An Economic Theory Masterclass

Part V: Price or Quantity Constraints

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February 21, 2020

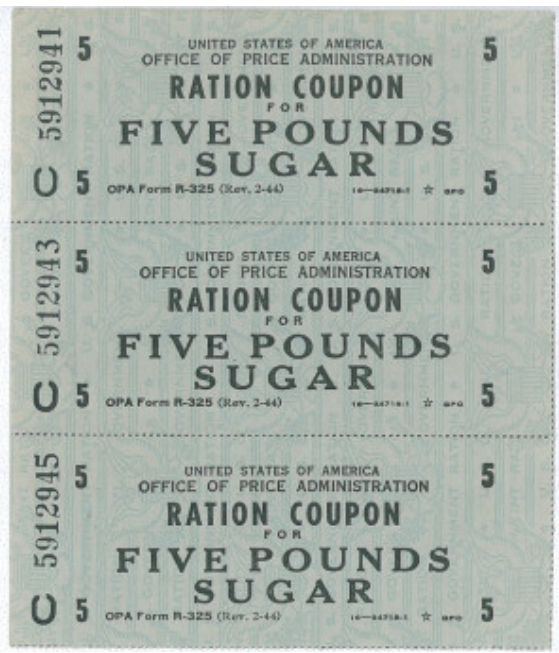
Price or Quantity Constraints

- Governments often disallow or limit transactions that they do not like, and mandate maximum or minimum prices
- Example: one child policy in China
  - 118 boys born for every 100 girls ($<$ 101 in USA)
  - 30 to 60 million "missing women" since 1982

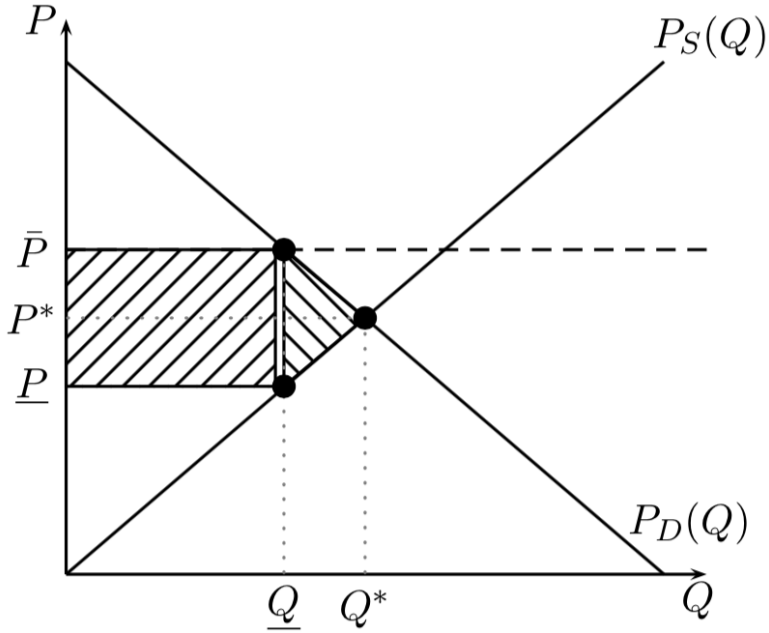
- "to build a modern country, each couple should have only one child"
- Lesson: Binding price or quantity constraints induce secondary markets that help clear the market.

Officially Sanctioned Demand

- Some token or record must be kept of quantity
- Example: ration coupons in WWII for clothing, shoes, coffee, gasoline, fuel oil, etc.
- After Hurricane Sandy, cars with license plates ending in
  - an odd number or a letter can buy gas on odd-numbered days
  - an even number or zero can buy gas on even-numbered days.
- Example: fewer NYC taxi medallions than 1937



