference, Details



- Before
  - $CS =$

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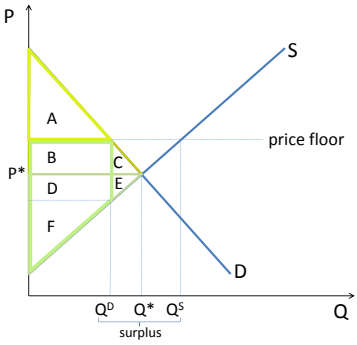

- Before
  - $CS = A + B + C$
  - $PS =$

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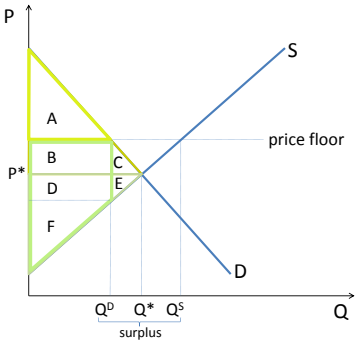

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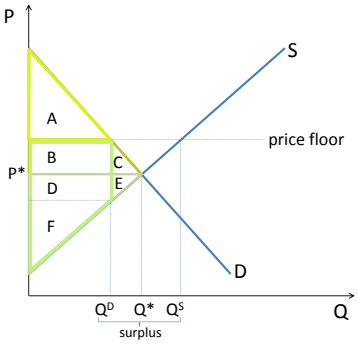

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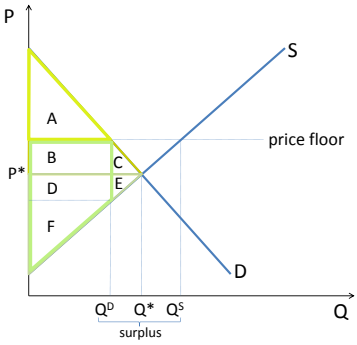

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  - $CS = A$
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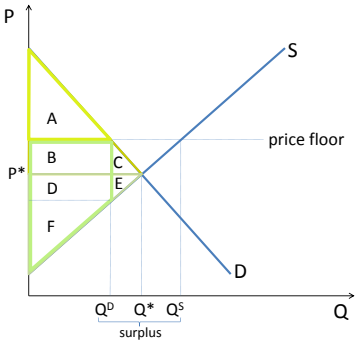

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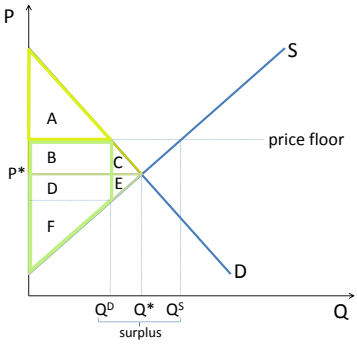

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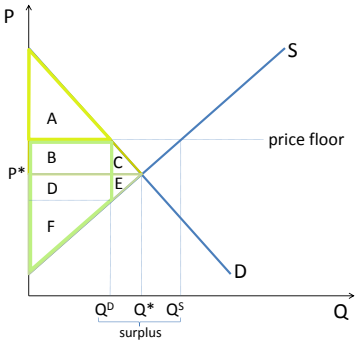

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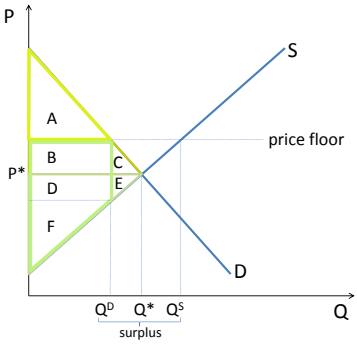

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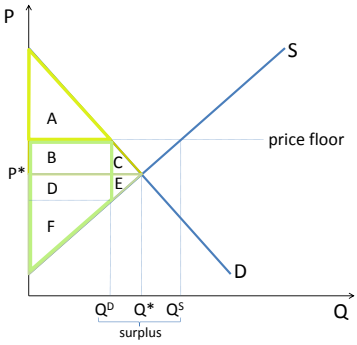

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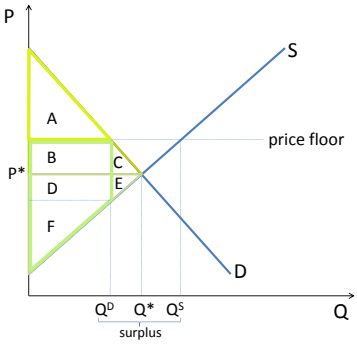

