Econ 201: Introduction to Economic Analysis

September 14 Lecture: Analysis Using the Competitive-Market Model

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Daily Far Side

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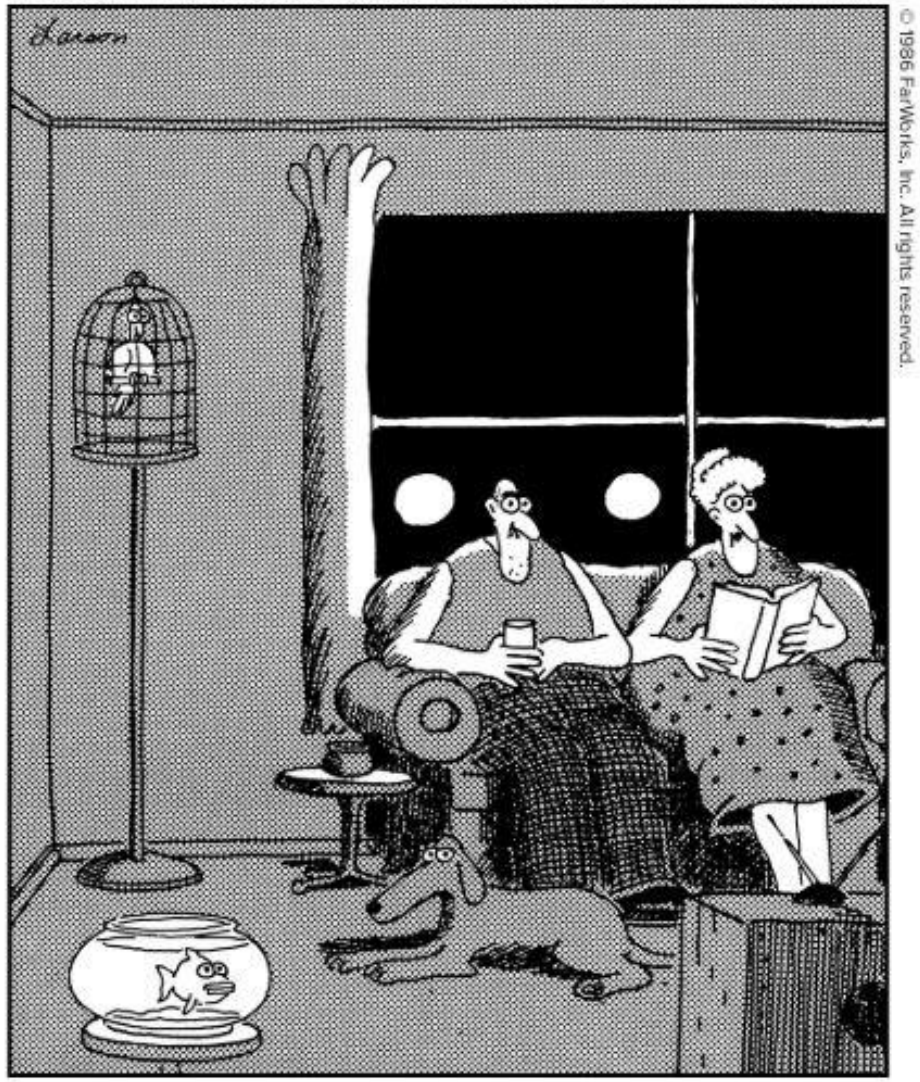


Suddenly, the living room was flooded with light and the angry sounds of an engine being revved. And everyone knew: The cat was back.

Preview of this class session

- In this class, we introduce the measurement of gains from exchange using consumer and producer surplus
- We analyze how price controls (ceilings or floors) prevent the market from clearing and change the amount of gains from exchange
- We also discuss the effects of taxes levied on buyers or sellers on price, quantity exchanged, and consumer and producer surplus