Quantity Ceilings with Tokens

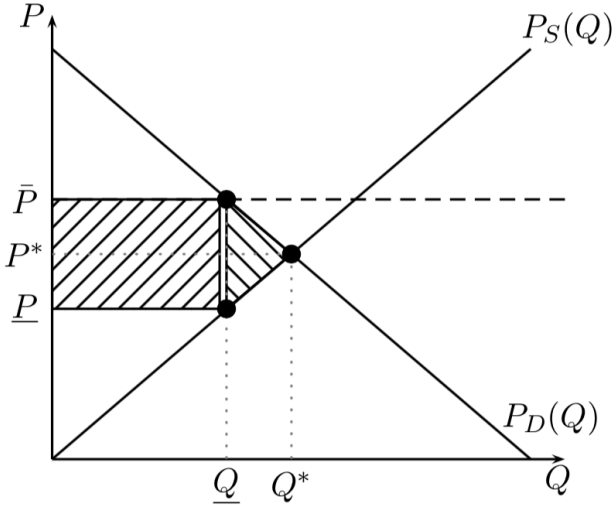


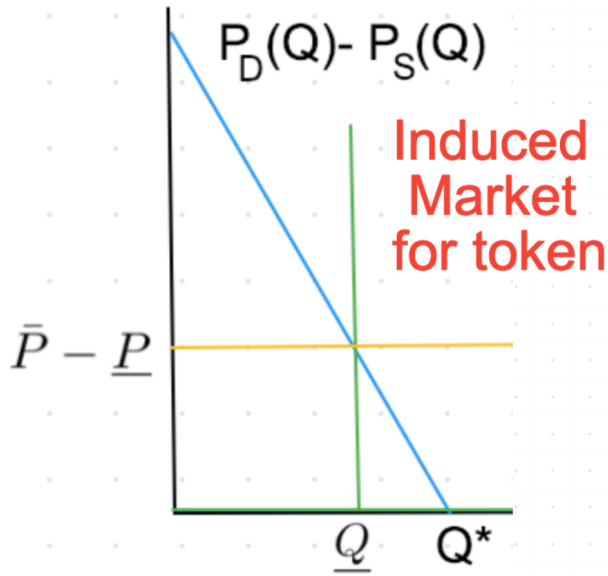
- Assume a binding quantity ceiling $\underline{Q} < Q^*$.
- This induces a market for the token (medallion or coupon)
- binding price ceiling

$\Rightarrow$ supply is on the **short side of the market**

$\Rightarrow$ token has value $P_D(\underline{Q}) - P_S(\underline{Q}) = \bar{P} - \underline{P} > 0$

Quantity Ceilings with Tokens





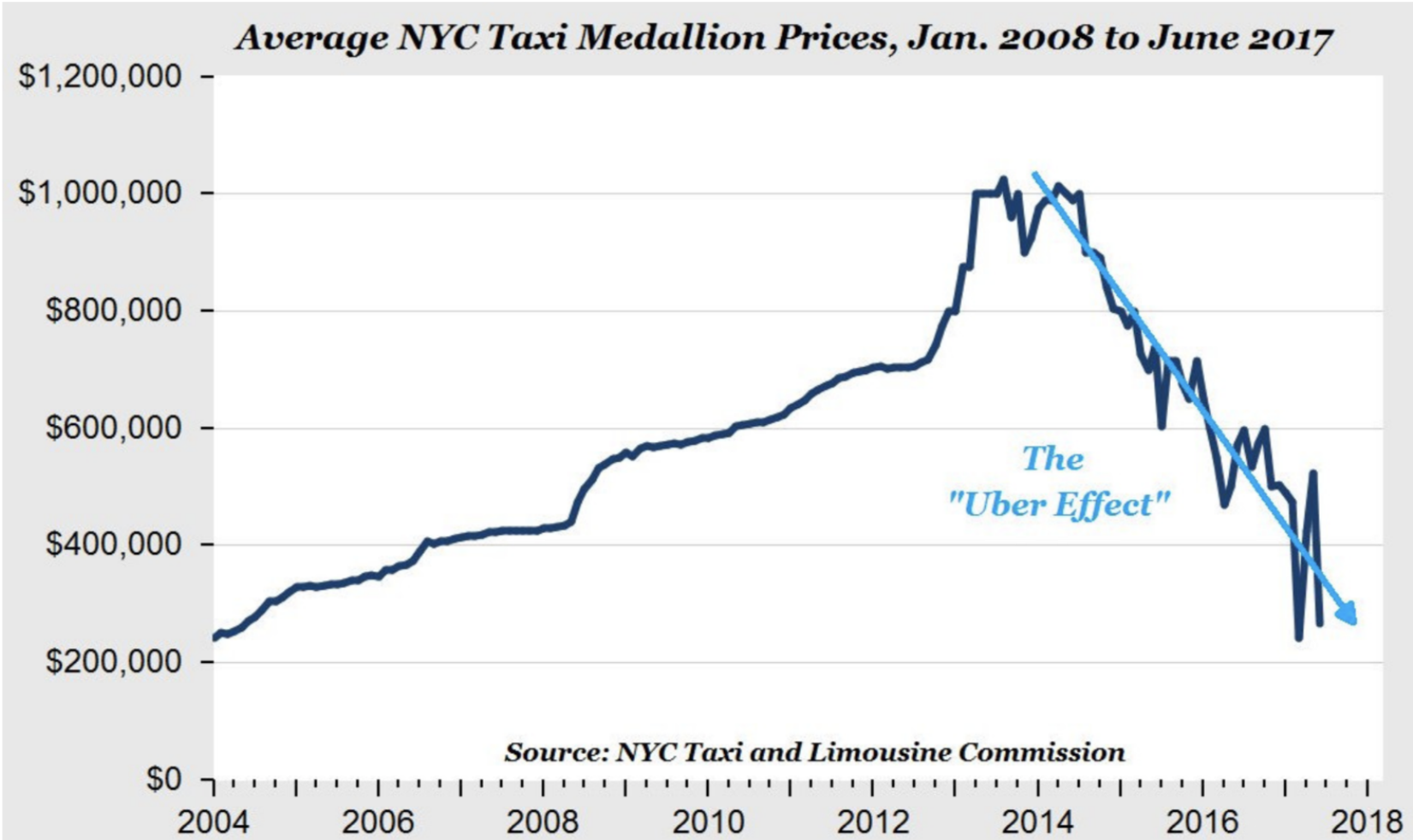
- Assume a binding quantity ceiling $\underline{Q} < Q^*$.
- Demand price exceeds supply price at that quantity
- Marshallian quantity adjustment wants to happen but cannot
- This induces a market for the token (medallion or coupon)
- binding quantity ceiling

