

Economics 1: Introduction to Economics

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Administrivia

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

Webtools and Other...

- Webtools
- Problem Sets and Exercises
- Topics: We Are Now About to Start Storming Through “Market Failure”

Webtools...

- Webtools:
 - <http://www.bradford-delong.com/course-syllabus-econ-1-spring-2016-uc-berkeley.html>, and
 - <https://bcourses.berkeley.edu/courses/1411451/assignments/syllabus>

Exercises...

- Problem Sets and Exercises:
 - Problem Set 1 answers up...
 - Section exercise answer files up...
 - Problem Set 2 due later this week...
 - Then skip a week: Problem Set 3 due around February 24...

Topics...

- Topics:
 - We Are Now About to Start Storming Through “Market Failure”
 - That will take us four weeks
 - And then it will be time to take our breath, look back, try to gather everything together, and get ready for the midterm...

Algebra 1 for Econ 1

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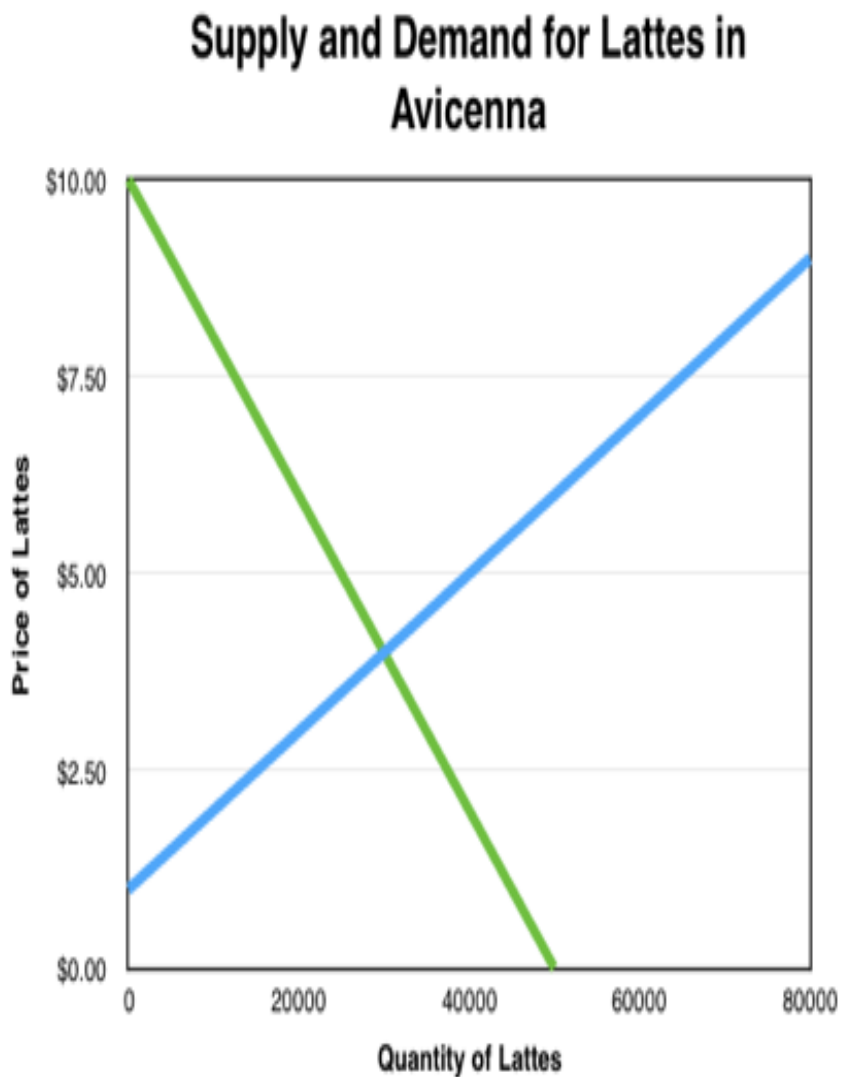
Algebra: The Marshallian Toolkit

- We—and the first seven chapters of FBAH —have built up the basic toolkit: the supply-and-demand apparatus
- It leads to very optimistic conclusions about the market.
- The rest of the textbook—and the lectures—apply this toolkit
- And partly walk back the optimism
- *Mechanical* reliance on supply-and-demand creates a bad economist
- As J.R. McCulloch said: “We must beware of becoming parrots...”



Algebra: The Marshallian Toolkit II

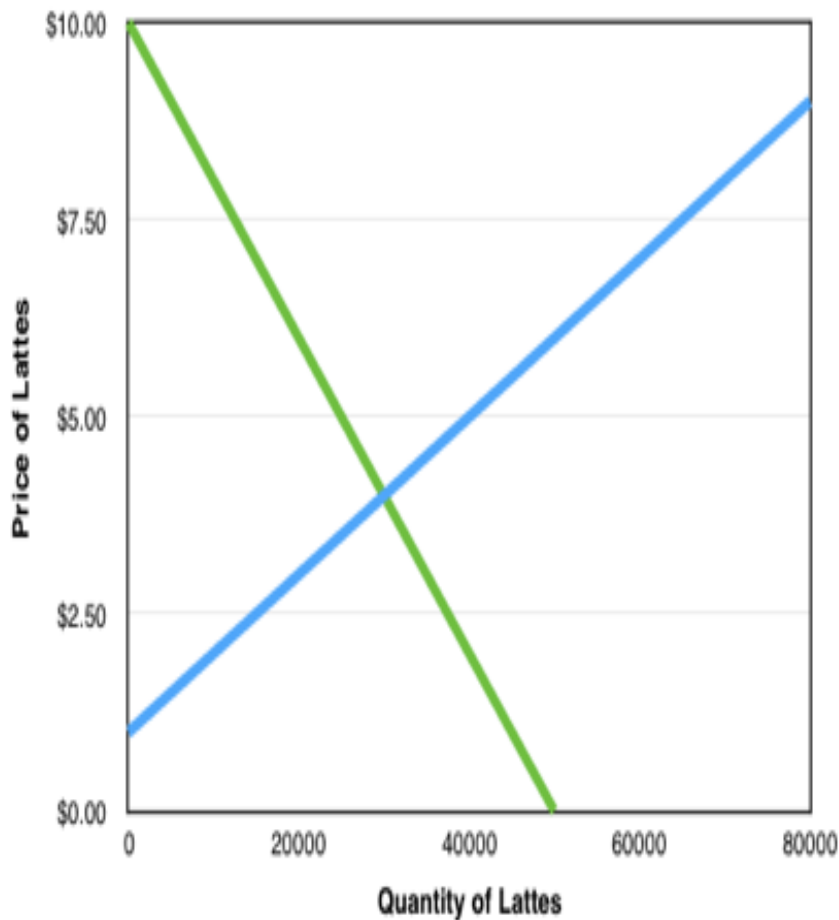
- As I said, it took economists 150 years to get this (largely) right
- By John Maynard Keynes's teachers, Alfred (and Mary Paley) Marshall
- The toolkit starts with individuals capabilities, resources, incomes, and preferences
- Derives opportunity cost, income, willingness to pay...