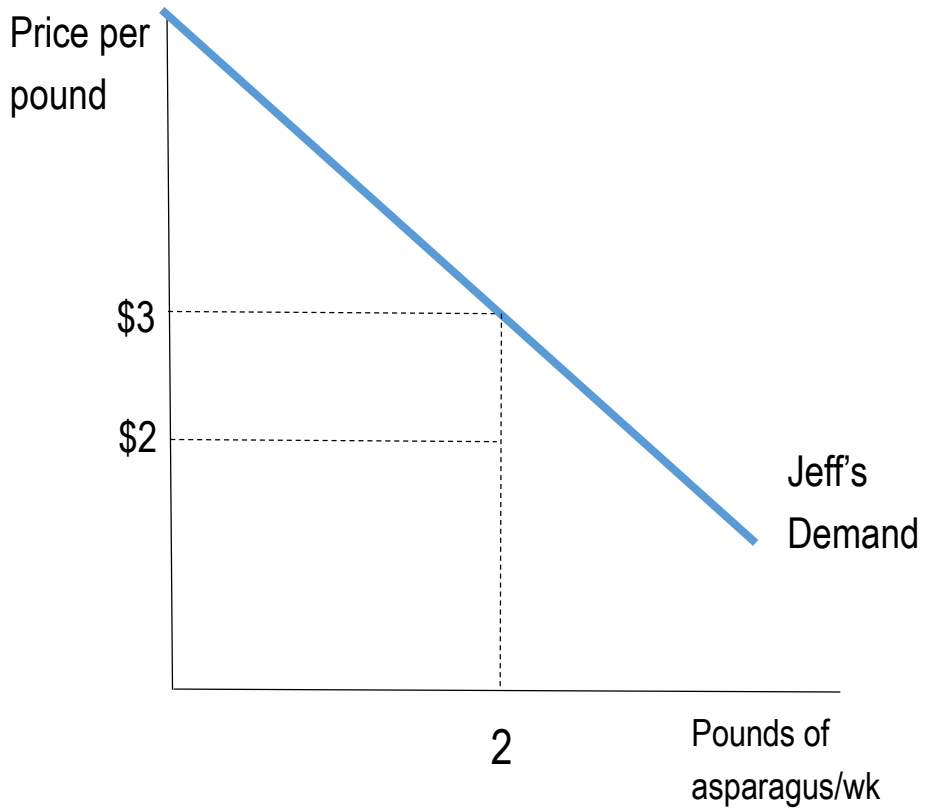
Gains from Exchange

Gains from exchange

- Voluntary exchange → both buyer and seller are better off trading than not
- How can we quantify the amount that each gains from any given transaction?
  - What is buyer willing to pay for this unit of the good in question?
  - What is the minimum that the seller would be willing to accept for the unit?
- Consumer surplus on the unit is the difference between willingness to pay and the price actually paid
- Producer (seller) surplus is the different between reservation price and sale price

Consumer surplus and the demand curve

- My demand curve for asparagus
- At a price of $3/pound, I would buy 2 pounds
- Alternatively, I would be willing to pay $3/pound for 2 pounds
- $3/pound is my willingness to pay for the last unit of asparagus
- If I can buy that unit for $2, I get a consumer surplus of $3 – $2 = $1 on the unit

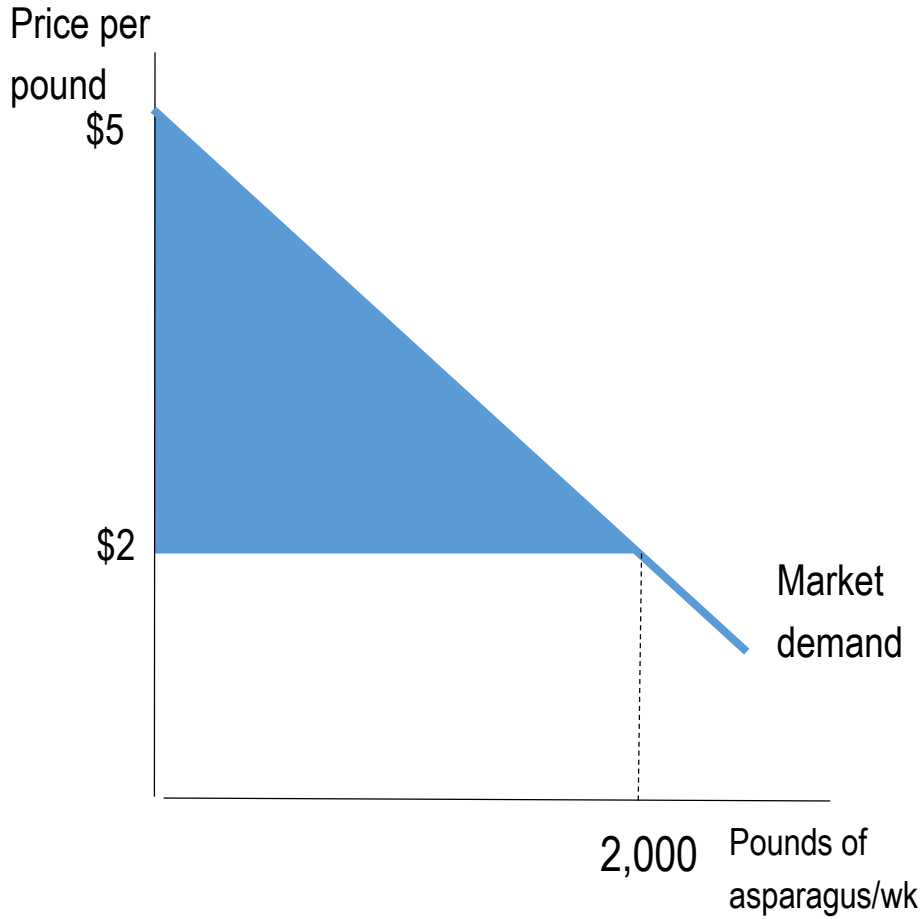


Consumer surplus and the demand curve

- This graph shows that at a price of $2/pound, I would buy 2.5 pounds/wk
  - I get all 2.5 pounds for $2/pound, or $5.00 total expenditure (yellow box)
- Blue triangle adds up the consumer surplus on each bit of asparagus I buy
  - This is my total consumer surplus
  - Area of blue triangle = ½ × base × height = ½ × 2.5 × ($5 – $2) = $3.75
  - My spending on asparagus is $5.00
  - My total valuation of consumed asparagus is $5.00 + $3.75 = $8.75