$\Rightarrow$ supply is on the **short side of the market**

$\Rightarrow$ token has value $P_D(\underline{Q}) - P_S(\underline{Q}) = \bar{P} - \underline{P} > 0$

- Some efficient trades don't happen $\Rightarrow$ triangular deadweight loss, provided the coupons or medallions are efficiently traded

Medallion Value in the Uber Era



Professional Certification as an Occupational Quantity Cap

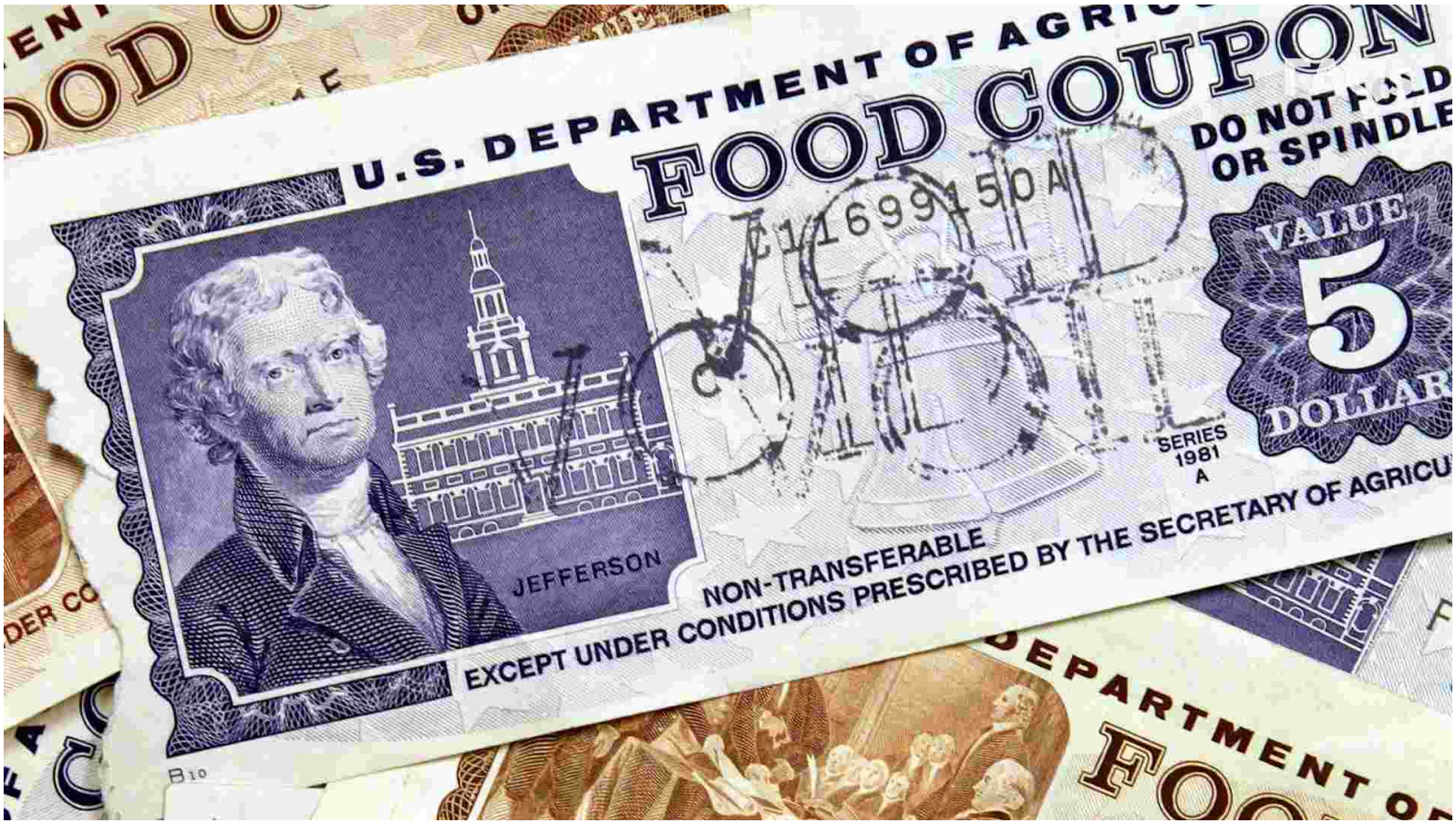
Breaking the AMA Monopoly

By Shikha Dalmia
August 26, 2009

Milton Friedman warned back in 1961 that the American Medical Association was a government-sanctioned guild or trade cartel that would raise health care costs and diminish quality. Today, most economists agree with him. That's because the costs of AMA's aggressive tacticts to keep physician wages up by, among other things, imposing onerous licensure rules, capping the number of new doctors, and harassing nurses, midwives etc. who can treat certain routine conditions more cheaply than doctors have become painfully obvious:

Food Stamps

- Food stamps not tradable, and so the after market is illicit and creates a deadweight loss

