Economics 220, Jan 2022
Homework 12

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Consider the market for taxi services in Boston. The weekly demand for taxi services is given by

$$Q_D = 300{,}000 - 20{,}000p \Rightarrow p = \frac{300000}{20000} - \frac{Q_D}{20000} = 15 - \frac{Q_D}{20000}$$

There are 400 taxi drivers, each of whom has marginal costs given by

$$MC(q) = q/100 = p \Rightarrow (p = q/100) \Rightarrow q = 100p$$
$$q_S = 40{,}000p$$

where q is the individual driver's weekly output.

Find the equation for the overall market supply curve.

Overall Market Supply curve would be $\boxed{p = \frac{q_S}{40{,}000}}$

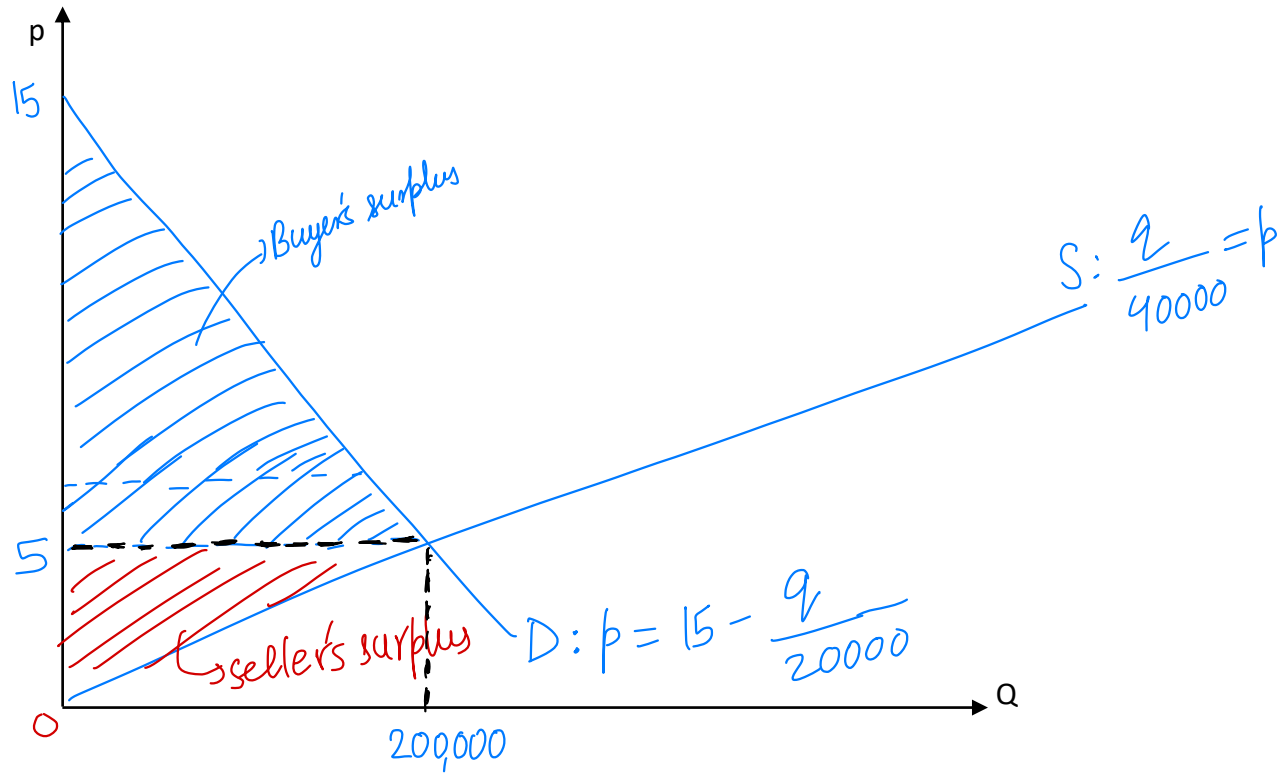
Find the equilibrium price and quantity of taxi services, and the quantity supplied by a typical taxi driver.

$$\frac{3q}{40000} = 15 \Rightarrow \boxed{q_{eq} = 200{,}000}$$

$$\boxed{p_{eq} = 5}$$

$$q/400 = \boxed{q_{by\ one} = 500}$$

Sketch the supply and demand curves and the market equilibrium.