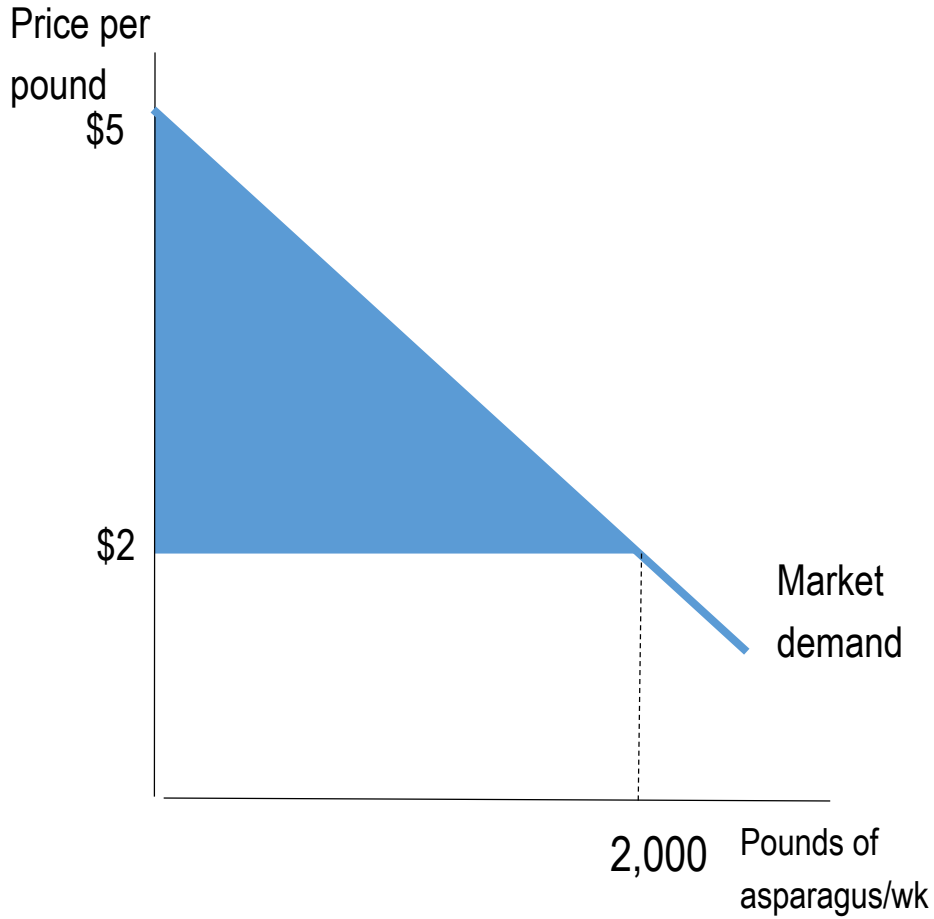
Individual vs. market consumer surplus

- What about the total Portland market for asparagus?
  - Use the market demand curve (rather than mine) in the same way
- In graph, total consumer surplus = ½ × 2,000 × ($5 – $2) = $3,000
- This represents the total net benefit from asparagus achieved by consumers in Portland (above and beyond what they paid)



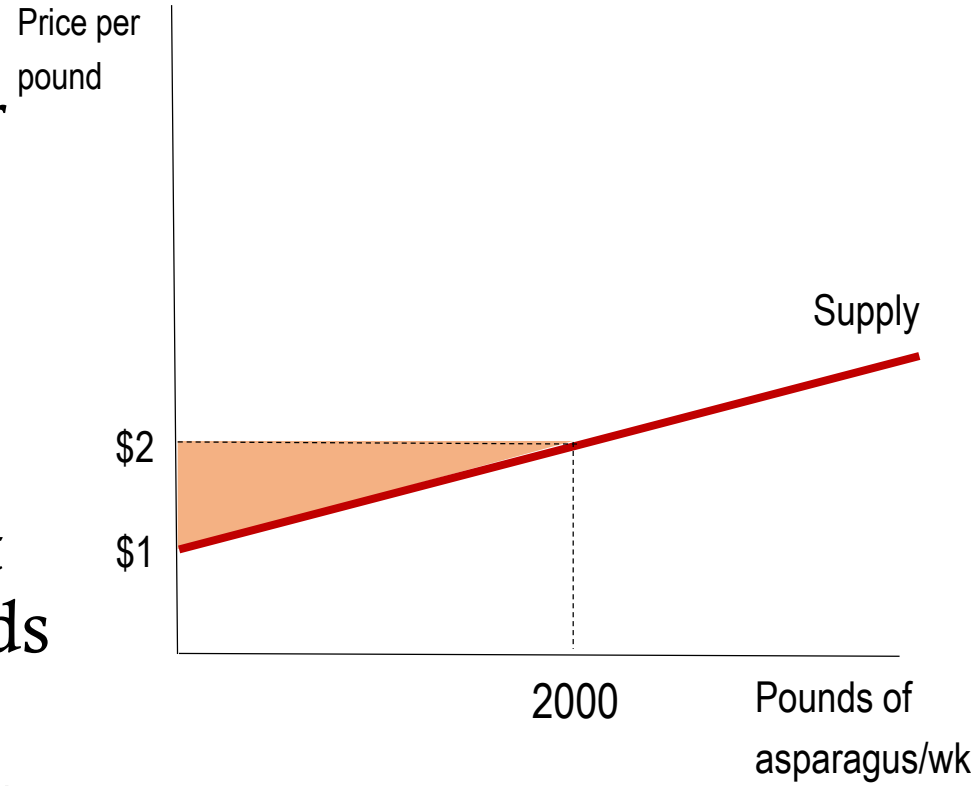
Non-consumers' benefit?