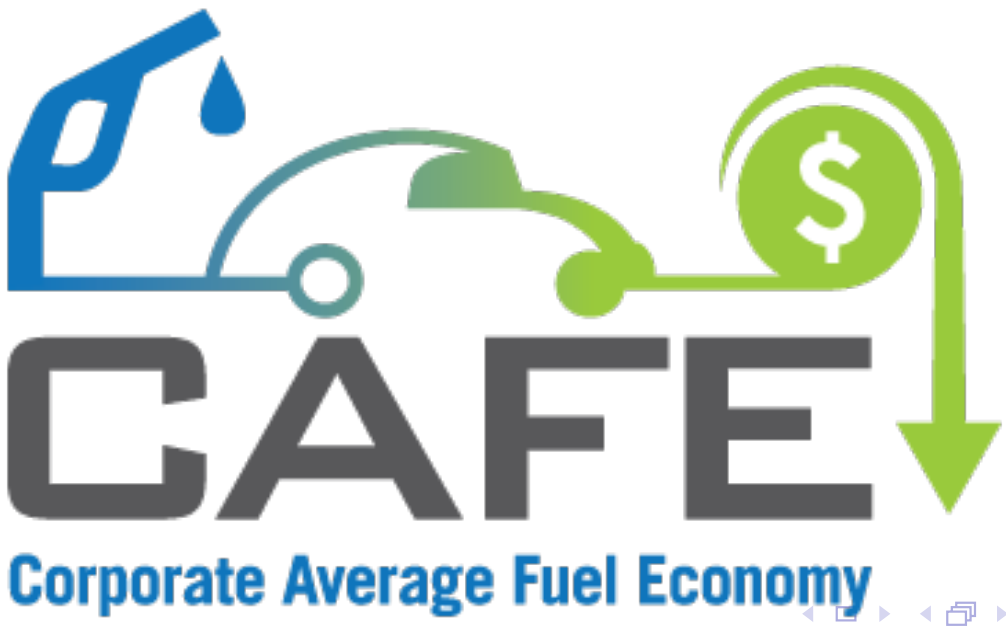


Quantity Management for Car Companies

- Example: Corporate Average Fuel Economy (CAFE) standards
  - 1985-2011: Car companies must average 27.5MPG for cars
  - Firms discounted fuel efficient sedans, sold trucks at a premium
  - Profit maximization over sedans s and trucks t becomes:

$$\max_{x,y}[sP_S(s,t) - C_S(s)] + [tP_T(t,s) - C_T(t)] \text{ s.t. } s \geq \alpha t$$

  - What is the efficient Pigouvian tax approach?



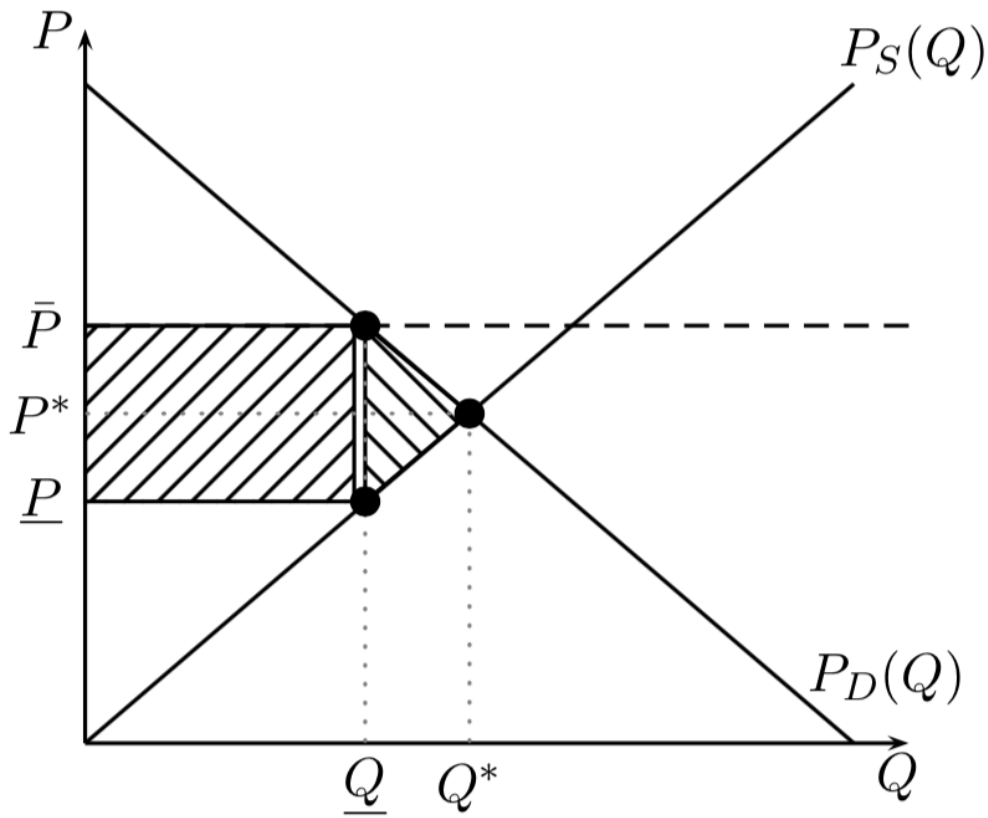
Price Floors with Tokens

- Assume a binding price floor $\bar{P} > P^*$

$\Rightarrow$ Quantity supplied exceeds that demanded

$\Rightarrow$ Assume a costly token clears the market

$\Rightarrow$ **Short side of the market** (demand) determines quantity $\underline{Q}$ traded, via $\underline{P} = P_S(\underline{Q})$.