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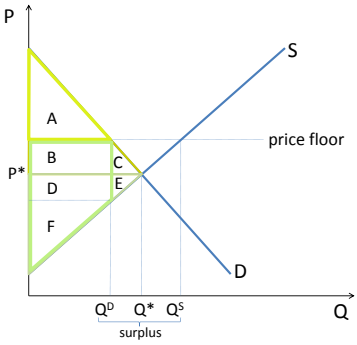

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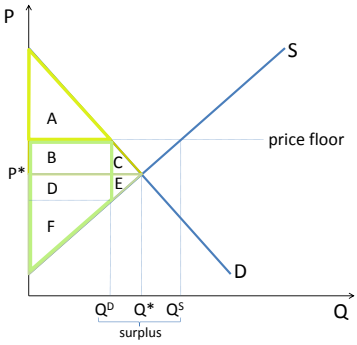

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  - transfer from consumers to producers is B
  - Note that nobody gets C or E after $\rightarrow$ trades that don't take place $\rightarrow$ DWL $= C + E$

Example: Vanilla Price Controls

- Most of the world's vanilla is grown in Madagascar
- Since the 1890s when the French introduced it
- During the colonial era, French exporters capture most of the profits
- Think about supply elasticity: How easily can vanilla producers switch into producing alternative goods?

Vanilla Price Regulation

First Republic, 1960 to 1972

- Government makes a Vanilla Stabilization Fund to purchase vanilla at a fixed price
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Second Republic, 1972 to 1995

- Socialist revolution
- Government still buys all the vanilla at a fixed price
- Market prices climb, but Madagascar price floor does not
- Other countries enter the vanilla market, prices fall
- Government eventually buys four years' worth of beans to prop up prices
- Ends up burning 3/4 of vanilla bean stockpile

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All information is from here. And even more on vanilla in "Vanillanomics" here.

Give it a Try

Suppose

- Supply: $Q^S = 2000P - 10000$
- Demand: $Q^D = 20000 - 1000P$
- Govt. institutes price floor of \$15

1. In market equilibrium, find
   1. equilibrium price
   2. producer surplus
   3. consumer surplus
2. After the price floor, find
   1. consumer surplus
   2. producer surplus
      - hint: find price at eqbm Q_D
   3. deadweight loss

Draw yourself an accompanying picture!

Answer Overview

1. In equilibrium, before price reg.
   1. $P = 10$, and $Q = 10,000$
   2. $PS = (0.5)(10,000)(10 - 5) = 25,000$
   3. $CS = (0.5)(10,000)(20 - 10) = 50,000$
2. After price floor
   - new Q_D at $P = 15$ is $Q = 5,000$
   - new Q_S at $P = 15$ is $Q = 20,000$
   - new eqbm price is 15, and $Q* = 5,000$
   - we need P on supply curve at $Q = 5,000$
   - yields $P = 7.5$
   - $CS = (20 - 15) * 5000 * 0.5 = 12,500$
   - $PS = (15 - 7.5) * 5000 + (7.5 - 5) * 5000 * 0.5 = 43,750$
   - $DWL = (15 - 7.5) * 0.5 * (10000 - 5000) = 18,750$

Quantity Regulations

Two Types of Quantity Regulations

We just looked at regulations on price. Now we consider regulations on quantity.

1. Quota $\equiv$ a regulated (almost always limited) "quantity of a good or service provided"
2. Government provision of a good or service (skip for time reasons)

Policy Aside: Quotas in the World

- Number of US doctors per year
  - limited by the number of Medicare-funded medical residency slots
- US used to have "tariff rate quotas"
  - higher tariff after a certain amount of imports
  - import limit may vary by country
  - dairy, stainless steel, ...
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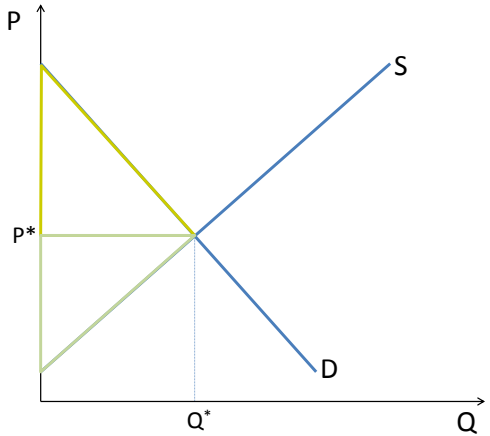
Next: Ask how quotas impact prices and total surplus