- Some potential demand is not satisfied
  - Below $2 on demand curve
  - Some people don't buy
  - Some people restrict buying
- Those people who value asparagus less than $2/pound don't buy any. Is this a problem?
  - Not if they hate asparagus
  - What if they love it but have low income?
  - Best way to help poor: Mandate lower price, give them asparagus, or give them more income?



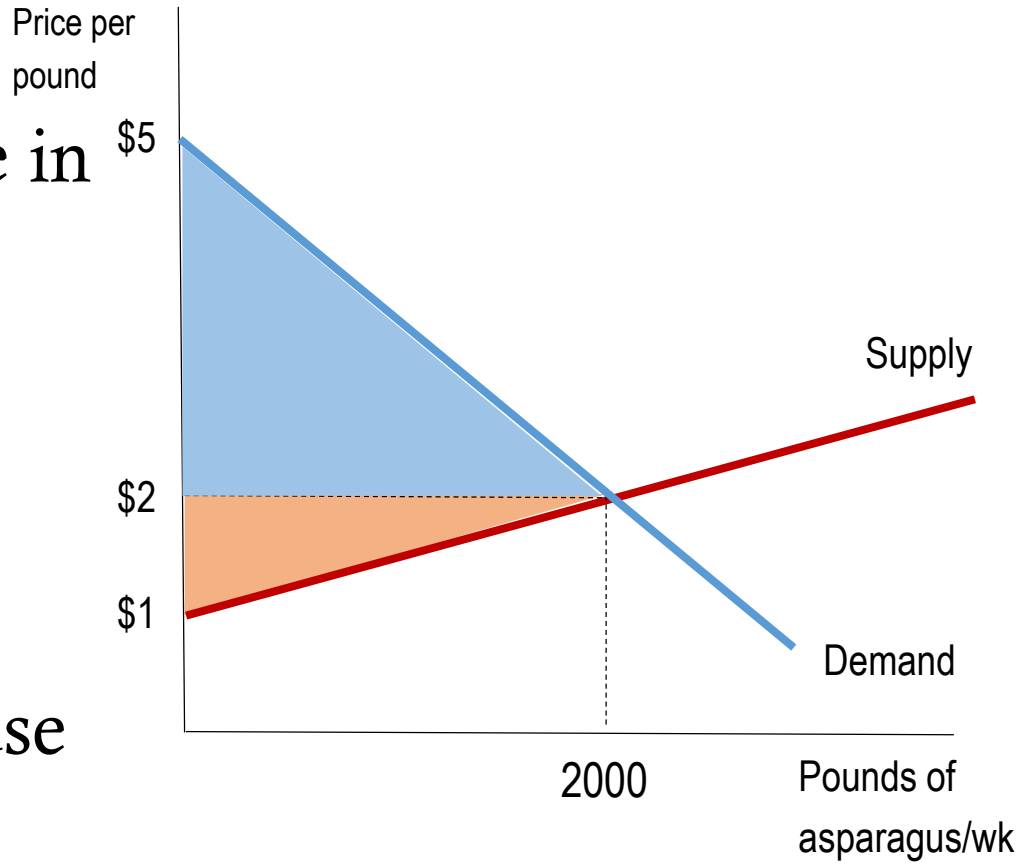
Producer surplus

- Same argument applies on the seller side: producer surplus is difference between sale price and reservation price (minimum acceptable price)
  - Reservation price ~ marginal cost
- With supply curve shown, if market price is $2/pound, then 2,000 pounds per week are sold
- Producer surplus: ½ × 2000 × ($2 – $1) = $1,000
  - Producer surplus is not exactly profit, though it is closely related



