

Economics 1: Introduction to Economics

J. Bradford DeLong <delong@econ.berkeley.edu>

Administrivia

February 10, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley

Webtools and Other Matters...

- <http://www.bradford-delong.com/course-syllabus-econ-1-spring-2016-uc-berkeley.html> and <https://bcourses.berkeley.edu/courses/1411451/assignments/syllabus>
 - Section exercise answer files...
 - Problem Set 2 answers this weekend...
 - No Tuesday sections (unless your GSI thinks your class is behind, and needs it)...
 - Problem Set 3 due Feb 24/25...
 - Paper Assignment: Dasgupta, Snee, Friedman and Friedman, or any two...
 - Details to follow...

Meta-Announcement

- We are moving announcements and administrivia out of lecture time and onto the “announcements” bCourses page...
- That is all...

Except... To Your i>Clickers!

- So far this semester I have had 10 hours of office hours dedicated to Econ 1
- 12 people have showed up, for an average of 15 minutes each
- Question: What fraction of office-hour time is actually being utilized?
 - A. All of it
 - B. One-half of it
 - C. Three-quarters of it
 - D. One-third of it
 - E. Less than any of the above

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To Your i>Clickers: Why?

- My theory is that it is because Evans is located about 100 vertical feet above Bancroft & Telegraph
- Unless you are already over in Chemistry-land or Engineering-land, you already do enough hill climbing
- Question: Should I move my Econ 1 office hours down to Cesar Chavez
 - A. Yes
 - B. No
 - C. Haven't thought about it
 - D. Don't care what you do

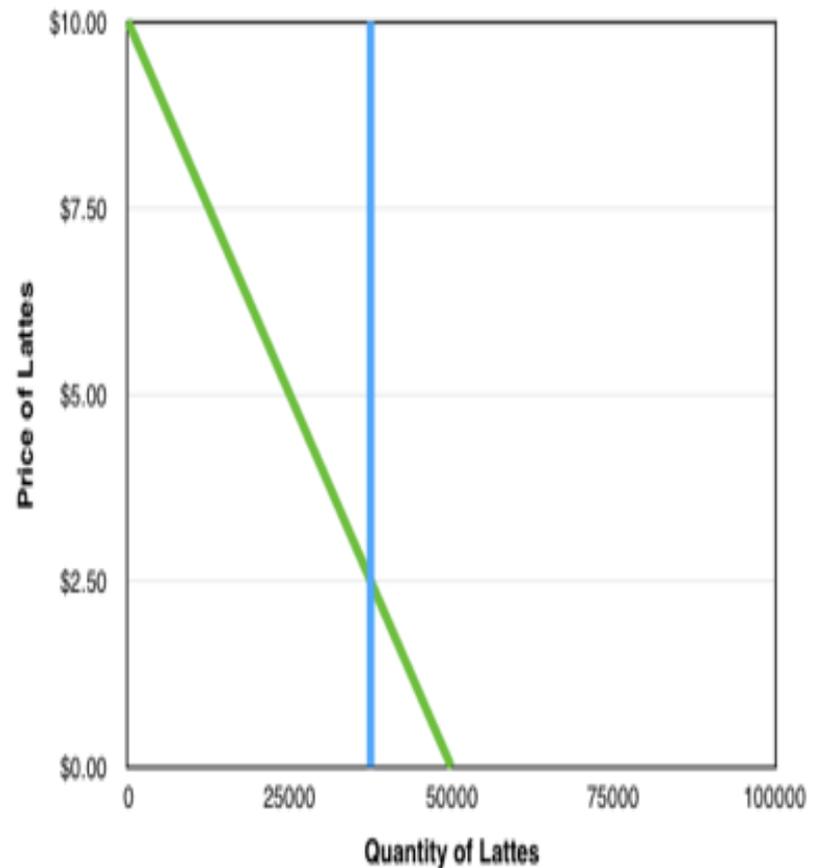
Out of Equilibrium

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Some Difficulty on Problem Set 2 with the Vertical Supply Curve

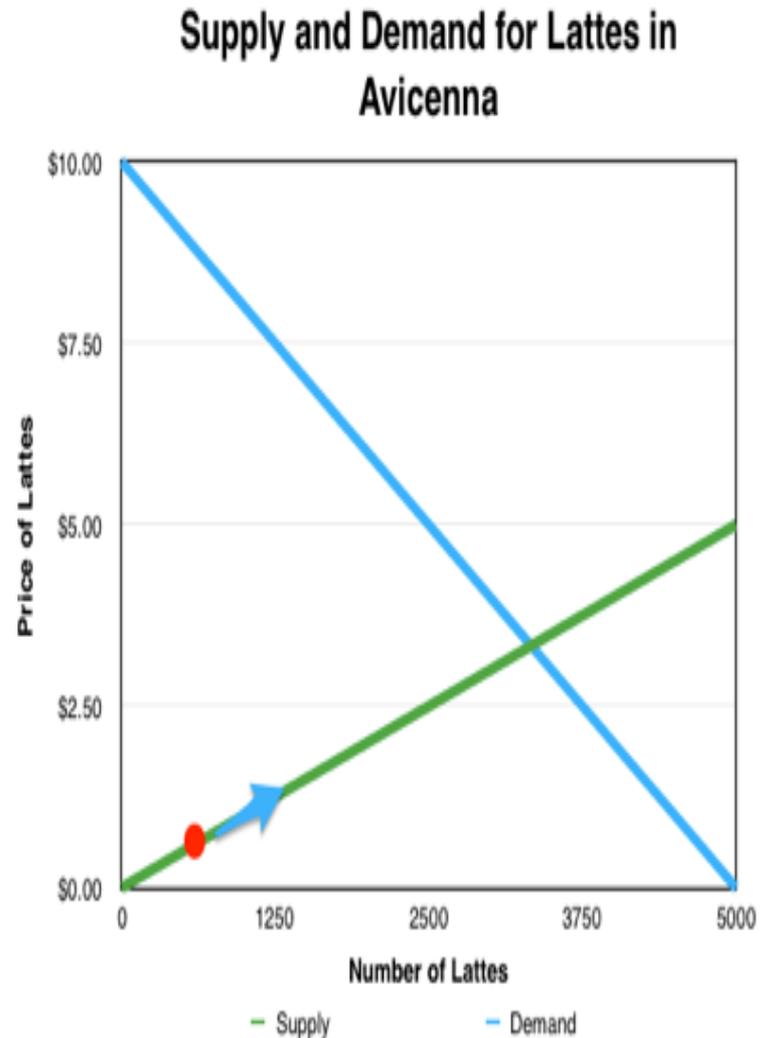
- Some more explicit talk about what people are doing on the S&D graph...
- The supply and demand curves tell you combinations of price and quantity for which producers or consumers, respectively, are content —neither ecstatic or unhappy.
- If you are off the supply (or off the demand curve) someone is either ecstatic or unhappy
- How ecstatic or unhappy? Ask at what price they would be willing to buy (or sell) that quantity, and how the current price compares to it

Supply and Demand for Lattes in Avicenna: Perfect Rent Case



Out of Equilibrium I

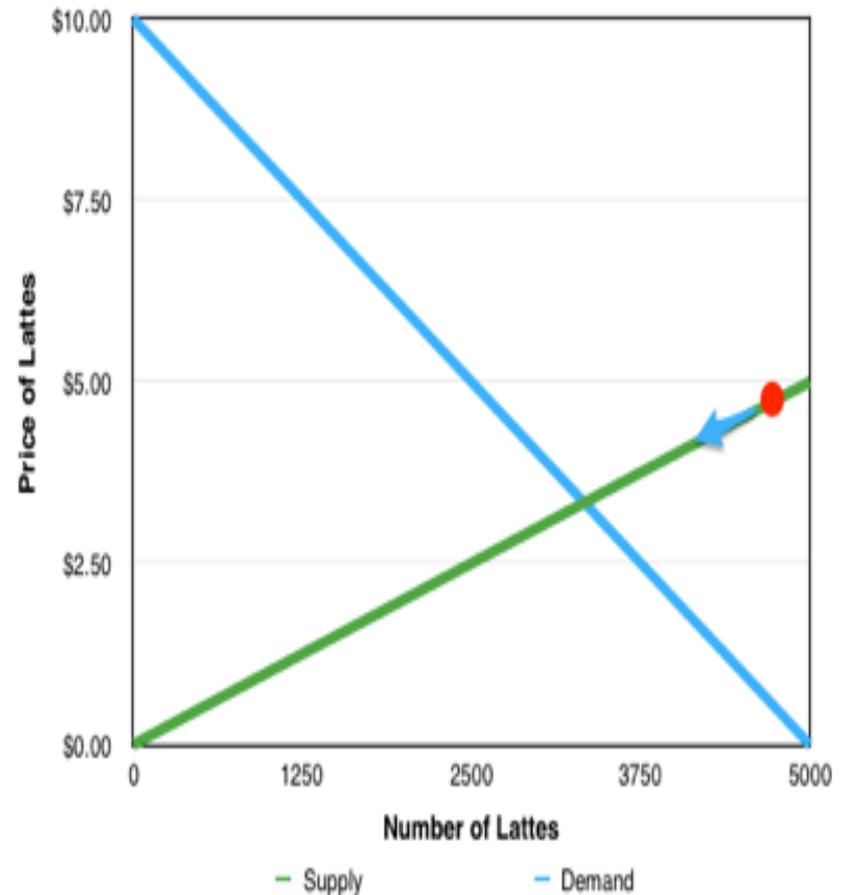
- On the supply curve, below and to the left of the demand curve:
- Producers are happy
- Consumers are ecstatic: they are buying at prices that, for some reason, are less than they counted on when they decided how much to buy
- At the margin willingness-to-pay is greater than price
- Marginal potential purchasers are eager to buy, and are entering the marketplace



Out of Equilibrium II

- On the supply curve, above and to the right of the demand curve:
- Producers are happy
- Consumers are unhappy. Some are--for whatever reason--buying when the cost they are paying is above their willingness-to-pay
- Marginal consumers are cutting their purchases, and exiting the marketplace
- The quantity sold is going down, and the price is dropping