Algebra: The Marshallian Toolkit III

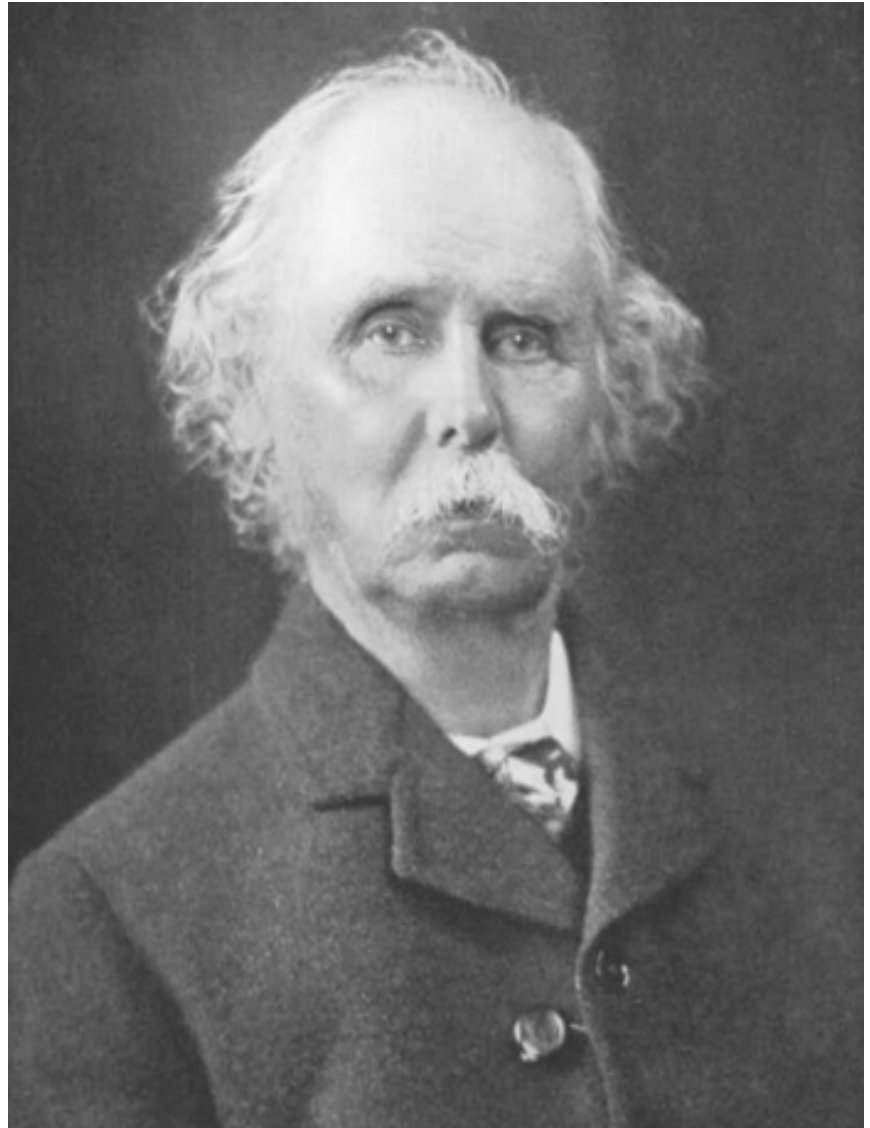
- It starts with individuals capabilities, resources, incomes, and preferences
- Derives opportunity cost, willingness to pay
- Constructs:
 - Demand: $P = P_{d0} - dQ$
 - Supply: $P = P_{s0} + sQ$
- Solves for market equilibrium quantity and price:
 - $Q^* = (P_{d0} - P_{s0})/(s+d)$
 - $P^* = (d/(d+s))P_{s0} + (s/(d+s))P_{d0}$
- Toolkit built up by Alfred and Mary Paley Marshall

Supply and Demand for Lattes in Avicenna



Algebra: Evaluating the Marshallian Outcome I

- Demand: $P = P_{d0} - dQ$
- Supply: $P = P_{s0} + sQ$
- $Q^* = (P_{d0} - P_{s0}) / (s + d)$
- $P^* = (d / (d + s)) P_{s0} + (s / (d + s)) P_{d0}$
- Consumer surplus:
 - Average-willingness-to-pay =
AWTP = $(P_{d0} + P^*) / 2$
 - $CS = (AWTP - P^*) \times Q$
- How valuable the opening-up and existence of this market is to consumers
- https://en.wikipedia.org/wiki/Alfred_Marshall



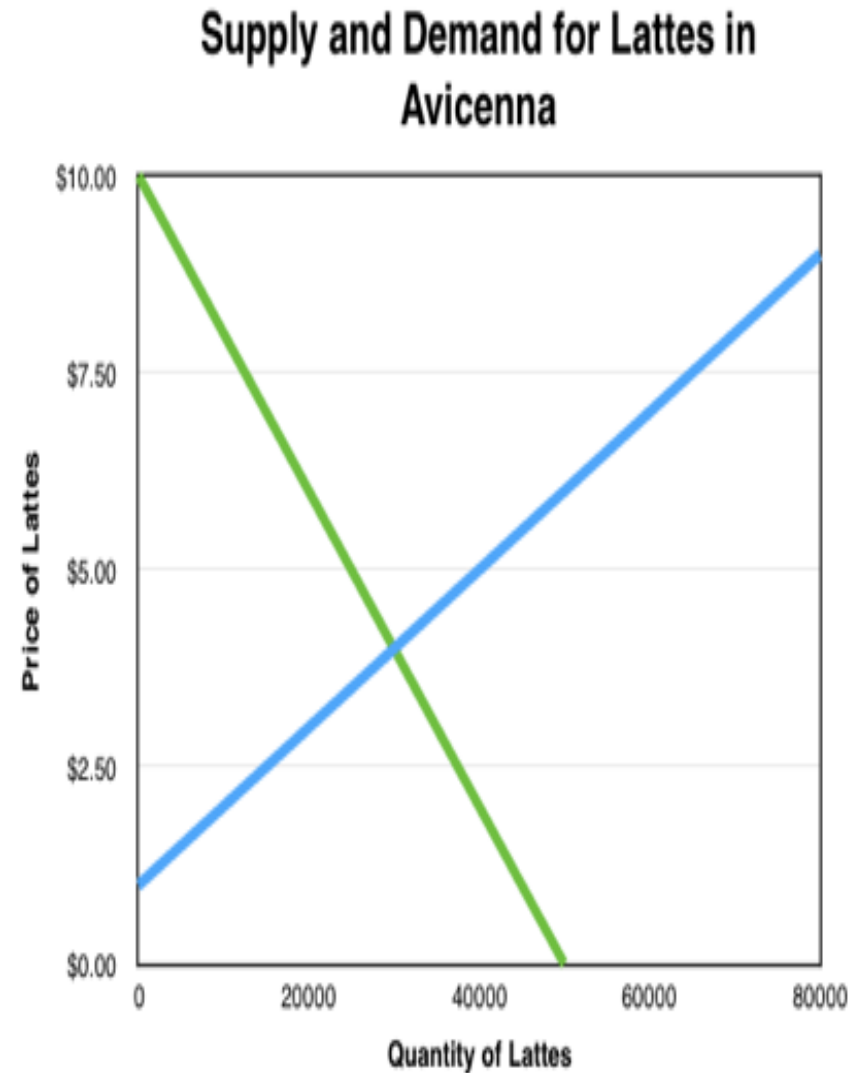
Algebra: Evaluating the Marshallian Outcome II

- D: $P = P_{d0} - dQ$ & S: $P = P_{s0} + sQ$
- $Q^* = (P_{d0} - P_{s0}) / (s + d)$
- $P^* = (d / (d + s)) P_{s0} + (s / (d + s)) P_{d0}$
- Producer surplus:
 - Average Opportunity Cost = AOC = $(P_{s0} + P^*) / 2$
 - $PS = (P^* - AOC) \times Q$
- How valuable the opening-up and existence to this market is to producers
- $TS = CS + PS$
- https://en.wikipedia.org/wiki/Mary_Paley_Marshall



What Good Is This Marshallian Toolkit?

