

Cost and the Supply Curve

- **Cost** is the value of everything a seller must give up to produce a good (i.e., opportunity cost).
- Includes cost of all resources used to produce good, including value of the seller's time.
- Example: Costs of 3 sellers in the lawn-cutting business.

name	cost
Edward	\$10
Felix	20
Geo	35

A seller will only produce and sell the good if the price exceeds his or her cost.

Hence, cost is a measure of willingness to sell.

Explicit costs + Implicit costs
(= hidden costs)

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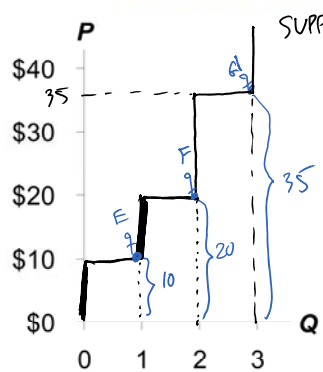
Cost and the Supply Curve

Derive the supply schedule from the cost data:

name	cost
Edward	\$10
Felix	20
Geo	35

P	Q ^s
\$0 – 9	0
10 – 19	1
20 – 34	2
35 & up	3

Cost and the Supply Curve



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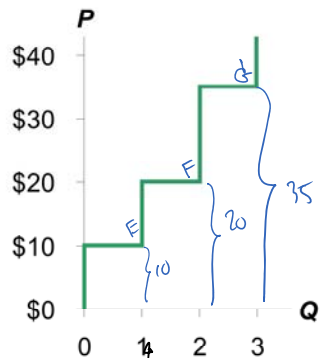
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SUPPLY CURVE w/ 3 sellers; E, F, G

P	Q ^s
\$0 - 9	0
10 - 19	1
20 - 34	2
35 & up	3

The height from the ground to the roof of the supply curve measures the seller's cost or the seller's willingness to sell or the lowest price the seller is "willing to accept" in order to sell.

Cost and the Supply Curve



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21

At each Q, the height of the S curve is the cost of the **marginal seller**, the seller who would **leave** the market if the price were any lower.

At $Q=1$, E is the marginal seller.
At $Q=2$, F is _____
At $Q=3$, G is _____

Producer Surplus

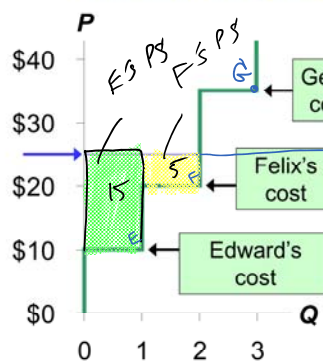


Producer surplus (PS):

the amount a seller
is paid for a good
minus the seller's cost

$$PS = \text{Price seller gets (P)} - \text{his cost}$$

Producer Surplus and the S Curve



$$PS = P - \text{cost}$$

Suppose $P = \$25$.

$$\text{Edward's PS} = P - \text{cost} = 25 - 10 = 15 \$$$

$$\text{Felix's PS} = P - \text{cost} = 25 - 20 = 5 \$$$

$$\text{Geo's PS} = 0$$

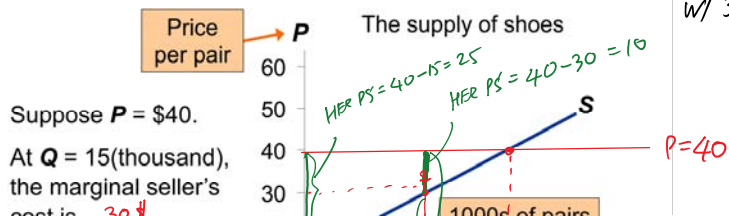
$$\text{Total PS} = 15 + 5 + 0 = 20 \$$$

Total PS equals

AREA ABOVE THE SUPPLY CURVE

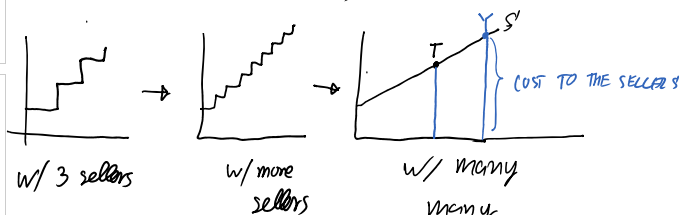
BUT UNDER THE PRICE LINE (OR PRICE LEVEL)

PS with Lots of Sellers & a Smooth S Curve



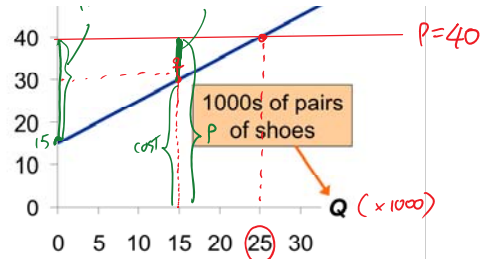
Suppose $P = \$40$.