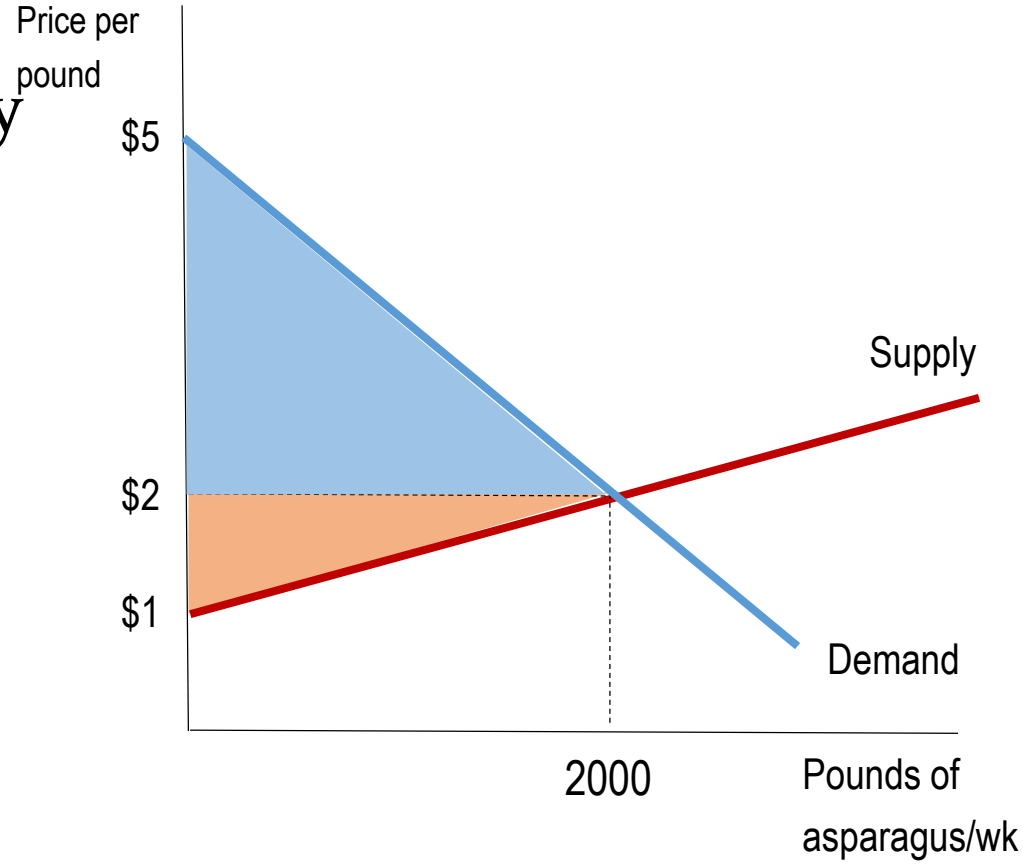
Gains from exchange

- Total (welfare) gains from exchange in market are sum of consumer and producer surpluses
  - As on earlier slides, blue consumer surplus area is $3,000 and orange producer surplus is $1,000
  - Total gains from exchange are $4,000
- Most goes to consumers here because of shapes of the curves
  - Not necessarily the case



Competitive equilibrium maximizes gains

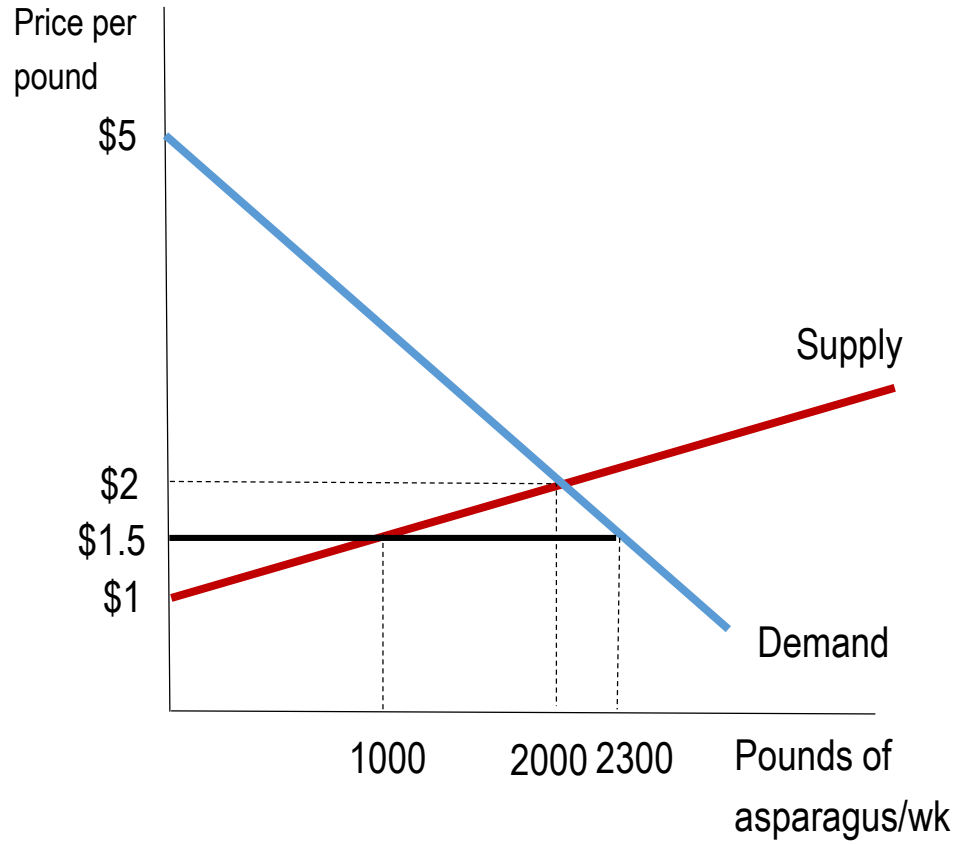
- At consumer equilibrium, every buyer who values good ≥ $2 buys it and every seller who can produce for ≤ $2 sells
- All profitable transactions actually happen, so no unrealized gains
- Consider one additional pound sold:
  - Seller's cost > $2
  - Buyer's willingness to pay < $2
  - Value to consumer does not justify producing: it should not be produced and sold
- Market price allocates good efficiently: it doesn't matter who sells to whom



