

# Market Structure and Perfect Competition

AEB 2104

Agricultural Economics

<http://www.geocities.com/dsolisw/AEB2104.html>

# Firm Supply

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- How does a firm decide how much to supply at a given price? This depends upon the firm's
  - goals;
  - technology;
  - market environment; and
  - competitors' behavior.

# Market Environment

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- Are there many other firms?
- How do other firms' decisions effect the firm's payoffs?

# Market Environment

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- ***Monopoly***: Just one seller that determines the quantity supplied/the market-clearing price.
- ***Oligopoly***: A very small number of firms, the decision of each influencing the payoffs of the other firms.

# Market Environment

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- ***Dominant Firm***: Many firms, but one much larger than the rest. The large firm's decisions affect the payoffs of each small firm. Decisions by any one small firm do not noticeably effect the payoffs of any other firm.

# Market Environment

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- ***Monopolistic Competition:*** Many firms each making a slightly different product. Each firm's output level is small relative to the total.
- **Perfect Competition:** Many firms, all making the same product. Each firm's output level is very small relative to the total output level.

# Perfect Competition

## Assumptions

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- There are many buyers and sellers,
  - each firm is a price-taker
- Homogeneous product
- Freedom of entry and exit
- Perfect information

# Perfect Competition

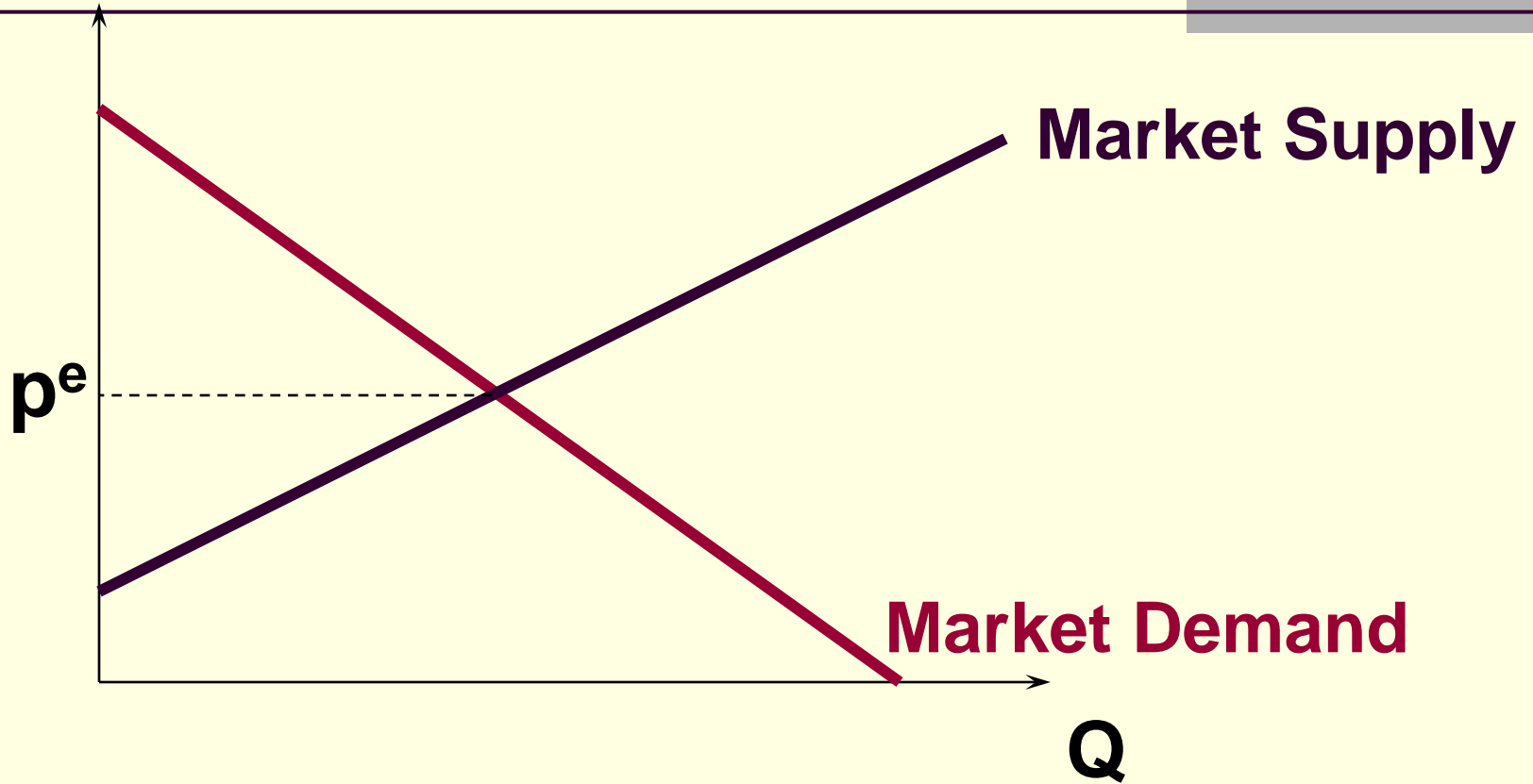
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- What is the demand curve faced by the firm?