The Minimum Wage is a Binding Price Floor

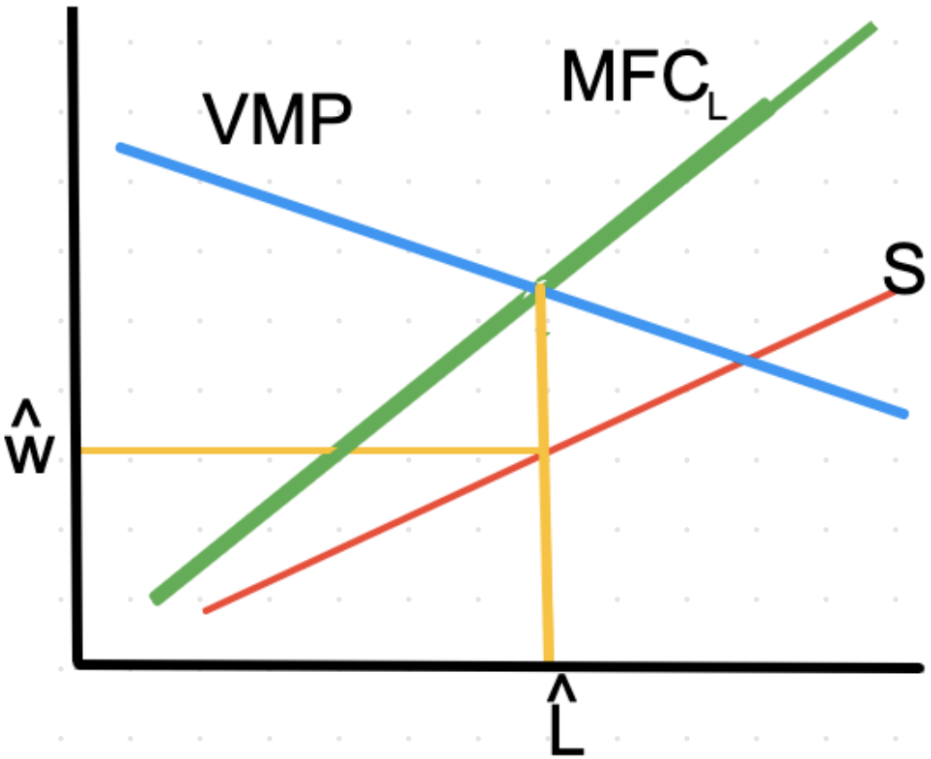
- A minimum wage leads to job losses with competitive demand
  - *Job losses are higher the more elastic is labor demand*
  - As depicted, total wage revenue falls *to employed workers*
  - High demand elasticity $\Rightarrow$ total wage revenue $\downarrow$ (2019 prelim)
  - Minimum wage has a bigger impact in the longer run, since demand is more elastic (Le Chetalier)
  - Job losses are unaffected by the supply elasticity

NYC Fast-Food Workers Stunned Some Are Being Fired after $15 Minimum Wage Hike

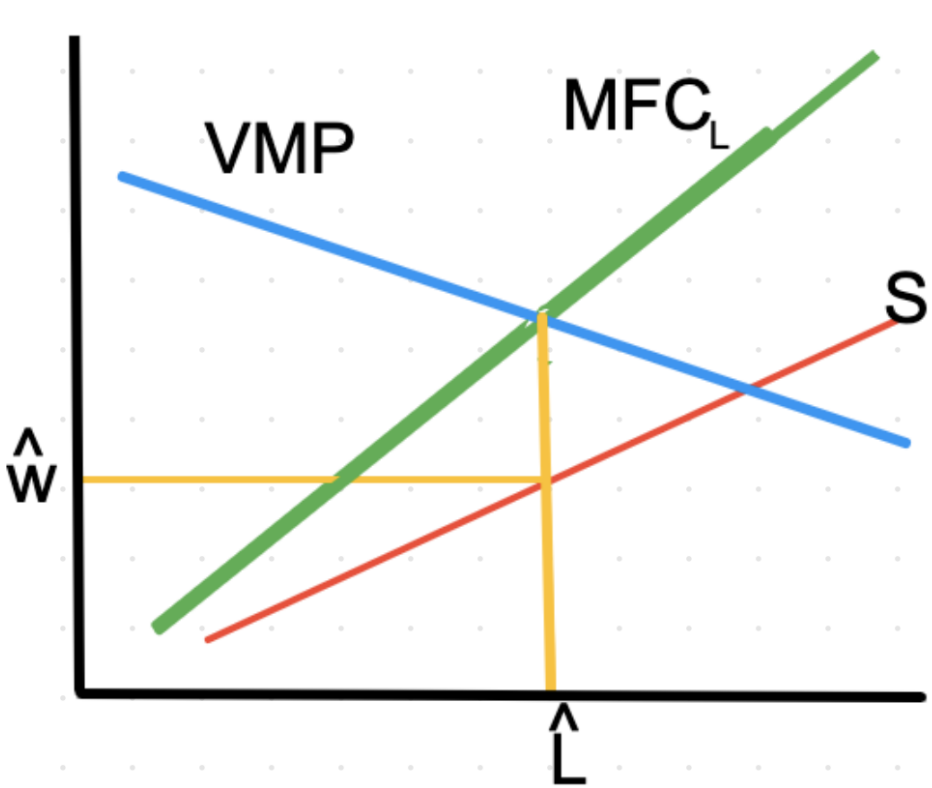
Serving as ground zero for the $15 minimum wage battle, New York City saw its fast-food workers also serve as the subjects in an experiment that completely ignored the laws of economics.

