

Economics 1: Introduction to Economics

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Office Hours: A Hint: Problem Set 1, Problem 2b

February 1, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley

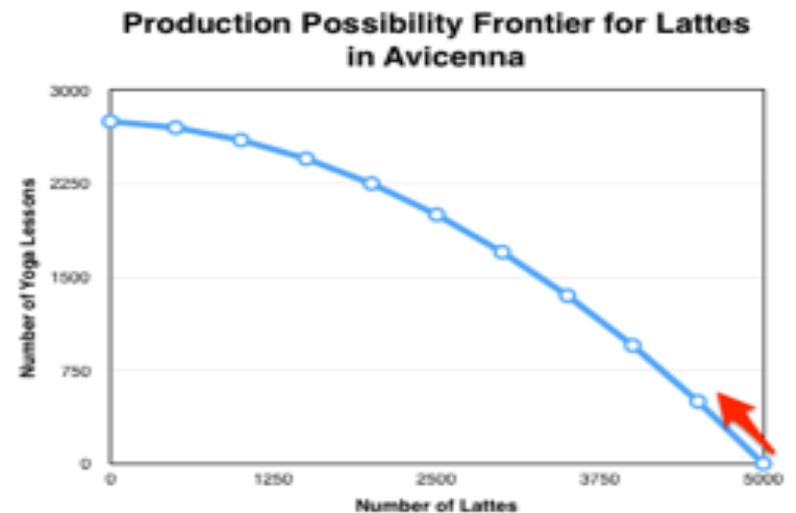
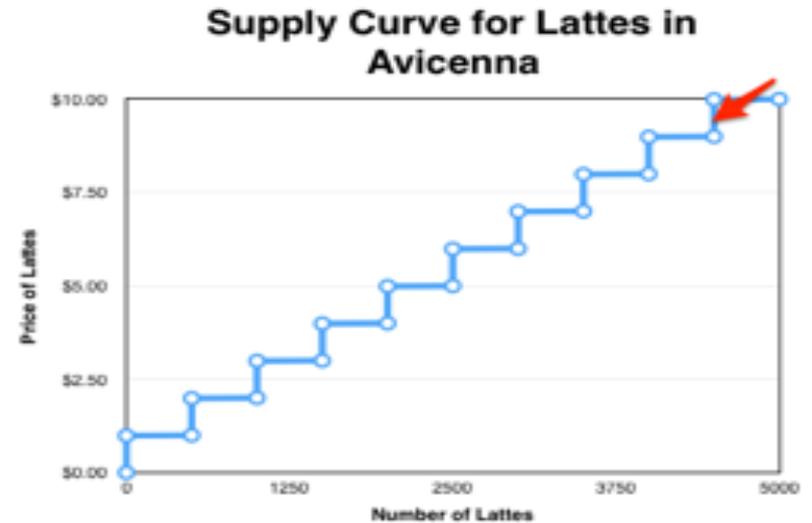
As Best as I Can Tell Over the Internet...

- Too many people are having a problem with 2b) on the problem set...
- Remember Problem 1: We gave you a table of productivities...
- And out of that you had to build the PPF and the supply curve.

Worker	Yoga Lessons Produced	Lattes Produced	Latte Comparative Advantage	Latte Price at Which They Switch...
Alfred	50	500	10.00	\$1.00
Beatrice	100	500	5.00	\$2.00
Cixi	150	500	3.33	\$3.00
Dante	200	500	2.50	\$4.00
Earendil	250	500	2.00	\$5.00
Faramir	300	500	1.67	\$6.00
Galus	350	500	1.43	\$7.00
Hrothgar	400	500	1.25	\$8.00
Indira	450	500	1.11	\$9.00
Jenghiz	500	500	1.00	\$10.00
	Memo: Yoga price = \$10/lesson			

The Table, the PPF, and the Supply Curve

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Isildur	450	500	1.11	\$9.00
Leghiz	500	500	1.00	\$10.00
	Memo: Yoga price = \$10/lesson			



Administrivia

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Webtools: Proposed Solution

- So we are going to link every file related to the course as a pdf off of: <http://www.bradford-delong.com/course-syllabus-econ-1-spring-2016-uc-berkeley.html>
- You can still get there via bCourses: that file will be mirrored and linked to at: <https://bcourses.berkeley.edu/courses/1411451/assignments/syllabus>
- And you may also want to check: <http://www.bradford-delong.com/2016/01/econ-1-spring-2016-uc-berkeley-things-moved-off-the-course-syllabus-page.html>

i>Clickers

- i>Clicker base station is supposed to appear today
- We need the base station because Wheeler does not have the wifi capacity to support 600 connections
- We need the base station because the local cellular network does not have the capacity either
- The LORD willing and the creek don't rise, we will start with i>Clickers come Monday
- Be prepared!

Surplus II

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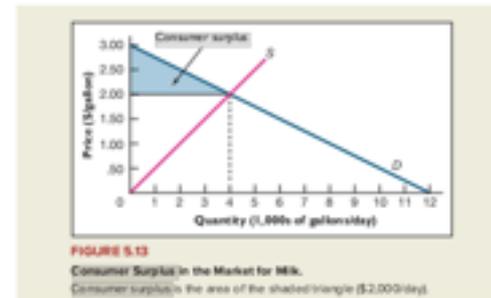
Last Week We Ended at the End of FBAH Chapter 5, Calculating Surplus

- Consumer surplus, producer surplus, and total surplus...
- The market as a machine for generating consumer utility—consumer well-being—by giving those with a high willingness-to-pay an opportunity to spend their income on something they want...
- The market as a machine for generating producer profit by giving those with a low opportunity cost the opportunity to devote their resources to producing things of the highest value, and thus gain income...
- Produces the right amount...

consumer surplus) is the cumulative difference between the most they'd be willing to pay for milk (as measured on the demand curve) and the price they actually pay.

Total consumer surplus received by buyers in the milk market is thus the shaded triangle between the demand curve and the market price in Figure 5.13. Note that this area is a right triangle whose vertical arm is $h = \$1$ gallon and whose horizontal arm is $b = 4,000$ gallons/day. And since the area of any triangle is equal to $(1/2)bh$, consumer surplus in this market is equal to

$$(1/2)(4,000 \text{ gallons/day})(\$1/\text{gallon}) = \$2,000/\text{day}$$



A useful way of thinking about consumer surplus is to ask what is the highest price consumers would pay, in the aggregate, for the right to continue participating in this milk market. The answer is \$2,000 per day, since that's the amount by which their combined benefit exceeds their combined costs.

As discussed in the chapter on supply and demand, the demand curve for a good can be interpreted either horizontally or vertically. The horizontal interpretation tells us, for each price, the total quantity that consumers wish to buy at that price. The vertical interpretation tells us, for each quantity, the most a buyer would be willing to pay for the good at that quantity. For the purpose of computing consumer surplus, we rely on the vertical interpretation of the demand curve. The value on the vertical axis that corresponds to each point along the demand curve corresponds to the marginal buyer's reservation price for the good. Consumer surplus is the cumulative sum of the differences between these reservation prices and the market price. It is the area bounded above by the demand curve and bounded below by the market price.

◉ SUMMARY ◉

• The rational consumer allocates income among different goods so that the marginal utility gained from the last dollar spent on each good is the same. This rational

spending rule gives rise to the law of demand, which states that people do less of what they want to do as the cost of doing it rises. Here, "roof" refers to the sum of all

There Follows Chapter 6, “Perfectly Competitive Supply”

- Lots of good stuff in chapter 6...
- The chapter focuses on “perfect competition” and producer surplus
- In a year-long course we would spend a week on it...
- In this course, no time: we skip over it:
 - We did producer surplus last time
 - “Perfect competition”: a situation in which no business has any *permanent* advantage in terms of a lower opportunity cost than any other...

and vice versa. And this ensures that the marginal cost curve must pass through the minimum points of both average cost curves.

Seeing the bottle maker's *AVC* curve displayed graphically makes the question posed in Concept Check 6.4 much easier to answer. The question, recall, was whether the firm should shut down in the short run if the price per bottle was only \$0.10. A glance at Figure 6.5 reveals that the firm should indeed shut down because this price lies below the minimum value of its *AVC* curve, making it impossible for the firm to cover its variable costs at any output level.

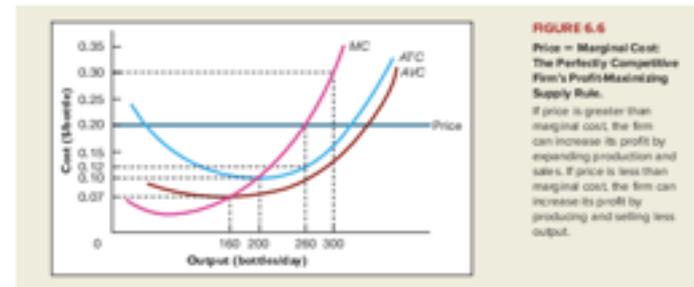
PRICE = MARGINAL COST: THE MAXIMUM-PROFIT CONDITION

So far, we've implicitly assumed that the bottle maker could employ workers only in whole-number amounts. Under these conditions, we saw that the profit-maximizing output level was one for which marginal cost was somewhat less than price (because adding yet another employee would have pushed marginal cost higher than price). In the next example, we'll see that when output and employment can be varied continuously, the maximum-profit condition is that price be equal to marginal cost.

The Graphical Approach to Profit Maximization

EXAMPLE 6.3

For the bottle maker whose cost curves are shown in Figure 6.6, find the profit-maximizing output level if bottles sell for \$0.20 each. How much profit will this firm earn? What is the lowest price at which this firm would continue to operate in the short run?

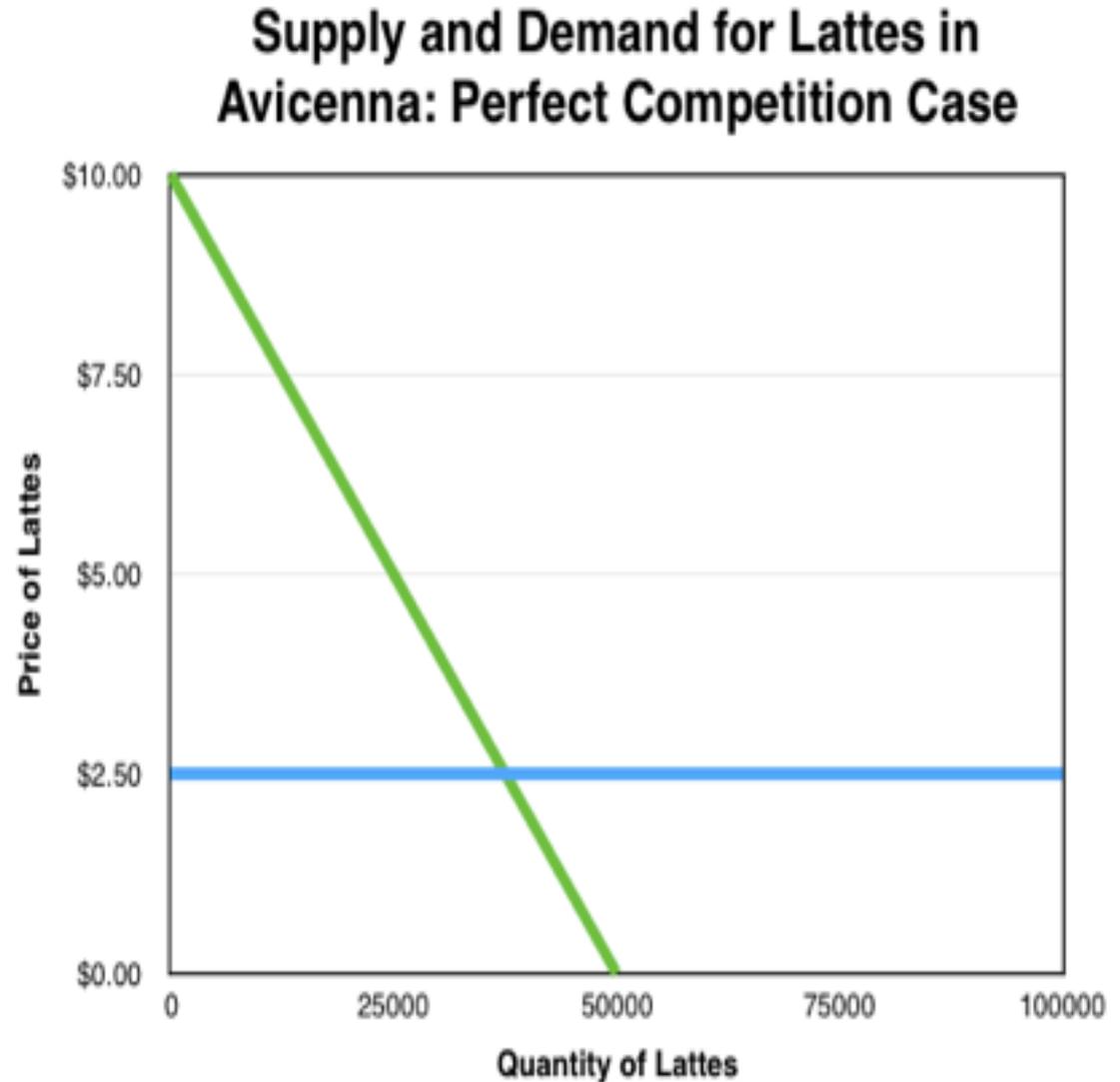


The Cost-Benefit Principle tells us that this firm should continue to expand as long as price is at least as great as marginal cost. In Figure 6.6 we see that if the firm follows this rule, it will produce 200 bottles per day, the quantity at which price and marginal cost are equal. To gain further confidence that 200 must be the profit-maximizing quantity when the price is \$0.20 per bottle, first suppose that the firm had sold some amount less than that—say, only 100 bottles per day. Its benefit from expanding output by one bottle would then be the bottle's market price, here 20 cents. The cost of expanding output by one bottle is equal (by definition) to the firm's marginal cost, which at 100 bottles per day is only 10 cents (see Figure 6.6). So by selling the 201st bottle for 20 cents and producing it for an extra cost of only 10 cents, the firm will increase its profit by $20 - 10 = 10$ cents.