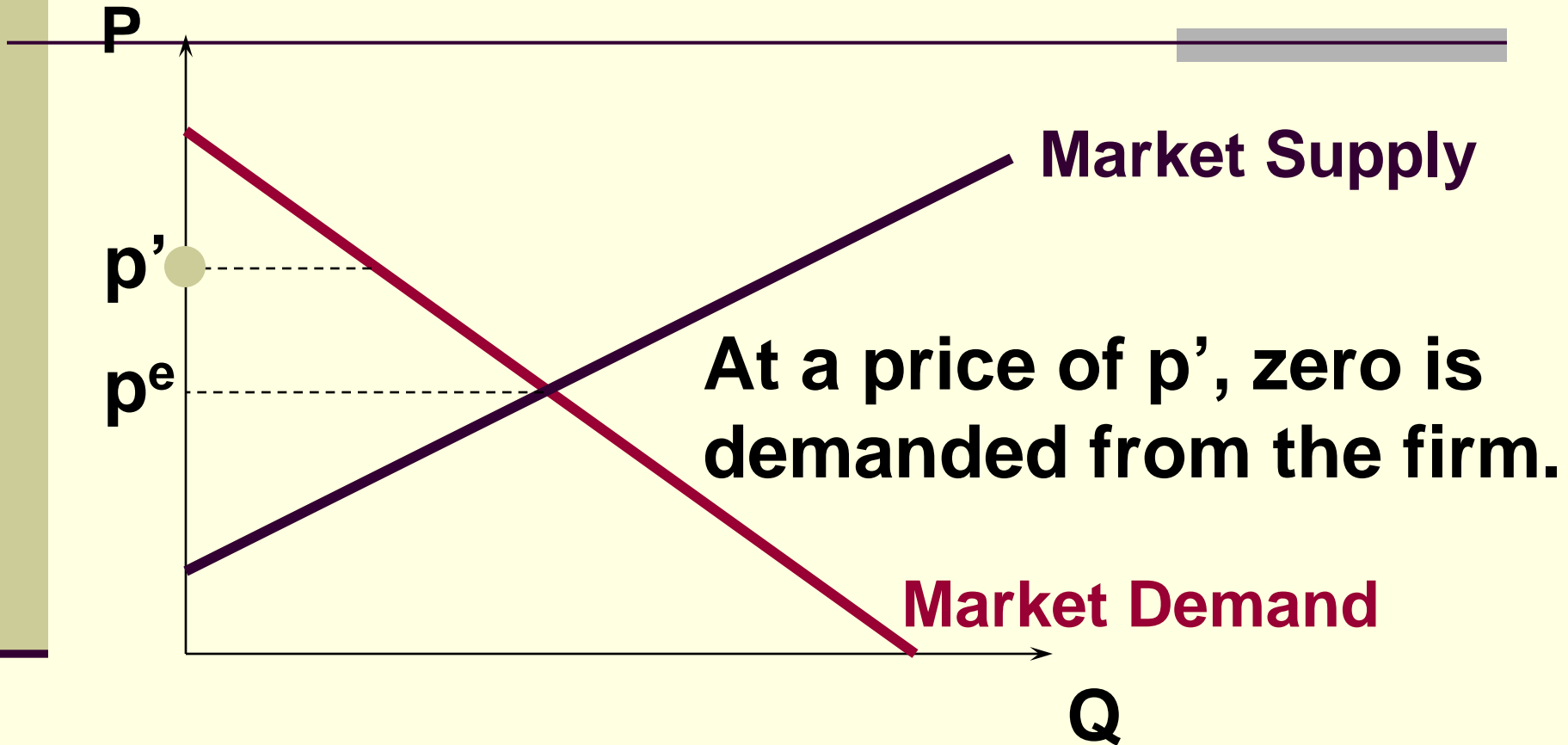


# Perfect Competition

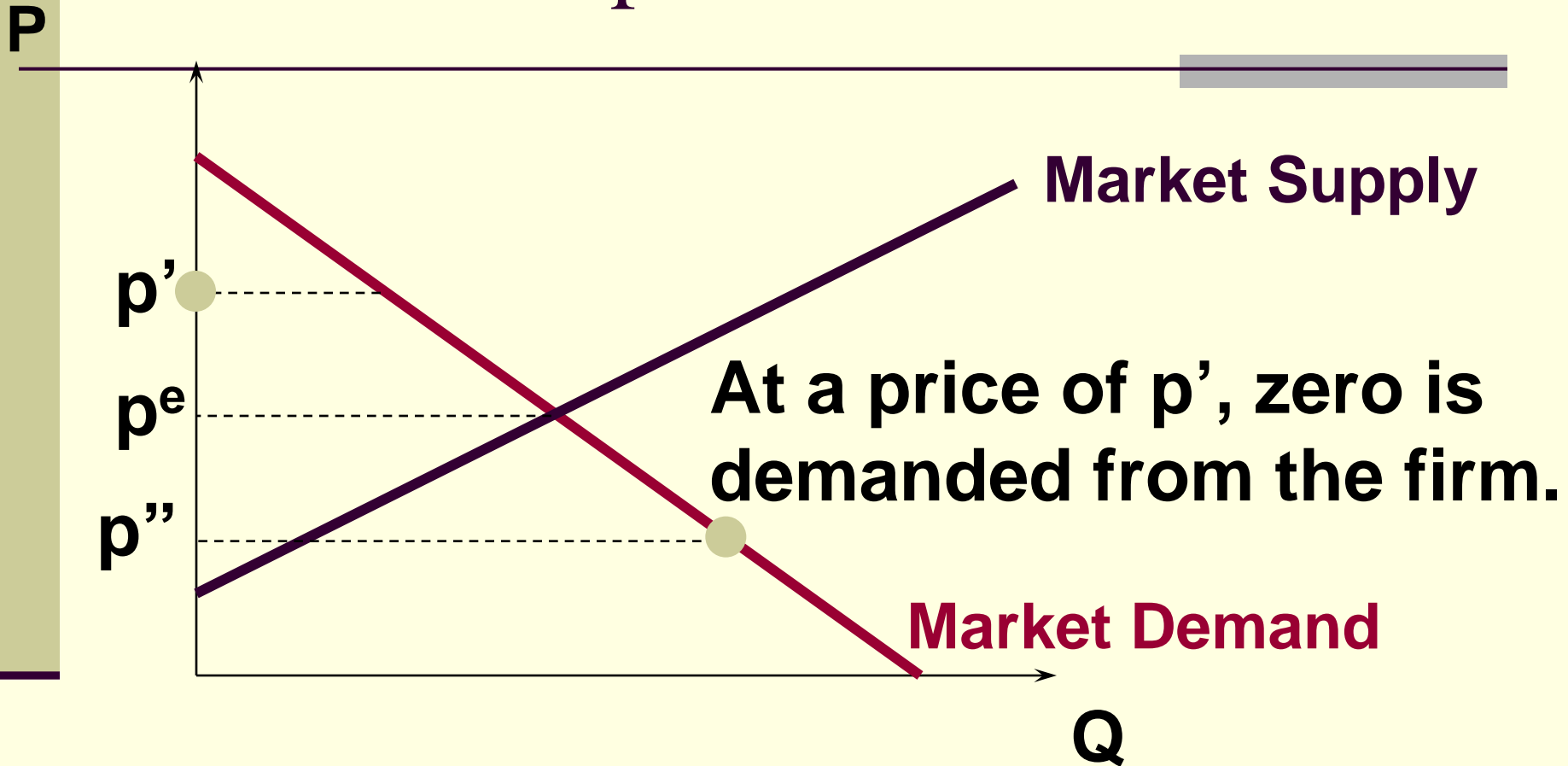
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# Perfect Competition



# Perfect Competition



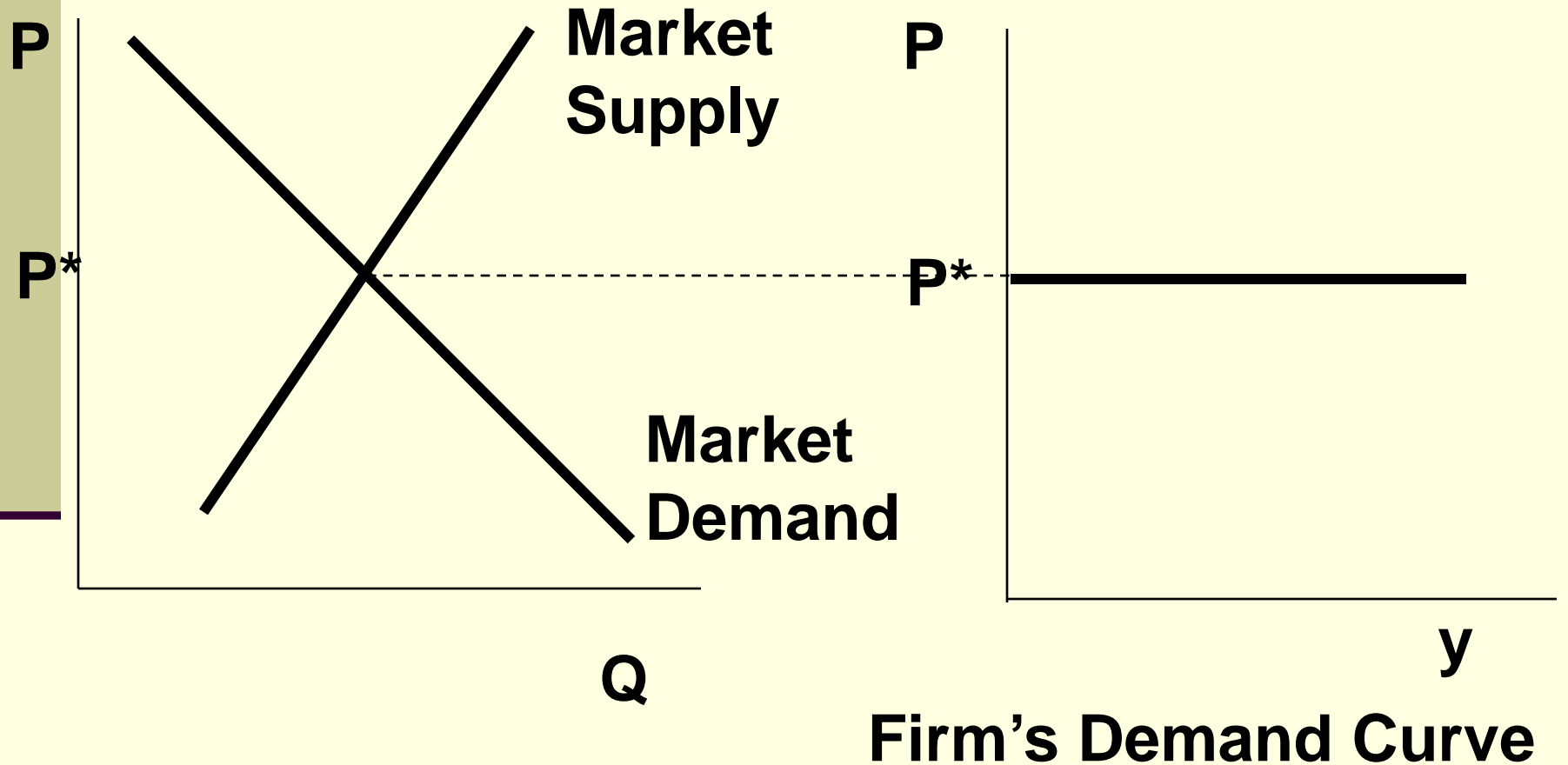
**At a price of  $p''$  the firm faces the entire market demand.**

# Perfect Competition

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- Therefore, the demand curve faced by the individual firm is ...