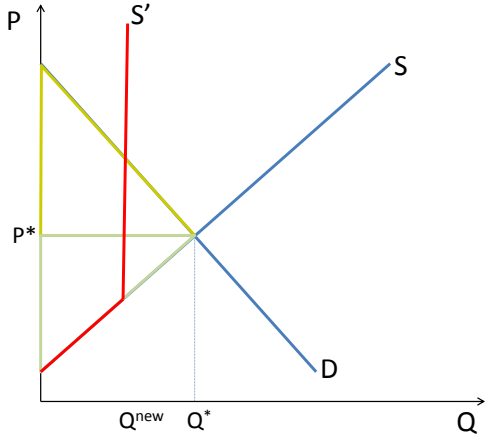
Quotas in Pictures

Market Equilibrium: How Does Supply Change with a Quota?



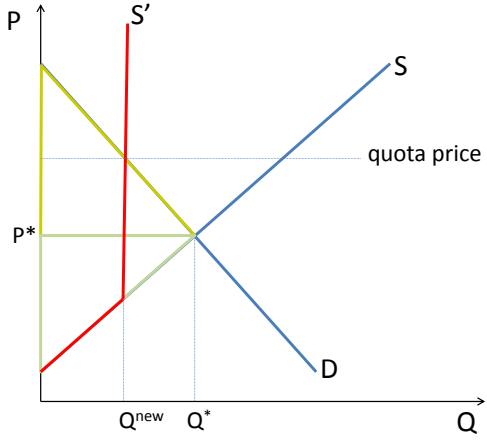
Quotas in Pictures

Supply with a Quota: What Happens to Price?



Quotas in Pictures

Supply with a Quota: What Happens to CS and PS?



Quotas in Pictures

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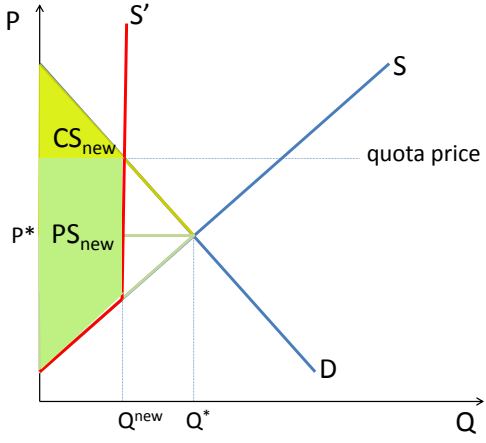
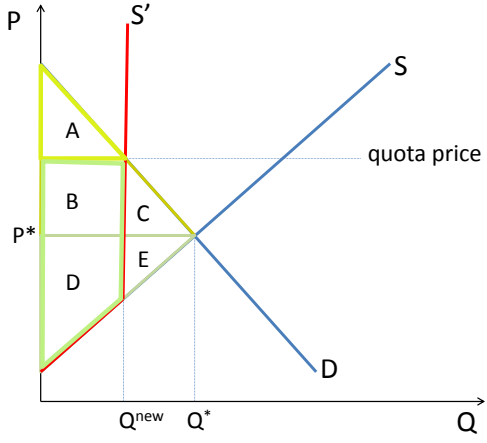


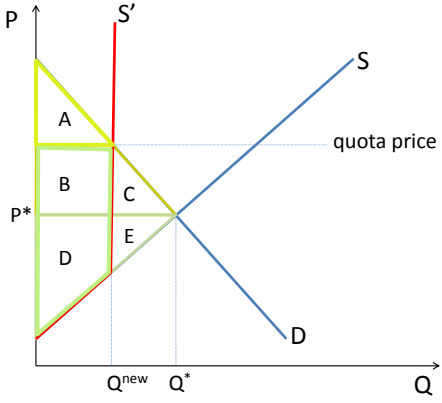
Quotas in Pictures

Figuring Out the Differences



Figuring Out the Difference, Details

- Before
  - $CS =$



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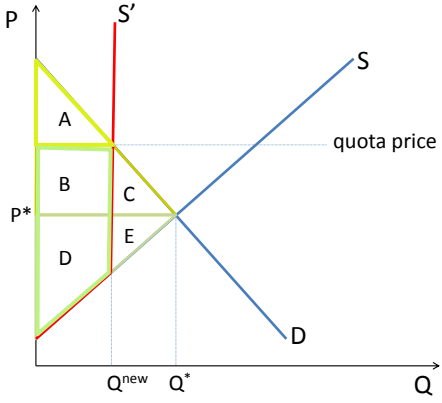