Cost-Benefit

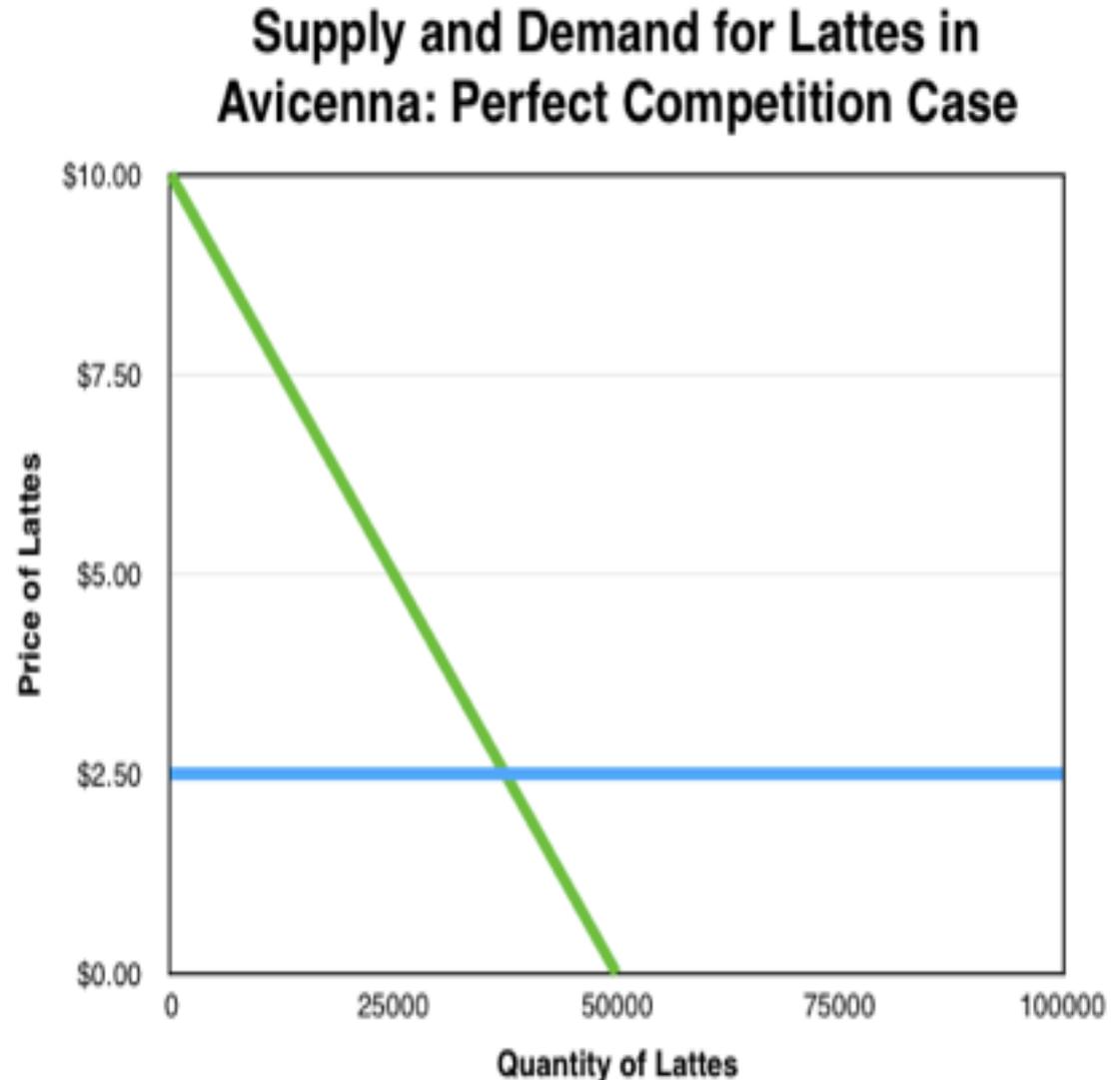
What Does Your Supply Curve Look Like If No Producer Has an Opportunity-Cost Advantage?

- Demand Curve:
 - $P = P_{d0} - dQ_d$
 - $P = 10 - 0.0002Q_d$
- The supply curve is?



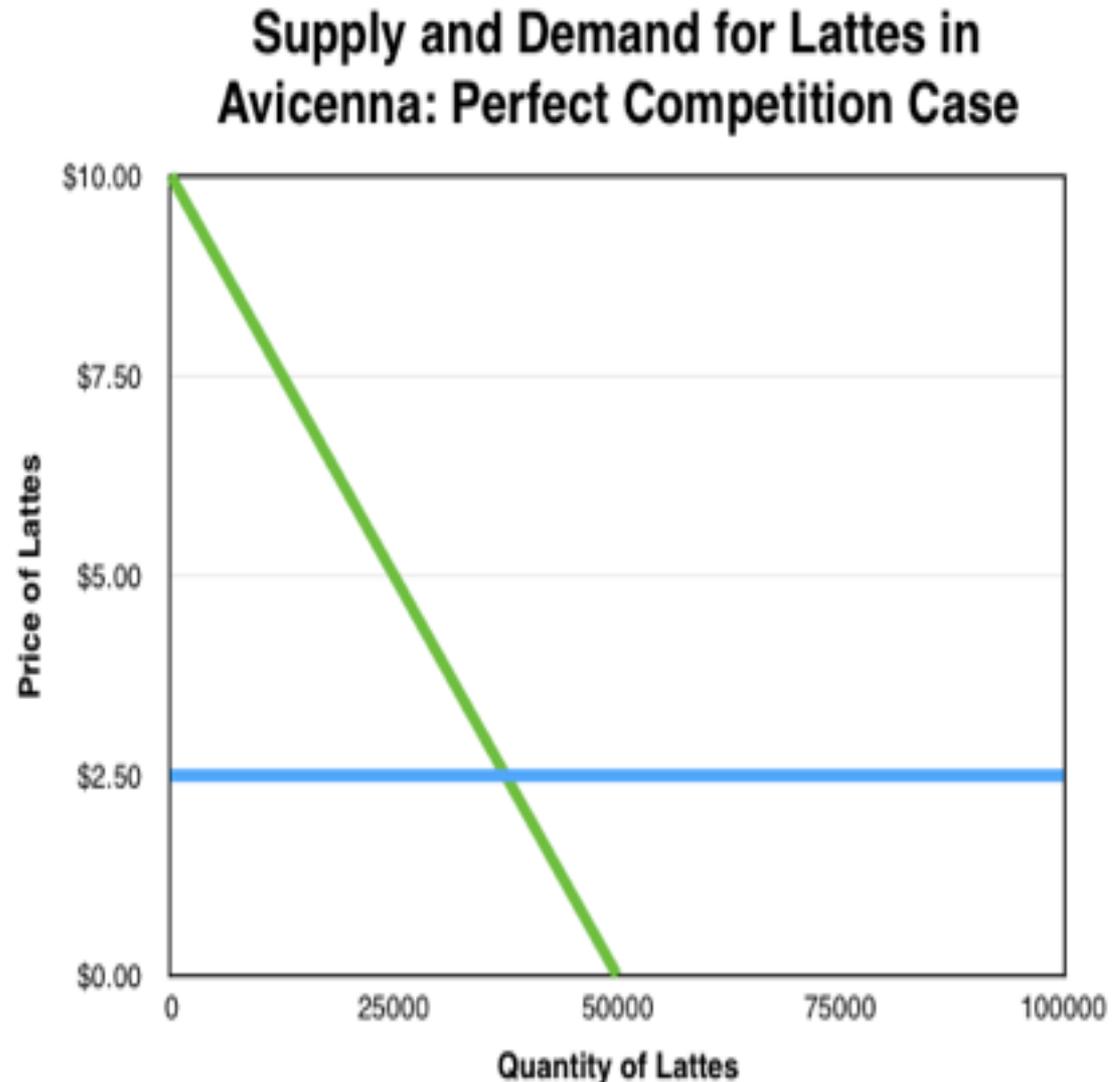
What Does Your Supply Curve Look Like If No Producer Has an Opportunity-Cost Advantage? II

- Demand Curve:
 - $P = P_{d0} - dQ_d$
 - $P = 10 - 0.0002Q_d$
- The supply curve is?
 - Suppose that everyone has an opportunity cost of producing lattes of \$2.50/latte...



What Does Your Supply Curve Look Like If No Producer Has an Opportunity-Cost Advantage? III

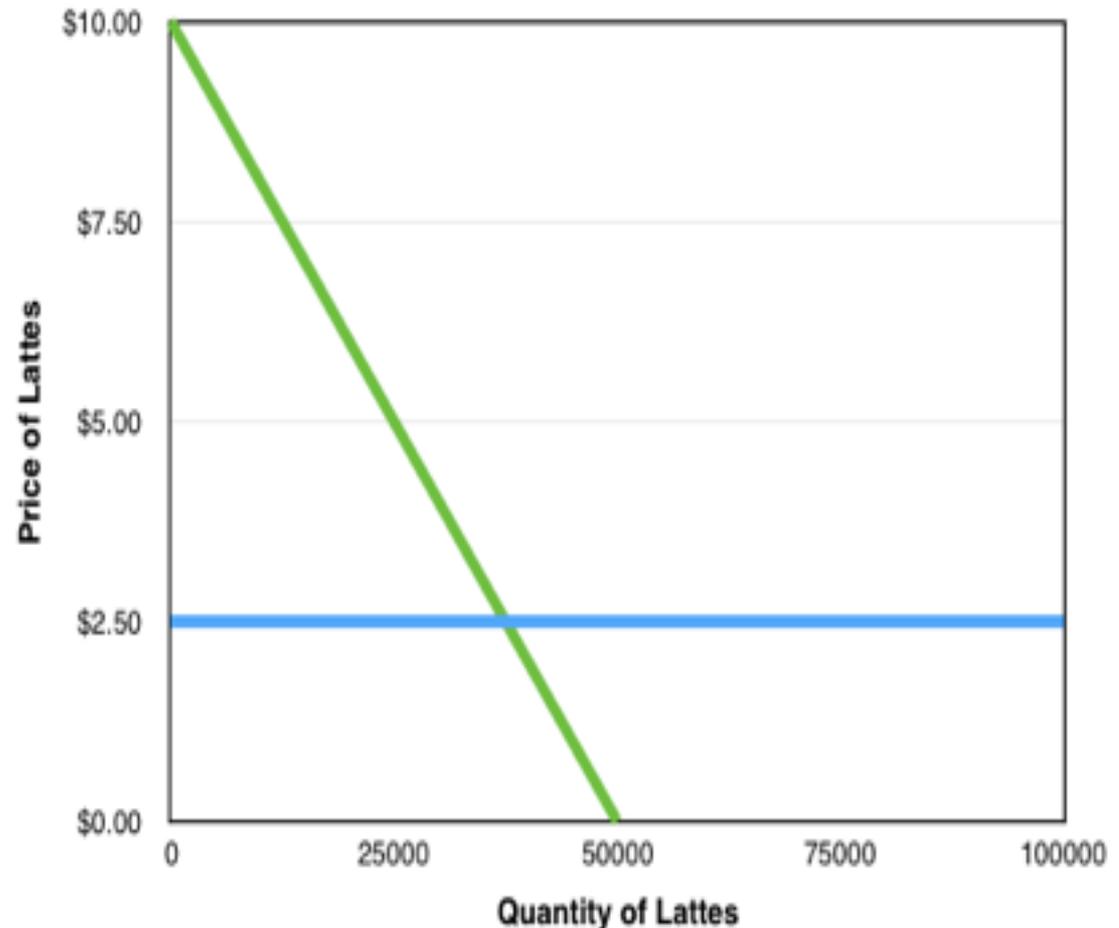
- Demand Curve:
 - $P = P_{d0} - dQ_d$
 - $P = 10 - 0.0002Q_d$
- The supply curve is?
 - Suppose that everyone has an opportunity cost of producing lattes of \$2.50/latte...
 - The supply curve is flat—perfectly elastic—at a price of \$2.50



What Does Your Supply Curve Look Like If No Producer Has an Opportunity-Cost Advantage? IV

- Demand Curve:
 - $P = P_{d0} - dQ_d$
 - $P = 10 - 0.0002Q_d$
- Supply Curve:
 - $P = \$2.50$
- Equilibrium: $P = \$2.50$,
 $Q = 37500$
- Calculating surplus:
Average producer opportunity-cost = \$2.50.