# Perfect Competition



# The Firm's Short-Run Supply Decision?

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- Each firm is a profit-maximizer
- Each firm choose its output level by solving

$$\max_{y \geq 0} \Pi(y) = py - c(y)$$

# The Firm's Short-Run Supply Decision?

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$$\max_{y \geq 0} \Pi(y) = py - c(y)$$

**What does the solution  $y_s^*$  look like?**

# The Firm's Short-Run Supply Decision?

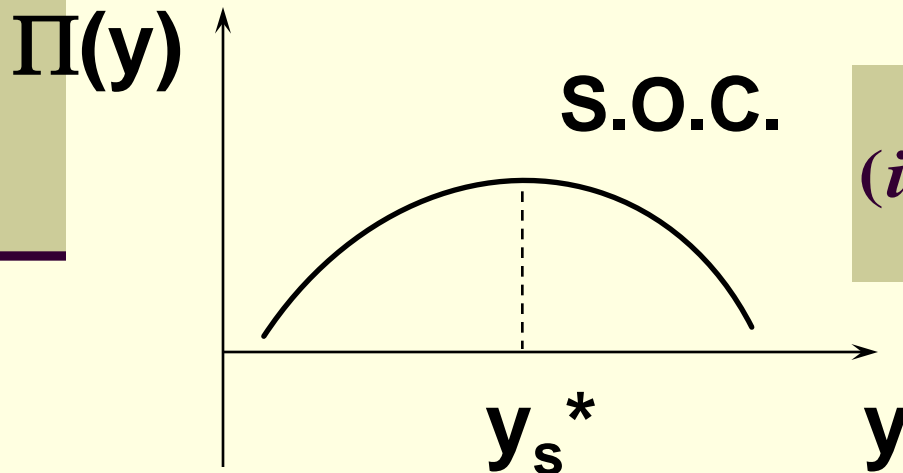
$$\max_{y \geq 0} \Pi(y) = py - c(y)$$

**F.O.C.**

$$(i) \frac{d\Pi(y)}{dy} = p - MC_s(y) = 0$$

**S.O.C.**

$$(ii) \frac{d^2\Pi(y)}{dy^2} < 0 \text{ at } y = y_s^*$$





# The Firm's Short-Run Supply Decision?

The first-order maximum profit condition is

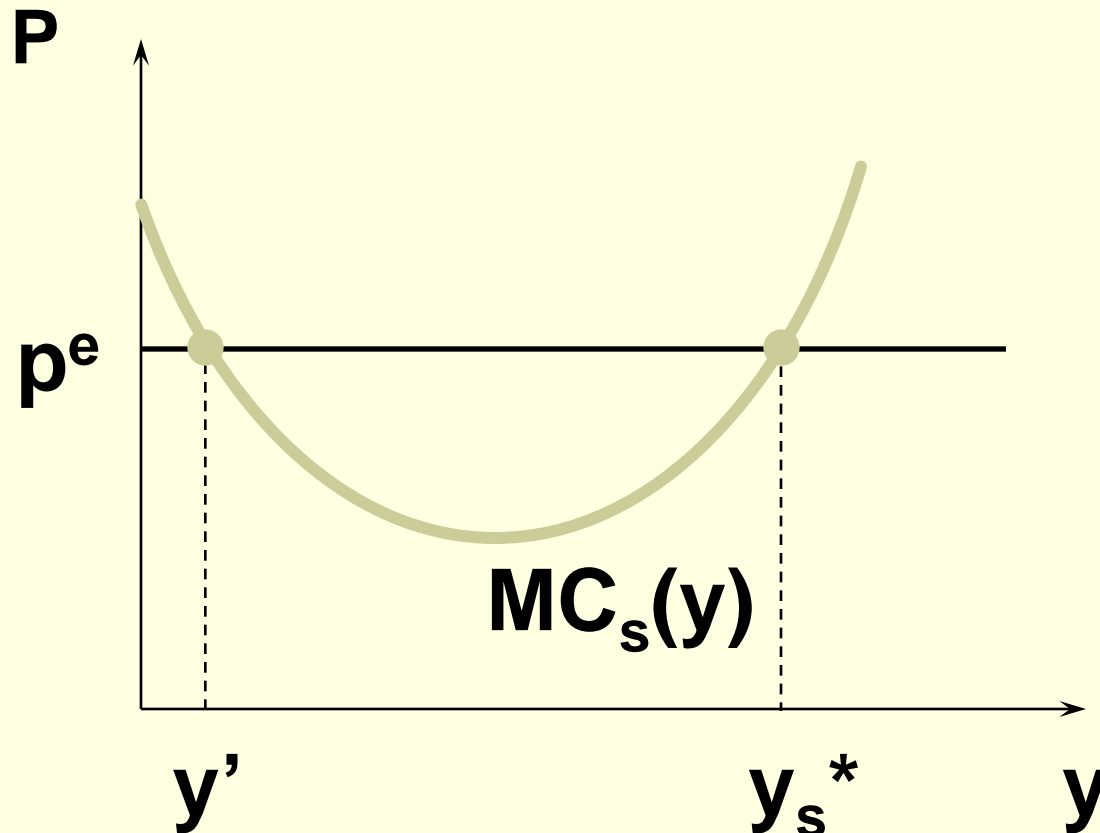
$$\frac{d\Pi(y)}{dy} = p - MC(y) = 0$$

That is,

$$p = MC$$

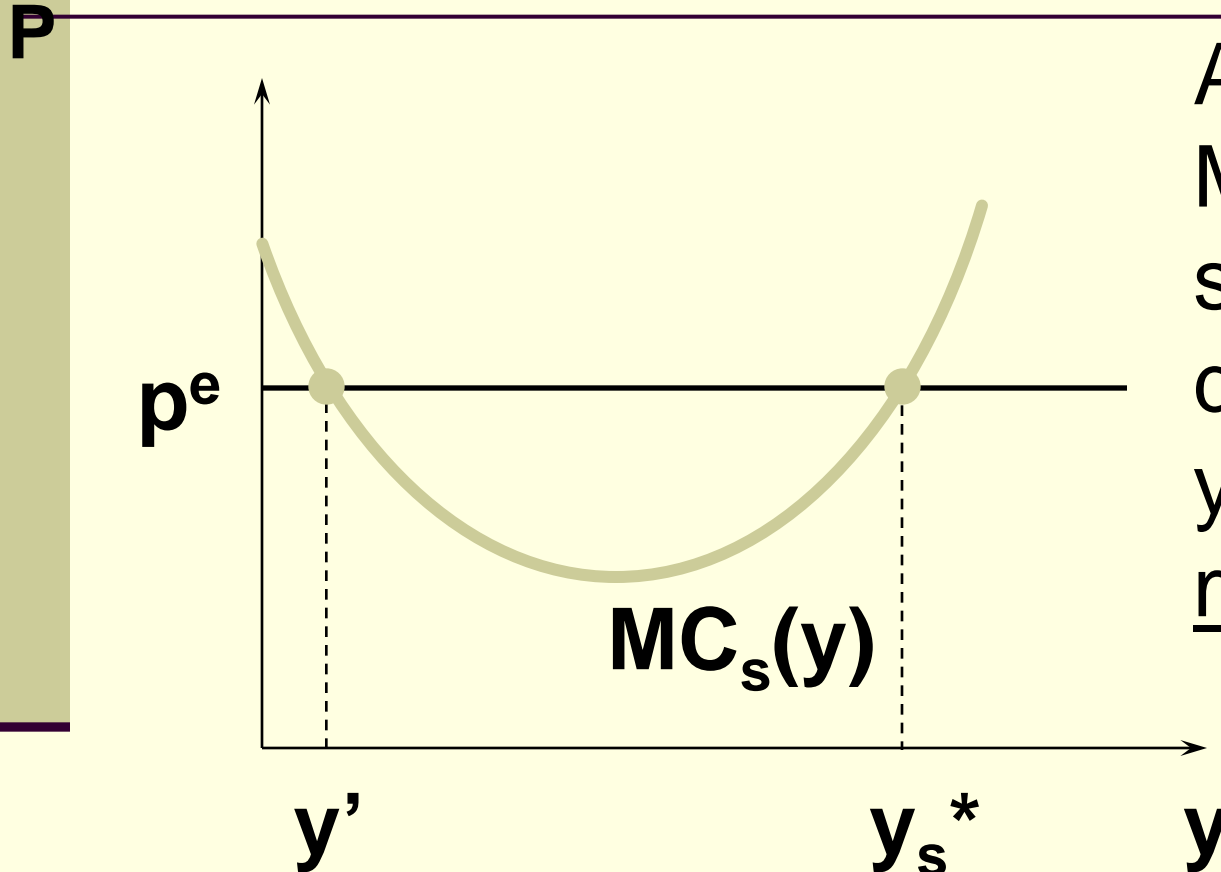
So at a profit maximum with  $y_s^* > 0$ , the market price  $p$  equals the marginal cost of production at  $y = y_s^*$ .