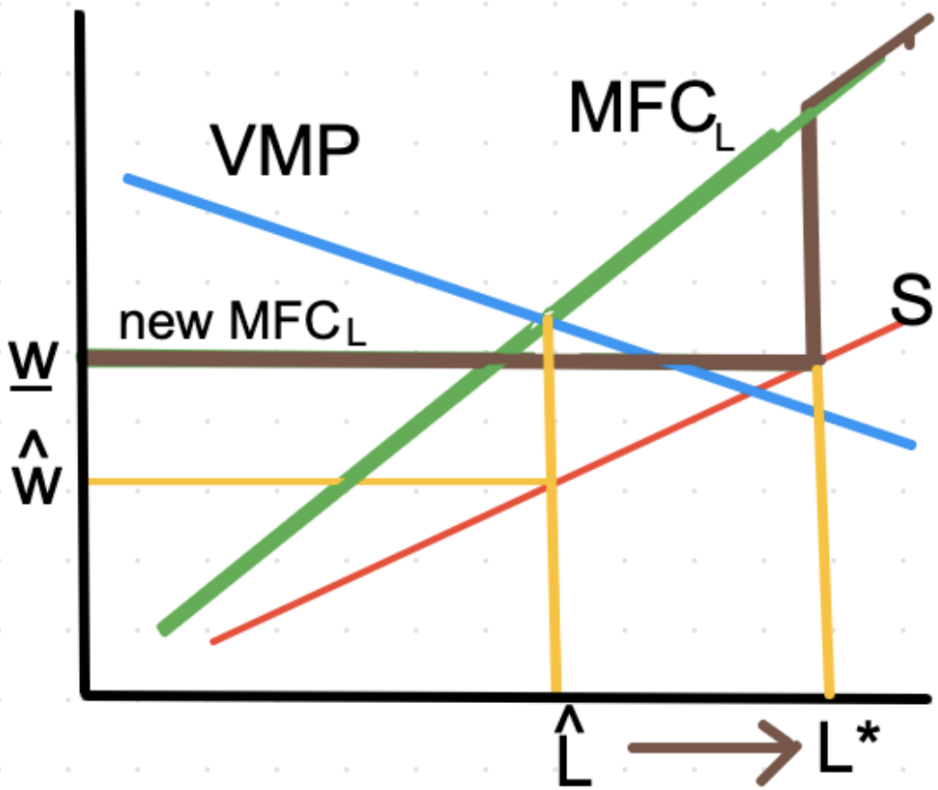
Wednesday, February 20, 2019

Minimum Wage with Monopsony

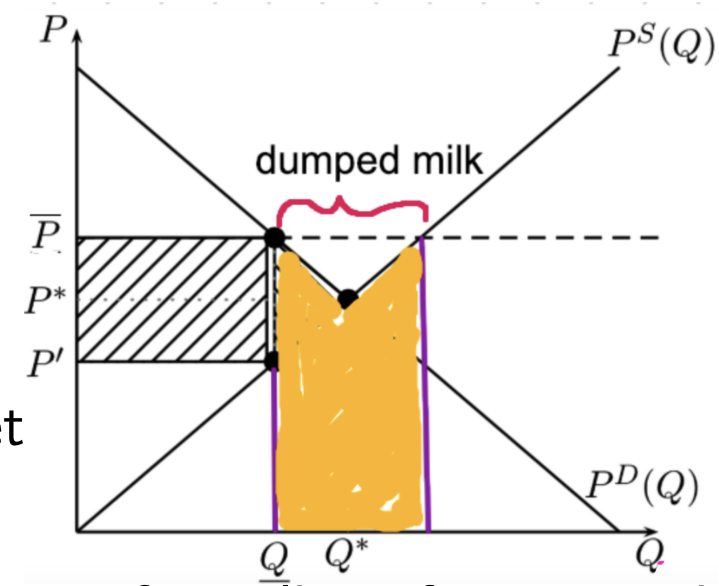


Minimum Wage with Monopsony



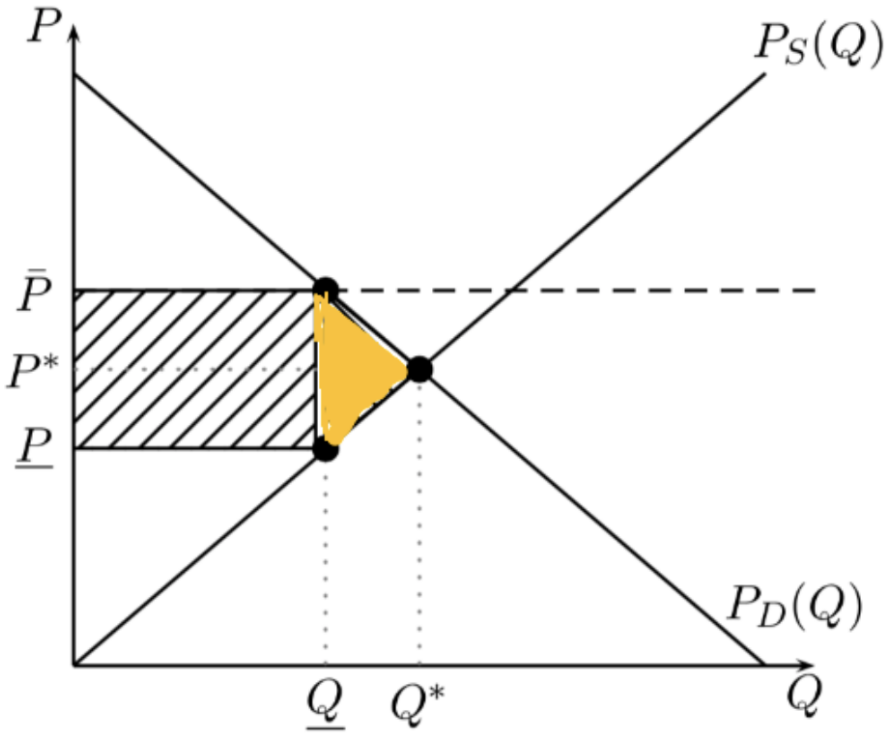


Guaranteed Price Floors Without Tokens



- A guaranteed price floor $\Rightarrow$ supply is long side of the market
- Government clears the market
- Governments may guarantee a price for milk to farmers and then dump the extra [$\Rightarrow$] large deadweight losses