Supply and Demand for Lattes in Avicenna: Perfect Competition Case



What Does Your Supply Curve Look Like If No Producer Has an Opportunity-Cost Advantage? V

- Demand Curve:

- $P = P_{d0} - dQ_d$
- $P = 10 - 0.0002Q_d$

- Supply Curve:

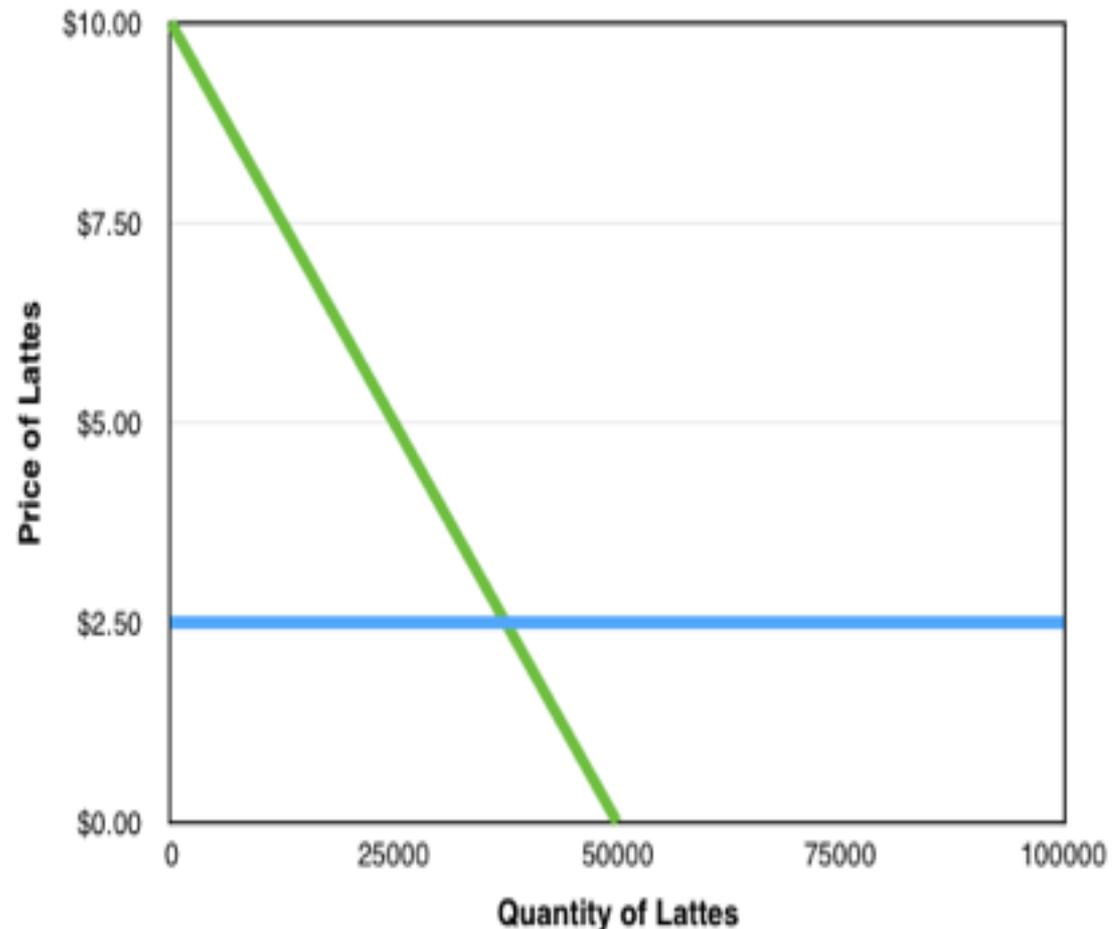
- $P = \$2.50$

- Equilibrium: $P = \$2.50$,
 $Q = 37500$

- Calculating surplus: Average producer opportunity-cost = $\$2.50$. $P = \$2.50$. No producer surplus

- Calculating surplus: Average consumer willingness-to-pay = $(\$10 + \$2.50) / 2 = \$6.25$.

Supply and Demand for Lattes in Avicenna: Perfect Competition Case



What Does Your Supply Curve Look Like If No Producer Has an Opportunity-Cost Advantage? VI

- Demand Curve:

- $P = P_{d0} - dQ_d$
- $P = 10 - 0.0002Q_d$

- Supply Curve:

- $P = \$2.50$

- Equilibrium: $P = \$2.50$,
 $Q = 37500$

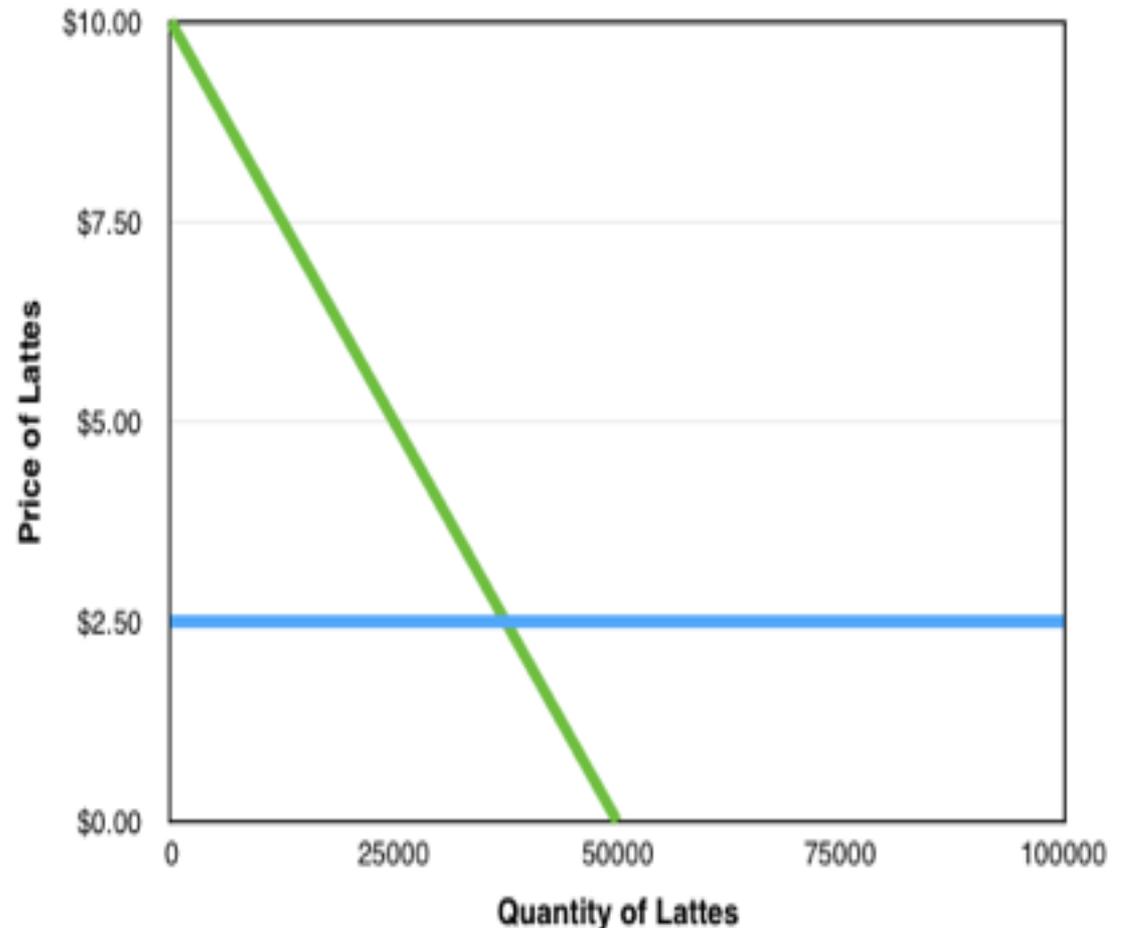
- Calculating surplus: Average producer opportunity-cost = \$2.50. $P = \$2.50$. No producer surplus

- Calculating surplus: Average consumer willingness-to-pay = $(\$10 + \$2.50) / 2 = \$6.25$. Price = \$2.50.

- $CS = 37500 \times (\$6.25 - \$2.50)$

- $CS = \$146,025$

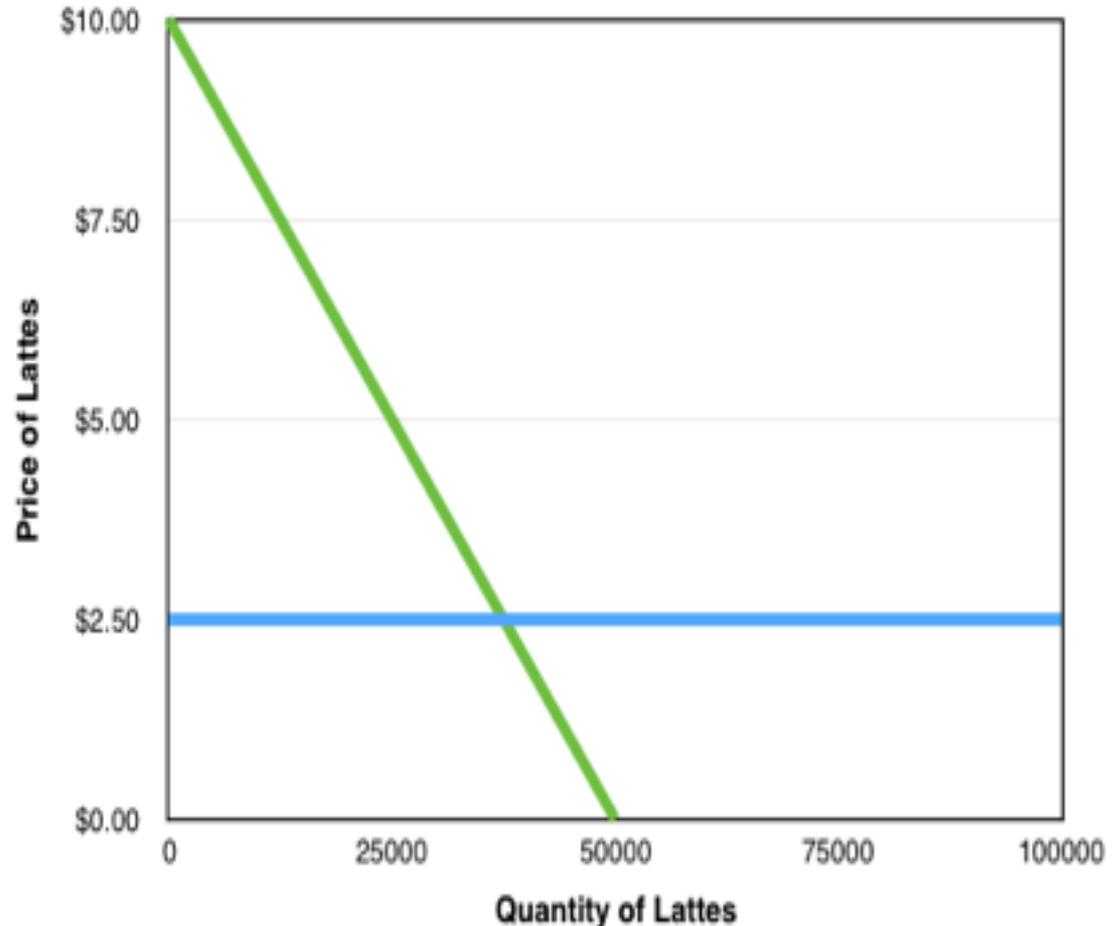
Supply and Demand for Lattes in Avicenna: Perfect Competition Case



Isn't It Interesting That...

- Where producers most have their act together—where they can share resources and technologies and quickly expand production cheaply...
- They do not receive any producer surplus?
- A perfectly-competitive market is a consumer surplus-generating machine

Supply and Demand for Lattes in Avicenna: Perfect Competition Case



And That Brings Us to the End of Chapter 6...

- That's all we have time for in chapter 6
- But read and pay attention to the “theory of the firm” stuff
- How large a profit-maximizing firm decides to be...
- How much profit it makes in the *short run*...
- And how the short run turns into the *long run* in which there is no producer surplus—in which factors of production all receive only their opportunity cost...

and vice versa. And this ensures that the marginal cost curve must pass through the minimum points of both average cost curves.

Seeing the bottle maker's ATC curve displayed graphically makes the question posed in Concept Check 6.4 much easier to answer. The question, recall, was whether the firm should shut down in the short run if the price per bottle was only \$0.10. A glance at Figure 6.5 reveals that the firm should indeed shut down because this price lies below the minimum value of its ATC curve, making it impossible for the firm to cover its variable costs at any output level.

PRICE = MARGINAL COST: THE MAXIMUM-PROFIT CONDITION

So far, we've implicitly assumed that the bottle maker could employ workers only in whole-number amounts. Under these conditions, we saw that the profit-maximizing output level was one for which marginal cost was somewhat less than price (because adding yet another employee would have pushed marginal cost higher than price). In the next example, we'll see that when output and employment can be varied continuously, the maximum-profit condition is that price be equal to marginal cost.

The Graphical Approach to Profit Maximization

EXAMPLE 6.3

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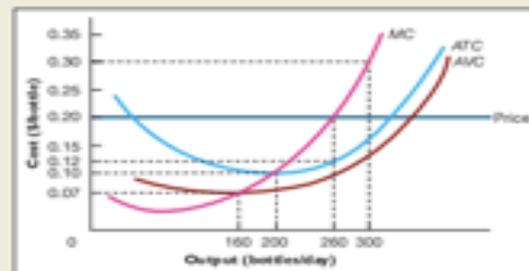


FIGURE 6.6

Price = Marginal Cost: The Perfectly Competitive Firm's Profit-Maximizing Supply Rule.

If price is greater than marginal cost, the firm can increase its profit by expanding production and sales. If price is less than marginal cost, the firm can increase its profit by producing and selling less output.

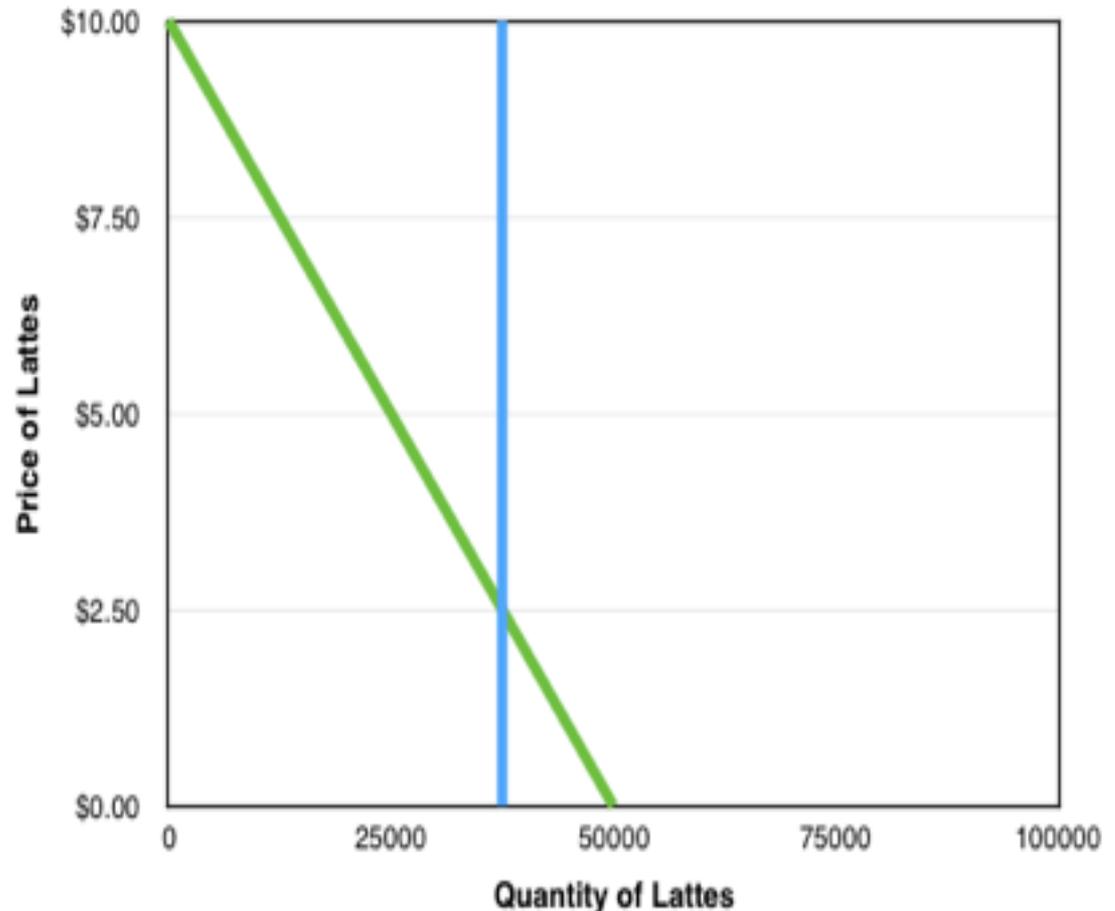
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Cost-Benefit

What Does Your Supply Curve Look Like If There Is No Supply Elasticity at All?