Price ceilings and taxes

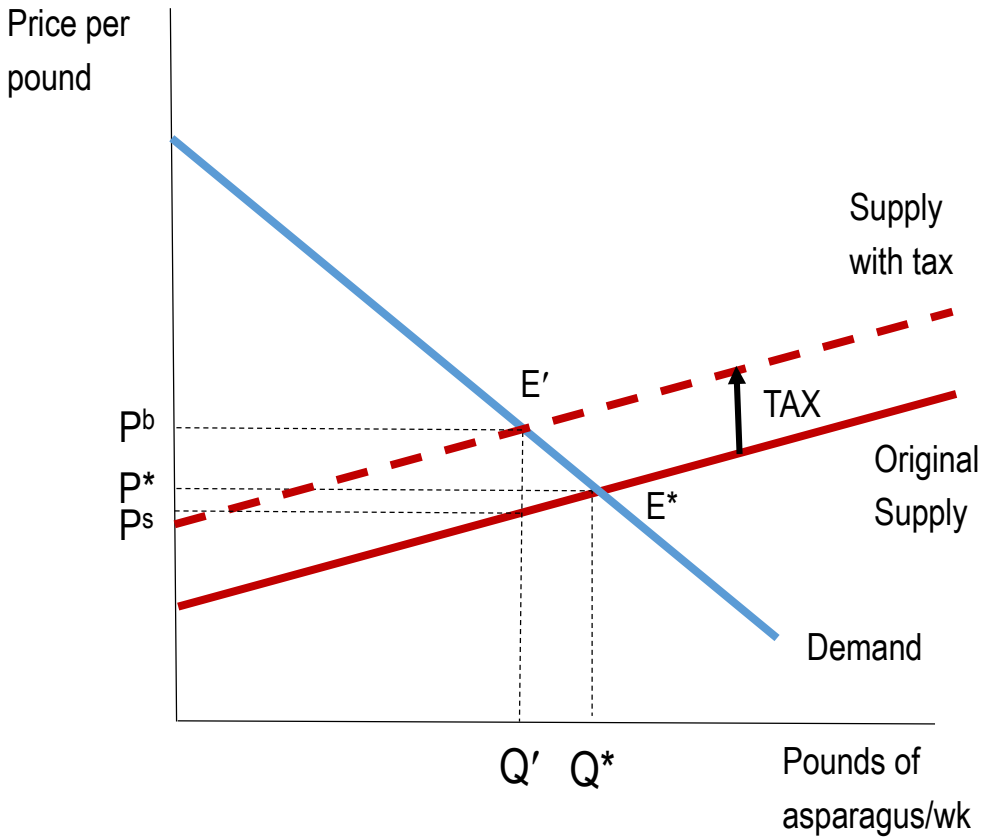
Price ceiling

- Suppose government imposes price ceiling at $1.50
  - Quantity demanded now increases to 2,300 pounds per week
  - Quantity supply falls to 1,000
- Shortage: 2,300 – 1,000 = 1,300
- Who gets the available 1,000 pounds?
  - Prices no longer ration good
  - CS is large if $5 people get good, small if $1.75 people get it
- Price floor above market price is similar analysis in opposite direction