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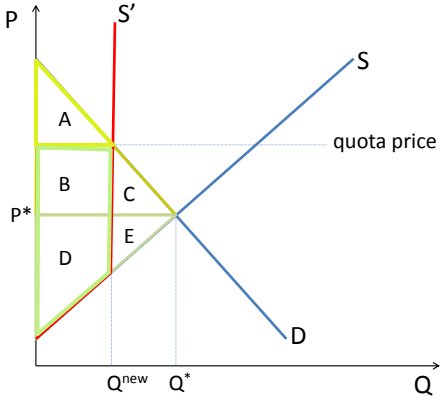

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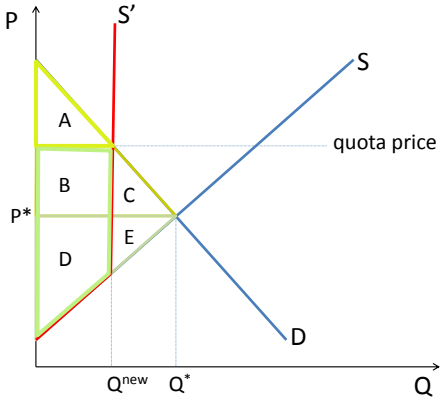
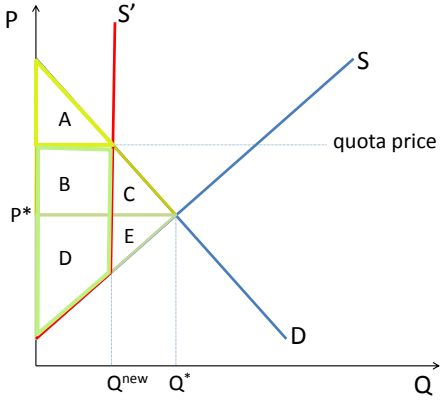
  - $PS = D + E$

Figuring Out the Difference, Details



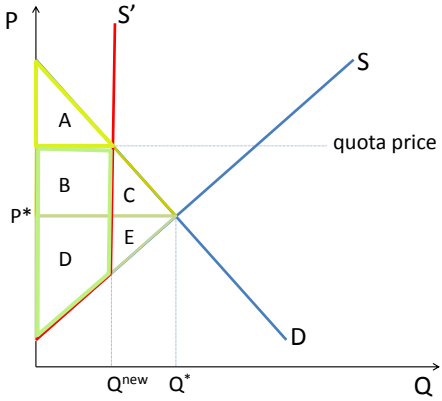
- Before
  - $CS = A + B + C$
  - $PS = D + E$
- After
  - $CS =$

Figuring Out the Difference, Details



- Before
  - $CS = A + B + C$
  - $PS = D + E$
- After
  - $CS = A$
  - $PS =$

Figuring Out the Difference, Details



- Before
  - $CS = A + B + C$
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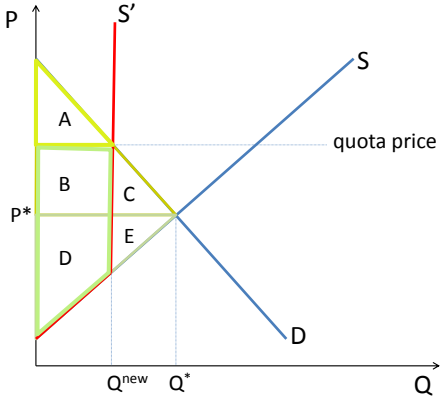
- After
  - $CS = A$
  - $PS = B + D$

Figuring Out the Difference, Details



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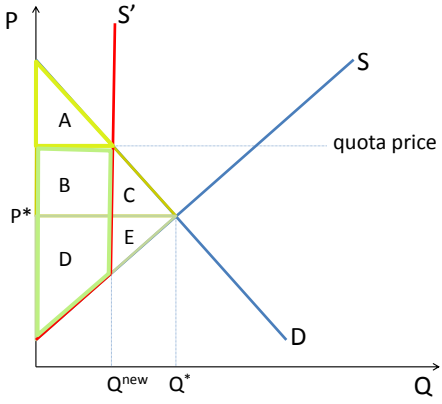
Figuring Out the Difference, Details