- Demand Curve:
 - $P = P_{d0} - dQ_d$
 - $P = 10 - 0.0002Q_d$
- Supply Curve:
 - $Q = 37500$
- Equilibrium: $P = \$2.50$,
 $Q = 37500$
- Calculating surplus: Average producer opportunity-cost = \$0. $P = \$2.50$.

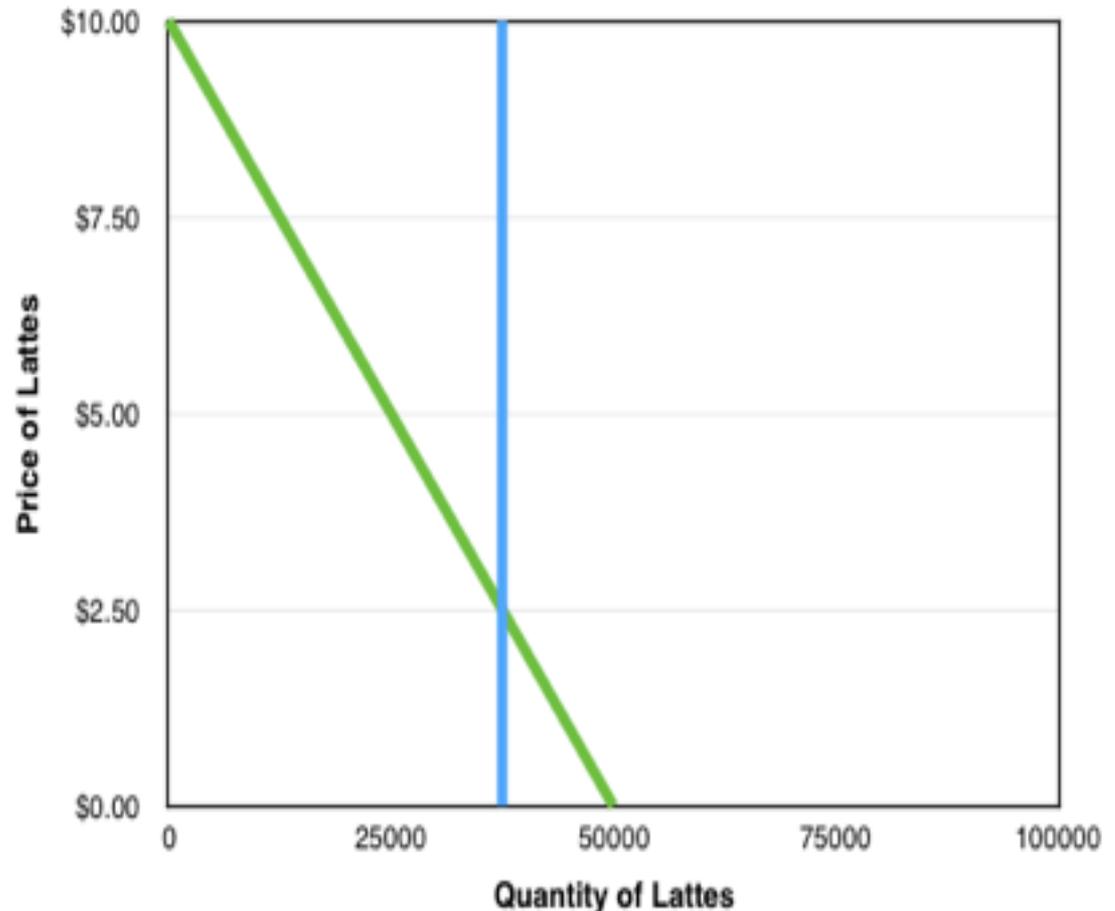
Supply and Demand for Lattes in Avicenna: Perfect Rent Case



What Does Your Supply Curve Look Like If There Is No Supply Elasticity at All?

- Demand Curve:
 - $P = P_{d0} - dQ_d$
 - $P = 10 - 0.0002Q_d$
- Supply Curve:
 - $Q = 3750$
- Equilibrium: $P = \$2.50$, $Q = 3750$
- Calculating surplus: Average producer opportunity-cost = \$0. $P = \$2.50$.
- $PS = 3750 \times \$250$
- $PS = \$9375$
- Producers are, here, useless: they don't do anything—they can't—to expand production. They don't sacrifice anything in order to produce
- Yet they are well-rewarded

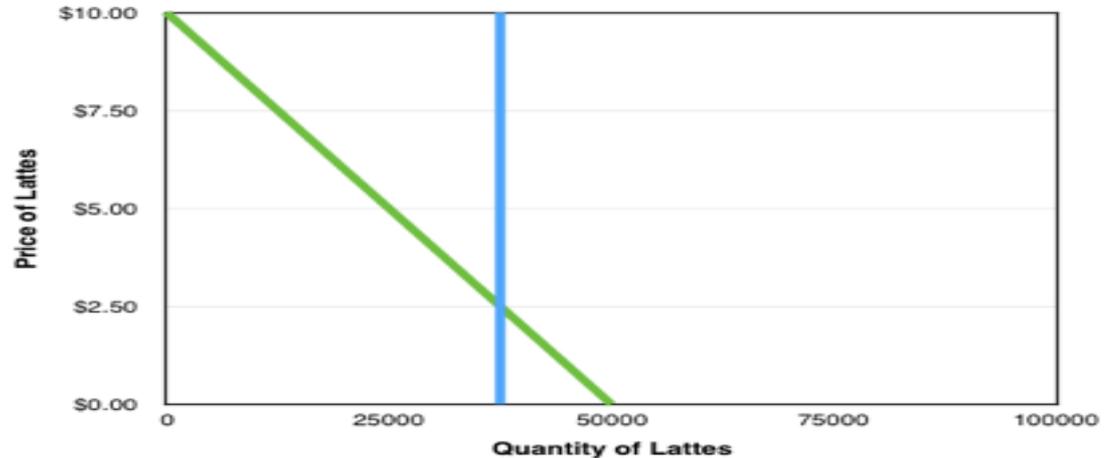
Supply and Demand for Lattes in Avicenna: Perfect Rent Case



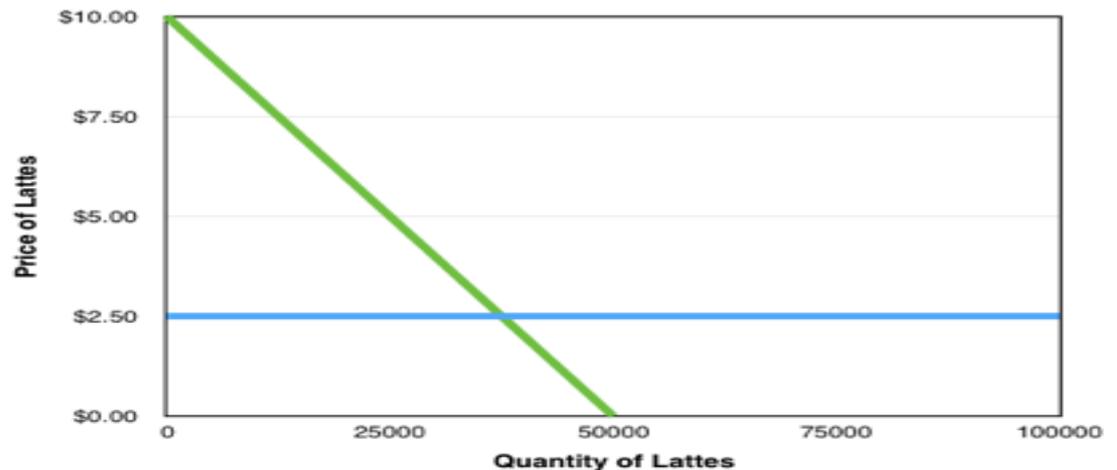
These Observations Are the Root of the Socialist Critique of the Market

- When producers are parasitic, static, and monopolistic, they are amply rewarded
- When producers are contributors, expanding, sharing, and competitive, they get little

Supply and Demand for Lattes in Avicenna: Perfect Rent Case



Supply and Demand for Lattes in Avicenna: Perfect Competition Case



Quotas

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On to FBAH Chapter 7: Efficiency, Exchange, and the “Invisible Hand” of the Market in Action

- A competitive market in equilibrium produces one piece of information: the equilibrium price
- That price of information and the market mechanism then:
 - Ration consumption—only those consumers with a willingness-to-pay higher than the price consume
 - Direct production—only those potential producers with an opportunity-cost lower than the price produce
 - Proper scale of operation...
- In so doing, the market produces the maximum money-value surplus
- In the sense of maximizing money-value surplus, we can't do better *in this case*

THE INVISIBLE HAND THEORY

TWO FUNCTIONS OF PRICE

In the free enterprise system, market prices serve two important and distinct functions. The first, the **rationing function of price**, is to distribute scarce goods among potential claimants, ensuring that those who get them are the ones who value them most. Thus, if three people want the only antique clock for sale at an auction, the clock goes home with the person who bids the most for it. The second function, the **allocative function of price**, is to direct productive resources to different sectors of the economy. Resources leave markets in which price cannot cover the cost of production and enter those in which price exceeds the cost of production.

Both the allocative and rationing functions of price underlie Adam Smith's celebrated **theory of the invisible hand** of the market. Recall that Smith thought the market system channeled the selfish interests of individual buyers and sellers so as to promote the greatest good for society. The **quest for economic profit** and the **stick of economic loss**, he argued, were the only forces necessary to ensure that existing supplies in any market would be allocated efficiently and that resources would be allocated across markets to produce the most efficient possible mix of goods and services.

RESPONSES TO PROFITS AND LOSSES

To get a feel for how the invisible hand works, we begin by looking at how firms respond to economic profits and losses. If a firm is to remain in business in the long run, it must cover all its costs, both explicit and implicit. A firm's **normal profit** is just a cost of doing business. Thus, the owner of a firm that earns no more than a normal profit has managed only to recover the opportunity cost of the resources invested in the firm. By contrast, the owner of a firm that makes a positive economic profit earns more than the opportunity cost of the invested resources; she earns a normal profit and then some.

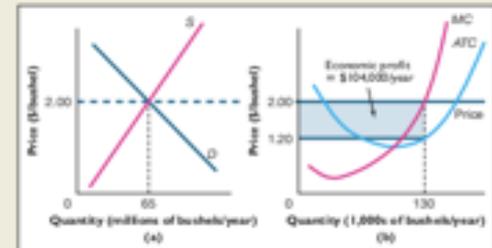
Naturally, everyone would be delighted to earn more than a normal profit, and no one wants to earn less. The result is that those markets in which firms are earning an economic profit tend to attract additional resources, whereas markets in which firms are experiencing economic losses tend to lose resources.

To see how this happens, we'll examine the workings of the market for corn, whose short-run supply and demand curves are shown in Figure 7.2(a). Figure 7.2(b) depicts the marginal and average total cost curves for a representative farm. The equilibrium price of \$2 per bushel is determined by the supply-demand intersection in (a).

FIGURE 7.2

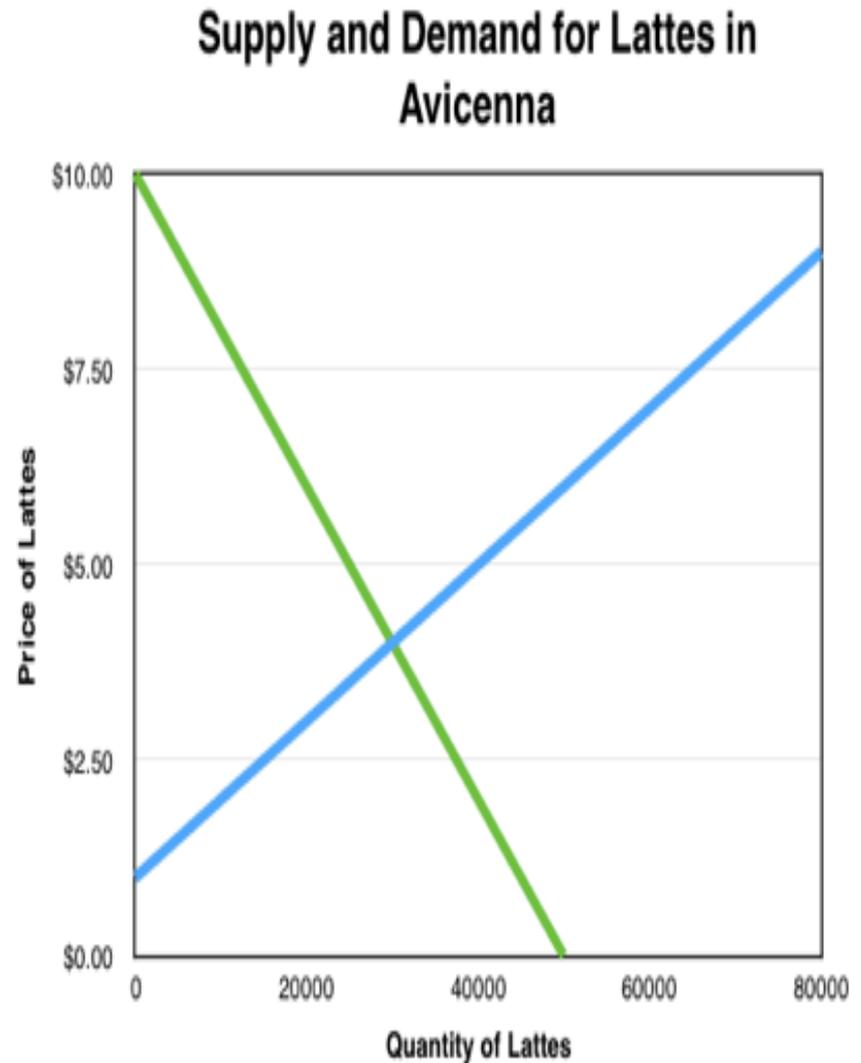
Economic Profit in the Short Run in the Corn Market.