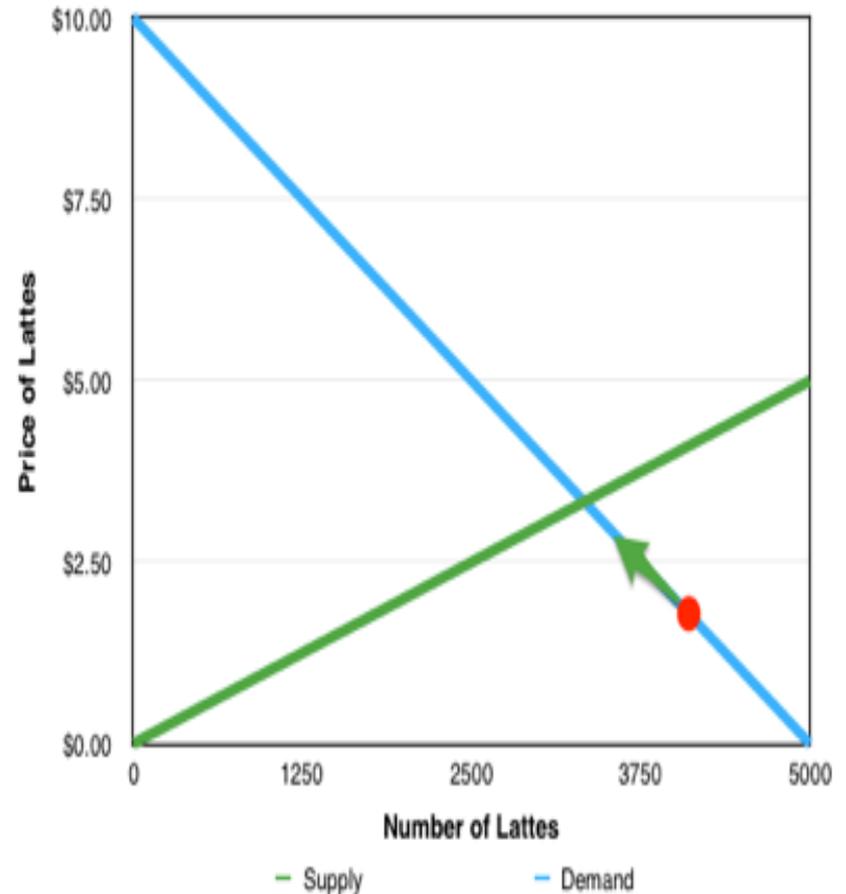
Supply and Demand for Lattes in Avicenna



Out of Equilibrium III

- On the demand curve, below and to the right of the supply curve:
- Consumers are happy
- Producers are unhappy. They are receiving less money than they thought they would when they decided how much to produce.
- For the marginal producers, price is below opportunity cost
- Some producers are cutting back production and exiting the market
-
- The quantity produced is falling, and the price is going up

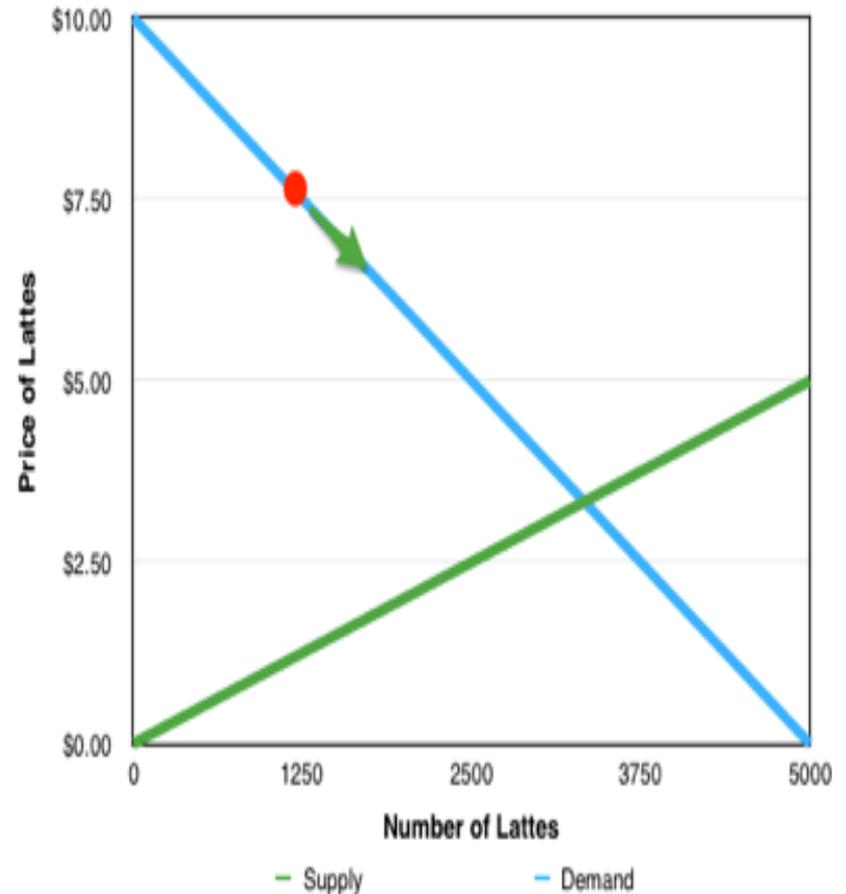
Supply and Demand for Lattes in Avicenna



Out of Equilibrium IV

- On the demand curve, above and to the left of the supply curve:
- Consumers are happy
- Producers are ecstatic: they are selling what they produce for more than they thought they would when they decided how much to produce
- For marginal producers, price is above opportunity cost
- New producers would love to enter and produce--if they are allowed to sell, or to compete for the existing market
- If they can do so, the quantity produced and sold is rising, and the price is going down

Supply and Demand for Lattes in Avicenna

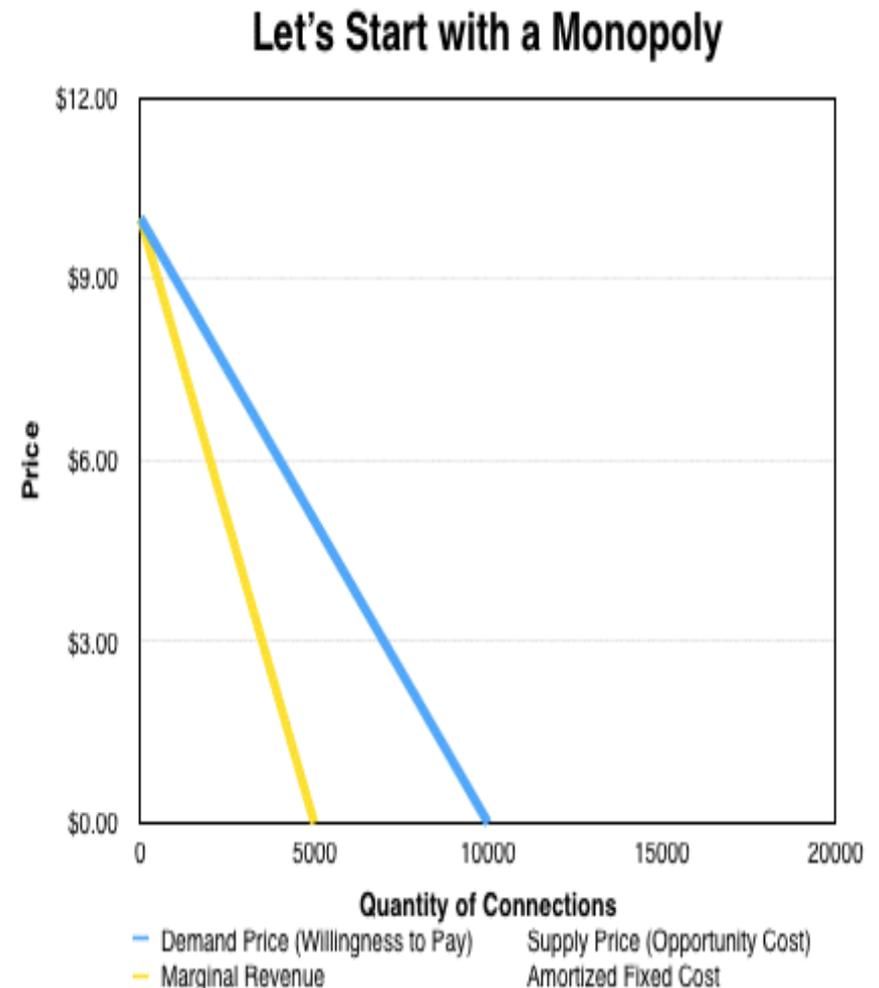


Accounting

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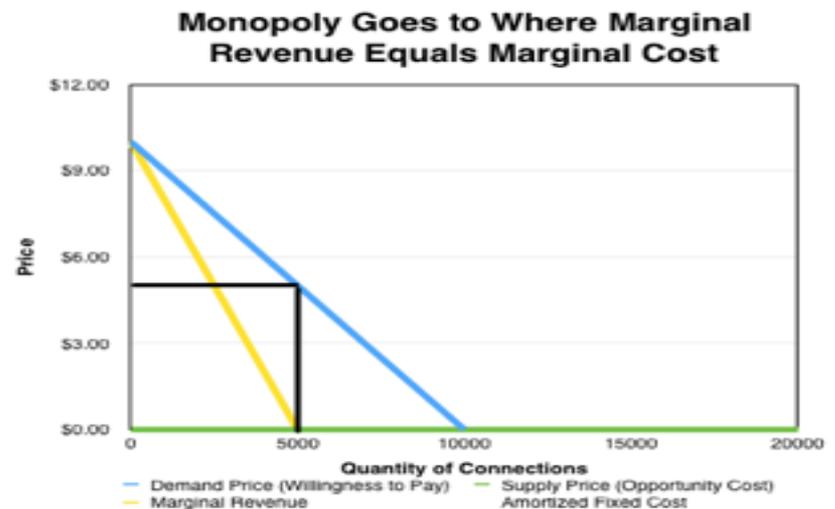
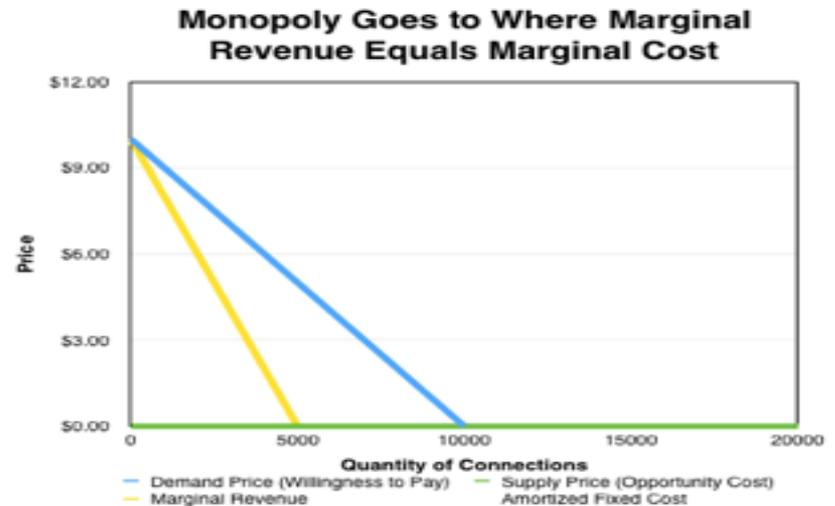
Accounting and Amortization