- At one level simply chicken scratches...
- ...that guide you to performing near-rote calculations...
- that allow you to gain our approval...
- ...and so (perhaps) open doors to well-paying jobs in the future...



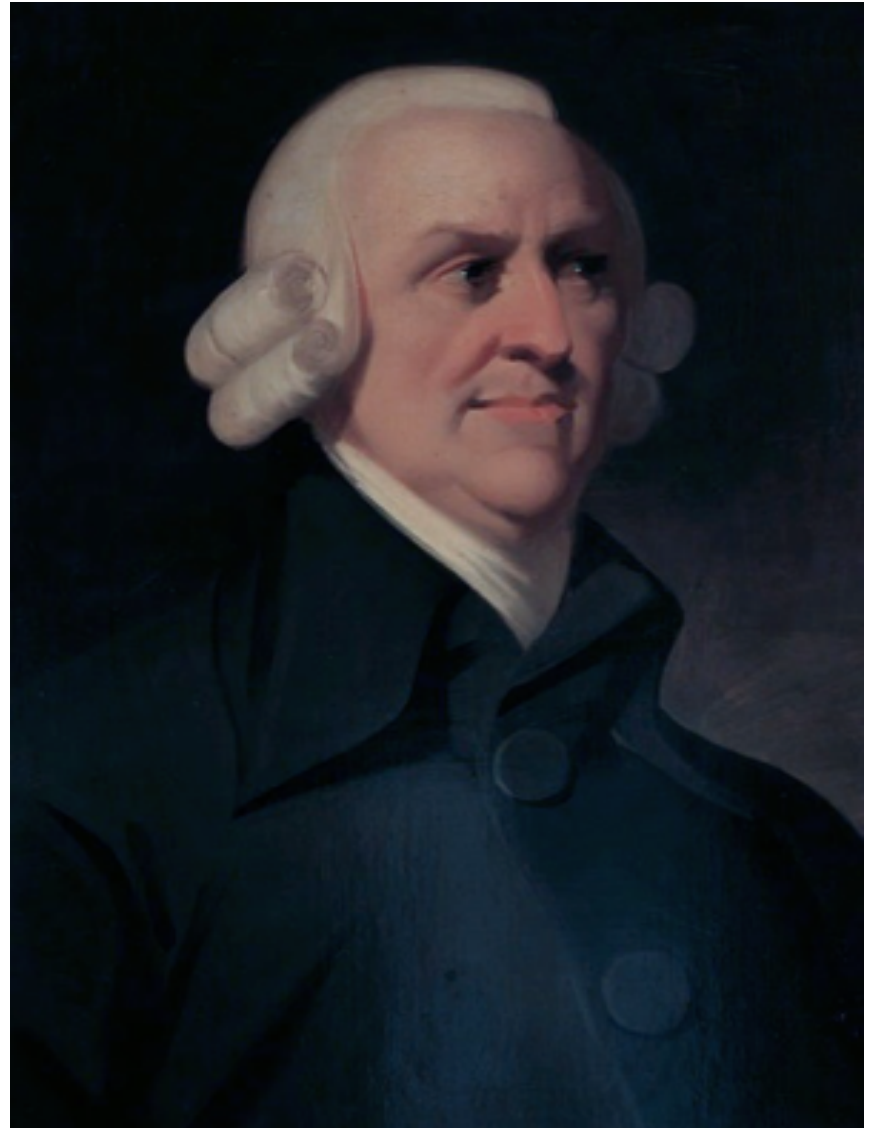
What Good Is This Marshallian Toolkit? II

- At one level simply chicken scratches...
- At another level a sophisticated and subtle analysis...
- ...of how production and distribution of a particular commodity is guided by our societal economic institutions...
- ...and what the benefits of these institutions are...
- https://en.wikipedia.org/wiki/Richard_Cantillon



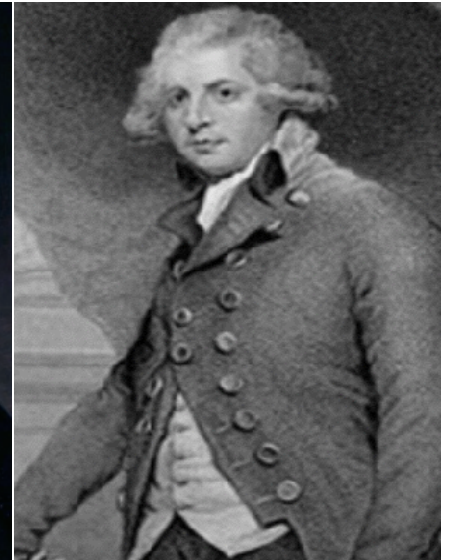
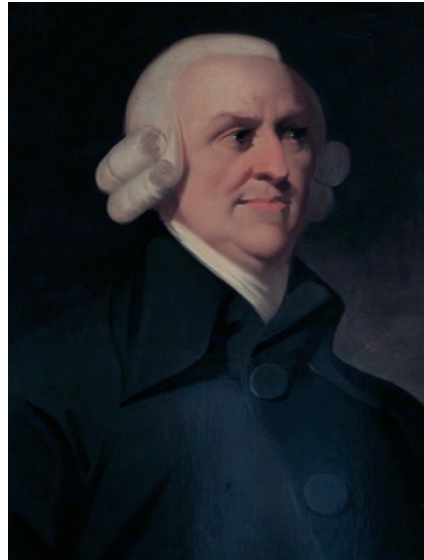
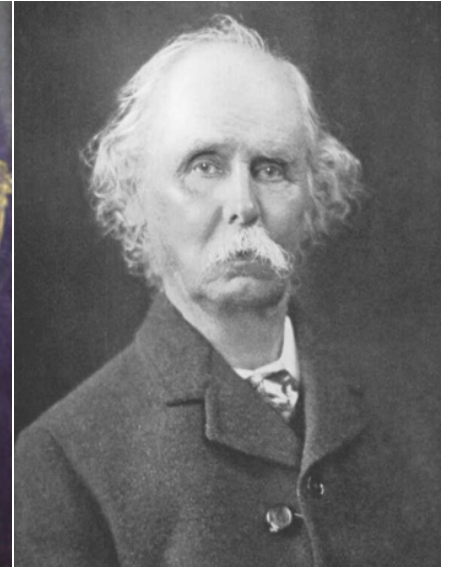
An Analysis That, Once Done...

- ...we can then adapt and replicate whenever it turns out to be useful...
- And there are many, many opportunities to adapt and replicate this analysis
- And the chicken scratches allow us to do so very quickly
- https://en.wikipedia.org/wiki/Adam_Smith



All We Need Is...

- Four things needed: the demand intercept P_{d0} ; the demand slope d ; the supply intercept P_{s0} ; the supply slope s
- The chicken scratches lead us to be able, nearly immediately, to reach powerful, subtle—and largely accurate—conclusions
- That brings us to the end of FBAH, ch. 7...



The Market System: Balance Sheet

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Balance Sheet

- The competitive market in equilibrium, from the perspective of a utilitarian greatest-good-of-the-greatest-number:
 1. Allocates the roles of producers and sellers to those who can make and sell in a way least costly to society's resources, those with the lowest *opportunity cost*.
 2. Produces at a scale that exhausts all possible win-win exchanges
 3. Allocates the goods produced to those with the greatest *willingness-to-pay*—those who, by the money standard, need and want it the most
- But the market:
 - Can be out of equilibrium
 - Can be messed up by a government that imposes quotas (then the price adjusts to make the best of a bad situation)
 - Can be messed up by a government that fixes prices (then people respond to the wrong price signals)

What Can Go Wrong with the Market?