At an equilibrium price of \$2 per bushel (a), the typical farm earns an economic profit of \$104,000 per year (b).



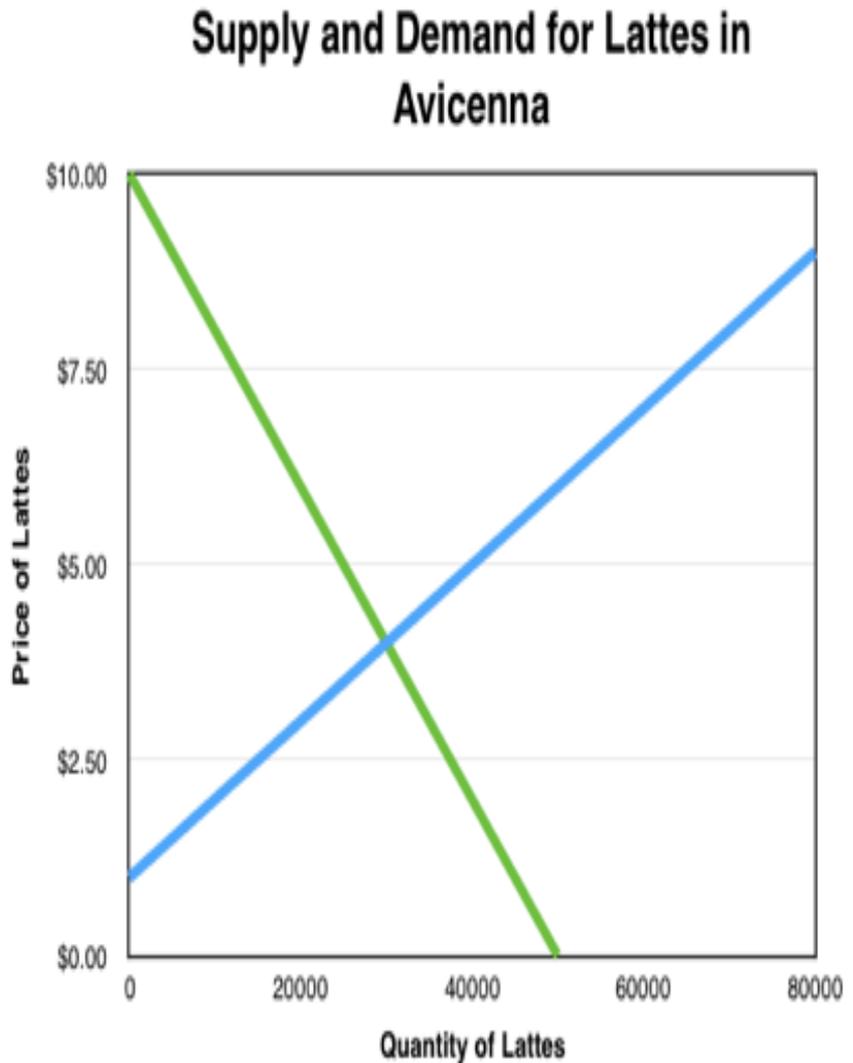
Monkeying with the Invisible Hand: Quotas

- Why couldn't we do better? We couldn't we find a better way of running the economy than the competitive market system?
 - Recall our free-market equilibrium:
 $P = \$4$, $Q = 30000$



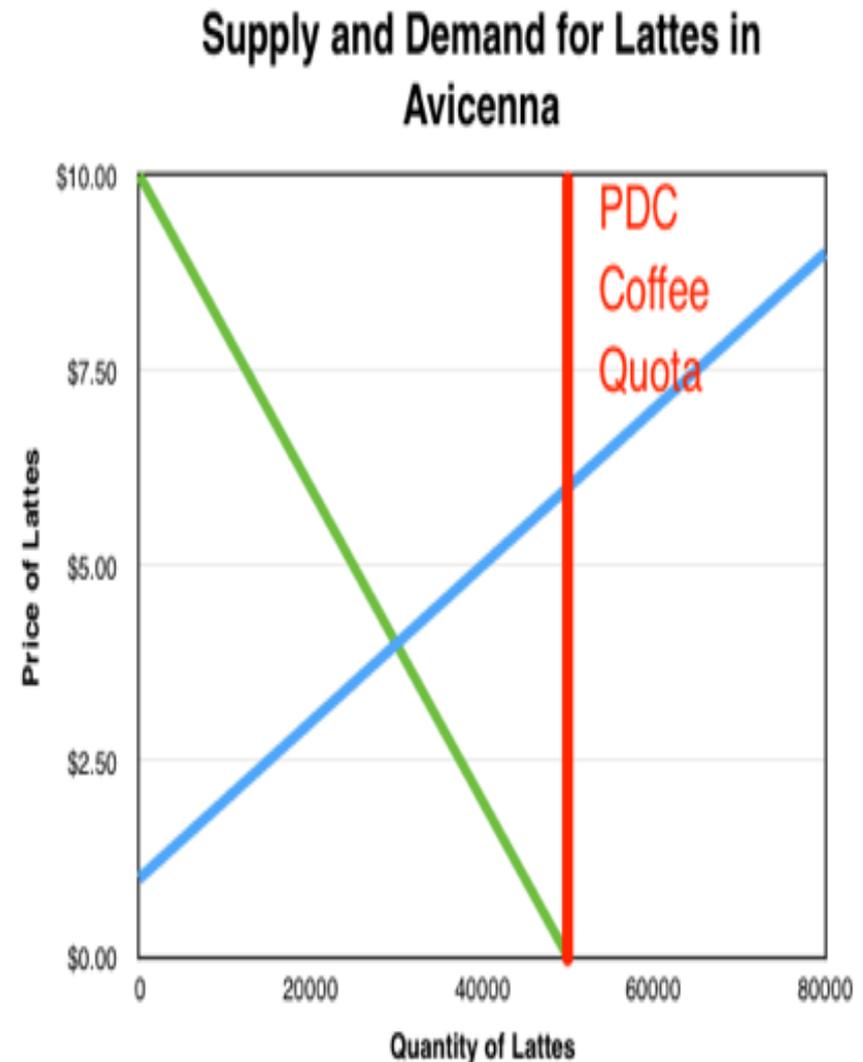
Monkeying with the Invisible Hand: Quotas II

- Why couldn't we do better? We couldn't we find a better way of running the economy than the competitive market system?
 - Recall our free-market equilibrium: $P = \$4$, $Q = 30000$
- The United Coffee Drinker's Movement elects a majority to the Avicenna Town Council
- They conduct a study, and decide that more coffee should be produced in Avicenna—not 30,000 lattes/day, but more
- They establish an organization, PDC, and empower it to fix the problem (cf: Ursula K. LeGuin (1974): *The Dispossessed* (New York: Harper and Row: 978-0062421074) <<http://amzn.to/1NJRJFt>>)



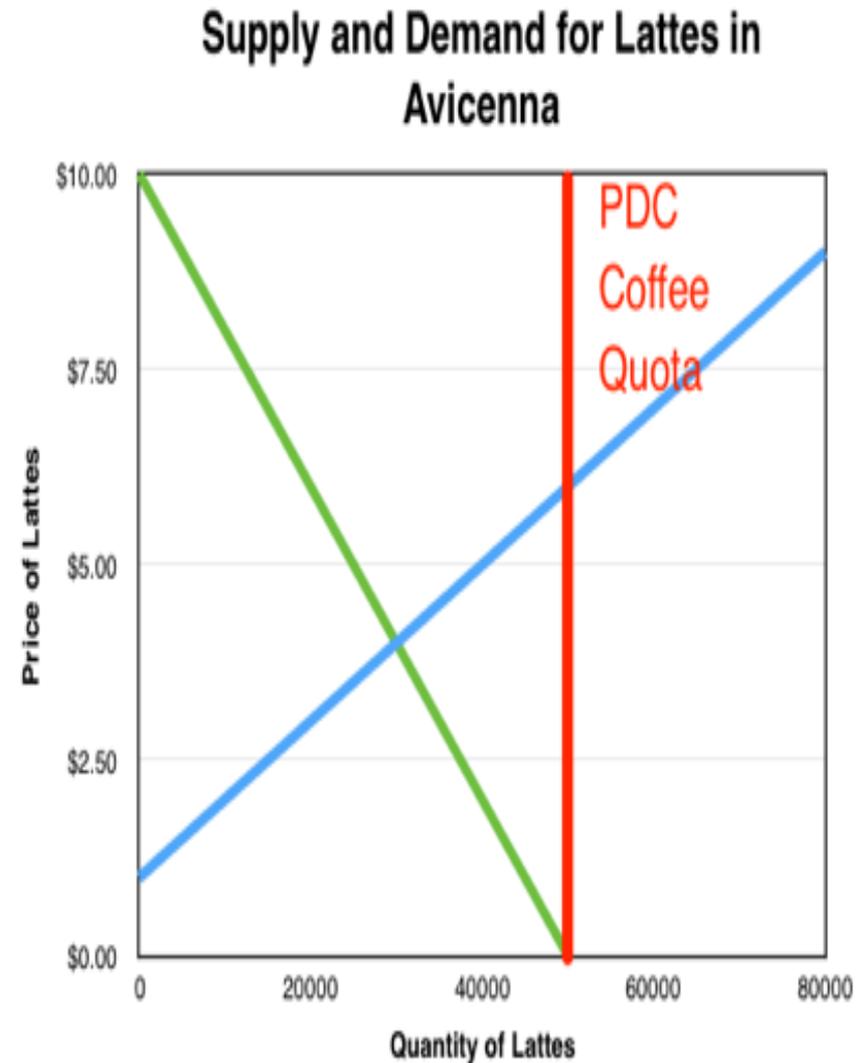
Monkeying with the Invisible Hand: Quotas III

- Why couldn't we do better? We couldn't we find a better way of running the economy than the competitive market system?
 - Recall our free-market equilibrium: $P = \$4$, $Q = 30000$
- PDC decrees that 50,000 lattes/day are going to be produced in Avicenna, and then sold to consumers in order to make enough coffee available
- What's the market price going to be?
- The price is going to be zero: cafes trying to get rid of their stock will undercut each other, and find that coffee is now so abundant they can (barely) give it away



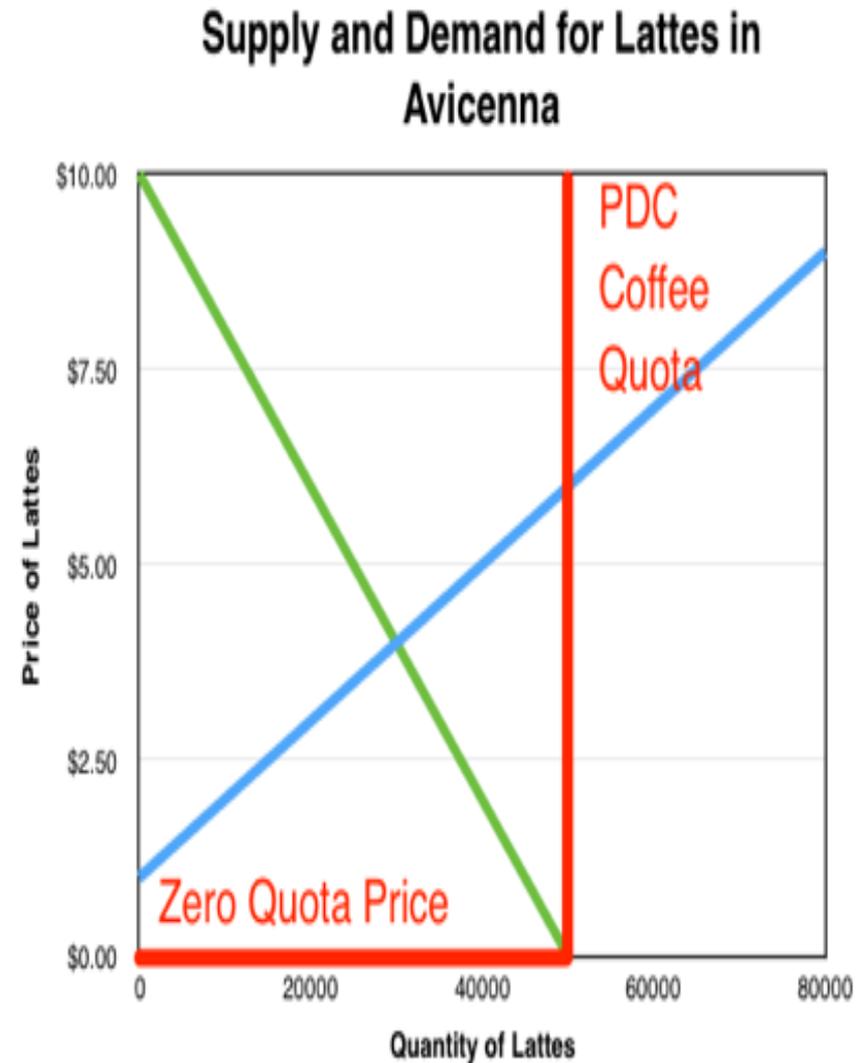
Monkeying with the Invisible Hand: Quotas III