- Variable costs and fixed costs
- Decentralized producers
- Organized producers
- Increasing returns—economies of scale—*non-rivalry*
- This word “amortization”: what does it mean



Monopoly: Marginal Revenue and Marginal Cost

- We know what a monopoly does
- And we know what the monopoly's *operating cash flow* is
- It's the rectangular wedge between the price line and the opportunity cost of decentralized producers/marginal cost to monopolist line

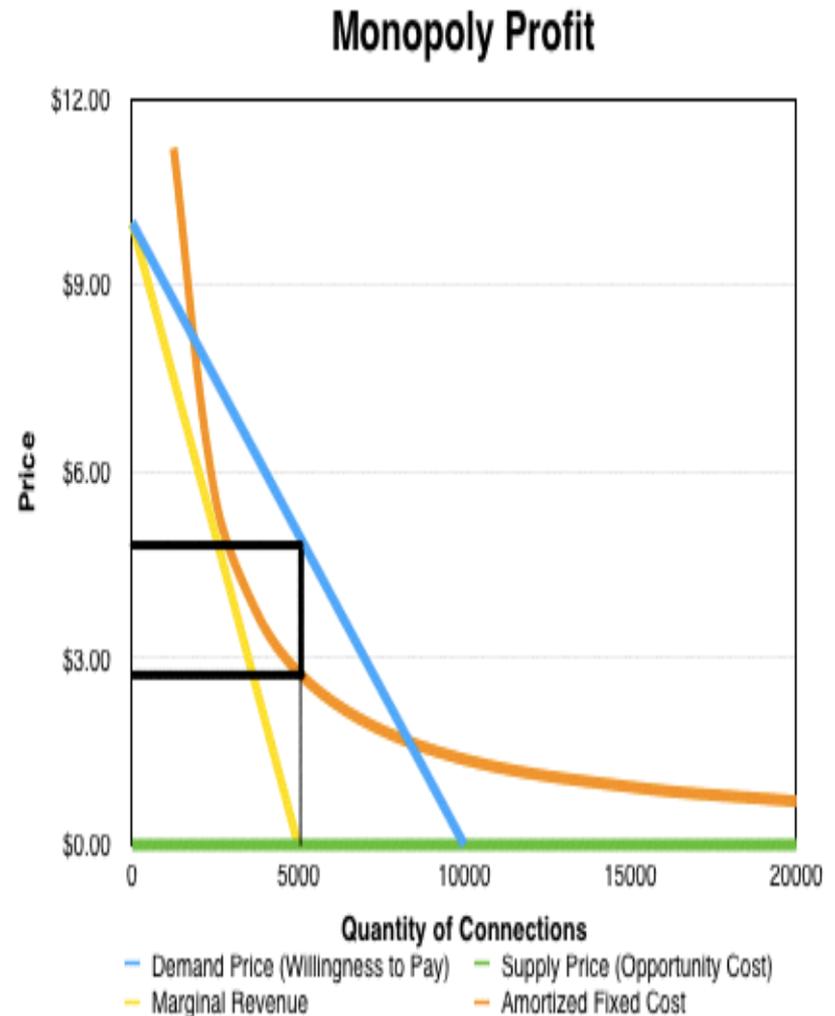


Monopoly: Fixed Costs

- But is that rectangle the monopolist's profit?
- Almost surely not
- What's keeping people from competing with the monopolist?
- Almost surely some up-front cost...
- The monopoly has had to borrow money from investors in order to finance its operations
- *Operating surplus* has to be large enough to *amortize* fixed costs or the business will lose money
- If *operating surplus* is positive the business will keep running—shutdown would be even worse
- But if *operating surplus* does not cover their share of the fixed costs, investors will be unhappy

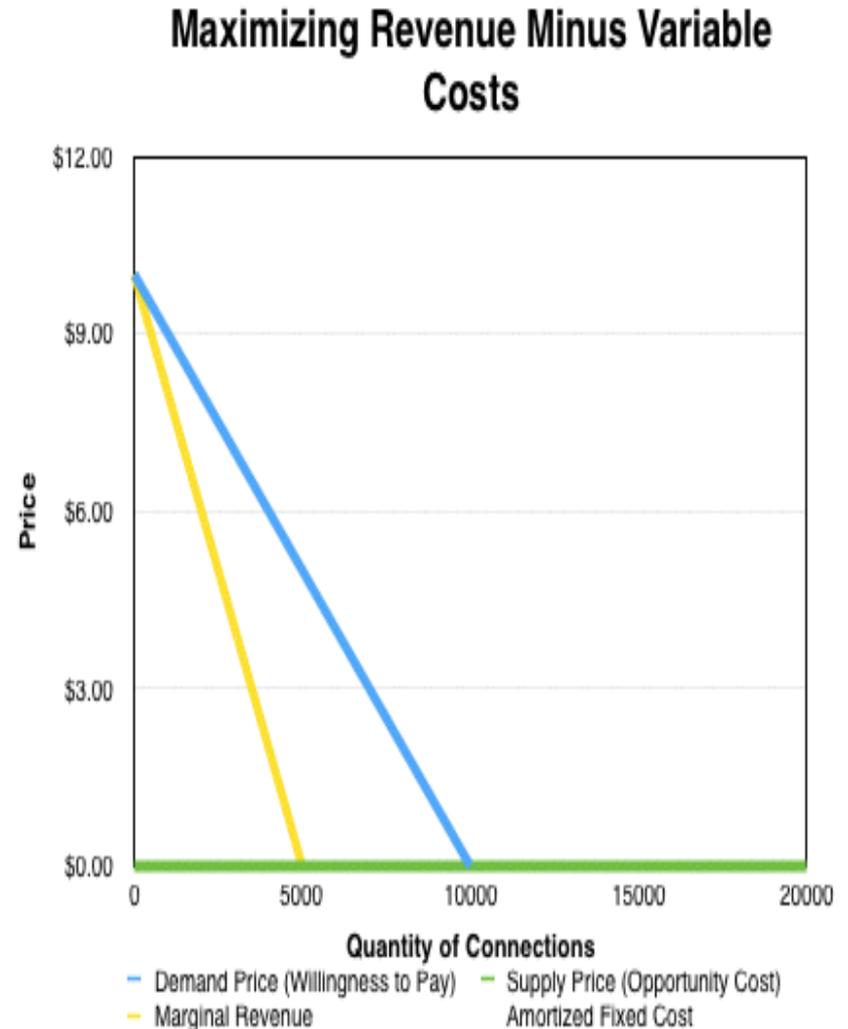
What Are the Monopoly's True Profits? I

- Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- Add to it the per-unit *amortization* of the fixed costs
 - That will—for pure fixed costs—be a hyperbola
- Multiply by the quantity
- PROFIT! = $(P - AOC - AFC) \times Q$



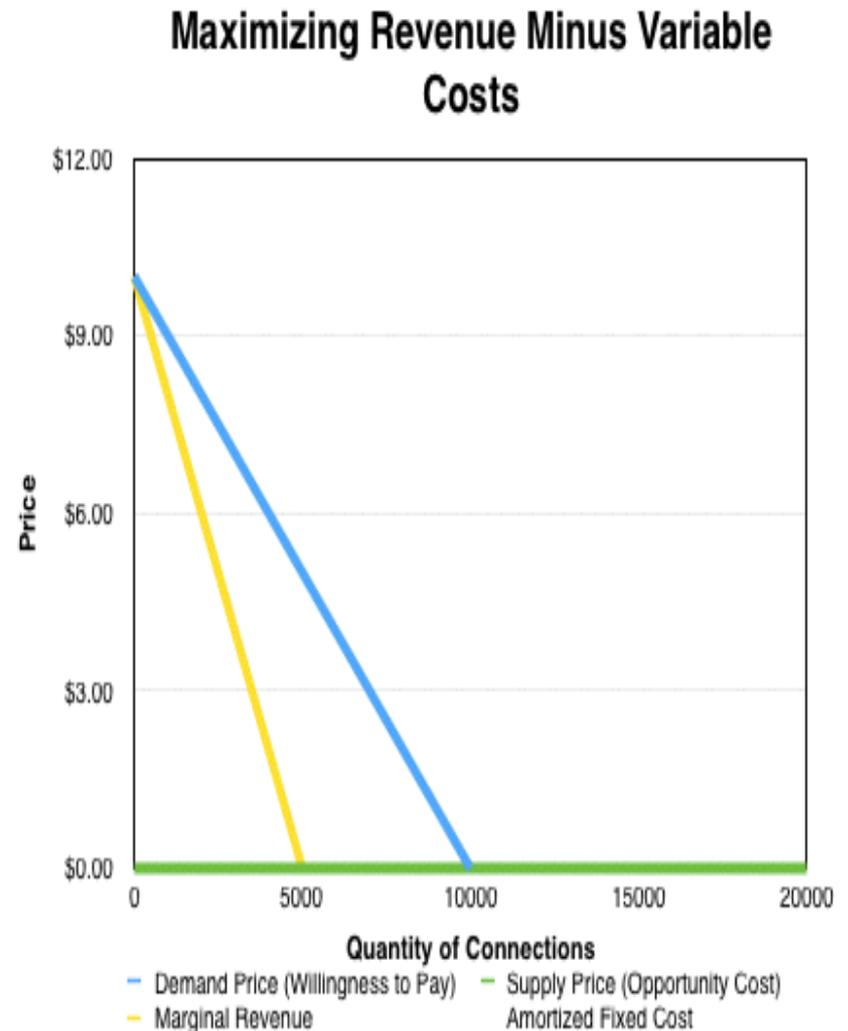
What Are the Monopoly's True Profits? II

- Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- $(P - AOC) \times Q = \textit{Operating Surplus}$



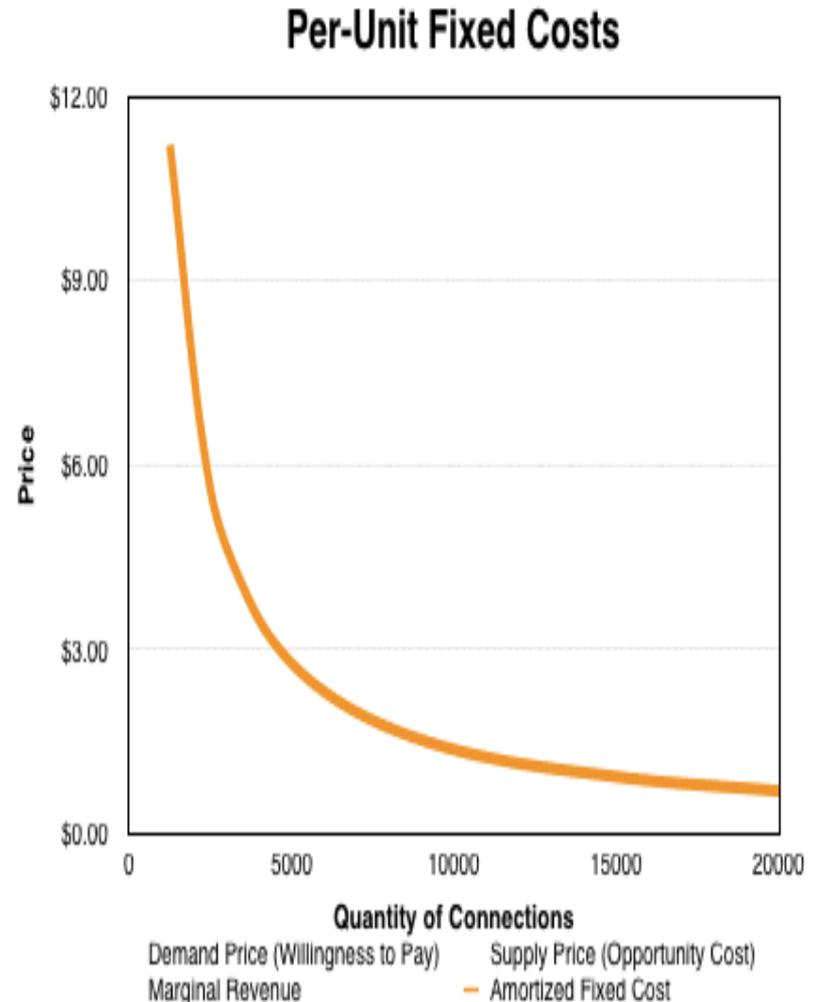
Aside: Decentralized Producers

- Decentralized producers make more product up to the point where the supply curve—the MOC line—crosses the demand curve
- Decentralized producers don't take account of how their expanding production reduces the revenue earned by the other producers
- Since the monopolist is centralized and organized and one entity, it can and does
- As the economy moves down the demand curve to the right of where $MR = MC$, *producers' net revenue is dropping*



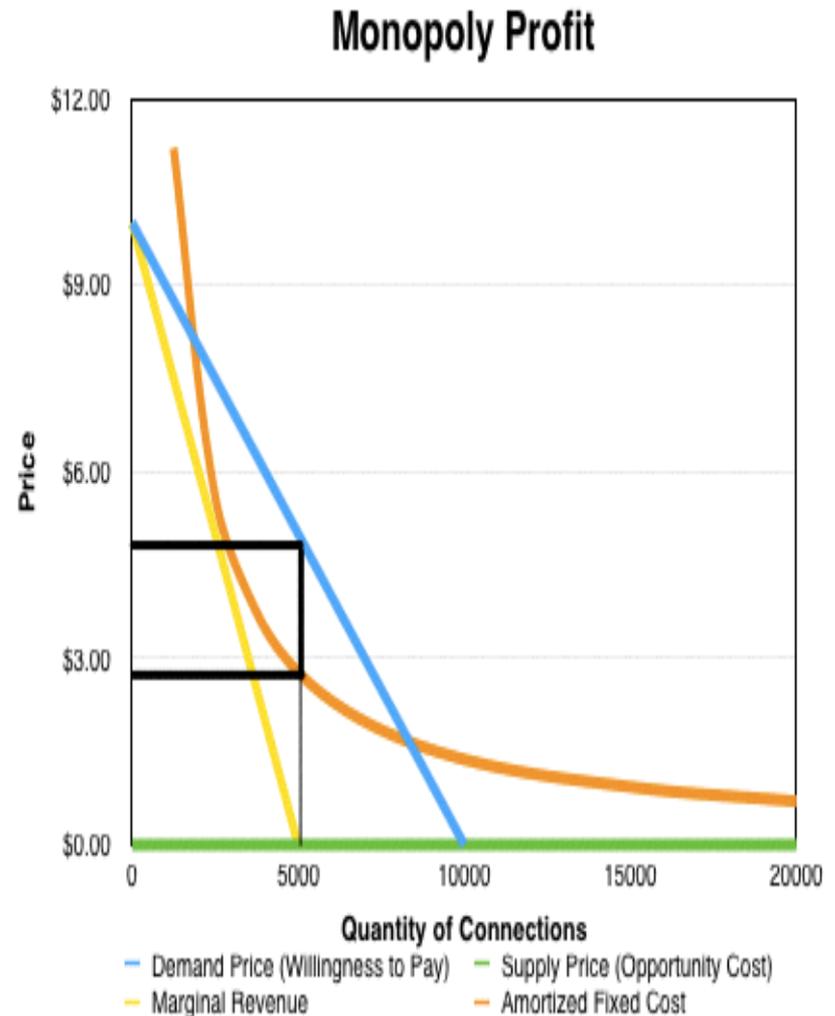
What Are the Monopoly's True Profits? III

- Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- But you have to add to the AOC the per-unit *amortization* of the fixed costs
 - That will—for pure fixed costs—be a hyperbola
 - $AFC = TFC/Q$



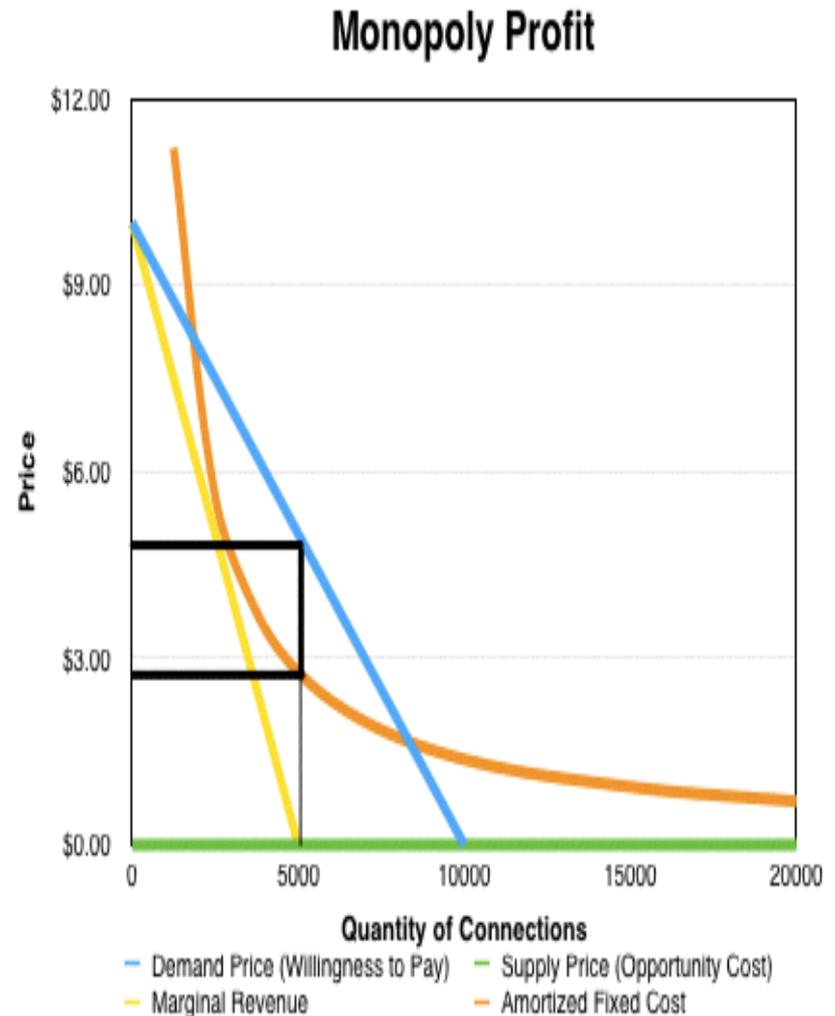
What Are the Monopoly's True Profits? IV

- Go to the profit-maximizing point—where marginal/ opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- Add to it the per-unit *amortization* of the fixed costs
 - That will—for pure fixed costs—be a hyperbola
- Multiply by the quantity
- PROFIT! = $(P - AOC - AFC) \times Q$



The Optimality of the Market Is Here Breaking Down

- Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- Add to it the per-unit *amortization* of the fixed costs
 - That will—for pure fixed costs—be a hyperbola
- Multiply by the quantity
- PROFIT! = $(P - AOC - AFC) \times Q$