- It can be out of equilibrium
- It can be messed up by a government that imposes quotas
 - (Then the price adjusts to make the best of a bad situation)
- It can be messed up by a government that fixes prices
 - (Then people respond to the wrong price signals)
- **Today we add: it can fail to be competitive**

CHAPTER 8

Monopoly, Oligopoly, and Monopolistic Competition

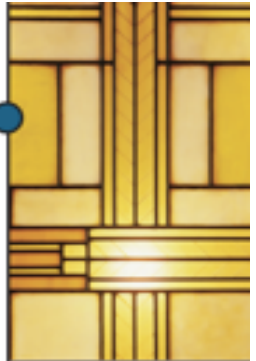


MONOPOLY SELLERS ALMOST ALWAYS OFFER DISCOUNT PRICES TO BUYERS WHO ARE WILLING TO MAIL IN A REBATE COUPON OR ENDURE SOME OTHER TYPE OF INCONVENIENCE

Some years ago, schoolchildren around the country became obsessed with the game of Magic: The Gathering. To play, you need a deck of Magic Cards, available only from the creators of the game. But unlike ordinary playing cards, which can be bought in most stores for only a dollar or two, a deck of Magic Cards sells for upward of \$10. And since Magic Cards cost no more to manufacture than ordinary playing cards, their producer earns an enormous economic profit.

In a perfectly competitive market, entrepreneurs would see this economic profit as cash on the table. It would entice them to offer Magic Cards at slightly lower prices, so that eventually the cards would sell for roughly their cost of production, just as ordinary playing cards do. But Magic Cards have been on the market for years now, and that hasn't happened. The reason is that the cards are copyrighted, which means the government has granted the creators of the game an exclusive license to sell them.

The holder of a copyright is an example of an imperfectly competitive firm, or price taker—that is, a firm with at least some latitude to set its own price. The competitive firm, by contrast, is a price taker, a firm with no influence over the price of its product.



LEARNING OBJECTIVES

After reading this chapter, you should be able to:

- LO1 Distinguish among three types of imperfectly competitive industries (monopoly, oligopoly, and monopolistic competition) and describe how imperfect competition differs from perfect competition.
- LO2 Identify the five sources of market power and describe why economies of scale are the most enduring of the various sources of monopoly power.
- LO3 Apply the concepts of marginal cost and marginal revenue to find the output level and price that maximize a monopolist's profit.
- LO4 Explain why the profit-maximizing output level for a monopolist is too small from society's perspective.
- LO5 Discuss why firms often offer discounts to buyers who are willing to jump some form of hurdle.
- LO6 Discuss public policies that are often applied to natural monopolies.

Understanding Monopoly

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Monopoly and Imperfect Competition

- In competitive markets firms (and buyers) do not think about how their decisions affect the equilibrium market price because they don't
- In markets with monopoly or market power firms do, and take account of those effects when they decide what to do
- Sources of monopoly power:
 - Exclusive control over inputs; patents and copyrights; government licenses; economies of scale and so-called “natural monopolies”; network economies...

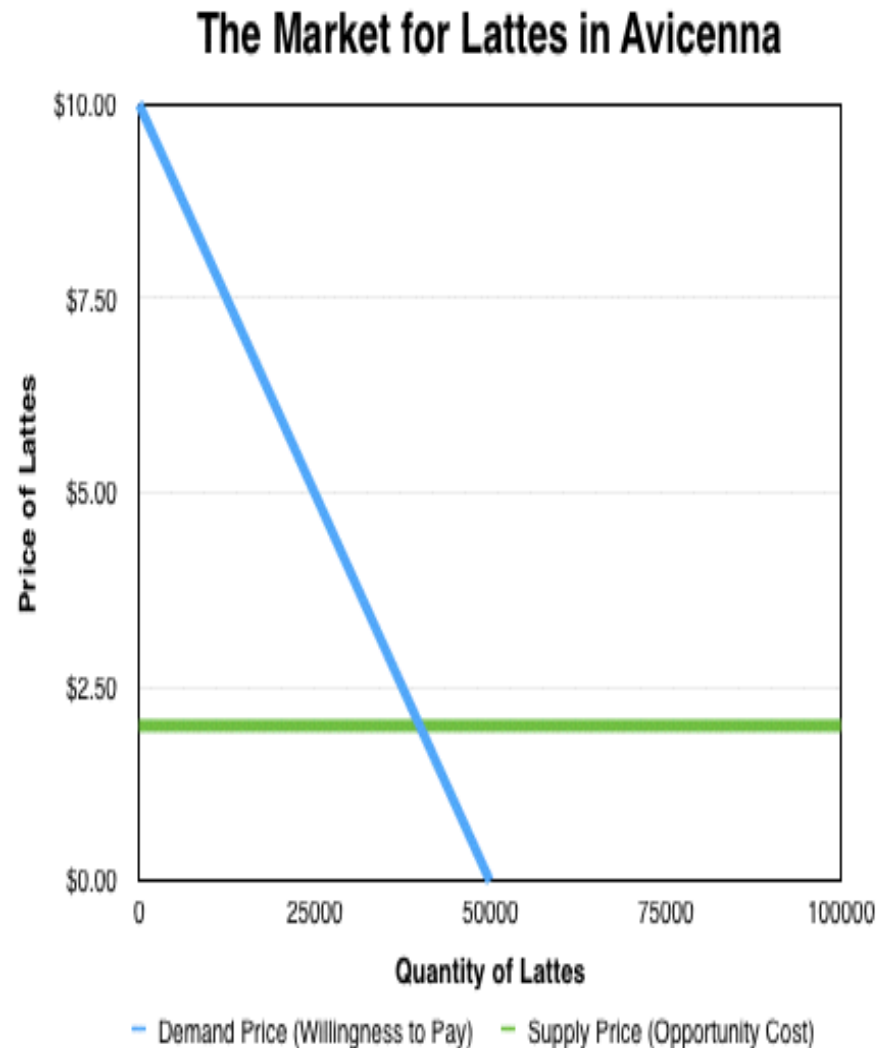
Start with a Monopoly Already Established

- A single seller...
- Has to decide how much to produce and what price to sell what it produces for...
- What does it do?
- So suppose a bunch of alumni of Crony Capitalism University in Old Stick establish a monopoly over latte production in Avicenna
- https://en.wikipedia.org/wiki/Leland_Stanford



