

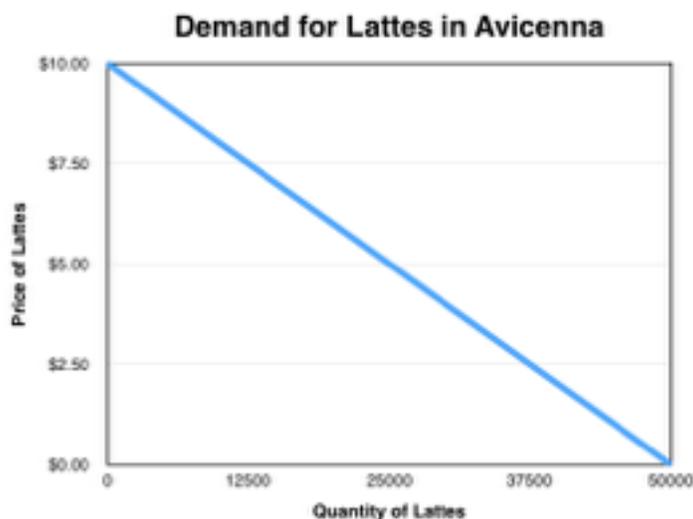
Section Exercise for February 3/4

1) In lecture, we went over the case of a quota in which the government required the economy to produce much more than the free-market equilibrium—50000 where the free-market equilibrium was 30000—and so the government had to draft people to produce. It was, then, obvious where the societal inefficiency came from: people with opportunity costs of making lattes between \$4/latte and \$6/latte were being commanded by the government to make and serve lattes to people whose willingness to pay varied between \$4/latte and \$0. On average, each of those extra 20000 lattes was worth -\$3 to society as a whole—a value-subtracting exercise that cost $-\$3 \times 20000 = -\60000 a day.

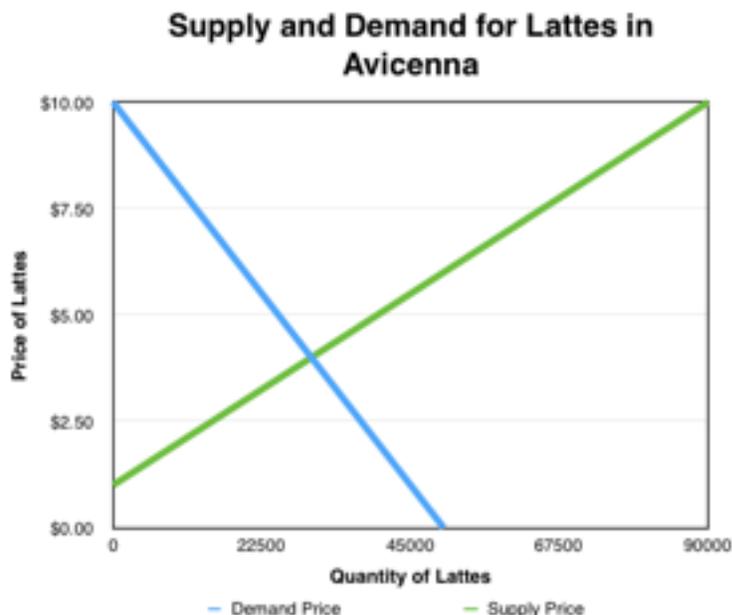


But what if the government commands a quota that is lower than the free-market equilibrium price? Is that equally bad.

a) Suppose that the demand curve is our standard: $P_d = \$10 - 0.0002Q$. Draw the demand curve:



b) Suppose that the supply curve is our standard: $P_s = \$1 + 0.0001Q$. Draw, on the same axes, the supply curve: calculate (again) the equilibrium price and quantity:



Equilibrium: $P = \$4/\text{latte}$; $Q = 30000/\text{day}$

c) What is the consumer and producer surplus?

Consumer Surplus = $(AWTP - P) \times Q = (\$7 - \$4) \times 30000 = \$90000$

Producer Surplus = $(P - AOC) \times Q = (\$4 - \$2.50) \times 30000 = \$45000$

AWTP = Average Willingness to Pay AOC = Average Opportunity Cost

d) Now suppose that Avicenna Production Distribution Coordination—PDC—imposes a quota of 10000/day on the number that can that could be produced: it will issue 10000 licenses a day, and no license, no latte. At what price will these 10000 lattes be sold?

$P_{\text{quota}=10000} = \8

e) What is the consumer surplus? How much have consumers lost as a result of the quota?

$CS = (AWTP - P) \times Q = (\$9 - \$8) \times 10000 = \10000 . Consumers have lost \$80000

f) Suppose that the low opportunity cost producers manage to gain the 10000 daily licenses to produce. What is their producer surplus? How much will they have gained as a result of the quota?

The low-opportunity-cost producers of the first 10000 lattes have an AOC of \$1.50. Their producer surplus is:

$$PS = (P - AOC) \times Q = (\$8 - \$1.50) \times 10000 = \$65000$$

Back in the free-market regime, they sold their lattes for \$4, and so got \$25000 of PS. They have gained \$40000

g) Suppose that the low opportunity cost producers manage to gain the 10000 daily licenses to produce. How much have the other producers lost as a result of the quota?

Total PS was \$45000 in the free-market regime, of which the low-opportunity-cost producers got \$25000. The other producers thus got \$20000. Now they get nothing. They have lost \$20000.

h) What is the total societal balance sheet for the quota?

LOC producers: +\$40000

Other producers: -\$20000

Consumers: -\$80000

NET TOTAL: -\$60000

i) Is it more likely that the LOC producers will get the licenses, or that those connected with the members and staff of PDC via various social networks will get the licenses to make lattes?

Low opportunity cost producers will benefit the most from gaining these licenses. This means they should be willing to spend the most money on lobbying the PDC to get the licenses. Also, PDC might want to limit the harms of the licensing scheme and give them to LOC producers. This would be the best case scenario as producer surplus is highest when production is done by low opportunity cost producers. However, LOC producers might not be good at lobbying or might not have enough resources to guarantee this outcome.

j) Suppose that each producer with an opportunity cost lower than the price at which the quota-constrained lattes will be sold has an equal shot at getting a license. What is your societal balance sheet for the quota now?

The quota price is \$8/latte. If every producer with an opportunity cost of \$8/latte or less has an equal chance of getting a license, the AOC will be \$4.50. Total surplus is:

$$TS = (AWTP - AOC) \times Q = (\$9 - \$4.50) \times 10000 = \$35000$$

In the free-market equilibrium, total surplus was: \$135000

PDC's quota has thrown almost three-quarters of the value of this market away...