# The Firm's Short-Run Supply Decision?



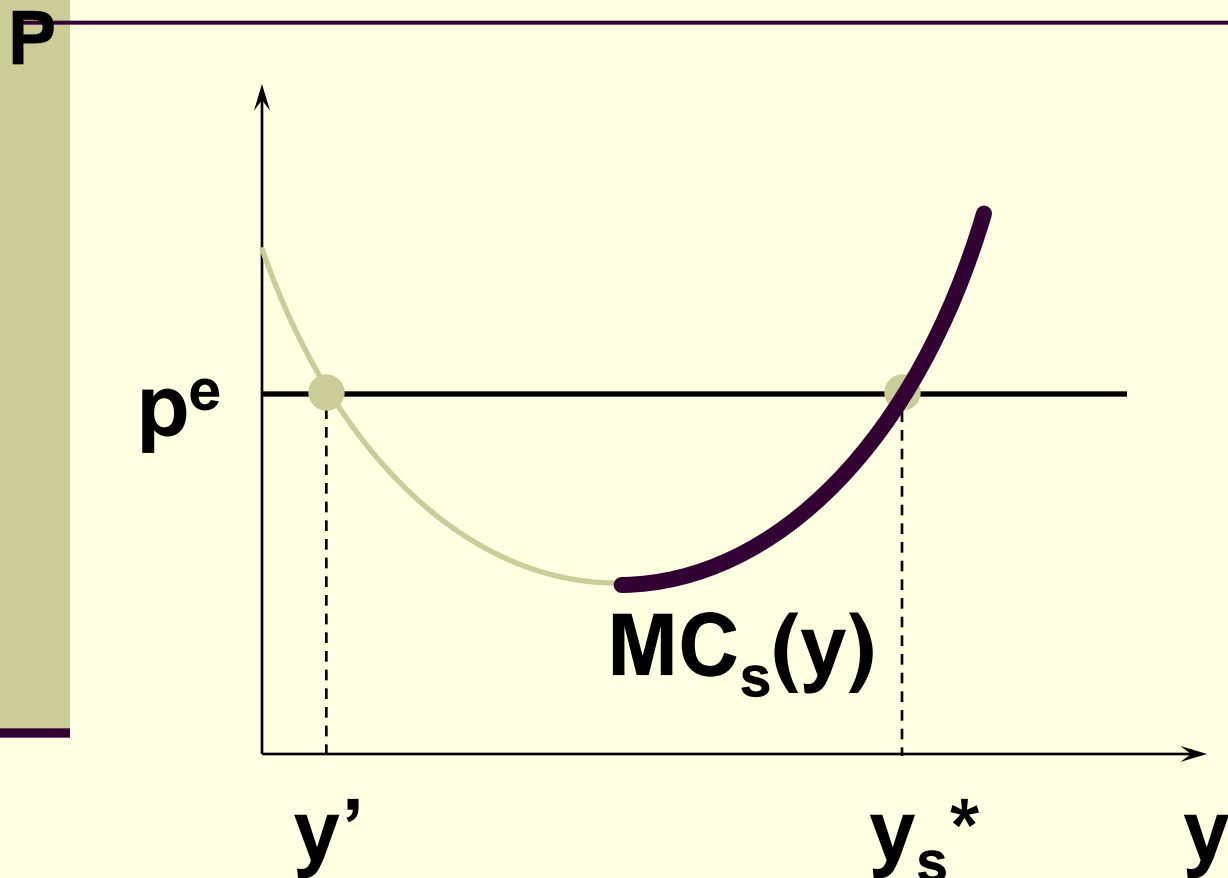
At  $y = y_s^*$ ,  
 $p = MC$   
and  $MC$   
slopes  
upwards,  
 $y = y_s^*$  is  
profit-  
maximizing.

# The Firm's Short-Run Supply Decision?



At  $y = y'$ ,  $p = MC$  and  $MC$  slopes downwards,  $y = y'$  is profit-minimizing.

# The Firm's Short-Run Supply Decision?



So a profit-maximizing supply level can lie only on the upwards sloping part of the firm's MC curve.

# The Firm's Short-Run Supply Decision?

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- But not every point on the upward-sloping part of the firm's MC curve represents a profit-maximum.
- The firm will choose an output level  $y > 0$  only if

$$p \geq AVC(y)$$

# The Firm's Short-Run Supply Decision?

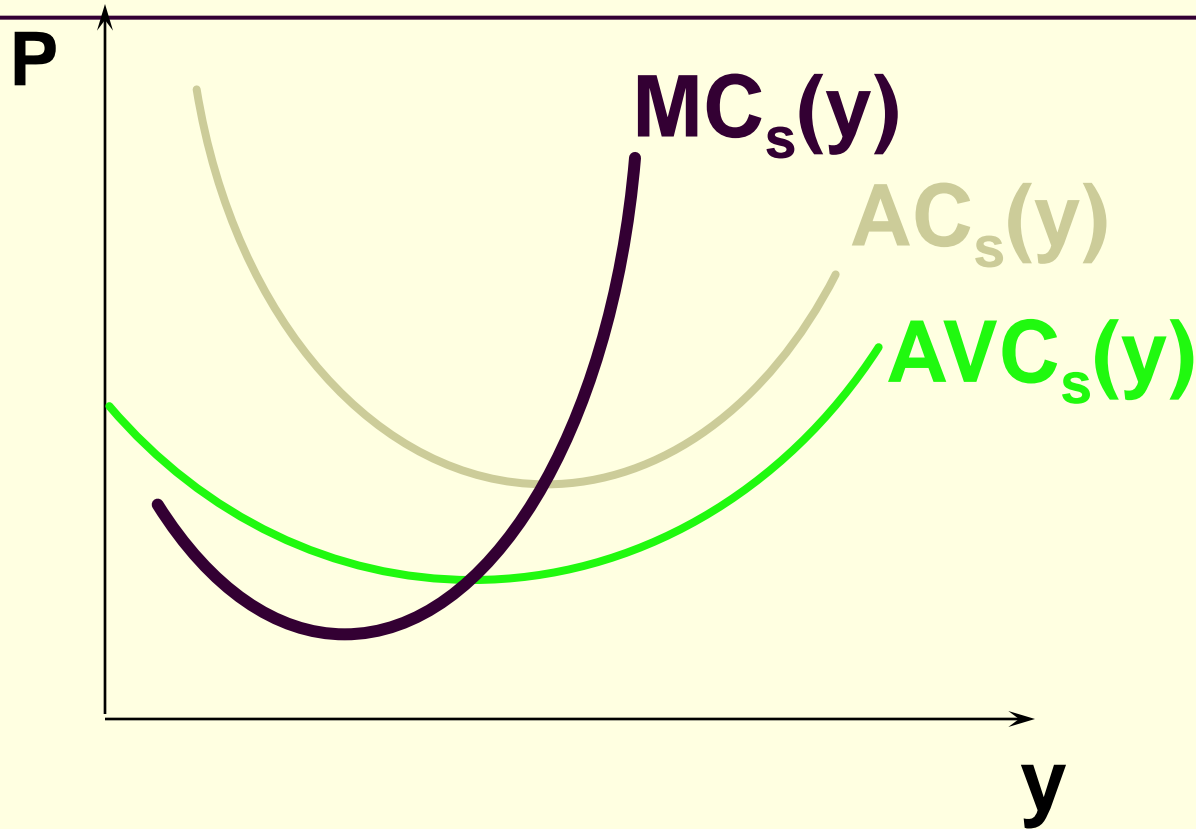
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- The firm will not supply any output if