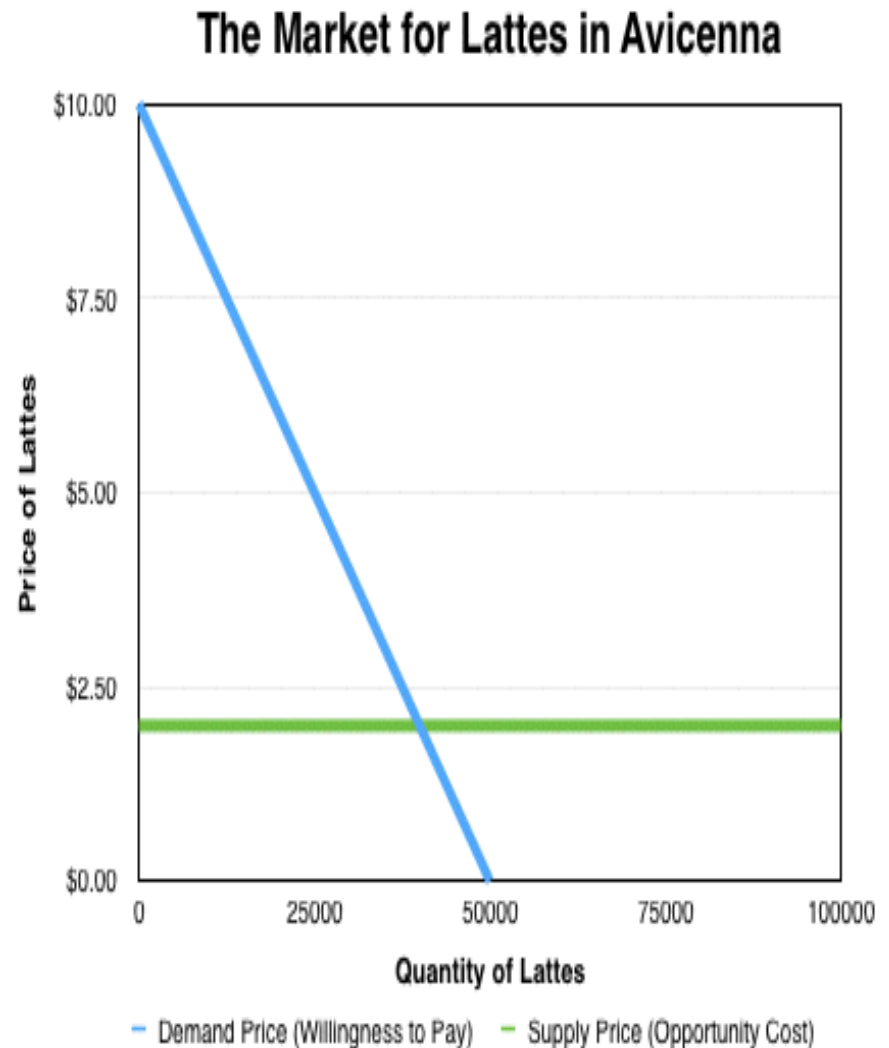
The Pre-Monopoly Equilibrium

- Suppose before the monopoly we had:
- D: $P = \$10 - 0.0002Q$
- S: $P = \$2$
- To your iClickers: what was the pre-monopoly price and quantity?
 - A. \$10/latte and 0 lattes
 - B. \$6/latte and 20000 lattes
 - C. \$4.67/latte and 25000 lattes
 - D. \$2/latte and 40000 lattes
 - E. \$2/latte and 50000



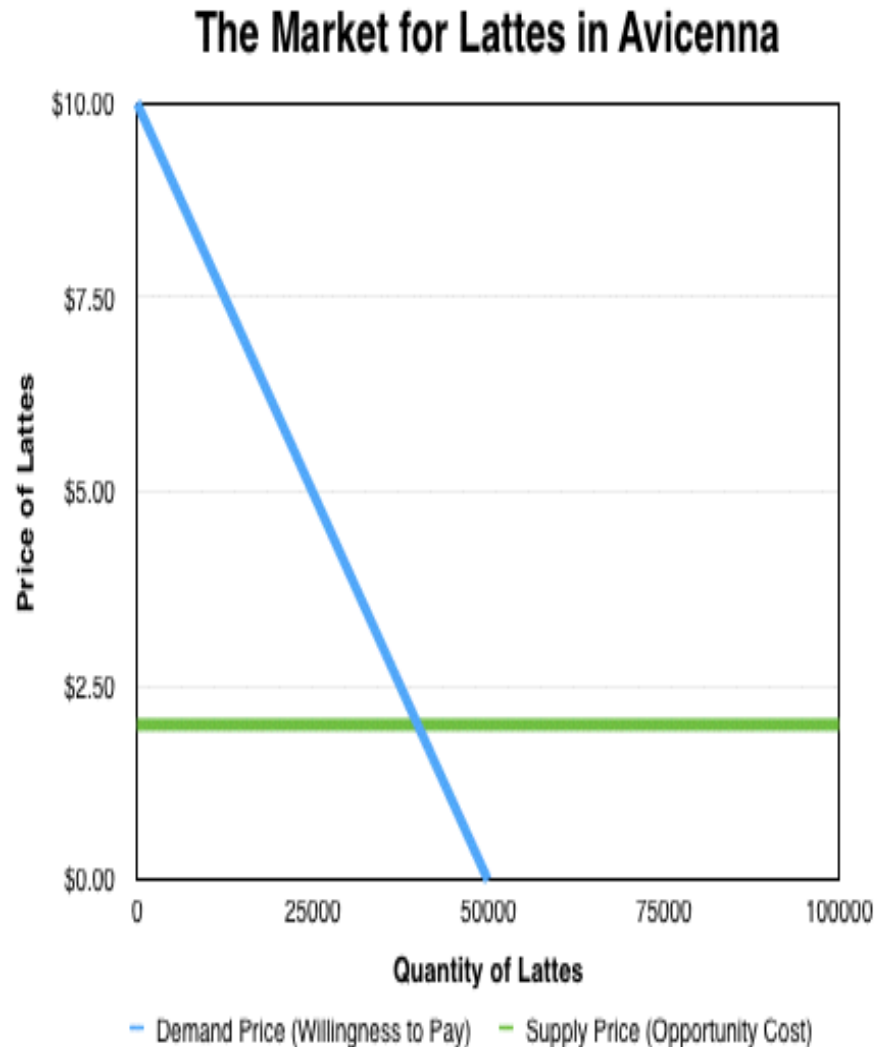
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 - C. \$4.67/latte and 25000 lattes
 - D. \$2/latte and 40000 lattes**
 - E. \$2/latte and 50000