Find the equilibrium values of buyers and sellers surplus in this market.

Buyer's surplus $= \frac{1}{2}(15-5)(200000) = \boxed{1{,}000{,}000}$ Ans

Seller's surplus $= \frac{1}{2}(5-0)(200000) = \boxed{500{,}000}$ Ans

Suppose the market is initially in long-run equilibrium. What are a typical taxi driver's fixed costs? *{recall: profits = sellers surplus – fixed costs}*

In long-run equilibrium, profits = 0

$\Rightarrow$ sellers surplus = fixed costs = **500,000**

$\Rightarrow$ fixed cost per taxi driver = $\frac{500000}{400}$ = **1250** Ans (from last part)

Suppose that demand increases to

$Q'_D = 420{,}000 - 20{,}000p \Rightarrow \left(p = 21 - \frac{q'_D}{20000}\right)$

In the short run (so there is no entry or exit) find the new equilibrium price and quantity of taxi services.

$p = \frac{q}{40000} = 21 - \frac{q}{20000} \Rightarrow \frac{3q}{40000} = 21$

$\Rightarrow \boxed{q'_{eq} = 280{,}000}$ Ans

$\Rightarrow \boxed{p'_{eq} = 21 - 14 = 7}$ Ans

What are the profits of a typical taxi driver (in the short run)?

seller's surplus = $\frac{1}{2} \times 7 \times 280000 = 980000$

fixed cost = 500,000

profit = 480000

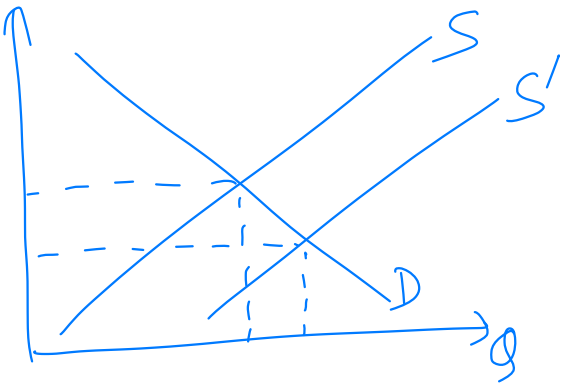
profit per taxi driver = $\frac{480000}{400}$ = **1200** Ans

If the market is competitive, what would you expect to happen over time to the price and quantity of taxi services, and to buyers surplus and taxi profits?

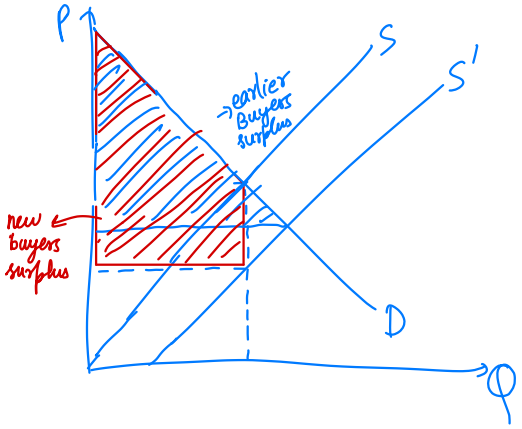
→ The taxi profits would eventually vanish.

→ Buyers surplus would increase

→ Supply curve shifts right and quantity goes up while price goes down.



Suppose the government decides to issue 400 taxi medallions, and to restrict the provision of taxi services to the holders of these medallions. The medallions are to be rented to taxi drivers at prices determined by auction: that is, prospective taxi drivers will bid for medallions in a competitive market. How would this affect buyers' welfare? What price would you expect these medallions to rent for?



The price of these medallions for rent is 1200.

Hence, the buyers surplus would be less than the last part. As the gains from the competitive market are prevented, the buyers surplus would be $= \frac{1}{2} \times (21-7) \times 280000 = 1,960,000$.

Taxi drivers would keep betting for the medallion until and unless they exhaust their profits.