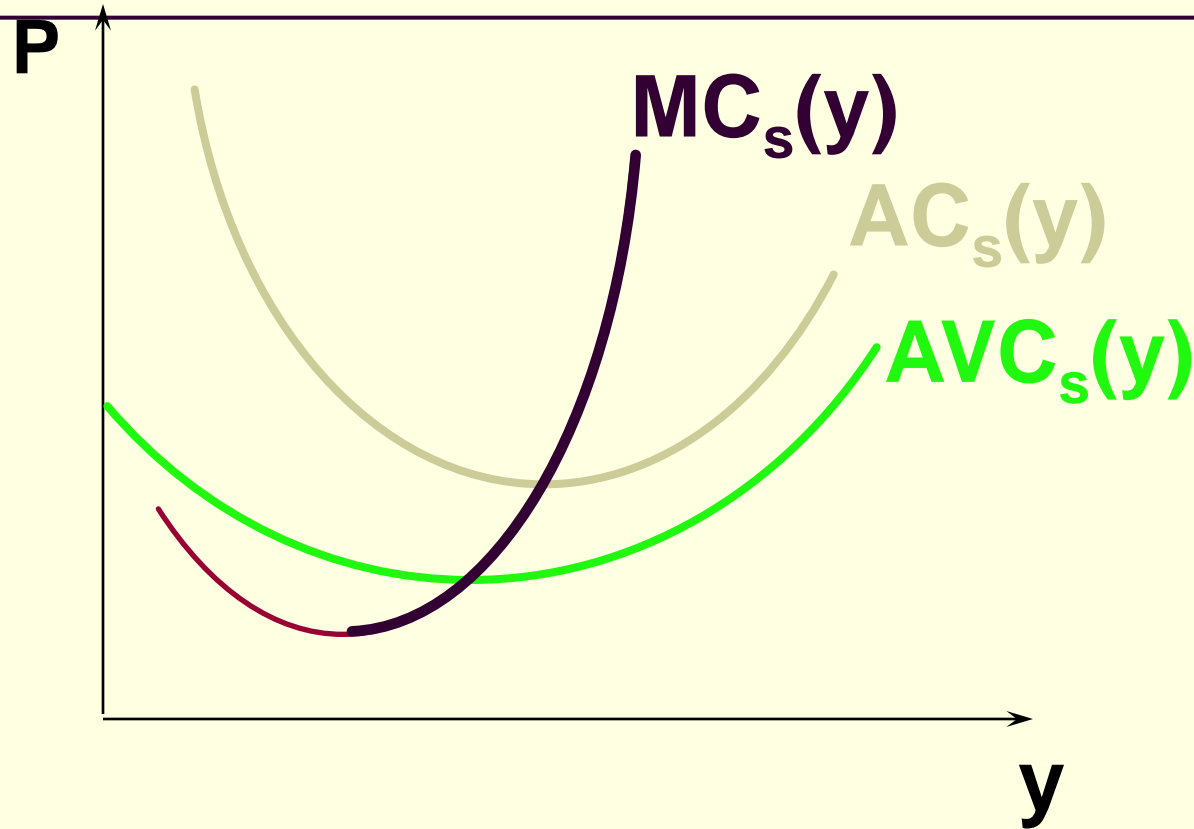
$$p < AVC(y)$$

**Shut Down Point:  $P = AVC(y)$**

# The Firm's Short-Run Supply Decision?

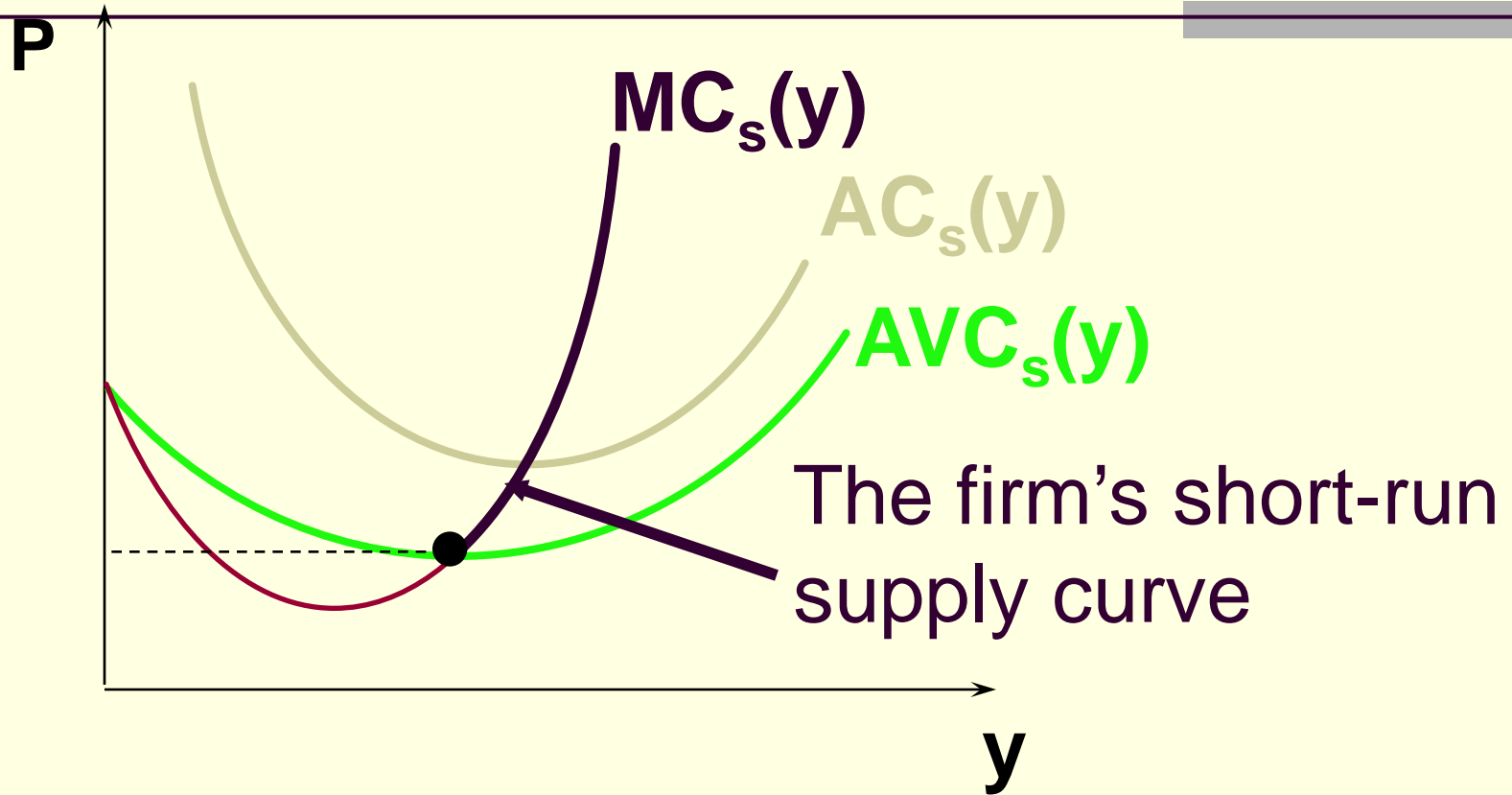


# The Firm's Short-Run Supply Decision?



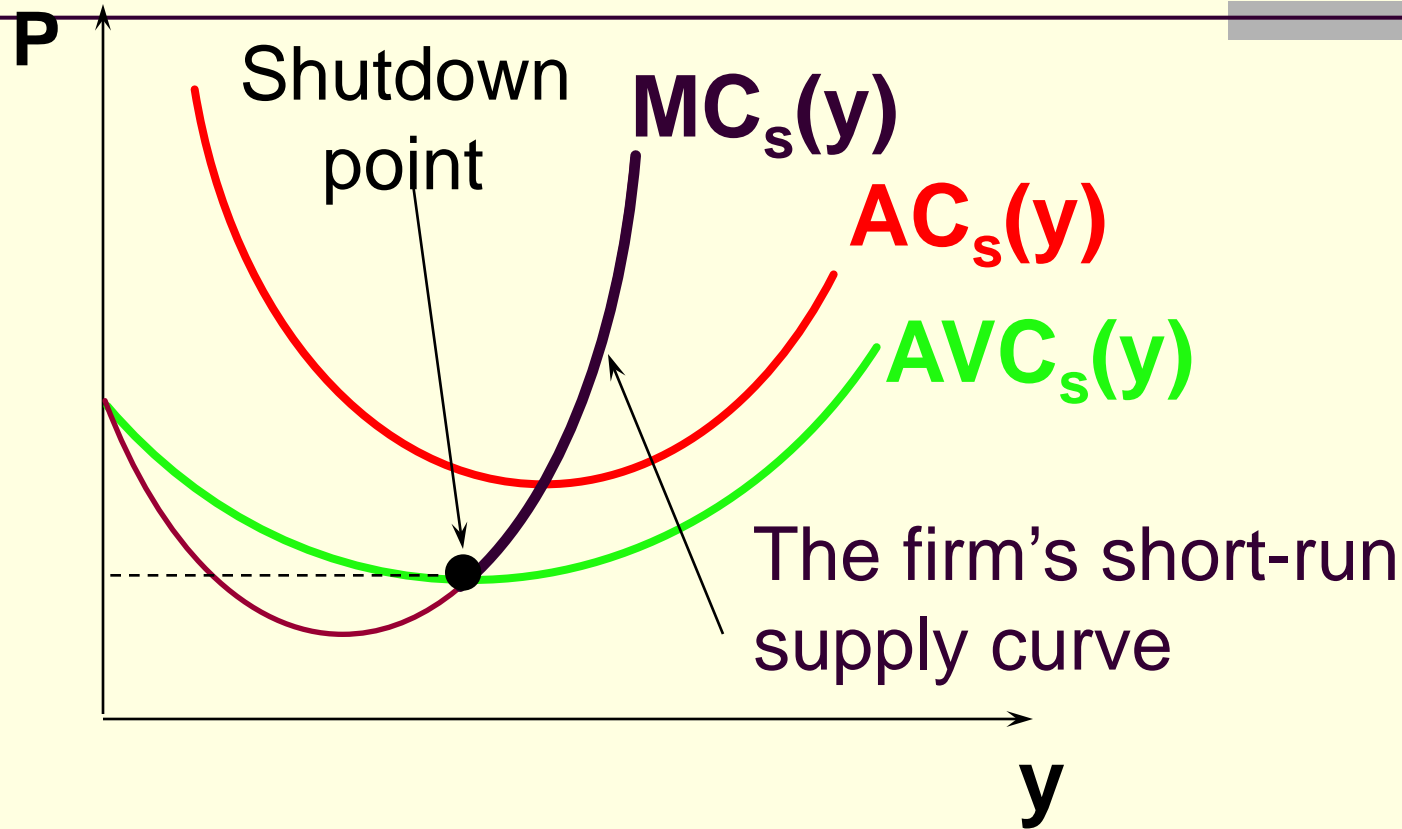


# The Firm's Short-Run Supply Decision?



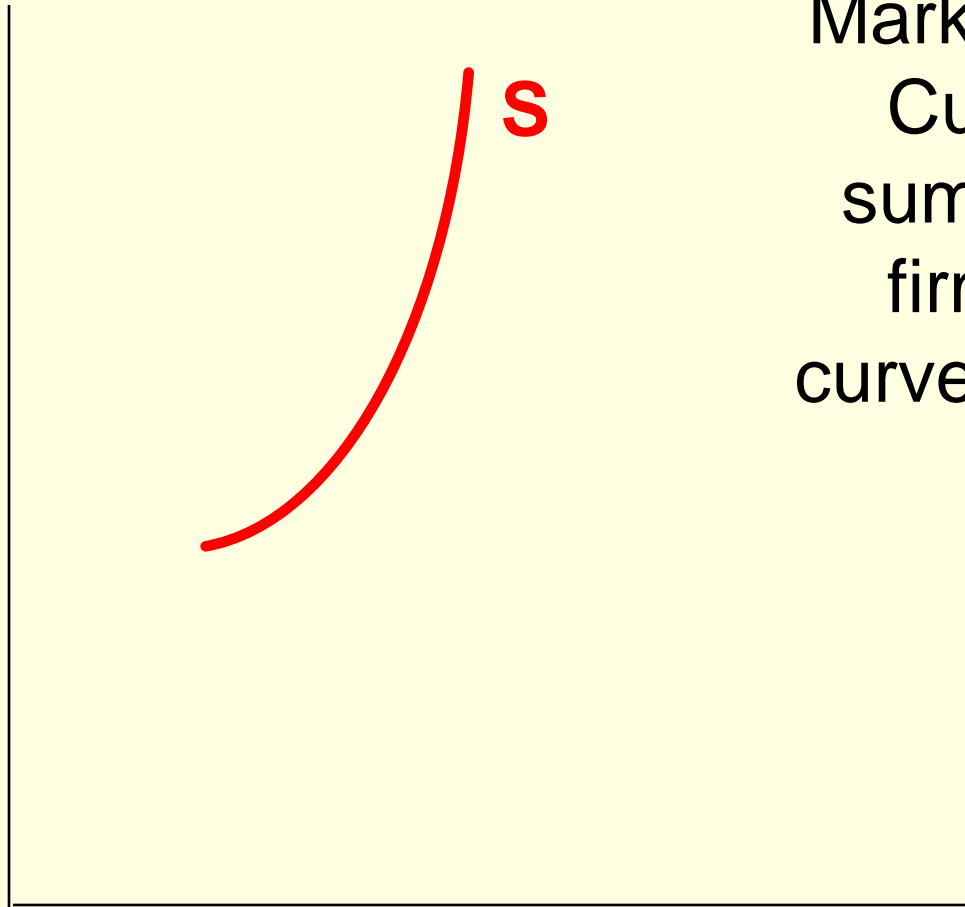
$$p > AVC_s(y)$$

# The Firm's Short-Run Supply Decision?



# Short Run Market Supply Curve

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Market Supply Curve is the sum of all the firms supply curves ( $\approx \Sigma MC$ )

Q

# The Firm's Long-Run Supply Decision?

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- The long-run is the circumstance in which the firm can choose amongst all of its short-run circumstances.
- How does the firm's long-run supply decision compare to its short-run supply decisions?

# The Firm's Long-Run Supply Decision?

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- A competitive firm's long-run profit function is

$$\Pi(y) = py - c(y)$$

- The long-run cost  $c(y)$  of producing  $y$  units of output consists only of variable costs since all inputs are variable in the long-run.

# The Firm's Long-Run Supply Decision?

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The firm's long-run supply level decision is to maximize,