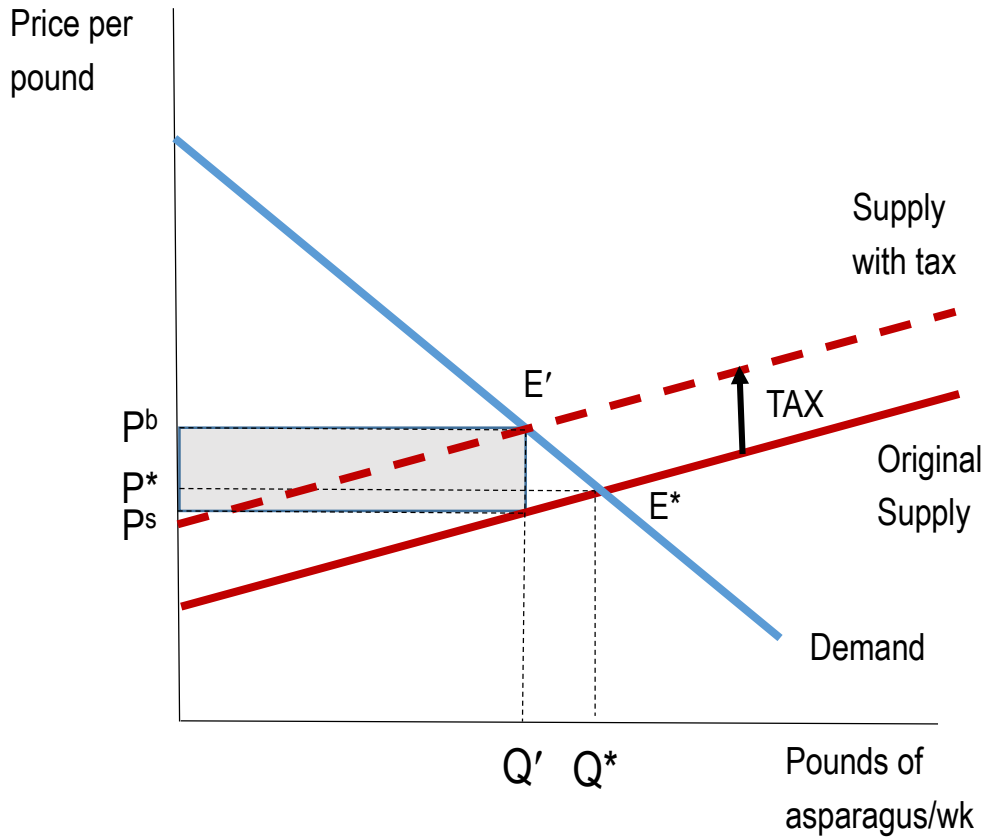
Tax on seller

- Shifts supply curve up by amount of tax per unit
  - Seller must receive original amount plus the tax to be willing to sell unit
- Equilibrium move up along demand curve from E^* to E'
  - Quantity falls to Q'
  - Price paid by buyers rises to P^b
  - Price received by sellers falls to P^s
- Both buyers and sellers are worse off



Welfare losses from tax

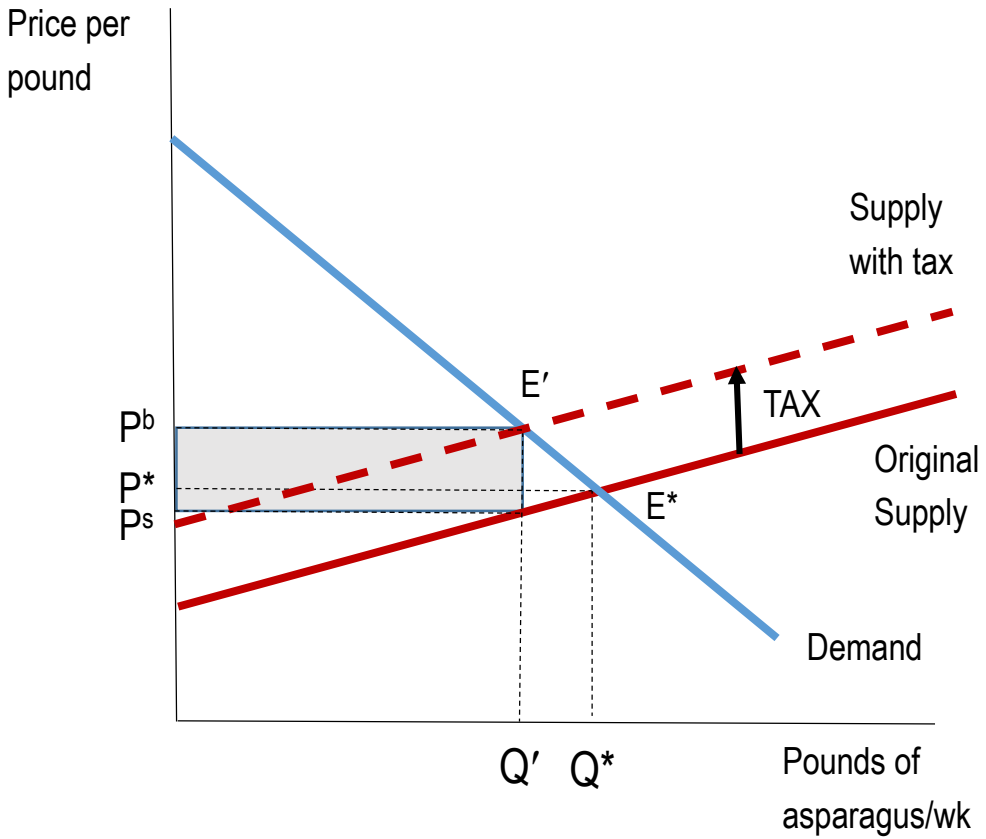
- Consumer surplus falls from area under demand out to E^* to E'
- Producer surplus falls from area above (old) supply curve to E^* to quantity Q'
- Tax revenue to government is light gray rectangle
- Triangle to its right is deadweight loss of welfare due to tax
- Loss to consumers + producers = government revenue + deadweight loss