At $Q = 15$ (thousand),
the marginal seller's
cost is 30 \$



(smooth
supply
curve)

At $Q = 15$ (thousand),
the marginal seller's
cost is 30
and her producer
surplus is \$ 10



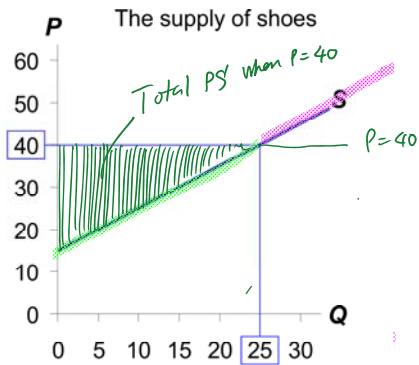
(Supply
curve)

PS with Lots of Sellers & a Smooth S Curve

PS is the area b/w
 P and the S curve,
from 0 to Q .

The height of this
triangle is

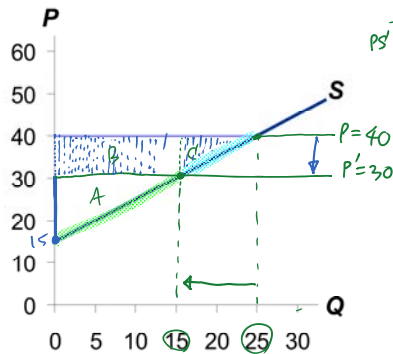
So,
 $PS = \frac{1}{2} \times b \times h$
=
=



How a Lower Price Reduces PS

If P falls to \$30,
 $PS = \frac{1}{2} \times 15 \times \15
 $= \$112.5$

Two reasons for
 the fall in PS.



	$(P = 40)$	$(P' = 30)$	
	B/F	A/F	Δ in PS
PS	$A+B+C$	A	$-B-C$
			loss in PS
			$-B =$ loss in PS
			when old sellers
			get lower price
			:-
			$-C =$ loss in PS
			when some sellers
			exit the market
			when $P \downarrow$. :-

ACTIVE LEARNING 2: Producer Surplus

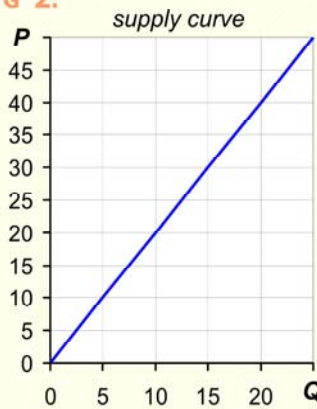
A. Find marginal
 seller's cost
 at $Q = 10$.

B. Find PS for
 $P = \$20$.

Suppose P rises to \$30.
 Find the increase
 in PS due to...

C. selling 5
 additional units

D. getting a higher price
 on the initial 10 units



ACTIVE LEARNING 2:

Answers

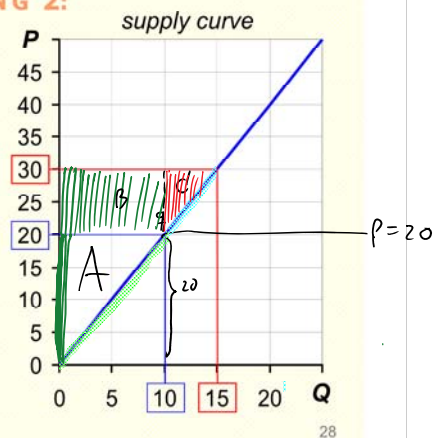
A. At $Q = 10$,
marginal cost = 20

B. PS = AREA A

P rises to \$30.

C. PS on
additional units
= AREA C

D. Increase in PS
on initial 10 units
= AREA B



What do CS, PS, and Total Surplus Measure?

$$CS = (WTP) - (P)$$

CS measures the benefit buyers receive
from participating in the market.

$$PS = (P) - (COST)$$

PS measures the benefit sellers receive
from participating in the market.

$$\text{Total surplus} = CS + PS$$

TS measures the total gains from trade in a market.

$$TS = CS + PS$$

The Market's Allocation of Resources

- In a market economy, the allocation of resources is decentralized, determined by the interactions of many self-interested buyers and sellers.
- Is the market's allocation of resources desirable? Or would a different allocation of resources make society better off?
- To answer this, we use total surplus as a measure of society's well-being.