$$\Pi(y) = py - c(y)$$

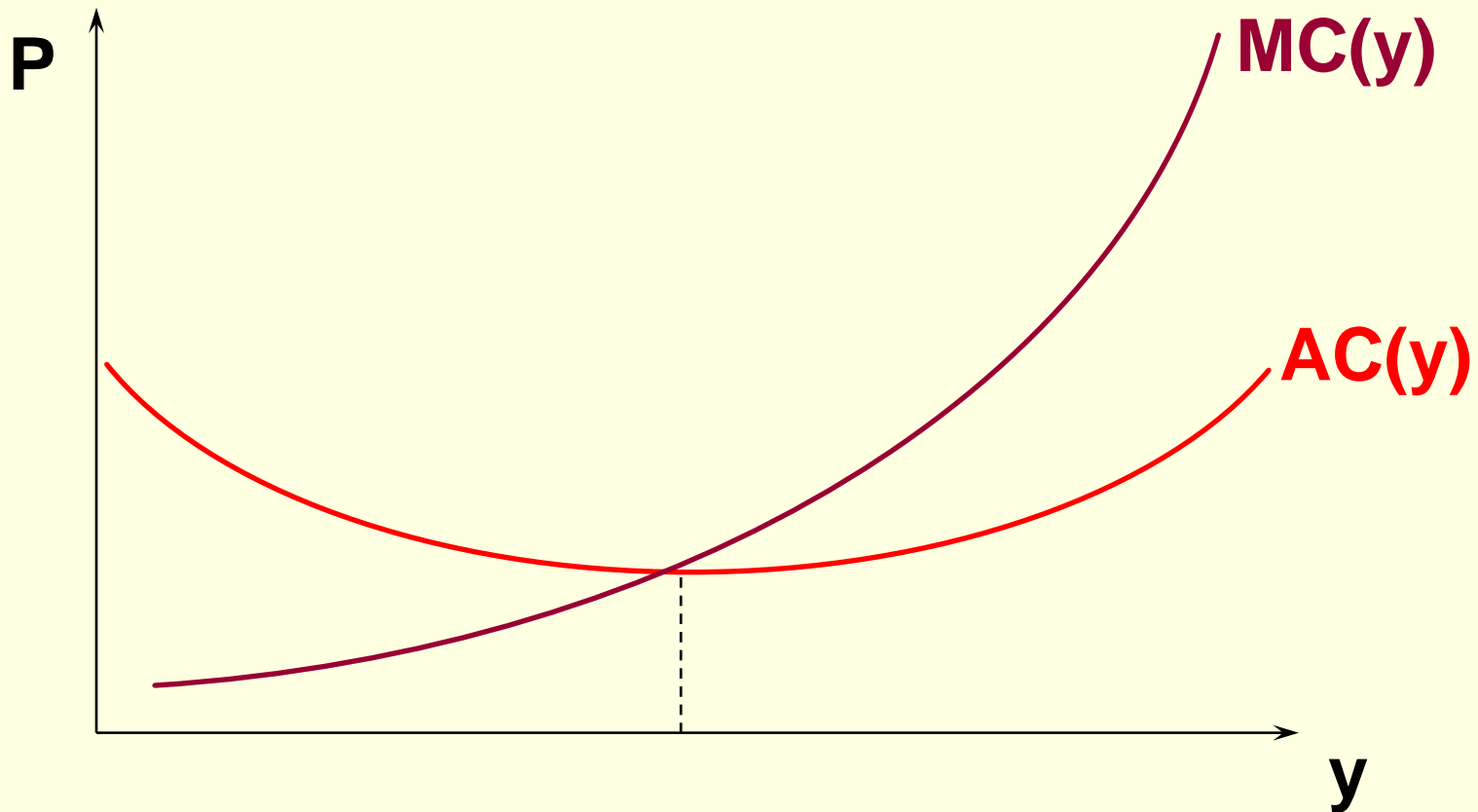
# The Firm's Long-Run Supply Decision?

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- Additionally, the firm's economic profit level must not be negative, since the firm would exit the market in that case. Therefore,