- Why couldn't we do better? We couldn't we find a better way of running the economy than the competitive market system?
 - Recall our free-market equilibrium: $P = \$4$, $Q = 30000$
- PDC decrees that 50,000 lattes/day are going to be produced in Avicenna, and then sold to consumers in order to make enough coffee available
- What's the market price going to be?
- The price is going to be zero: cafes trying to get rid of their stock will undercut each other, and find that coffee is now so abundant they can (barely) give it away
- That evening, everybody quits—you make no money in the latte business



Monkeying with the Invisible Hand: Quotas IV

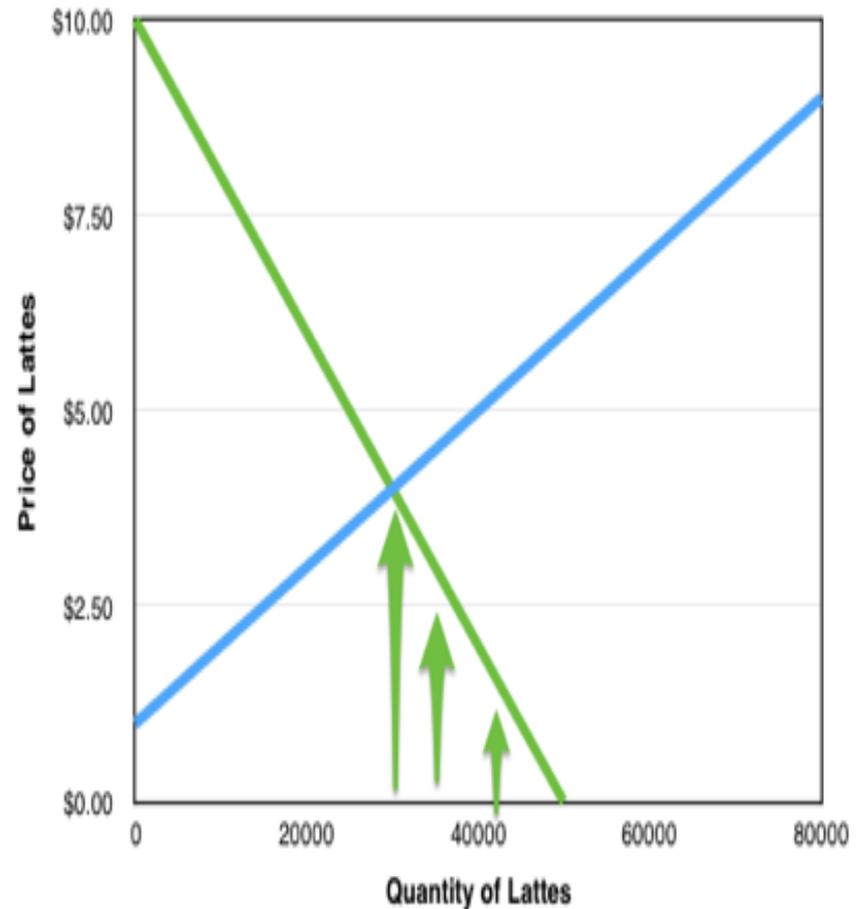
- Why couldn't we do better? We couldn't we find a better way of running the economy than the competitive market system?
 - Recall our free-market equilibrium: $P = \$4$, $Q = 3000$
- PDC decrees 5000 lattes/day
- On Day 2, PDC drafts enough potential latte producers into the Avicenna Caffeine Service to make sure that 5000 lattes/day are produced.
- The situation settles down
- 5000 lattes/day are produced
- They are then given away
- Has PDC made Avicenna better?



The Coffee Quota: Who Gains?

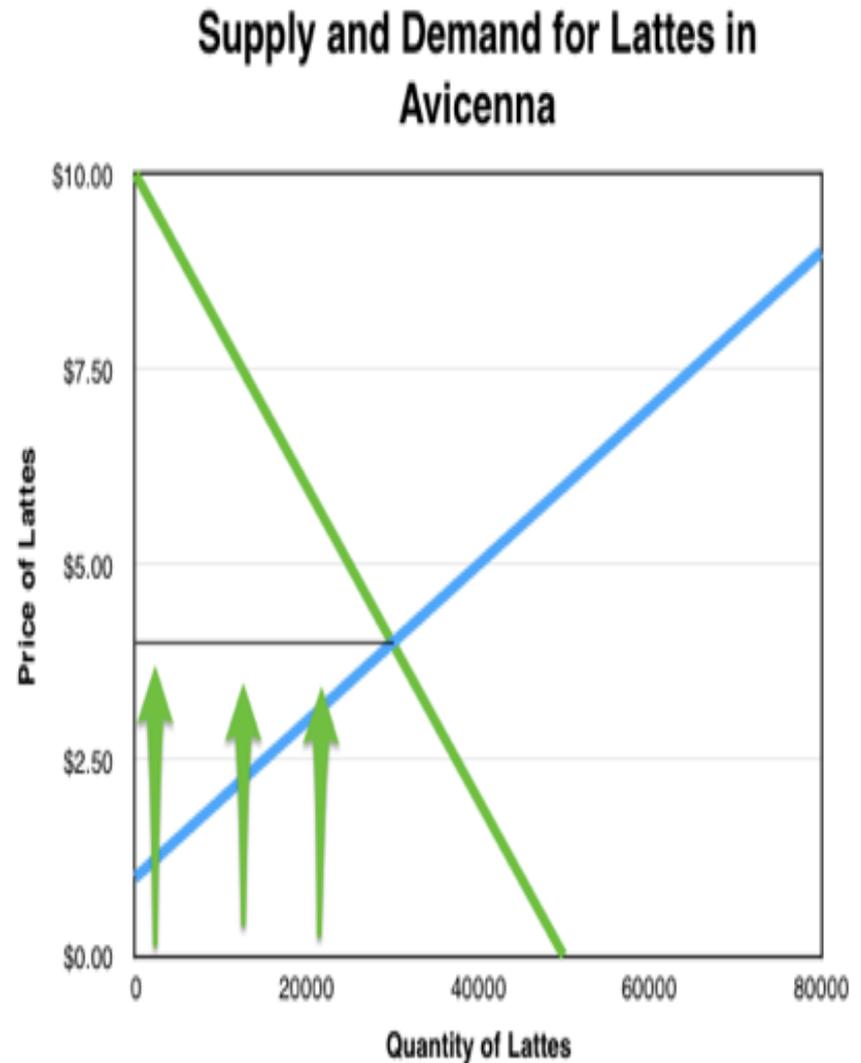
- Potential consumers who did not used to drink coffee gain
- It wasn't worth it for them before because their willingness-to-pay was less than the \$4/latte equilibrium price
- Now they get coffee for free
- They drink 20000 lattes/day
- They have an average willingness to pay of \$2
- $(AWP - P) \times Q = \text{surplus}$
- \$40000 in surplus

Supply and Demand for Lattes in Avicenna



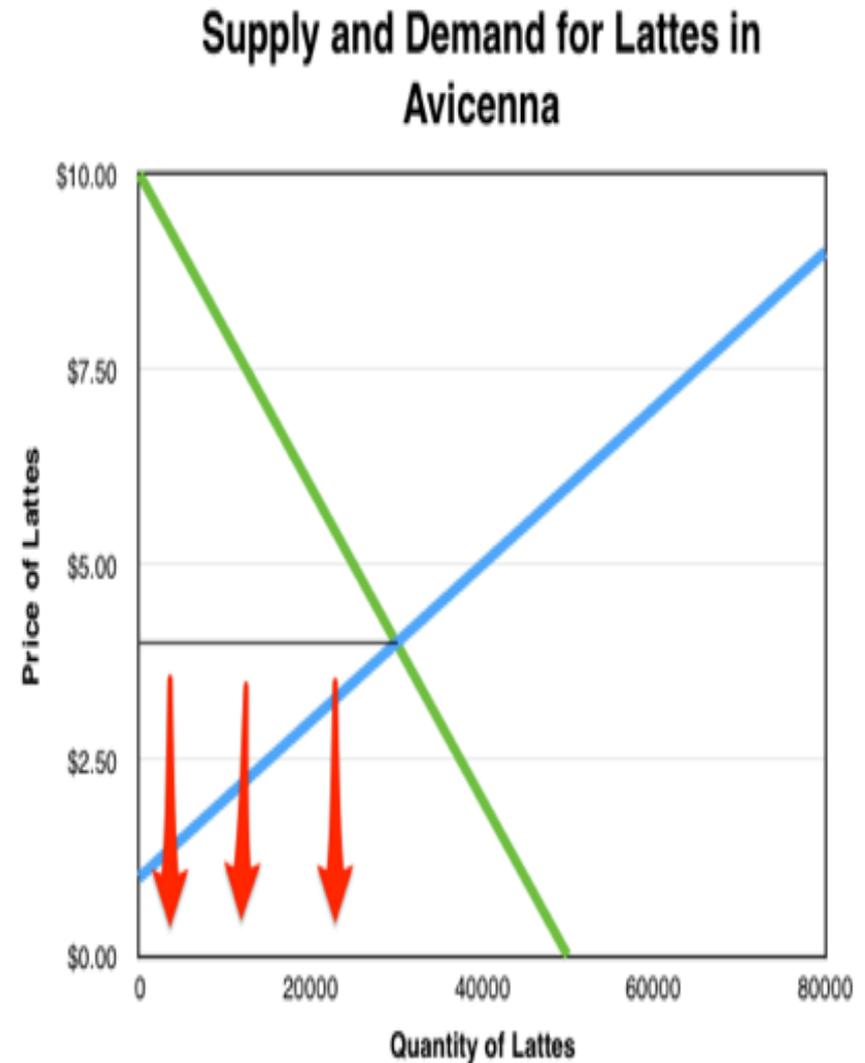
The Coffee Quota: Who Gains? II

- Consumers who used to drink coffee also gain
- They used to pay the \$4/latte equilibrium price
- Now they get coffee for free
- They drink 30000 lattes/day
- They save \$4/latte
- They receive an additional:
 - $30000 \times \$4 = \$120,000$ in extra surplus



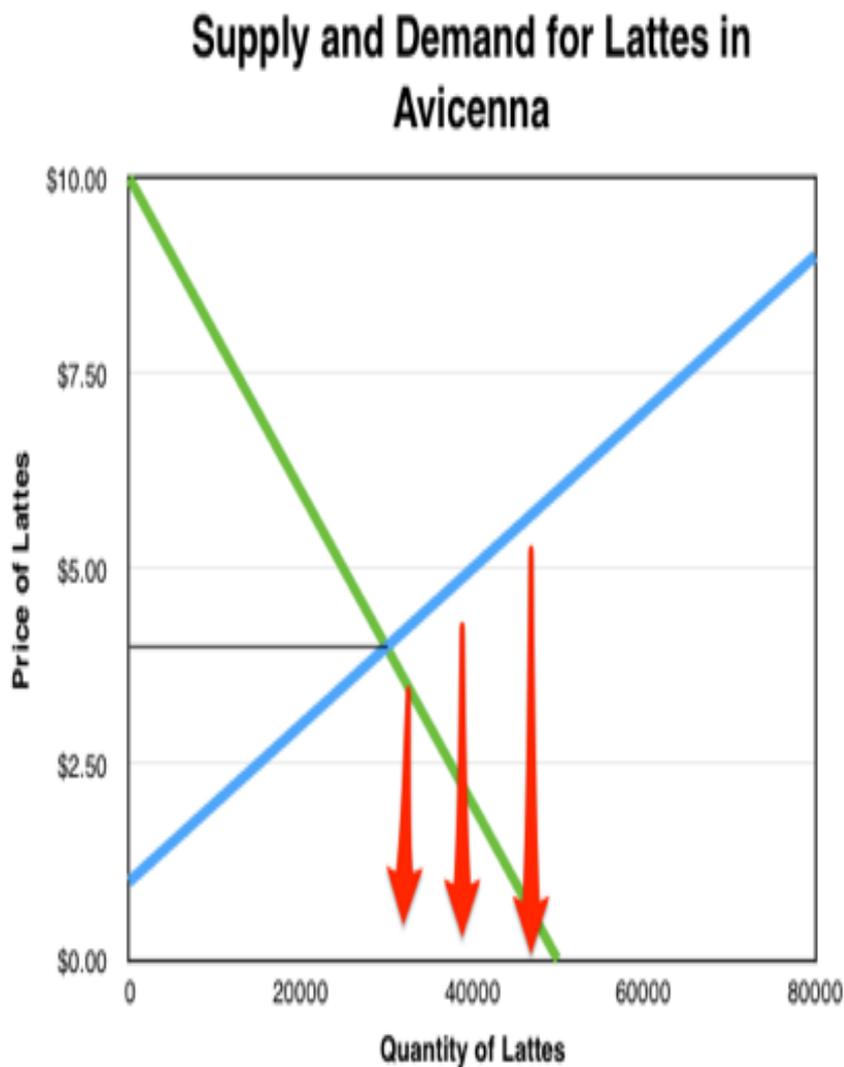
The Coffee Quota: Who Loses?