- Proof: Losses are the standard triangle plus the incurred production costs below the supply curve from $\underline{Q}$ to $\bar{Q}$

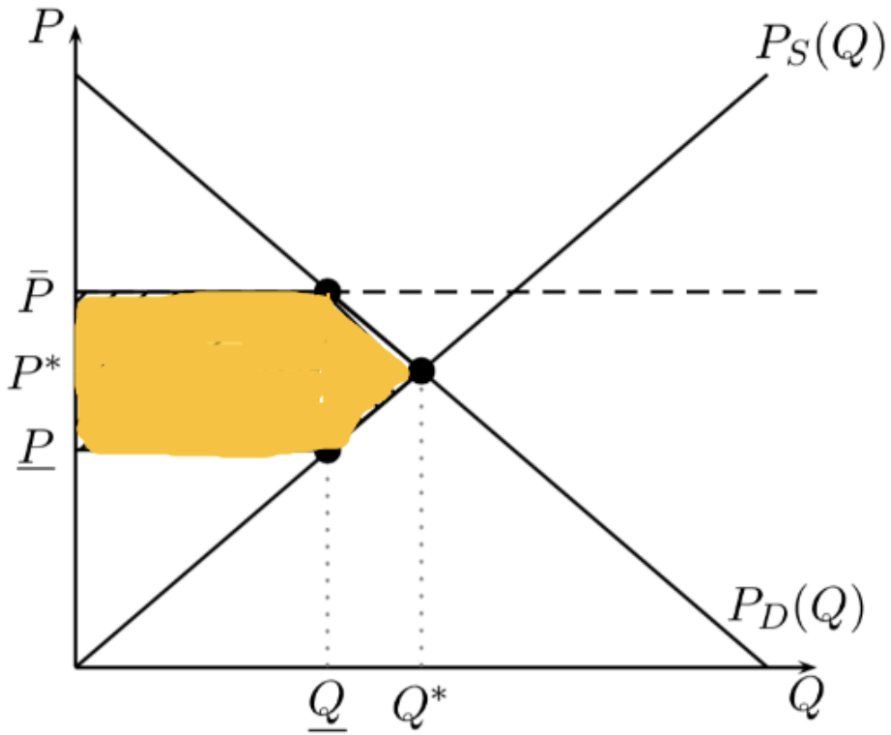
Price Floors Without Tokens



- minimum wage

$\Rightarrow$ losses far exceed standard triangular deadweight losses if higher wage jobs are secured by networking or luck, since these do not efficiently allocate workers to jobs.

Price Floors Without Tokens



- minimum wage with hired workers determined by rent-seeking or illegal activity
- "On the Waterfront"; Teamsters Truckers Union