Calculating Monopoly

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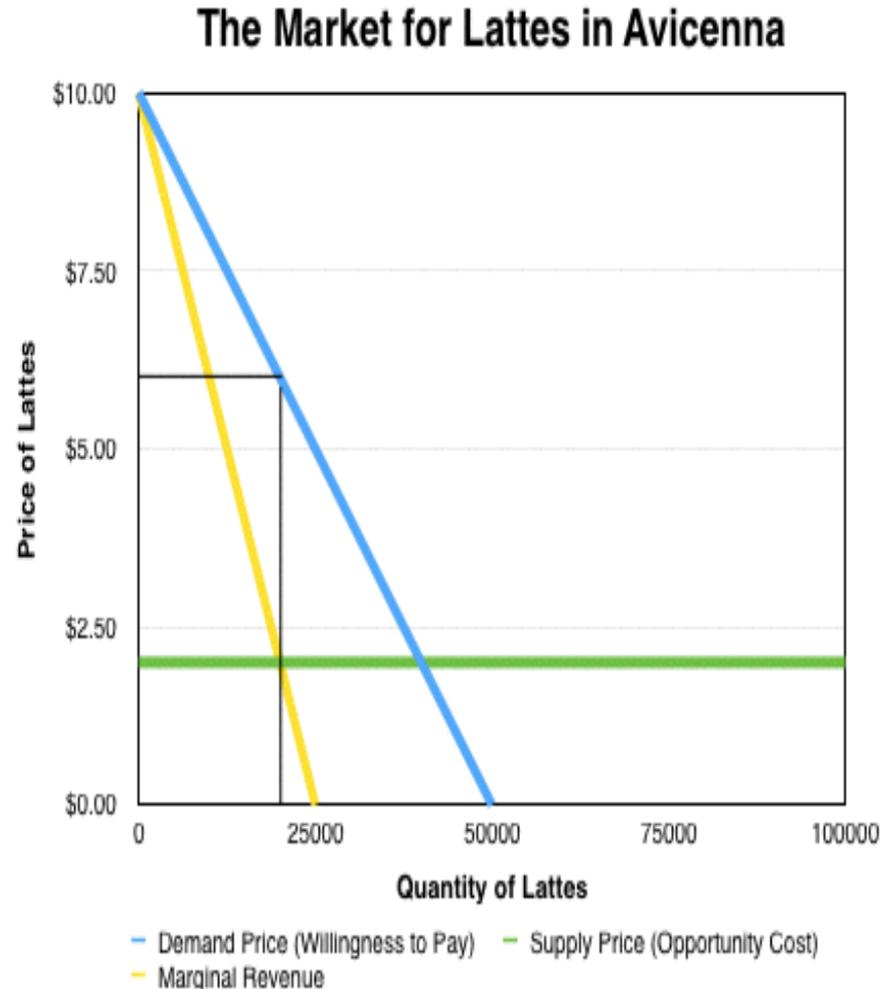
Start with a Monopoly Already Established

- A bunch of alumni of Crony Capitalism University in Old Stick establish a monopoly over latte production in Avicenna...
- We know their decision problem:
 - Demand: $P = P_{d0} - dQ$
 - $MR = P_{d0} - 2dQ$
 - $MC = S = P_{s0} + sQ$
 - $MR = MC$



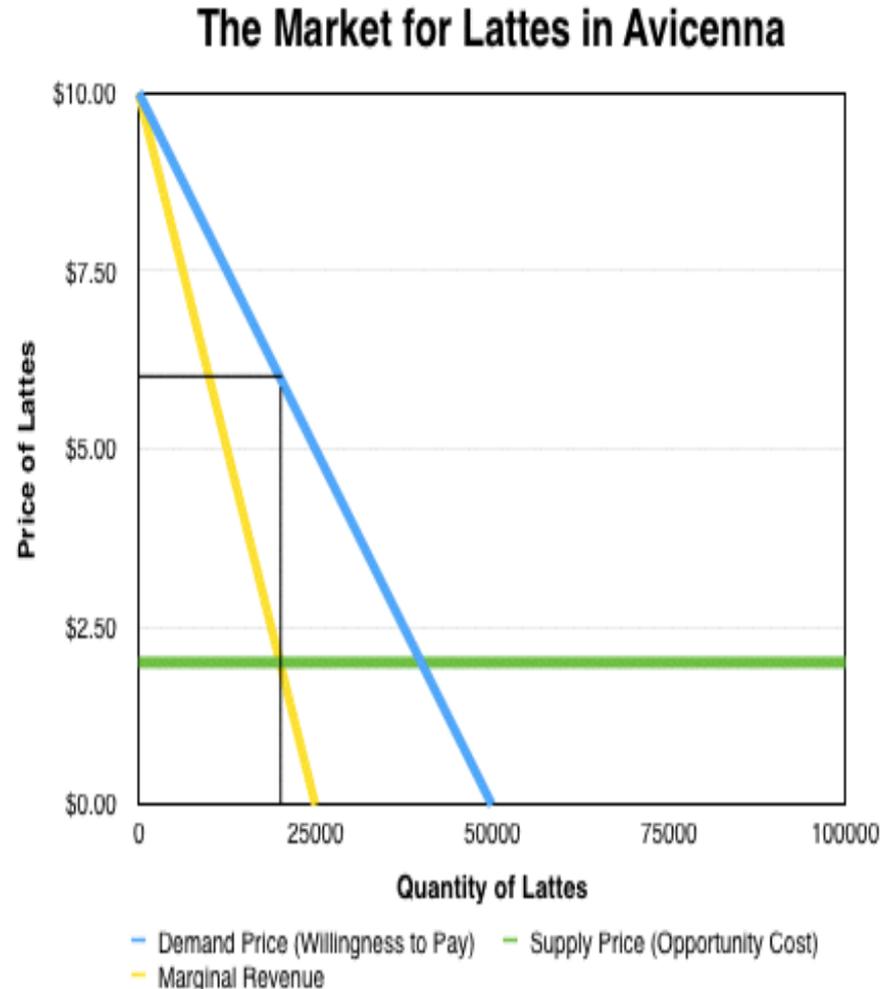
Our Monopoly Example...

- The financiers from CCU have bought up all the coffee shops in Avicenna:
- Now there is a monopoly
- We know its decision problem in general:
 - Demand: $P = P_{d0} - dQ$
 - $MR = P_{d0} - 2dQ$
 - $MC = P_{s0} + sQ$
 - $MR = MC$
- Let's put some (of our standard) numbers in here



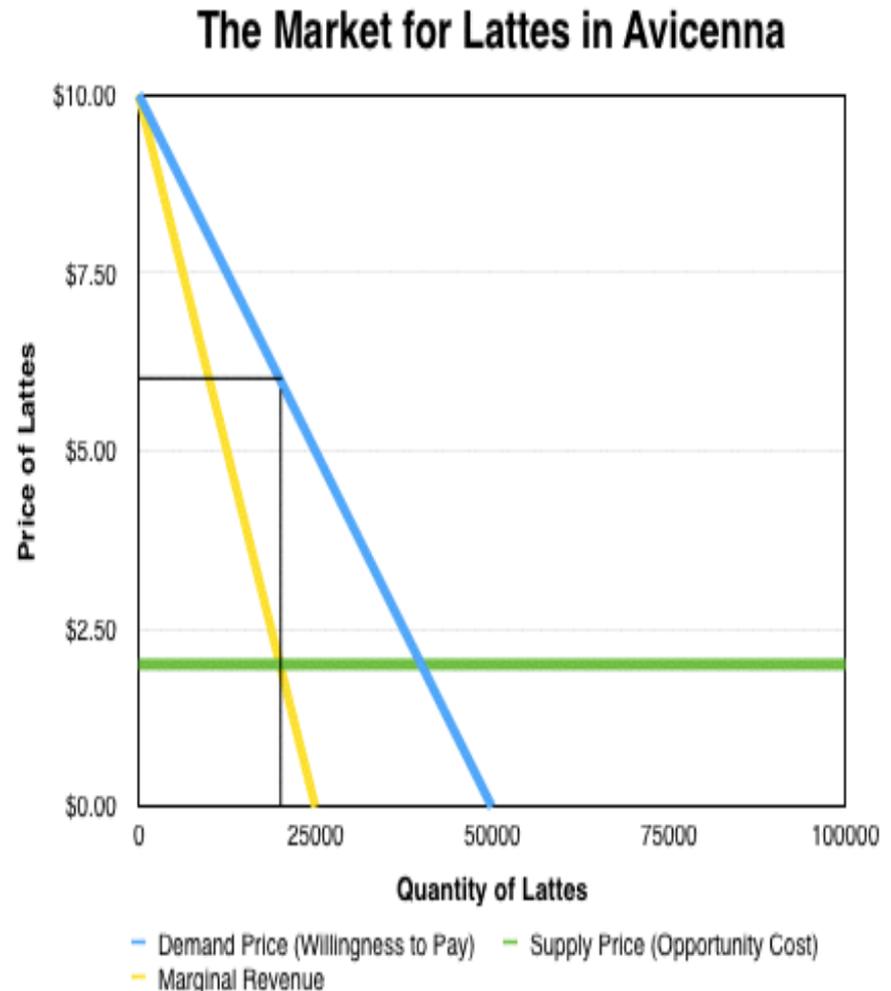
Put Some Numbers on...

- In general the latter monopoly's problem has this structure:
 - Demand: $P = P_{d0} - dQ$
 - $MR = P_{d0} - 2dQ$
 - $MC = P_{s0} + sQ$
- Specifically, in this particular case we have:
 - Demand: $P = \$10 - 0.0002Q$
 - $MR = \$10 - 0.0004Q$
 - $MC = \$2$



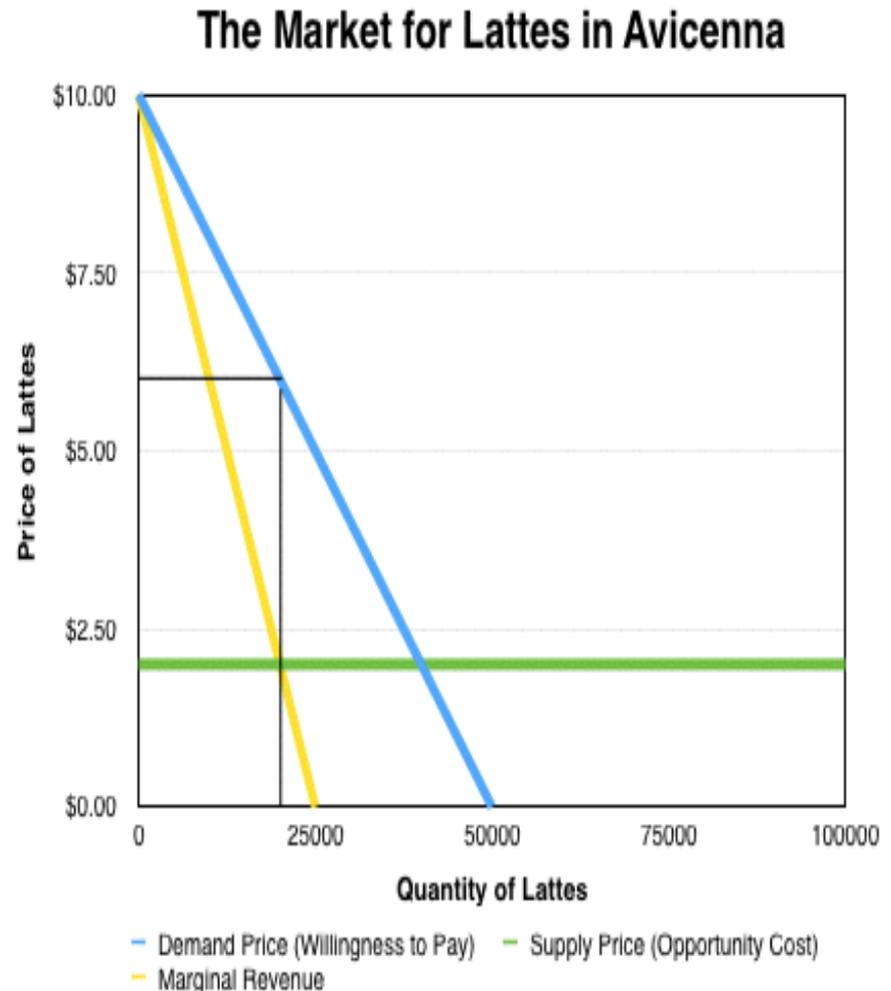
To Your i>Clickers: The Profit-Maximizing Quantity Is...