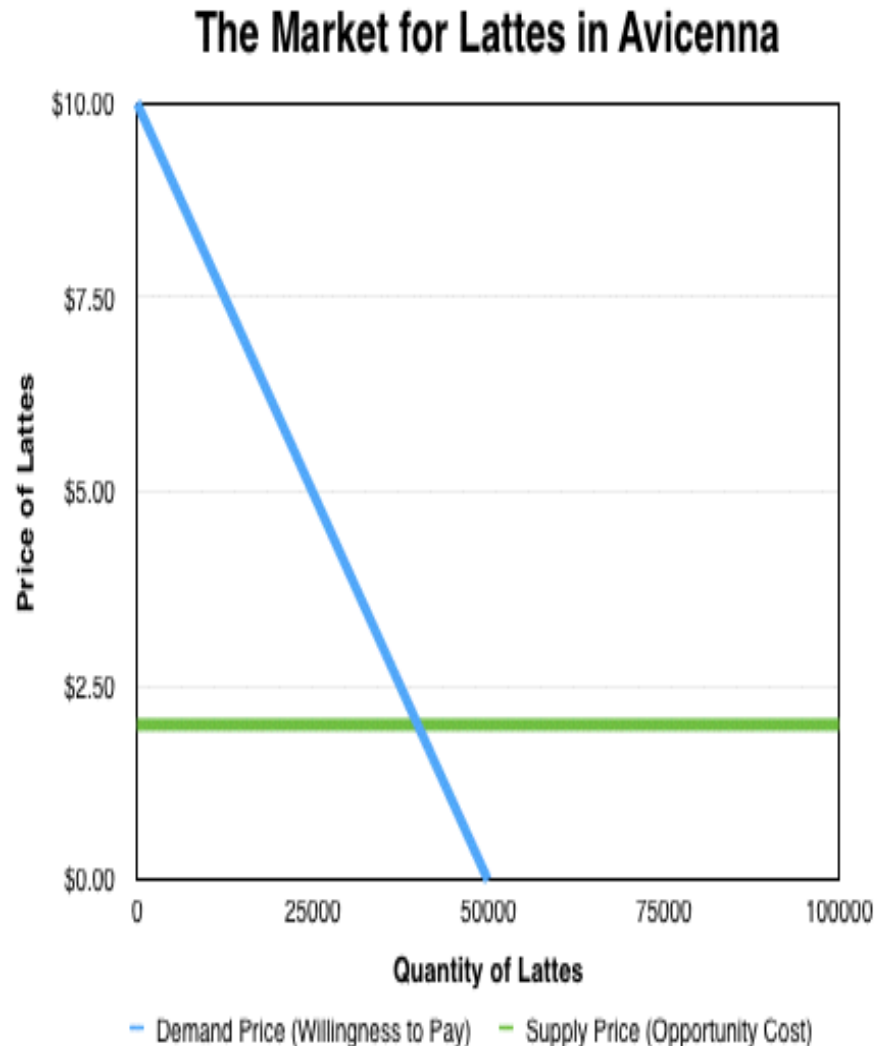
The Monopolist's Problem

- How much should the monopolist produce? And what price should it charge?
- Remember: $P = \$10 - 0.0002Q$
- To your iClickers: How much profit would the monopolist make if it produced 40000 lattes?
 - A. \$80000
 - B. \$0
 - C. \$90000
 - D. \$160000
 - E. I haven't given you enough information to say



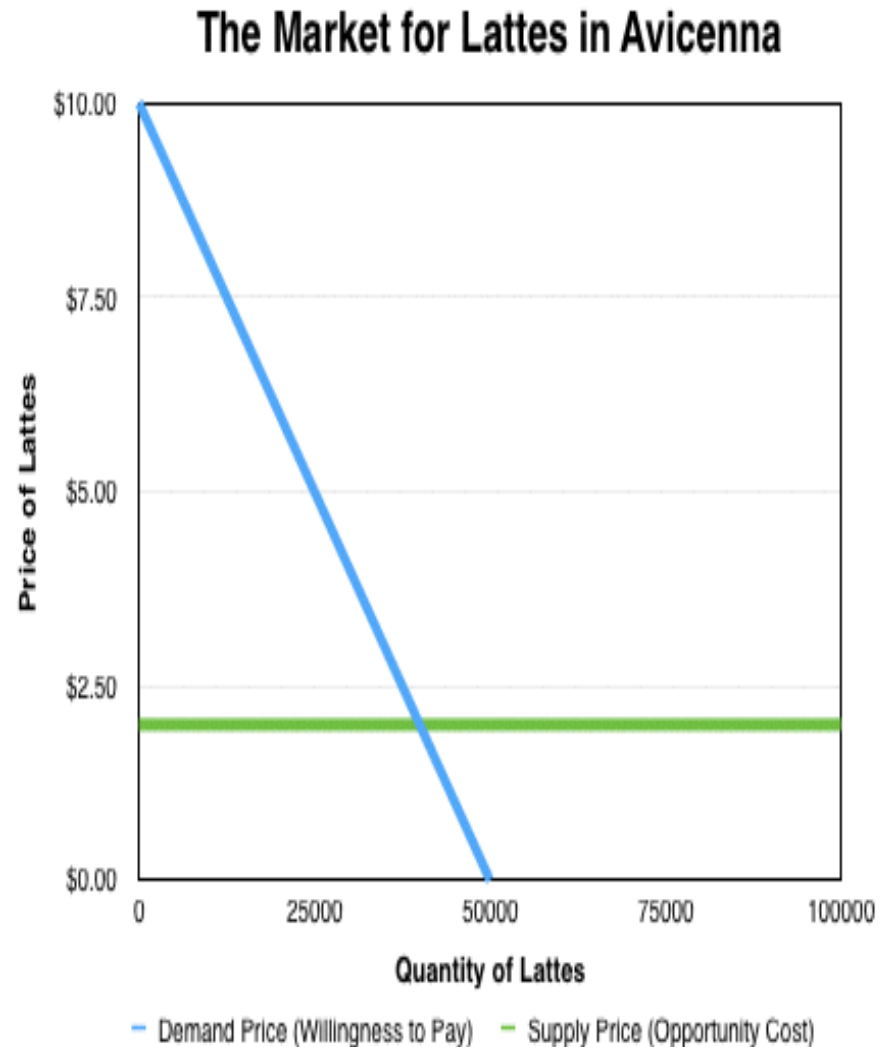
The Monopolist's Problem II

- How much should the monopolist produce? And what price should it charge?
- To your iClickers: How much profit would the monopolist make if it produced 40000 lattes?
 - A. \$80000
 - B. \$0**
 - C. \$90000
 - D. \$160000
 - E. I haven't given you enough information to say
- Why is profit zero at a production level of 40000 lattes?



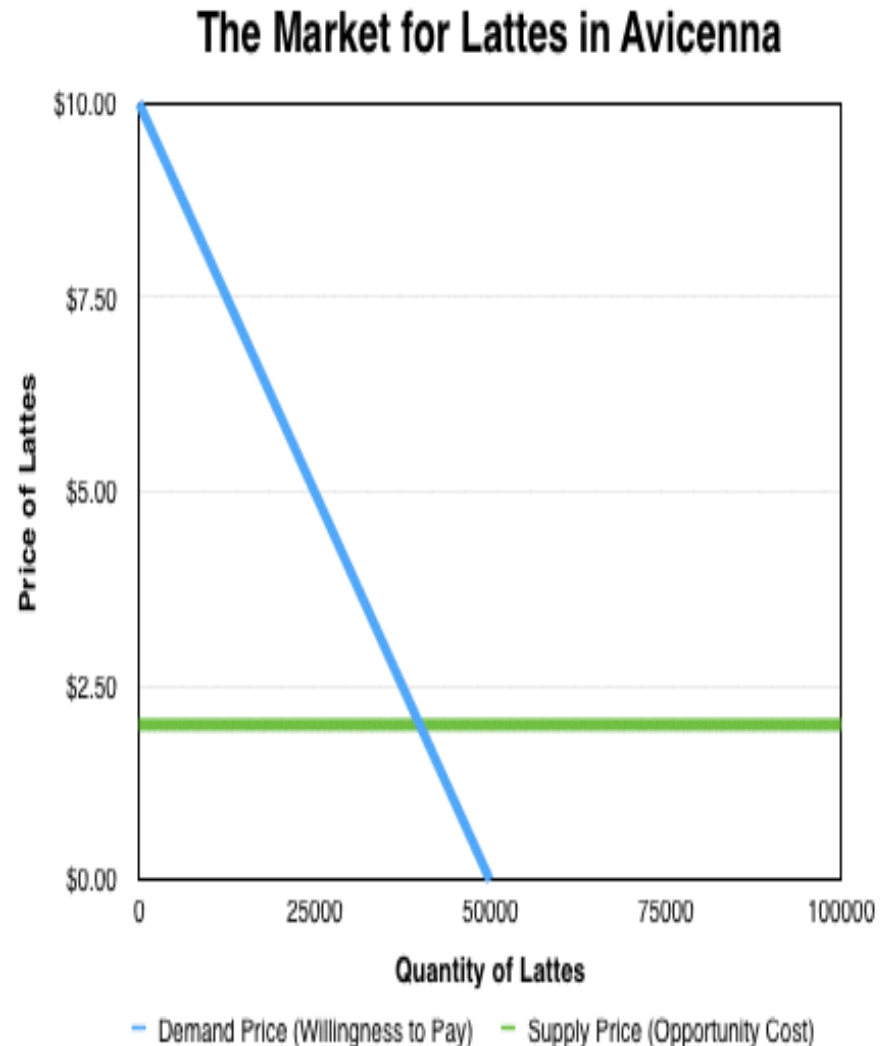
The Monopolist's Problem III

- The monopolist also makes zero in profit if it produces 0 lattes.
- To your iClickers: At what production level do you think profit is maximized?
 - A. 10000
 - B. 20000
 - C. 30000
 - D. 37500
 - E. 25000



The Monopolist's Problem IV

- To your iClickers: At what production level do you think profit is maximized?
 - A. 10000
 - B. 20000**
 - C. 30000
 - D. 37500
 - E. 25000
- I'm not going to mark off for not choosing (B). But it is (B). Let's figure out why...