- Producers lose
- They used to collect \$4/latte for the 30000 lattes/day they made
- Now they collect \$0/latte
- They lose \$120,000
- They would leave the industry and do something else—but they are drafted, and can't



The Coffee Quota: Who Loses? II

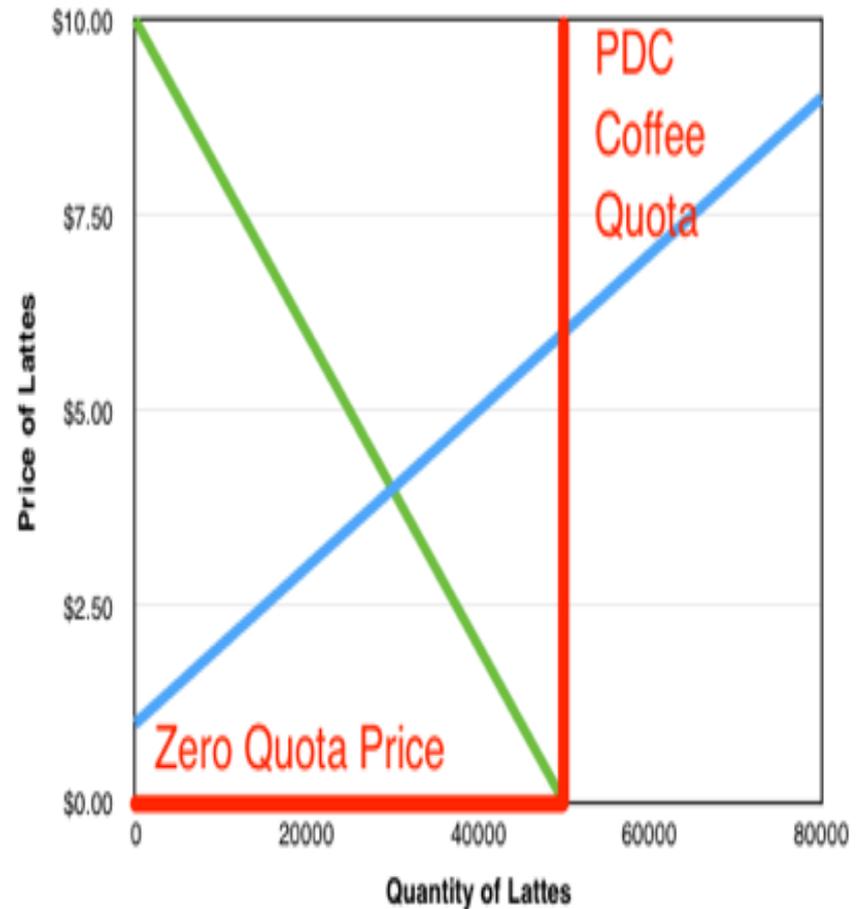
- People who did not use to produce lattes who are drafted into the ACS lose
- They now prepare 20000 lattes/day
- Their average opportunity cost of doing so is \$5/latte
- They lose \$100,000



Net Losses

- Old consumers: +\$120,000
- New consumers: +\$40,000
- Old producers: -\$120,000
- New producers: -\$100,000
- Net losses: -\$60,000
- PDC has taken from producers by paying them less and drafting them to work making lattes
 - They value their losses at -\$220,000
- PDC has given to consumers by giving them all as much free coffee as they want
 - They value their gains at \$140,000
- Is this a good policy?
- Is this politically sustainable?

Supply and Demand for Lattes in Avicenna

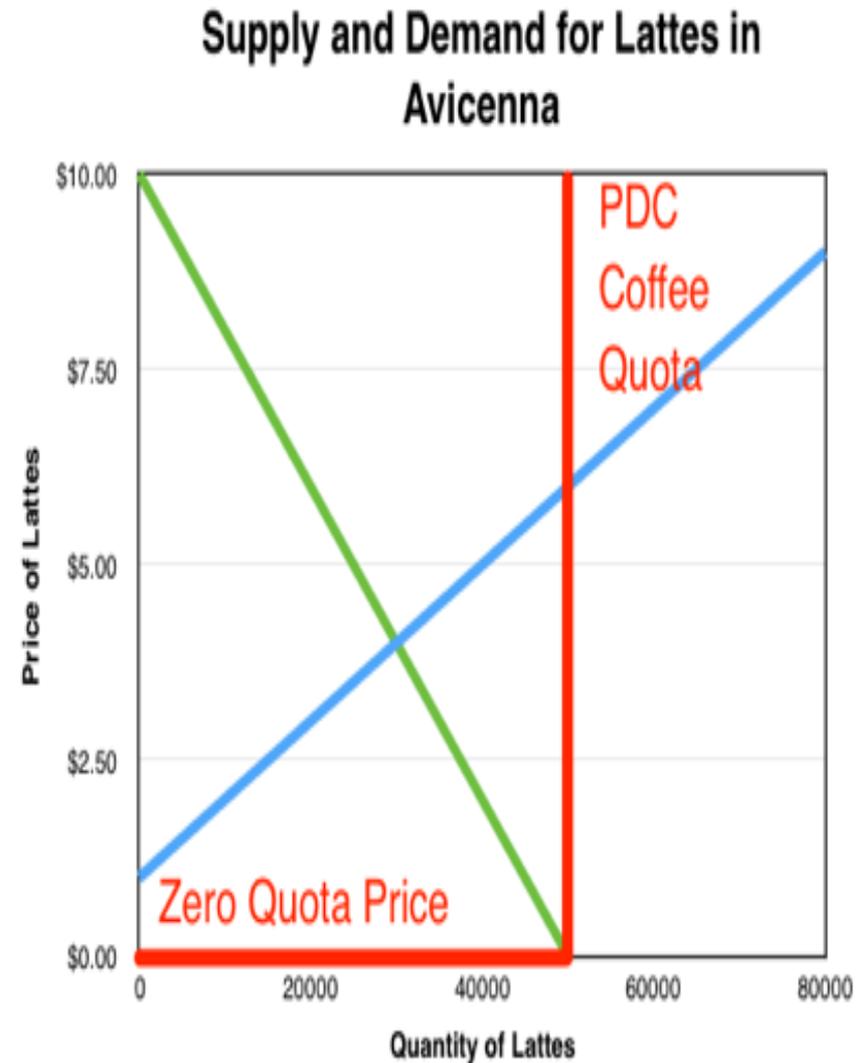


Fixed Prices

February 1, 2016 8-9 AM
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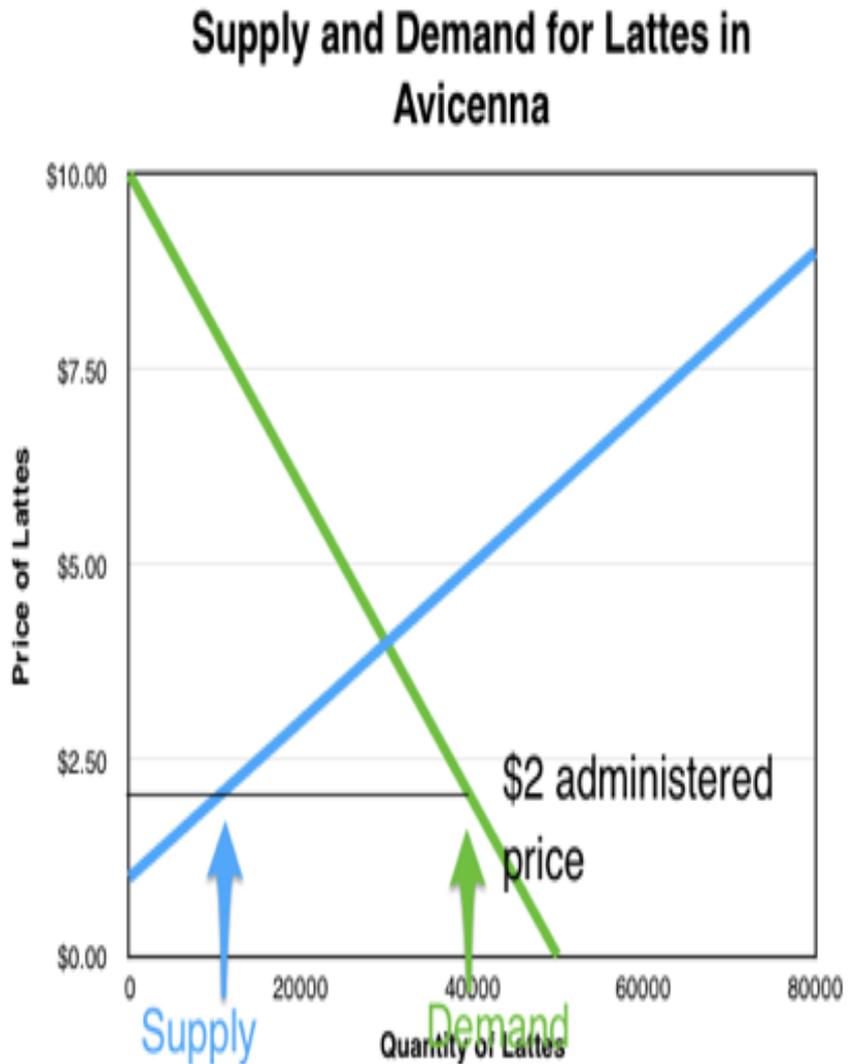
A Fixed Administrative Price

- Suppose PDC gets nervous, and backs off of its policy
- It says: the problem with the old free-market equilibrium was that the price of coffee was too high
- But going to free coffee was going too far
- PDC decides to set the price at \$2/latte...
- What happens?



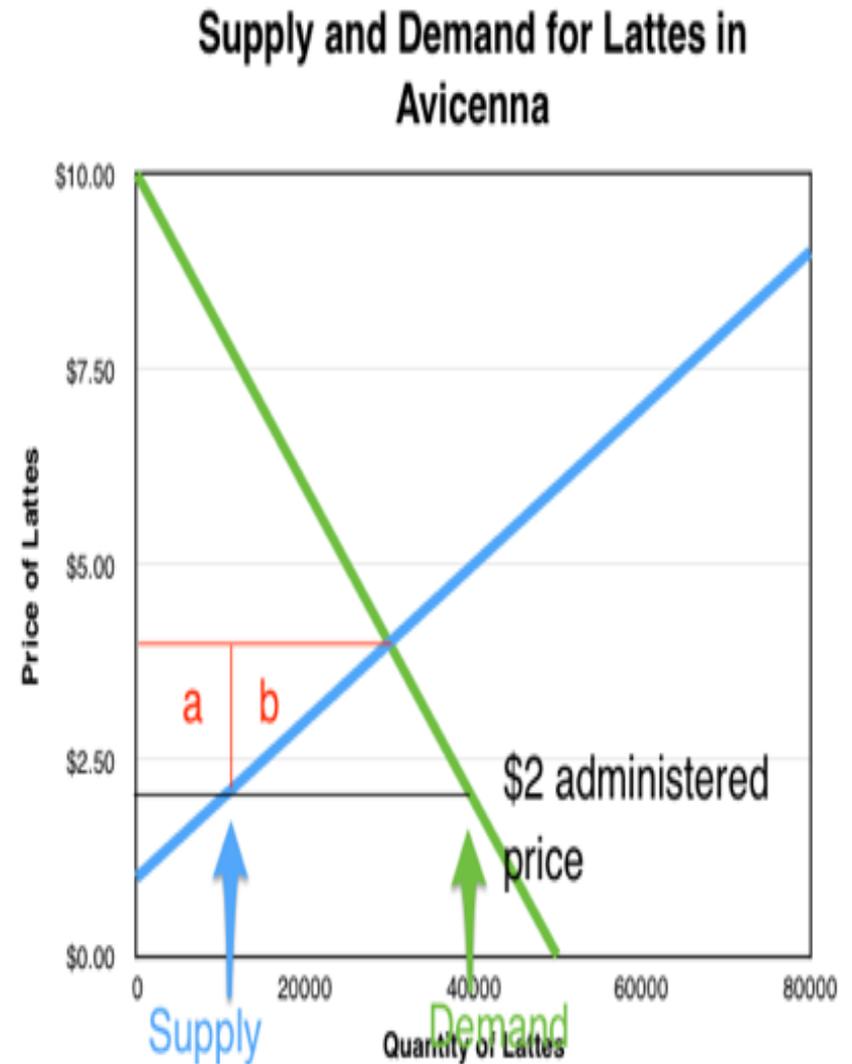
Excess Demand at \$2/Latte

- At \$2/latte, only those with low opportunity costs show up to make lattes
- Only 10,000 lattes/day are made
- But lots of people think a \$2 latte is worth buying
- Consumers try to buy 40000 lattes
- 3/4 of potential consumers are disappointed, and go home latteless...