- Demand: $P = P_{d0} - dQ$
- $MR = P_{d0} - 2dQ$; $MC = P_{s0} + sQ$
- Demand: $P = \$10 - 0.0002Q$
- $MR = \$10 - 0.0004Q$; $MC = \$2$
- To your i>Clickers... What is the profit-maximizing quantity the monopolist should produce?
 - A. 0
 - B. 50000
 - C. 40000
 - D. 20000
 - E. 25000



To Your i>Clickers: The Profit-Maximizing Quantity Is...

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Calculating What the Profit-Maximizing Monopolist Does...

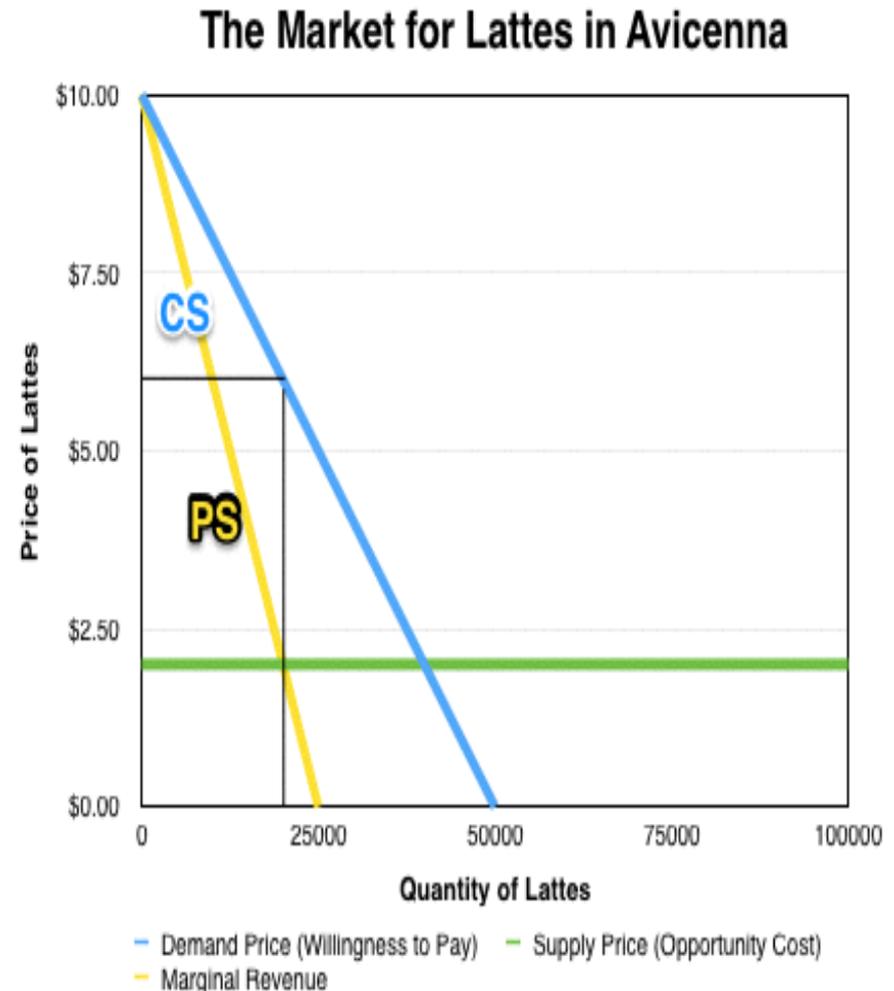
- Either “it’s where the MR curve crosses the MC curve”, or...
- Demand: $P = P_{d0} - dQ$
- $MR = P_{d0} - 2dQ$; $MC = P_{s0} + sQ$
- $P_{d0} - 2dQ = P_{s0} + sQ$
- $(P_{d0} - P_{s0}) = (s + 2d)Q$
- $Q_m = (P_{d0} - P_{s0}) / (s + 2d)$
 - The monopolist restricts supply and reduces the quantity
- Either “it’s where the MR curve crosses the MC curve”, or...
- Demand: $P = \$10 - 0.0002Q$
- $MR = \$10 - 0.0004Q$; $MC = \$2$
- $\$10 - 0.0004Q = \2
- $\$8 = 0.0004Q$
- $Q_m = 20000$ —the monopolist restricts supply and reduces the quantity

Calculating What the Profit-Maximizing Monopolist Does... II

- Demand: $P = P_{d0} - dQ$
- $MR = P_{d0} - 2dQ$; $MC = P_{s0} + sQ$
- $P_{d0} - 2dQ = P_{s0} + sQ$
- $(P_{d0} - P_{s0}) = (s + 2d)Q$
- $Q_m = (P_{d0} - P_{s0}) / (s + 2d)$
 - The monopolist restricts supply and reduces the quantity
- Why restrict the quantity?
- In order to raise the price--and raise the price by more than enough to offset reduced quantity:
- $P_m = P_{d0} - dP_{d0} / (s+2d) + dP_{s0} / (s+2d)$
- $P_m = [(s+d)/(s+2d)]P_{d0} + [d/(s+2d)]P_{s0}$
- Demand: $P = \$10 - 0.0002Q$
- $MR = \$10 - 0.0004Q$; $MC = \$2$
- $\$10 - 0.0004Q = \2
- $\$8 = 0.0004Q$
- $Q_m = 20000$
 - The monopolist restricts supply and reduces the quantity
- Why restrict the quantity?
- In order to raise the price
- And to raise the price by more than enough to offset reduced quantity in its effect on profits:
- $P_m = \$10 - .0002(\$10) / .0004 + .0002(\$2) / .0004$
- $P_m = [1/2](\$10) + [1/2](\$2) = \$6$

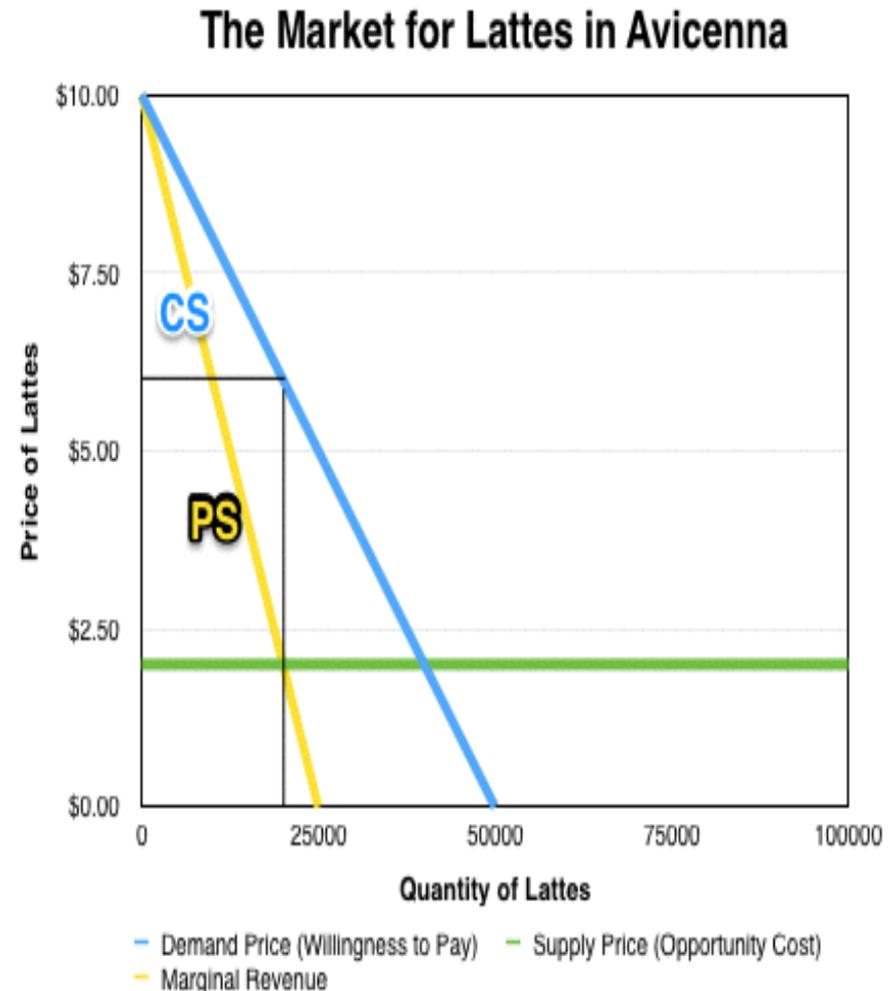
Calculating Consumer and Producer Surplus Under Monopoly

- $MR = P_{d0} - 2dQ$
- $MC = P_{s0} + sQ$
- $Q_m = (P_{d0} - P_{s0}) / (s + 2d)$
- $P_m = [(s+d)/(s + 2d)]P_{d0} + [d/(s + 2d)]P_{s0}$
- Consumer Surplus:
 - $CS = (AWTP - P_m) \times Q_m$
 - $AWTP = (P_{d0} + P_m) / 2$
- Producer Surplus:
 - $PS = (P_m - AC) \times Q_m$
 - $AC = P_{s0} + sQ_m / 2$