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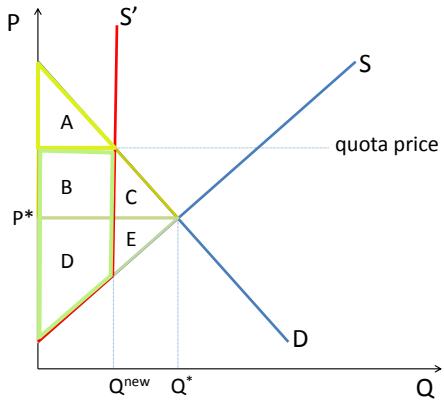
  - $\Delta CS = A - (A + B + C) = -(B + C) < 0$
  - $\Delta PS =$

Figuring Out the Difference, Details



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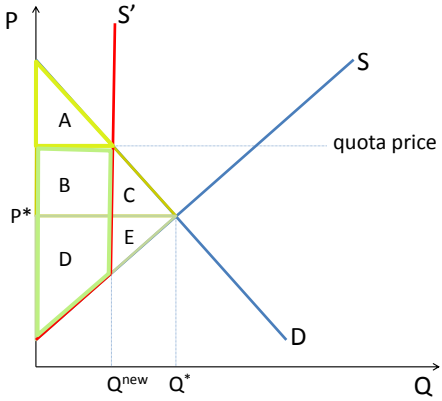

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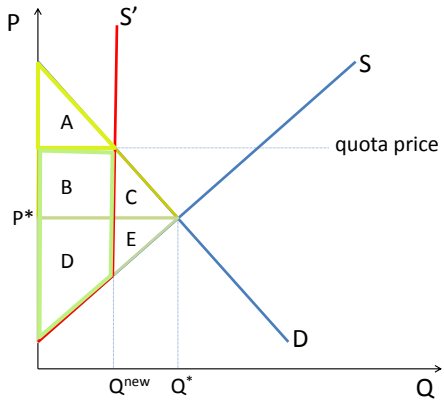
  - transfer from

Figuring Out the Difference, Details



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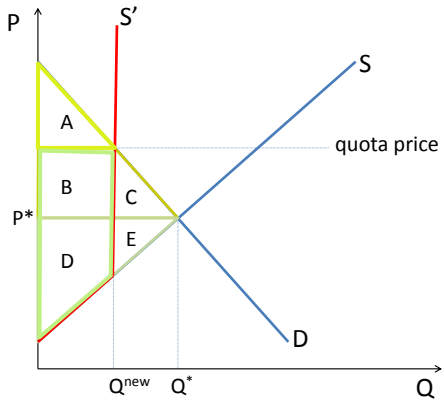
Figuring Out the Difference, Details



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  - transfer from consumers to producers is B
  - Note that nobody gets C or E after $\rightarrow$ trades that don't take place $\rightarrow$ DWL $= C + E$

Chapter 4: Individual Demand

Now – Chapter 4: Shift to Consumers' Problem

- Until now
  - Supply and demand equilibria
  - And policy choices that impact equilibrium outcomes
  - Graphs with P and Q axes

Now – Chapter 4: Shift to Consumers' Problem

- Until now
  - Supply and demand equilibria
  - And policy choices that impact equilibrium outcomes
  - Graphs with P and Q axes
- Next two classes focus on how economists think about consumer choices
- Today
  - Lay out consumer decision
  - Graphs with good X and good Y axes
- Lecture 5 and 6
  - Use consumer framework to understand responses to price changes and income changes
  - Review Use Numbers # 2

Why Do We Study the Consumer's Problem?

- Build up to the demand curve from first principles
- Understand consumer choices
- Clearly illuminate areas where policy can act
- Illustrate welfare consequences of policy choices
- Understand intuition of constrained maximization

Also Learn How Economists Think

- All decisions involve trade-offs
- Problems where agents try to do the best they can subject to constraints
- Called constrained minimization or maximization problems

Where We Are Going

1. Consumer preferences and utility
2. Indifference curves
3. Budget constraints
4. Optimization

The Big Ideas

- Chapter 3
  - Price regulations: price ceilings and price floors
  - Quantity regulations
- Chapter 4
  - Utility
  - What you like: indifference curves
  - What you can afford: budget constraint
  - The best you can do given these two: optimization

Next Class

- Read Chapter 4
- Turn in Use Numbers 2 of 2
- Read Ripped from Headlines articles