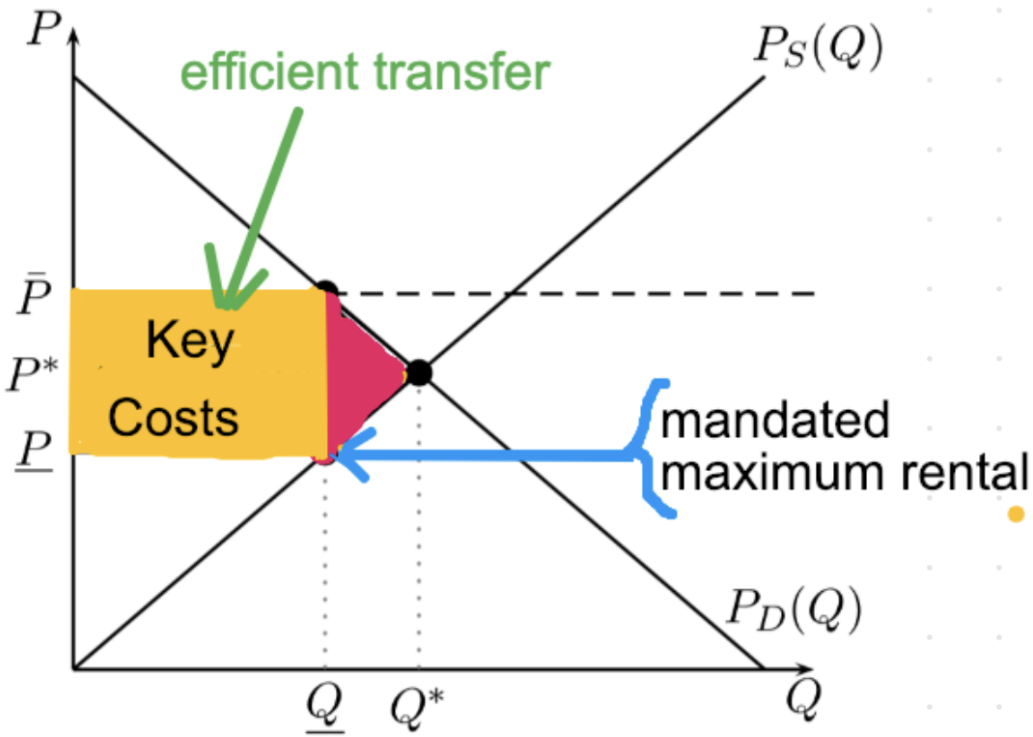
$\Rightarrow$ huge deadweight losses (no longer second order small for small deviations from the market price)

Price Floors where a Tradeable Token Emerges

- Assume the long side can pay a transfer to help clear the market in the resulting double auction — e.g., a union card
- If government does not buy surplus, then the **long side of the market** (supply) competes to secure the right to sell
- The transfer $t = \bar{P} - \underline{P}$ ensures that lowest cost sellers sell.

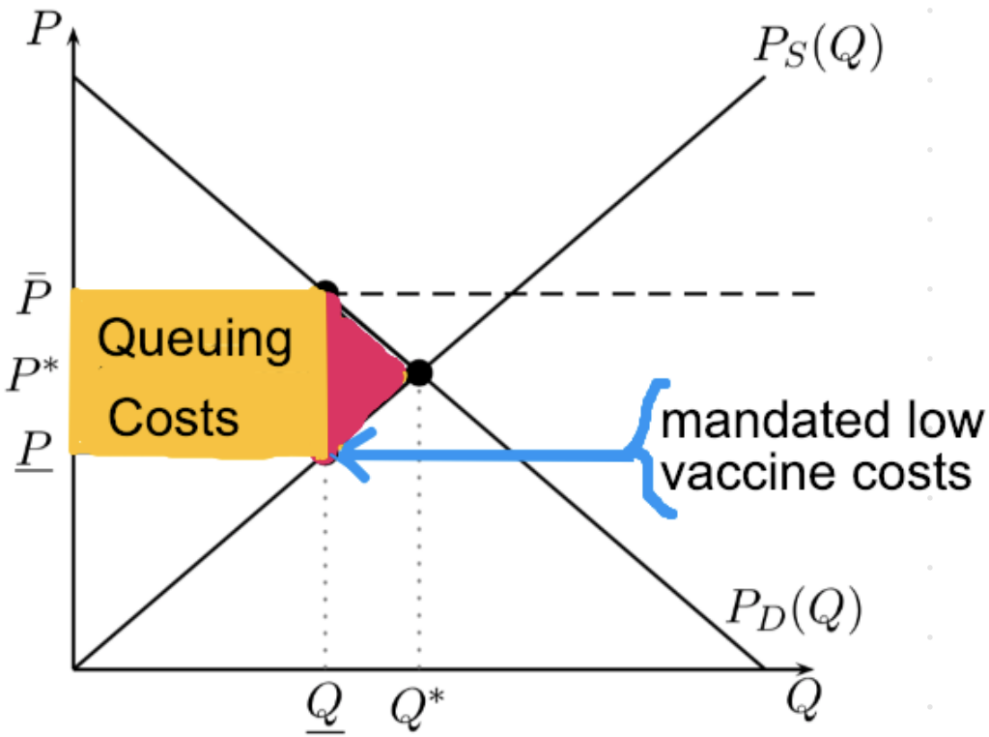
Price Ceilings with Tokens: Rent Control

- Sometimes a key price emerges (recall Seinfeld episode)



Price Ceilings with "Free" Tokens

- Example: Price Controls WWII lead to employer provided health insurance (that was the induced market)
- Swine Flu Vaccine (2009), vaccine required a bracelet token
- Just as in a communist country, where prices are kept artificially low, queueing cleared the bracelet market
- Secondary market of queuers efficiently emerged
- Exploring the search theory foundations is an open question



Price Ceilings without Tokens: Rent Control

- Sometimes the apartment is not kept up, reducing the supply curve, and price and quantity falls
- Social welfare losses are huge again
- Think of how to model what happens if a government makes consuming alcohol illegal (18th Amendment, 1919)