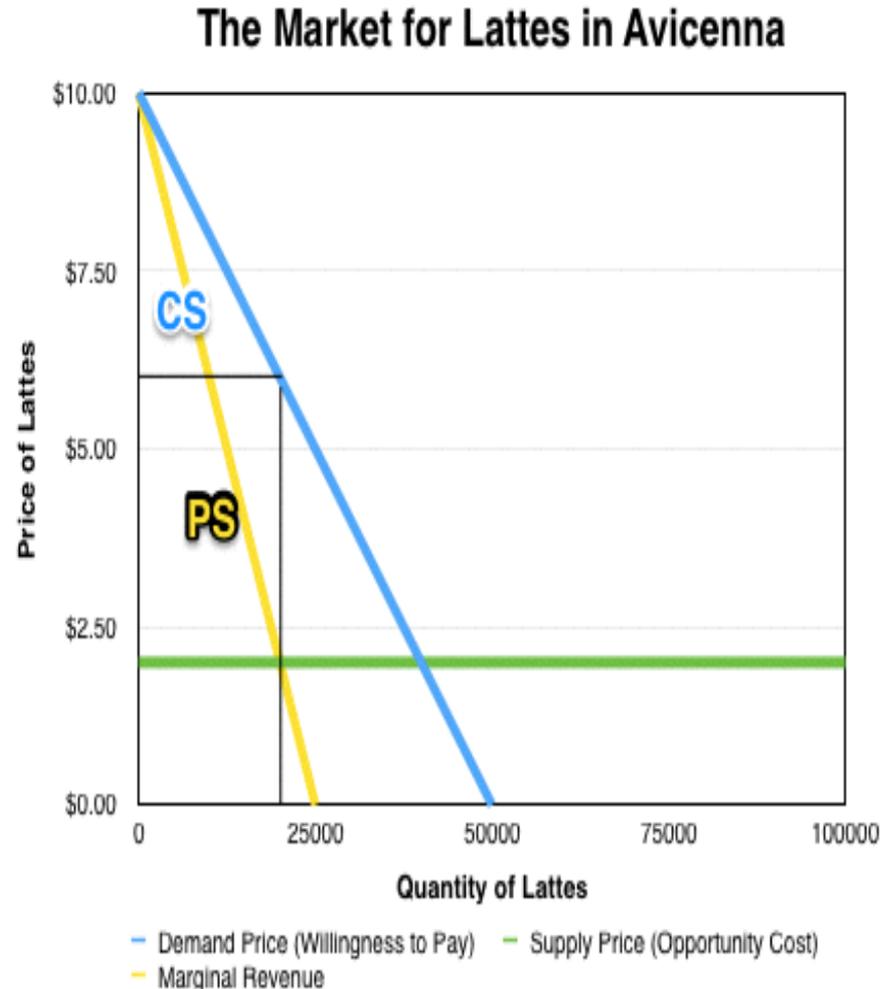
Calculating Consumer and Producer Surplus Under Monopoly II

- Consumer Surplus:
 - $CS = (AWTP - P_m) \times Q_m$
 - $AWTP = (P_{d0} + P_m)/2$
- Consumer Surplus is certainly not going to be greater than in a competitive market
 - Can you think of an example in which it is the same?



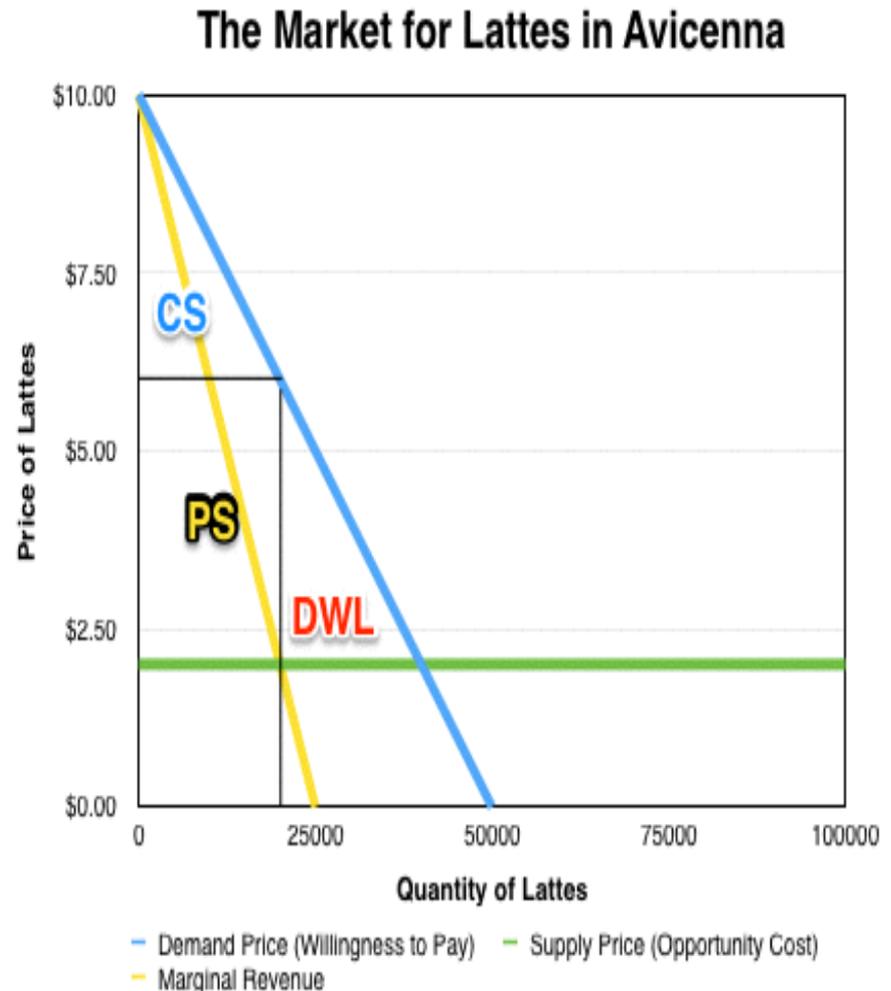
Calculating Consumer and Producer Surplus Under Monopoly III

- Producer Surplus:
 - $PS = (P_m - AC) \times Q_m$
 - $AC = P_{s0} + sQ_m/2$
- Producer Surplus is certainly not going to be less than in a competitive market
 - Can you think of an example in which it is the same?



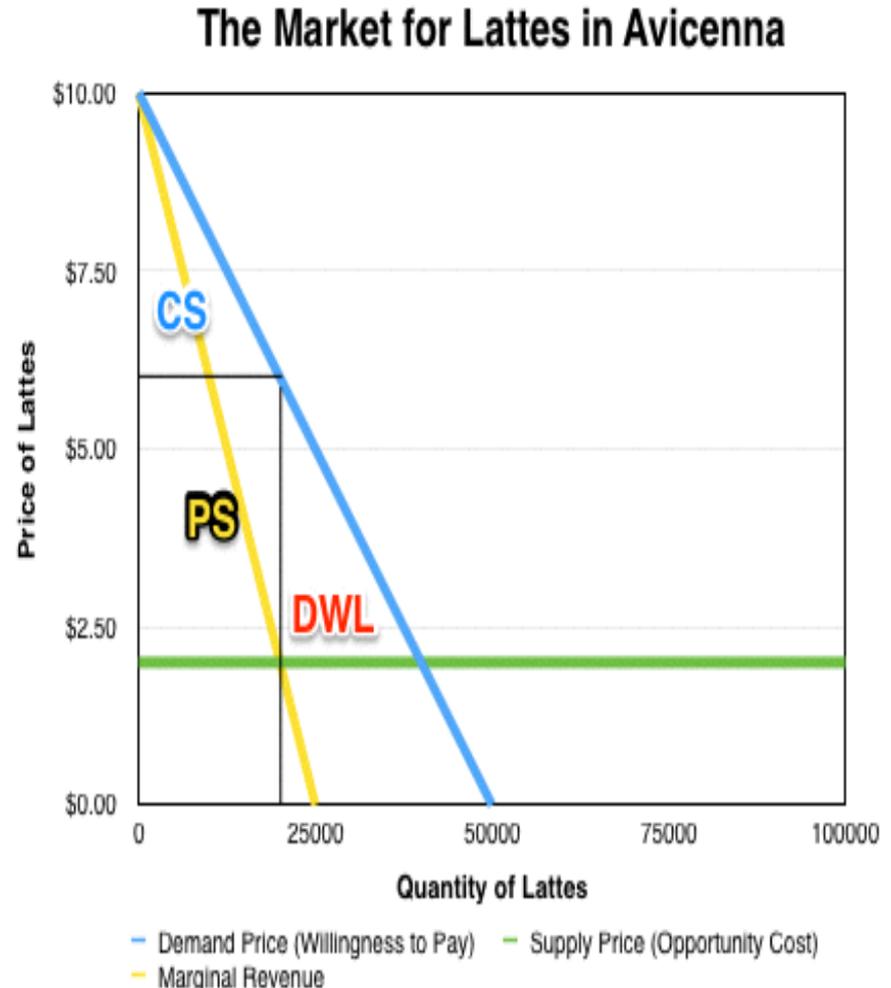
The Deadweight Loss from Monopoly

- The monopolist stops producing when there is still a wedge between the willingness-to-pay of the next potential purchaser and society's opportunity cost...
 - A wedge equal to $d \times Q_m$
 - The average surplus foregone per transaction not made?
 - That is half of this wedge