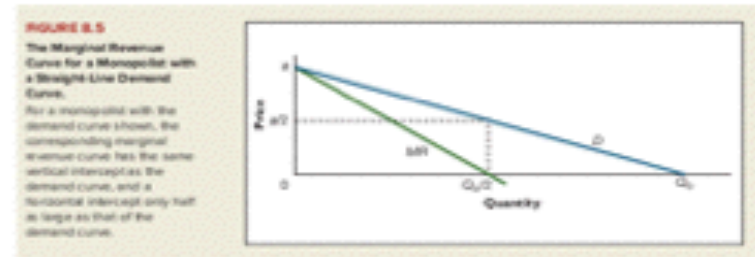


Marginal Revenue of a Monopolist

- When a monopolist cuts price, it:
 - Sells more
 - But gets less for each unit that it had already sold
- *Its extra—marginal—revenue MR is thus less than the price it charges*
- And expanding production into where $MR < \text{marginal cost } MC$ is a way to make less—or to lose—money



More generally, consider a monopolist with a straight-line demand curve whose vertical intercept is a and whose horizontal intercept is Q_D , as shown in Figure 8.5. This monopolist's marginal revenue curve also will have a vertical intercept of a , and it will be twice as steep as the demand curve. Thus, its horizontal intercept will be not Q_D but $Q_D/2$, as shown in Figure 8.5.



Marginal revenue curves also can be expressed algebraically. If the formula for the monopolist's demand curve is $P = a - bQ$, then the formula for its marginal revenue curve will be $MR = a - 2bQ$. If you have had calculus, this relationship is easy to derive,⁷ but even without calculus you can verify it by working through a few numerical examples.⁸ First, translate the formula for the demand curve into a diagram, and then construct the corresponding marginal revenue curve graphically. Starting from the graph, write the formula for the marginal revenue curve.

THE MONOPOLIST'S PROFIT MAXIMIZING DECISION RULE

Having derived the monopolist's marginal revenue curve, we're now in a position to describe how the monopolist chooses the output level that maximizes profit. As in the case of the perfectly competitive firm, the First-Best Principle says that the monopolist should continue to expand output as long as the gain from doing so exceeds the cost. At the current level of output, the benefit from expanding output is the marginal revenue value that corresponds to that output level. The cost of expanding output is the marginal cost at that level of output. Whenever marginal revenue exceeds marginal cost, the firm should expand. Conversely, whenever marginal revenue falls short of marginal cost, the firm should reduce its output. Profit is maximized at the level of output for which marginal revenue precisely equals marginal cost.

When the monopolist's profit-maximizing rule is stated in this way, we can see that the perfectly competitive firm's rule is actually a special case of the monopolist's rule. When the perfectly competitive firm expands output by one unit, its marginal revenue exactly equals the product's market price (because the perfectly competitive firm can expand sales by a unit without having to cut the price of existing units). So when the perfectly competitive firm equates price with marginal cost, it is also equating marginal revenue with marginal cost. Thus, the only significant difference between the two cases concerns the calculation of marginal revenue.



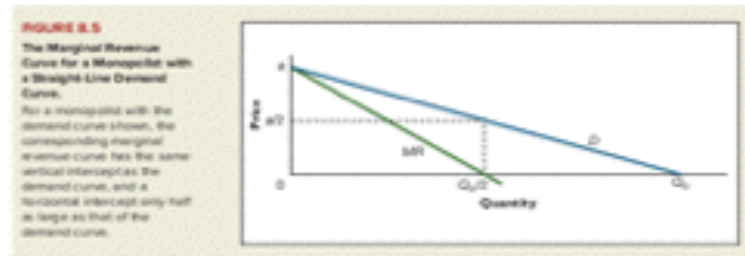
Marginal Revenue of a Monopolist

II

- FBAH say: “Consider a monopolist with a straight-line demand curve whose vertical intercept is $[P_{d0}]$ The marginal revenue curve also will have a vertical intercept of $[P_{d0}]$, and... be twice as steep...”



More generally, consider a monopolist with a straight-line demand curve whose vertical intercept is a and whose horizontal intercept is Q_D , as shown in Figure 8.5. This monopolist's marginal revenue curve also will have a vertical intercept of a , and it will be twice as steep as the demand curve. Thus, its horizontal intercept will be not Q_D but $Q_D/2$, as shown in Figure 8.5.



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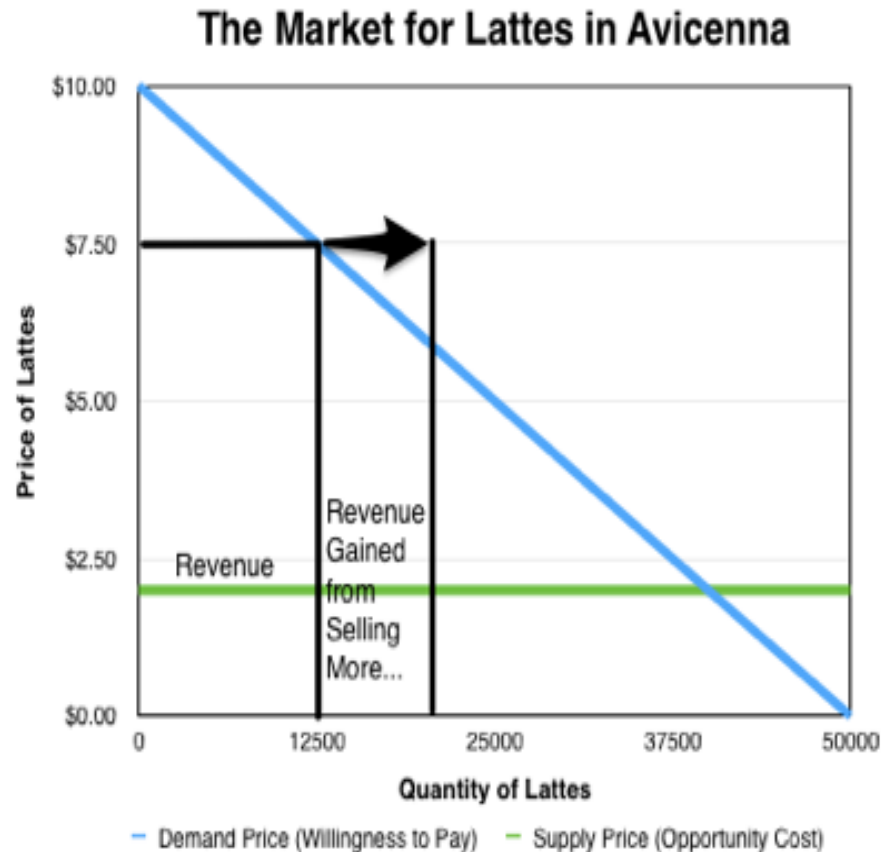
- And FBAH say: “If you have had calculus, this relationship is easy to derive, but even without... you can verify it by working through a few numerical examples...”
- But this is Berkeley.
- We—that is, you—can do better...