Measuring Society's Well-Being

Total surplus

$$= CS + PS$$

$$= (\text{value to buyers}) - (\text{amount paid by buyers}) \\ + (\text{amount received by sellers}) - (\text{cost to sellers})$$

$$= (\text{value to buyers}) - (\text{cost to sellers})$$

Efficiency

$$\text{Total surplus} = (\text{value to buyers}) - (\text{cost to sellers})$$

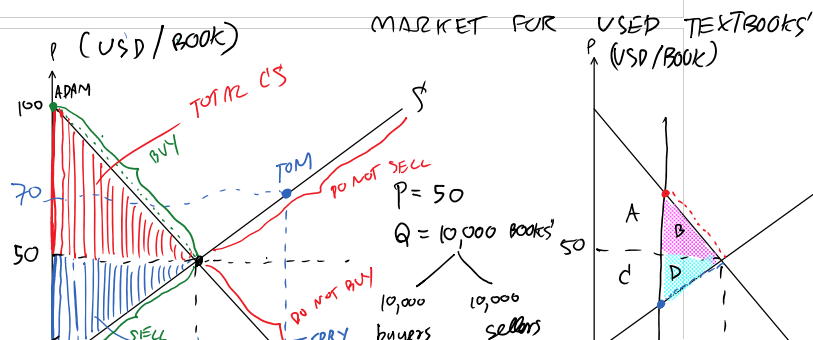
An allocation of resources is **efficient** if it maximizes total surplus. Efficiency means:

- Raising or lowering the quantity of a good would not increase total surplus.
- The goods are being produced by the producers with lowest cost.
- The goods are being consumed by the buyers who value them most highly.

Efficiency

$$\text{Total surplus} = (\text{value to buyers}) - (\text{cost to sellers})$$

- Efficiency means making the pie as big as possible.
- In contrast, **equity** refers to whether the pie is divided fairly.
- What's "fair" is subjective, harder to evaluate.
- Hence, we focus on efficiency as the goal, even though policymakers in the real world usually care about equity, too.



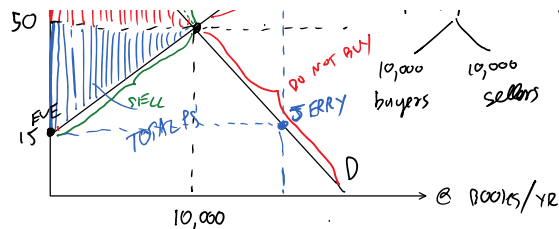
	Free mkt B/F	w/ Govt Intervention A/F	Δ
CS	A+B	A	-B → loss in CS
PS	C+D	C	-D → loss in PS
TS	A+B+C+D	A+C	-B-D → loss in TS

BUYERS
STUDENTS WHO DO NOT WANT TO BUY A NEW BOOK

SELLERS
STUDENTS WHO DO NOT WANT

so called "Deadweight loss" (is the welfare loss due to this intervention)

$$\begin{aligned} TS &= CS + PS \\ \Delta TS &= \Delta CS + \Delta PS \\ &\downarrow \quad \downarrow \\ &-B-D \quad -B \quad -D \end{aligned}$$



FREE MARKET

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34

$$TS = CS + PS$$

Economic Pie used to measure mkt efficiency

Evaluating the Market Equilibrium

Market eq'm:

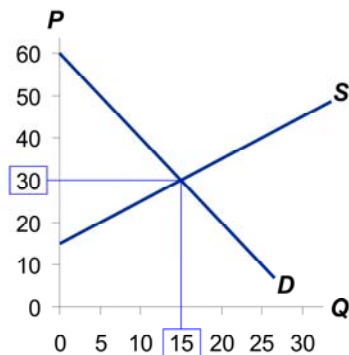
$P = \$30$

$Q = 15,000$

Total surplus

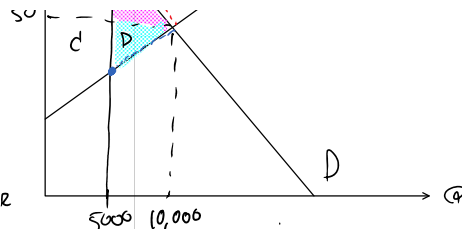
$= CS + PS$

Is the market eq'm efficient?



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35



MARKET W/ QUANTITY RESTRICTION

SELLERS
STUDENTS WHO
DO NOT WANT
TO KEEP
THE BOOK
ON THE SHELF

"... due to
this intervention"