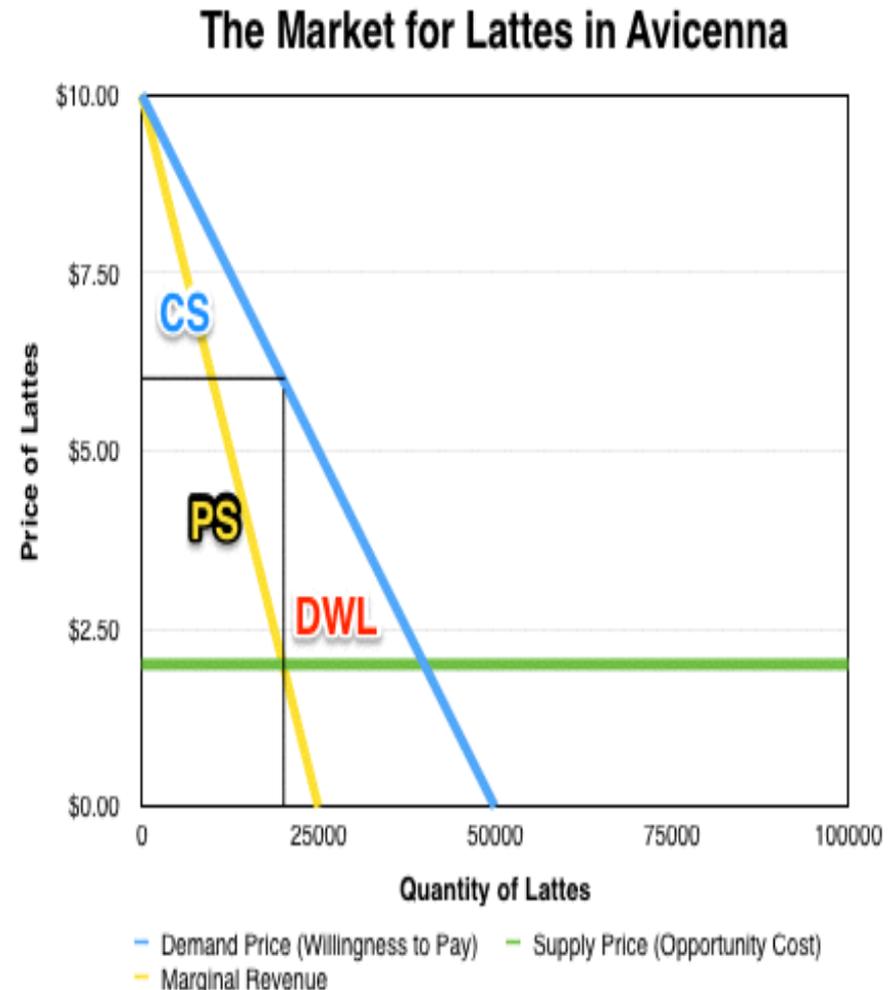
The Deadweight Loss from Monopoly II

- The monopolist stops producing when there is still a wedge between the willingness-to-pay of the next potential purchaser and society's opportunity cost...
 - A wedge equal to dQ_m
 - The average surplus foregone per transaction not made?
 - That is half of that wedge
- The number of win-win transactions not made is simply $Q^* - Q_m$
- Hence: $DWL = dQ_m(Q^* - Q_m)/2$
- There are other formulas—but they are not terribly illuminating



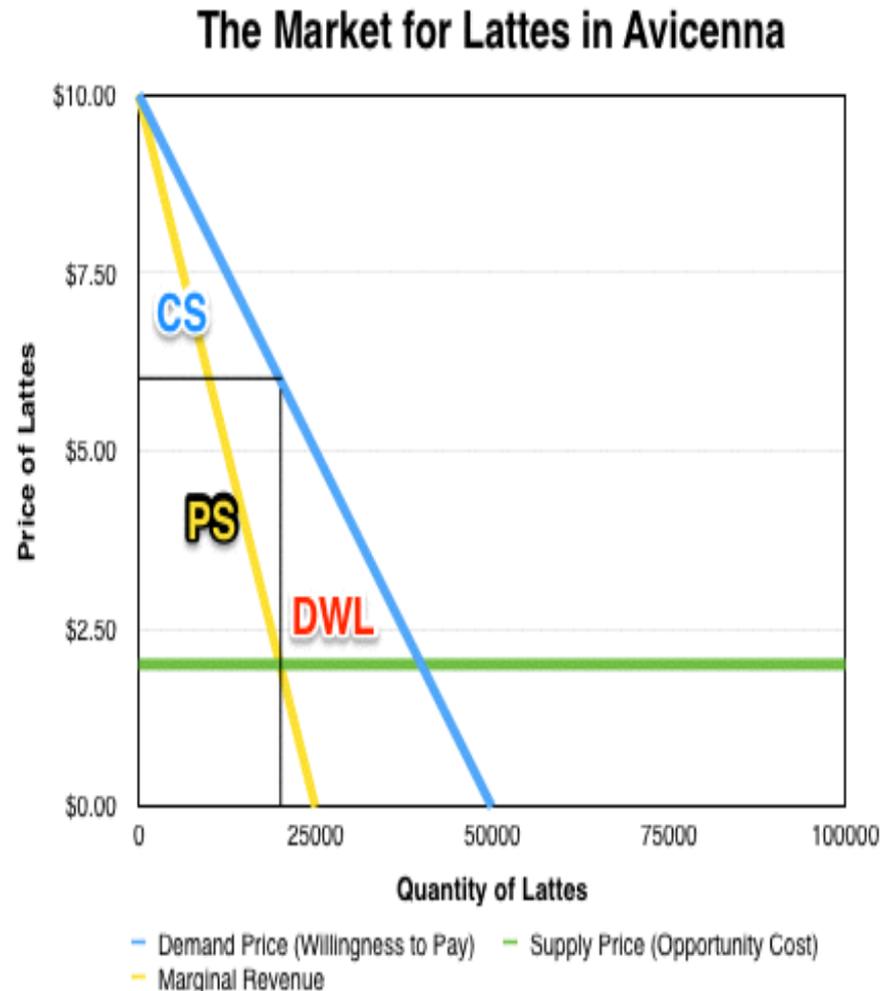
To Your i>Clickers: The Deadweight Loss from Monopoly

- In our example, we had:
- Demand: $P = \$10 - 0.0002Q$
- “Supply”: $MOC = \$2$
- $Q^* = 40000$
- $Q_m = 20000$
- $DWL = dQ_m(Q^* - Q_m)/2$
- To your i>Clickers: what is the deadweight loss from monopoly here?
 - A. \$160000
 - B. \$80000
 - C. \$40000
 - D. \$250000
 - E. I don't have enough information



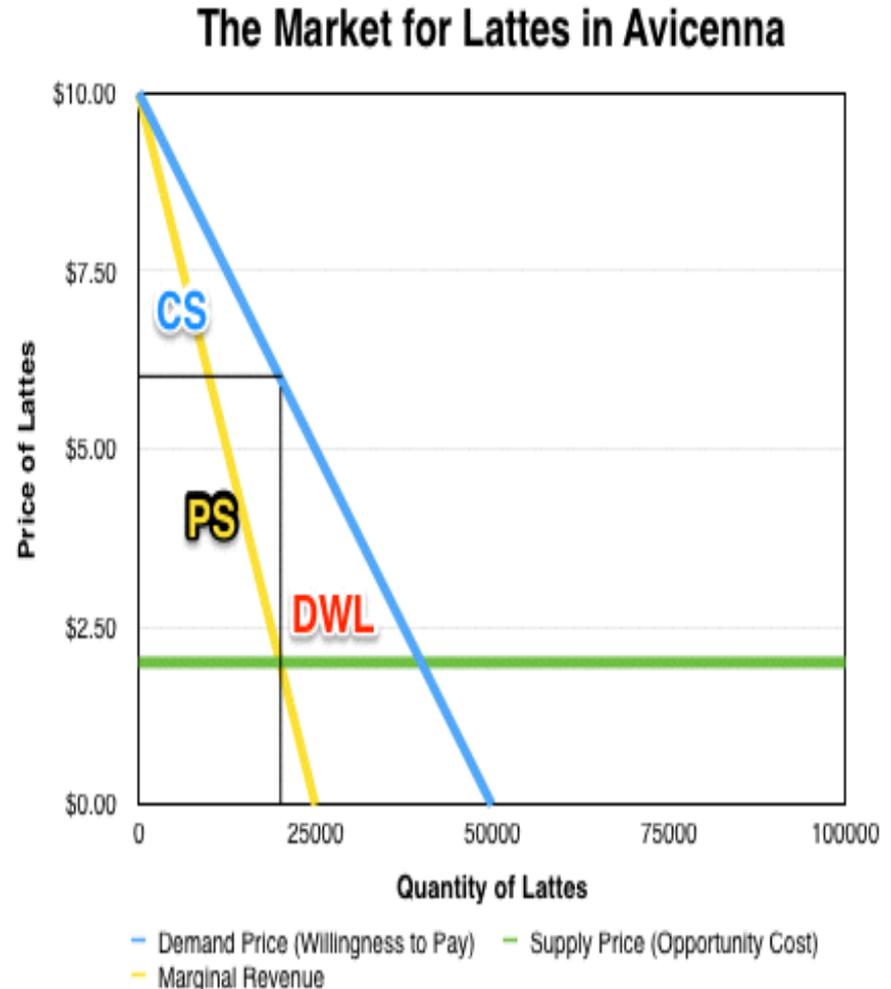
To Your i>Clickers: The Deadweight Loss from Monopoly

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- A. \$160000
 - B. \$80000
 - C. \$40000 <<**
 - D. \$250000
 - E. I don't have enough information



The Deadweight Loss from Monopoly: Our Example III

- In our example, we had:
- Demand: $P = P_{d0} - d \times Q$
- Demand: $P = \$10 - 0.0002Q$
- $Q^* = 40000$
- $Q_m = 20000$
- $DWL = dQ_m(Q^* - Q_m)/2$
- In this example, $DWL = \$40000$
- Consumer surplus is cut by 3/4, from \$160000 in our competitive free-market case to \$40000 in the monopoly case: this is a rather large cost to consumers
- Producer surplus—monopoly profit—is \$80000



The Deadweight Loss from Monopoly: Our Example IV

- In the words of Mel Brooks: “It is good to be the monopolist!”
- Formal monopoly, and informal collusion:
 - In the words of Adam Smith: “People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public... or in some contrivance to raise prices.”



Origins and Persistence of Monopolies

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How Is It That Monopolies Arise and Persist?

1. The government establishes them
 - For bad reasons (the rent-seeking society)
 - For good reasons (encourage invention and innovation)
2. They don't persist—competitors enter and erode them over time
3. Successful strategic game-playing by the monopolist to discourage entry
4. "Natural" monopolies
5. "Network externality" monopolies
 - "21 Jump Street"
 - "The Han Solo Origin Story"



Price of Lattes