Marginal Revenue of a Monopolist

III

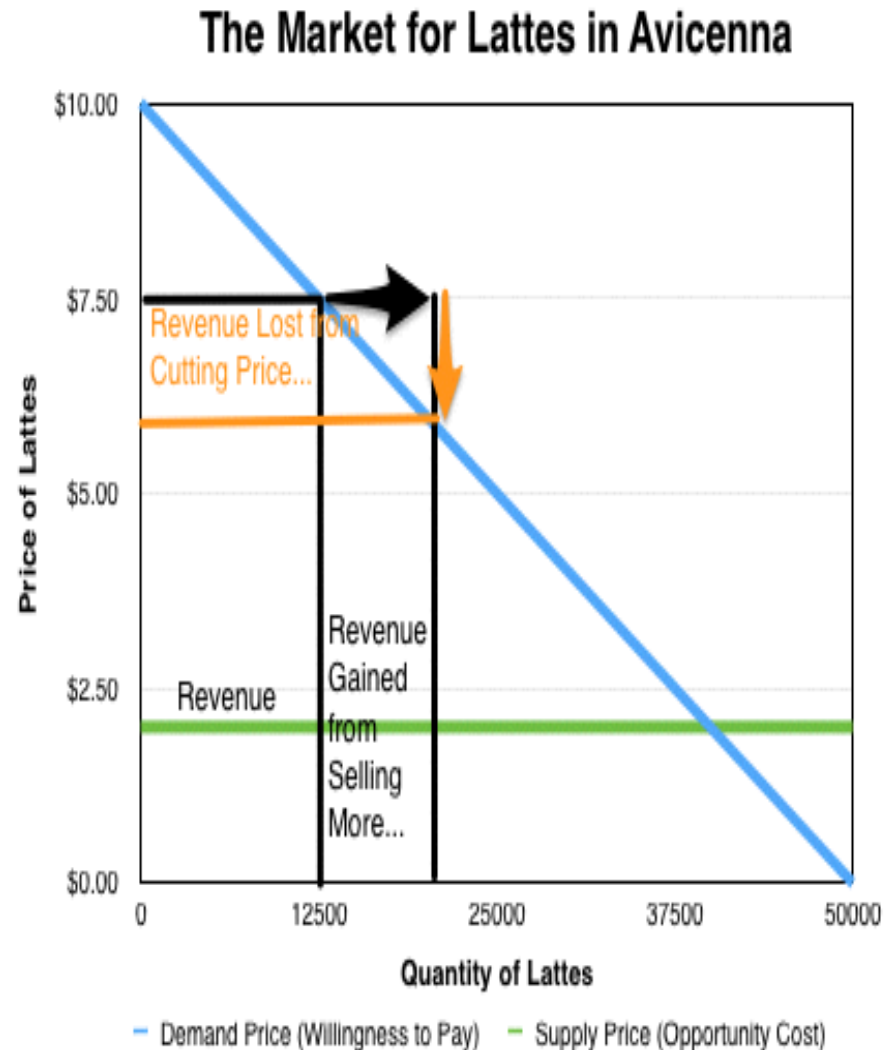
- We are going to start out producing and selling some level of production.
- We are going to ask: What is the revenue from selling an extra unit?
- The revenue gained from selling an extra unit is...
 - $RG = P_d$
 - $RG = P_{d0} - dQ$



Marginal Revenue of a Monopolist

IV

- Revenue gained from selling an extra unit...
 - $RG = P_d$
 - $RG = P_{d0} - dQ$
- But you had to cut the price in order to see that extra unit
- The revenue lost from cutting the price to sell the extra unit is...
 - $RL = - Q \times d$
- Subtract the second from the first:

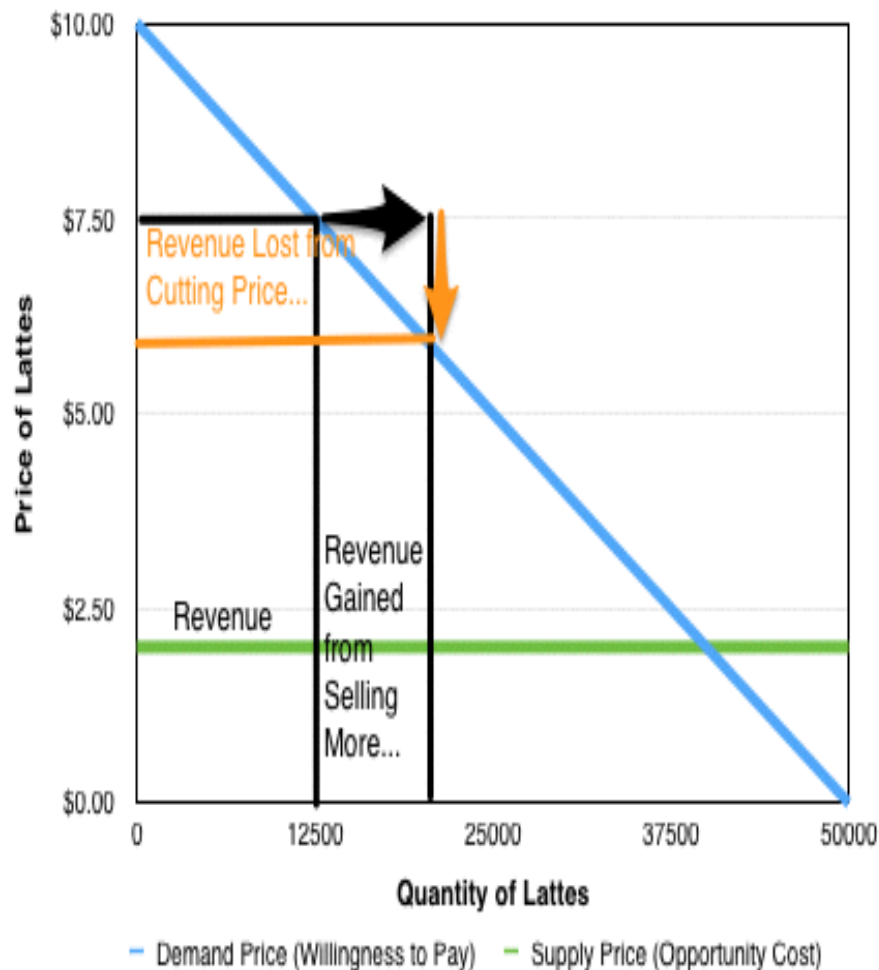


Marginal Revenue of a Monopolist

V

- Revenue gained from selling an extra unit...
 - $RG = P_d$
 - $RG = P_{d0} - dQ$
- Revenue lost from cutting the price to sell the extra unit...
 - $RL = - Q \times d$
- Subtracting the second from the first:
 - $MR = P_{d0} - dQ - dQ$
 - $MR = P_{d0} - 2dQ$
- *Marginal revenue MR is how much more revenue you get by producing and selling one more, not ...*

The Market for Lattes in Avicenna



Marginal Revenue of a Monopolist

VI

- For a monopolist
 - $MR = P_{d0} - dQ - dQ$
 - $MR = P_{d0} - 2dQ$
- Profit is maximized when $MR = MC$ —what would be the opportunity cost on the supply curve in a competitive market
- Question: why don't FBAH show this diagram—in which the black revenue-gain rectangle is $P_{d0} - dQ$ and the orange revenue-loss rectangle is dQ ?
- I haven't figured this out yet...