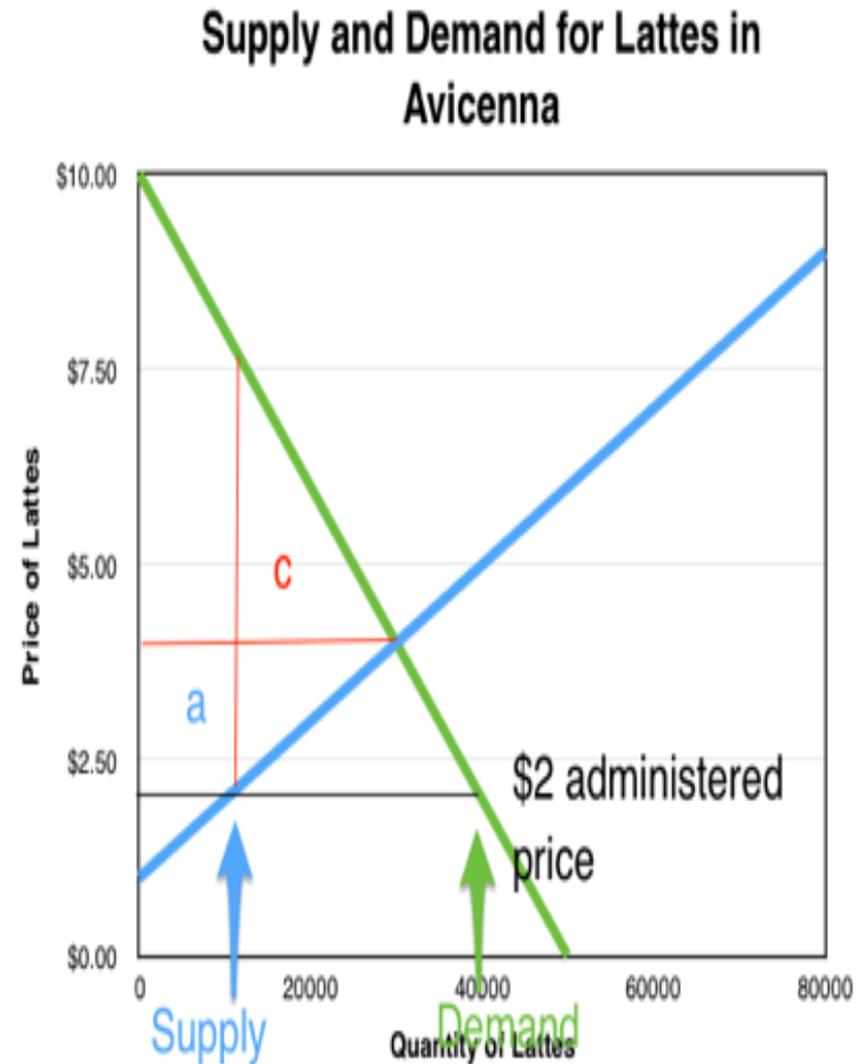
Winners and Losers Relative to Free Market

- Losers: Producers with $OC < \$2$. They used to receive $\$4$ /latte. Now they get $\$2$:
 - Losses: $10000 \times \$2 = \20000
- Losers: producers with $OC > \$2$. They used to make lattes. Now they exit. Lose producer surplus:
 - Losses: $10000 \times \$2 = \20000



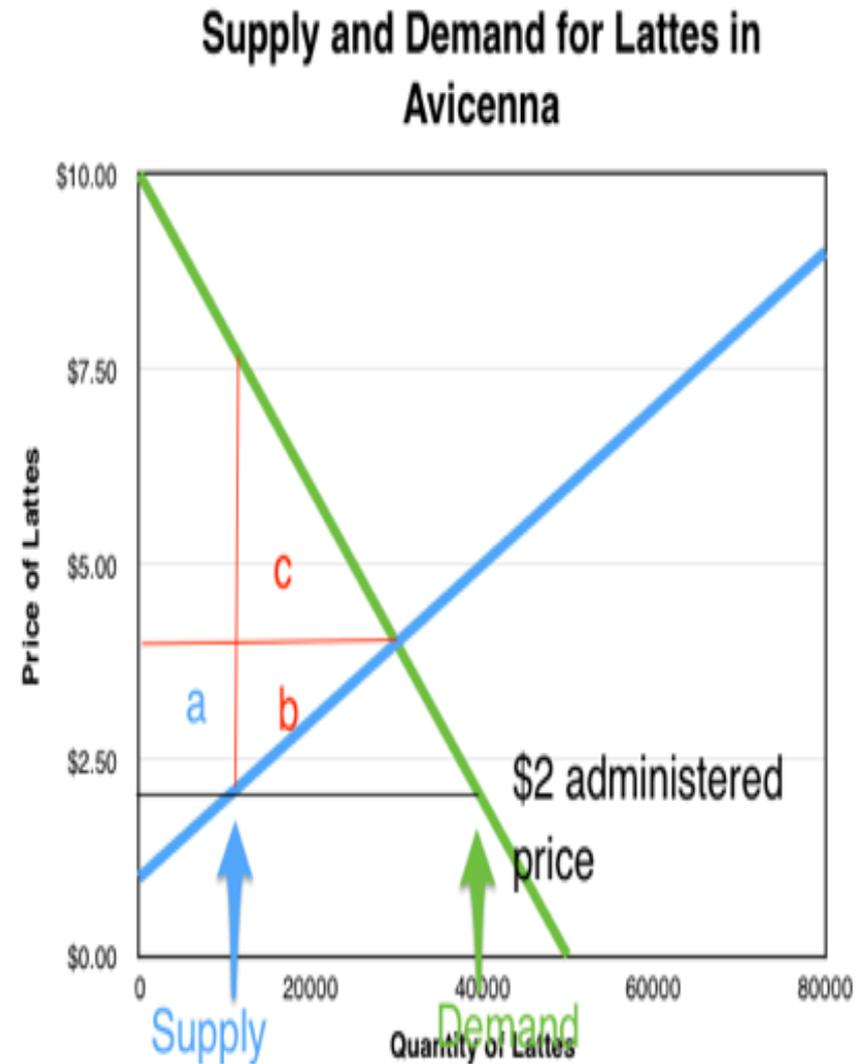
Winners and Losers Relative to Free Market II

- Winners: The 10000 who buy lattes used to pay \$4. Now they pay \$2.
 - Winnings: \$20000
- Losers: The 20000 who used to buy lattes at \$4, but now can't find one. Their average willingness to pay: \$6:
 - Losses: \$40000



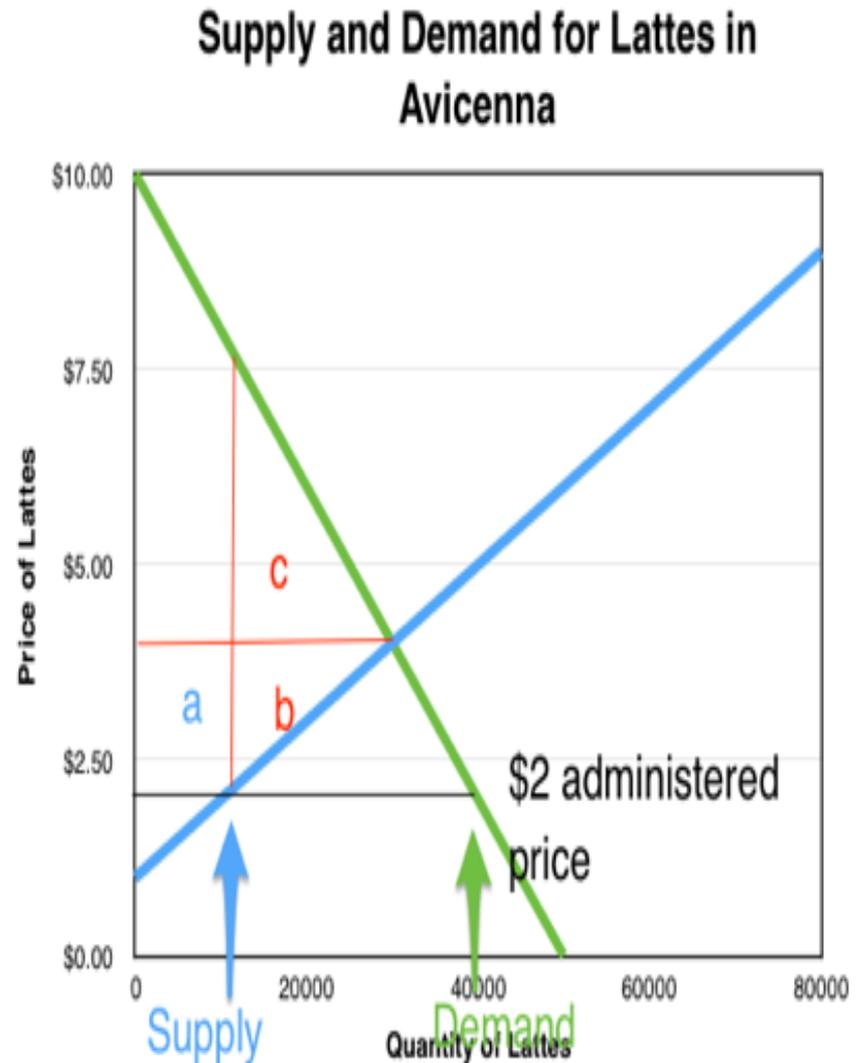
Winners and Losers Relative to Free Market III

- Former producers who exit **lose b**
- Producers who do not exit **lose a**
- Consumers who were willing to pay the old price but can't buy **lose c**
- Consumers lucky enough to buy **gain a**
- Net effect: $-b-c = -\$60,000$, in this example



Winners and Losers Relative to Free Market IV

- But consider that net effect: $-b - c = -\$60,000$
- Is that right?
- What about area (e)?
- With a fixed price, the wrong amount is being produced and sold
- It is, however, being produced by the right people—by the low opportunity-cost producers
- But is it being consumed by the right people—by the high willingness-to-pay consumers?
 - Nothing to make it so...



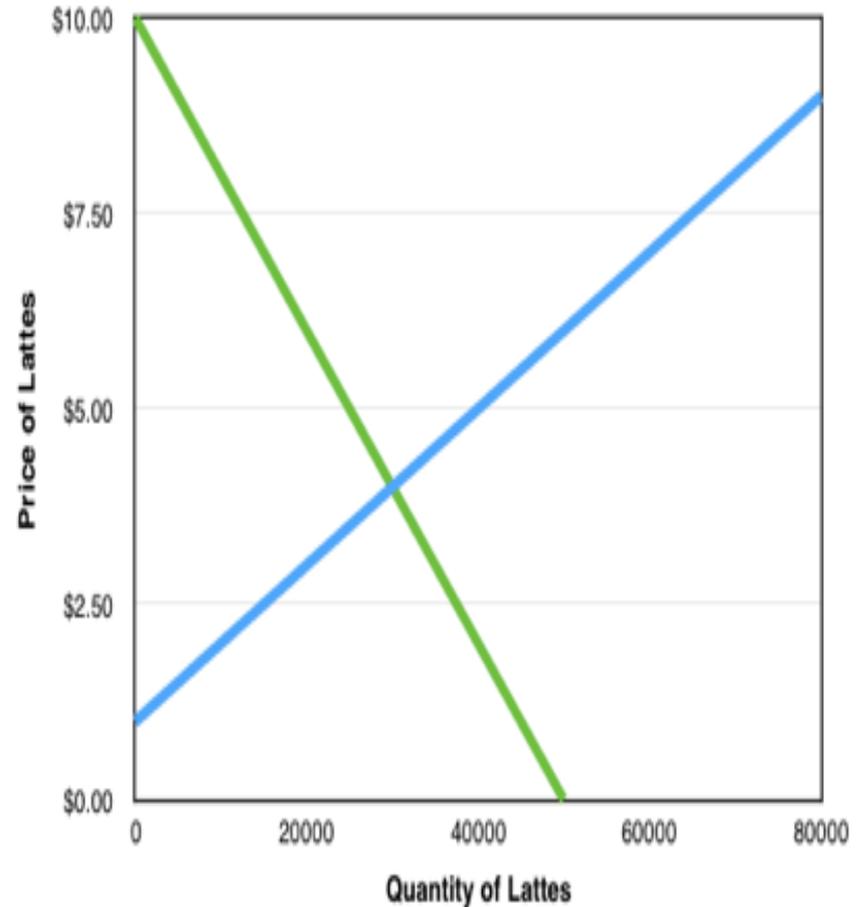
The Market System: Balance Sheet

February 1, 2016 8-9 AM
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The Advantages of the Competitive Market

- The competitive market, when it works:
 - Maximizes the dollar value of surplus
 - By producing the right amount
 - Having it made by the low opportunity-cost potential producers
 - Having it consumed by the high willingness-to-pay potential consumers

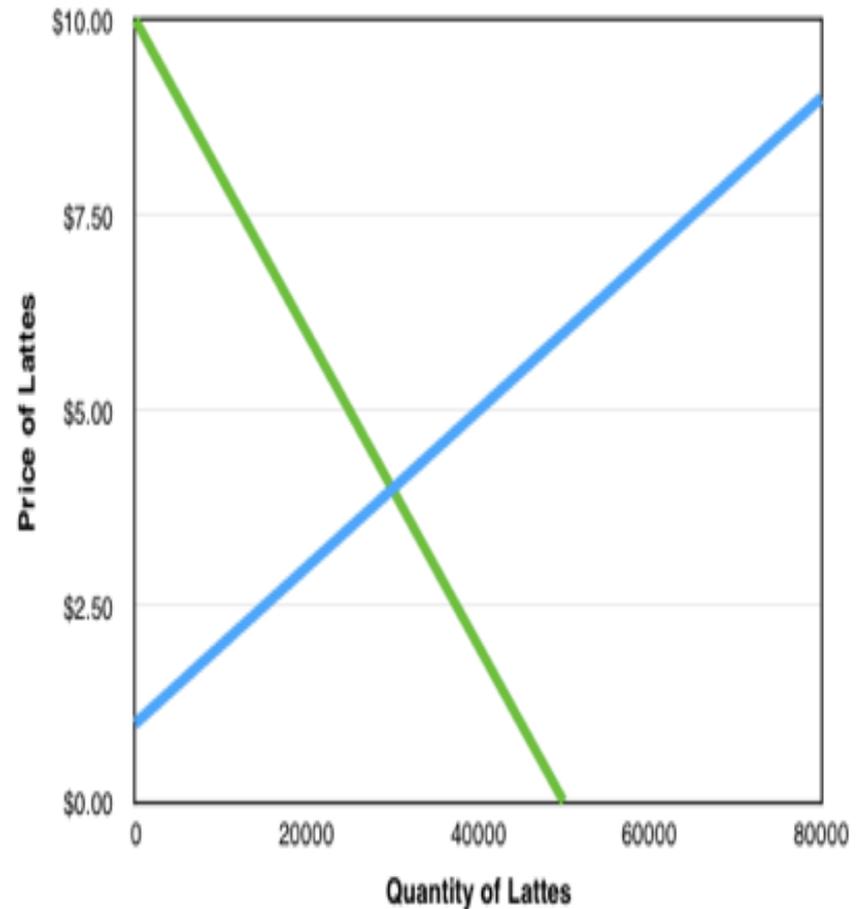
Supply and Demand for Lattes in Avicenna



What Can Go Wrong with the Market, I & II

- What can go wrong with the competitive market?
- First, the government can monkey with it
 - Via quotas that produce the wrong amount
 - Via fixed prices that lead to the wrong amount being produced
- And if the price is wrong, the rationing consumption/assigning production decision can go wrong as well
- And now we've reached page 202 of FBAH...

Supply and Demand for Lattes in Avicenna



Striking a Balance

- Plus:
 - Maximizes the dollar value of surplus
- Minuses:
 1. Can be monkeyed with by government via quotas
 2. Can be monkeyed with by government via fixed prices