Who loses most from tax

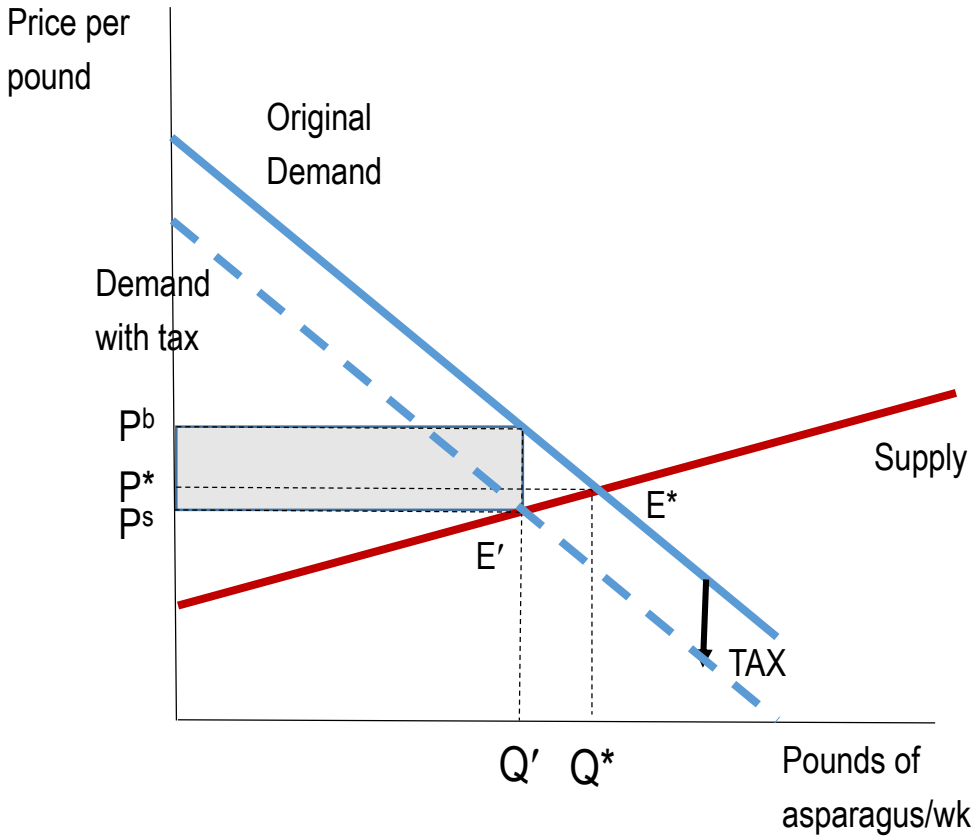
- In this case, consumer surplus seems to fall by more
- This is because demand is less elastic (steeper) than supply curve
  - Steep slope → willing to pay more
  - Flat slope → not willing
- Textbook shows that share of loss borne by consumers is

$$\frac{E^S}{E^S + \left|E^D\right|}$$



Tax on buyers rather than sellers

- Would shift demand curve down by the same amount
- Would not change the outcomes at all
  - Same amount exchanged
  - Buyers pay same amount (including tax)
  - Sellers receive same amount (need not pay tax)
  - No difference in effects on surplus, government revenue, or deadweight loss
- Only difference is who sends check to government



Subsidies as negative taxes

- Subsidies have opposite effect of taxes
  - Subsidy to producer shifts supply down
  - Subsidy to consumer (rebate) shifts demand up
  - Quantity increases, but gains to buyers and sellers rise less than the cost of the subsidy
- All price controls and taxes/subsidies on sales or consumption distort market signals and lower collective welfare

Review

- We measure the benefits of market exchange with consumer and producer surplus
  - Area below demand curve and above supply curve
- Competitive markets maximize these total gains from exchange
  - Price controls prevent market from clearing and reduce total gains
- Taxes distort market allocation, leading to deadweight loss

Daily diversion: Foods I’ve eaten recently!










What comes next?

- On Wednesday, we discuss the double-auction market you are analyzing in Problem Set #2, which is due Wednesday

- On Friday, we begin the analysis of the theory of the consumer, which underpins the demand curve for goods and services