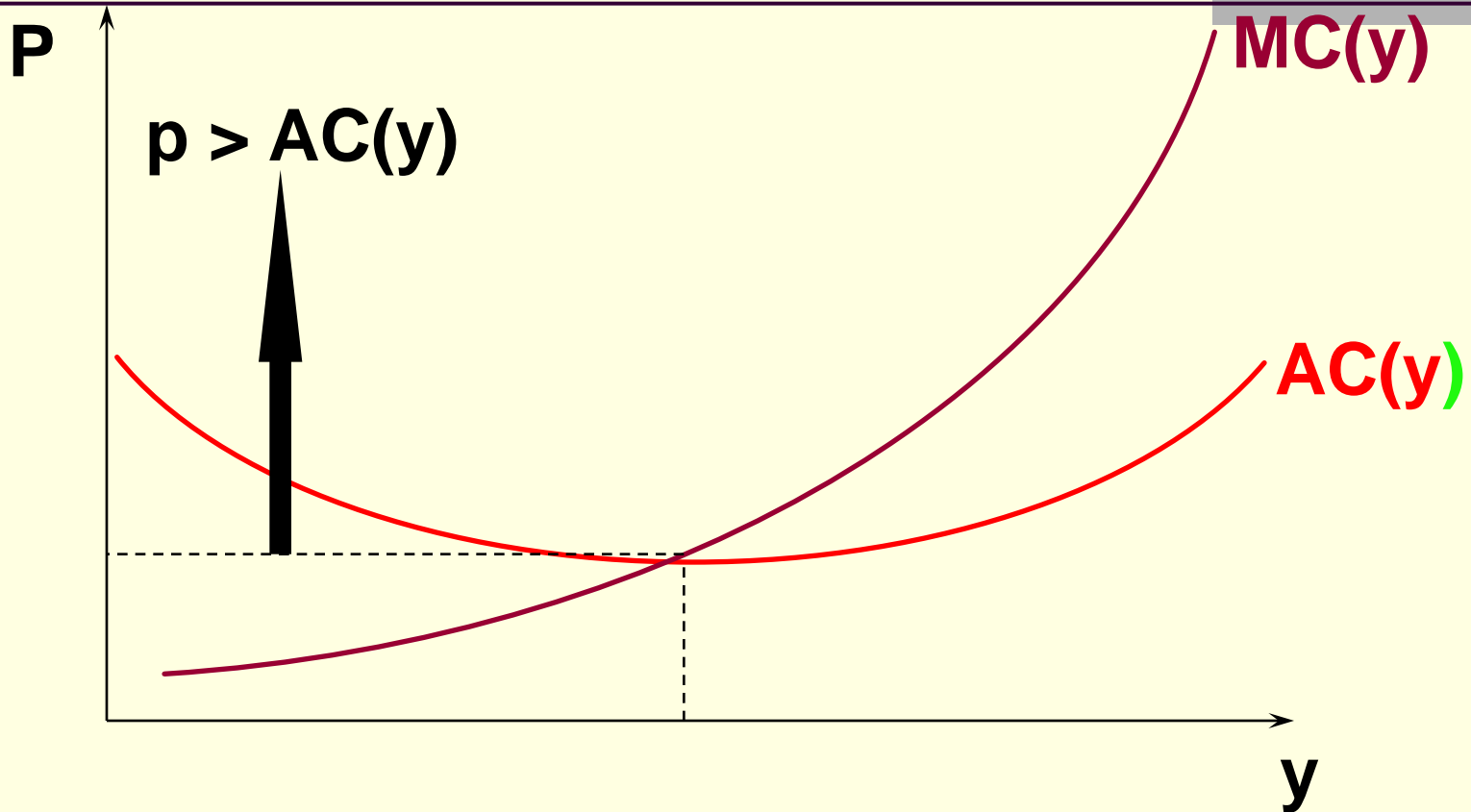
$$p \geq ATC(y)$$

# The Firm's Long-Run Supply Decision?

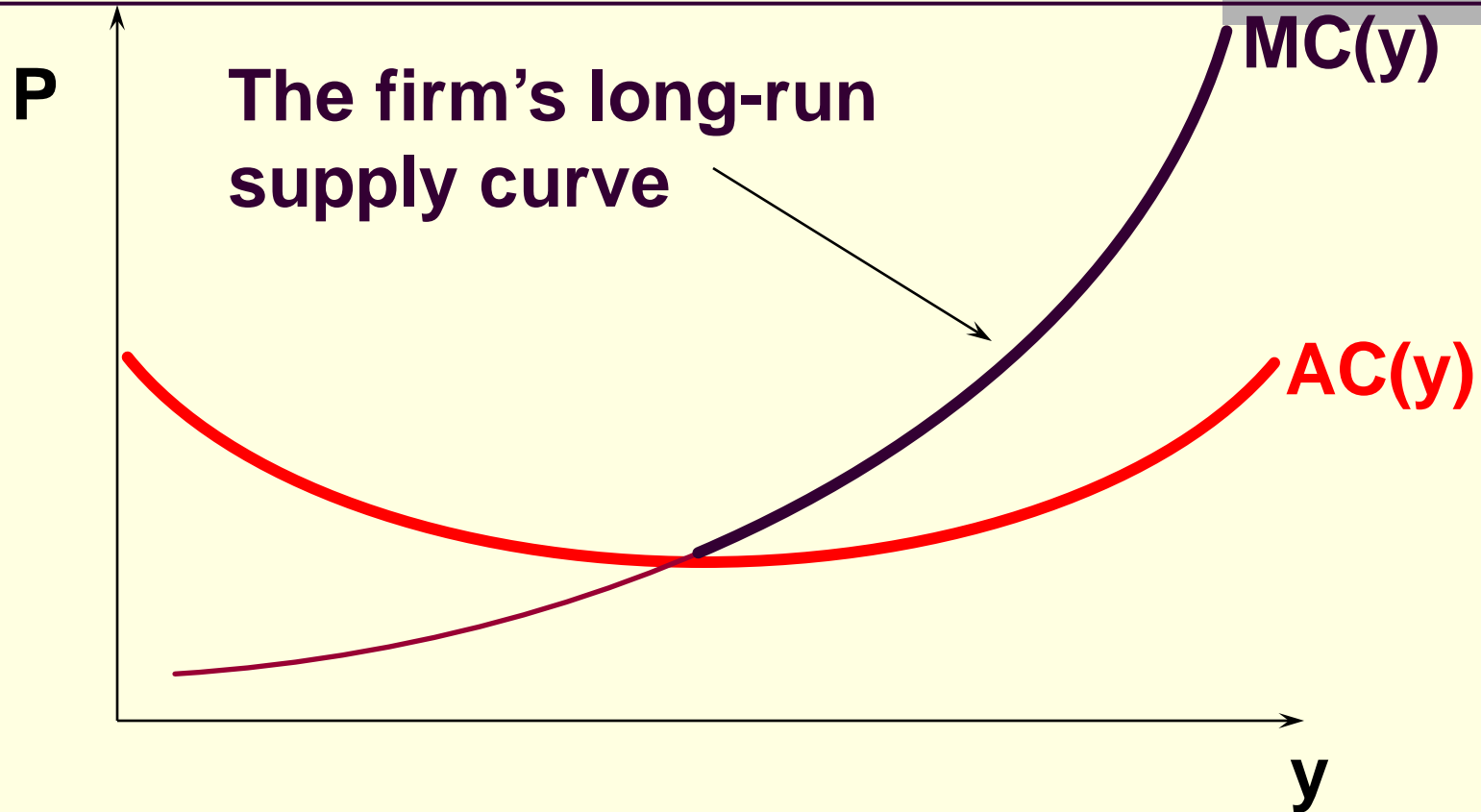




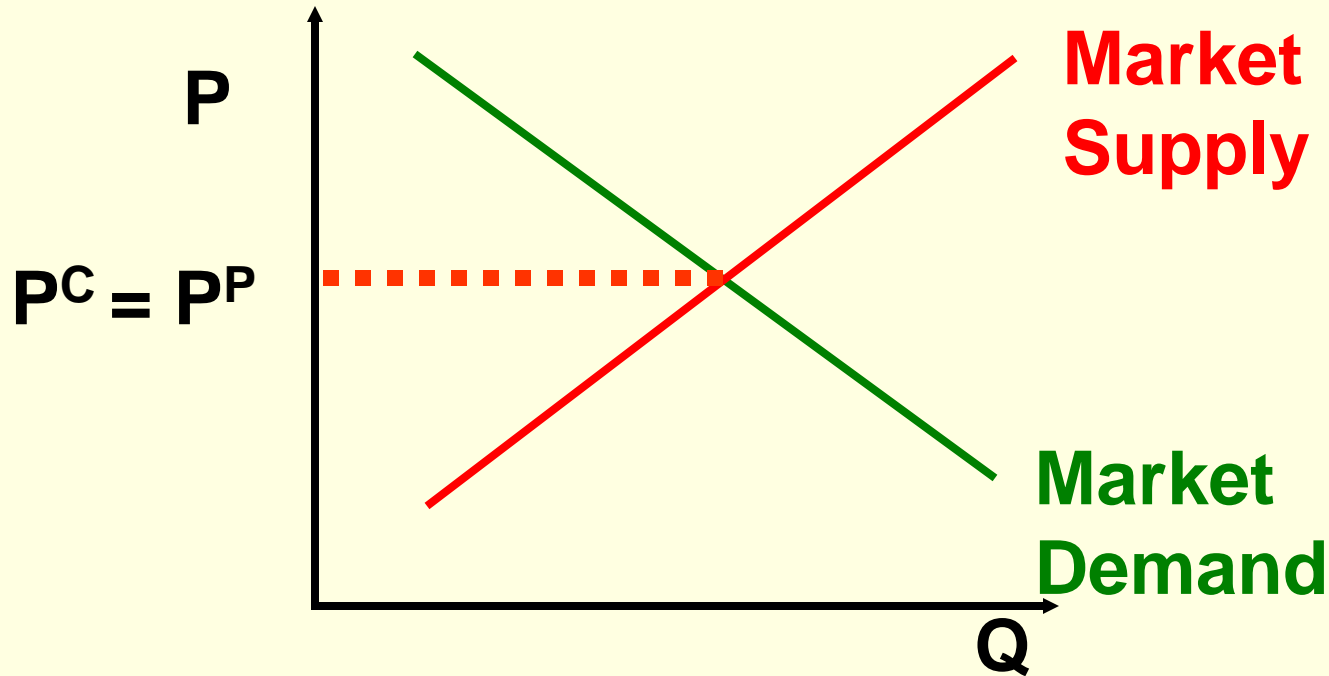
# The Firm's Long-Run Supply Decision?



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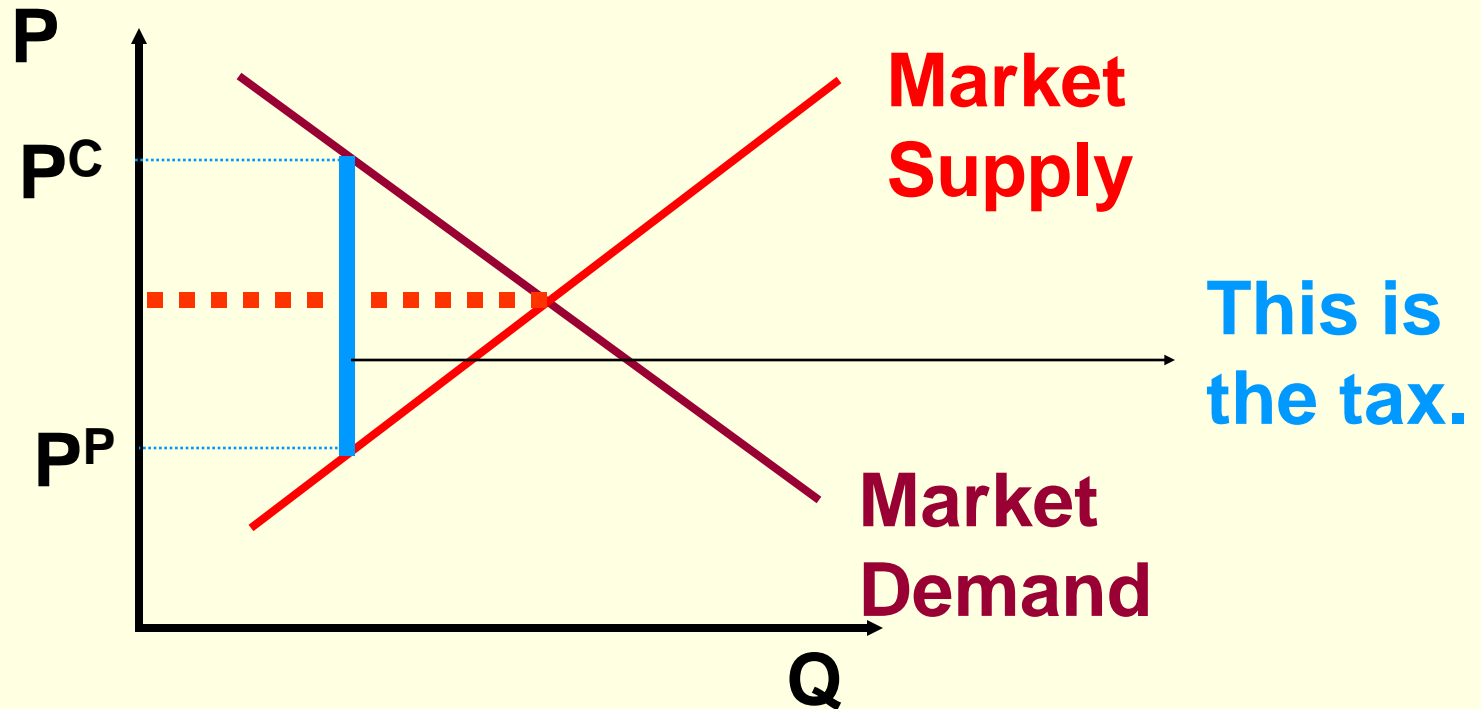


# Application: Tax Incidence In Perfect Competition



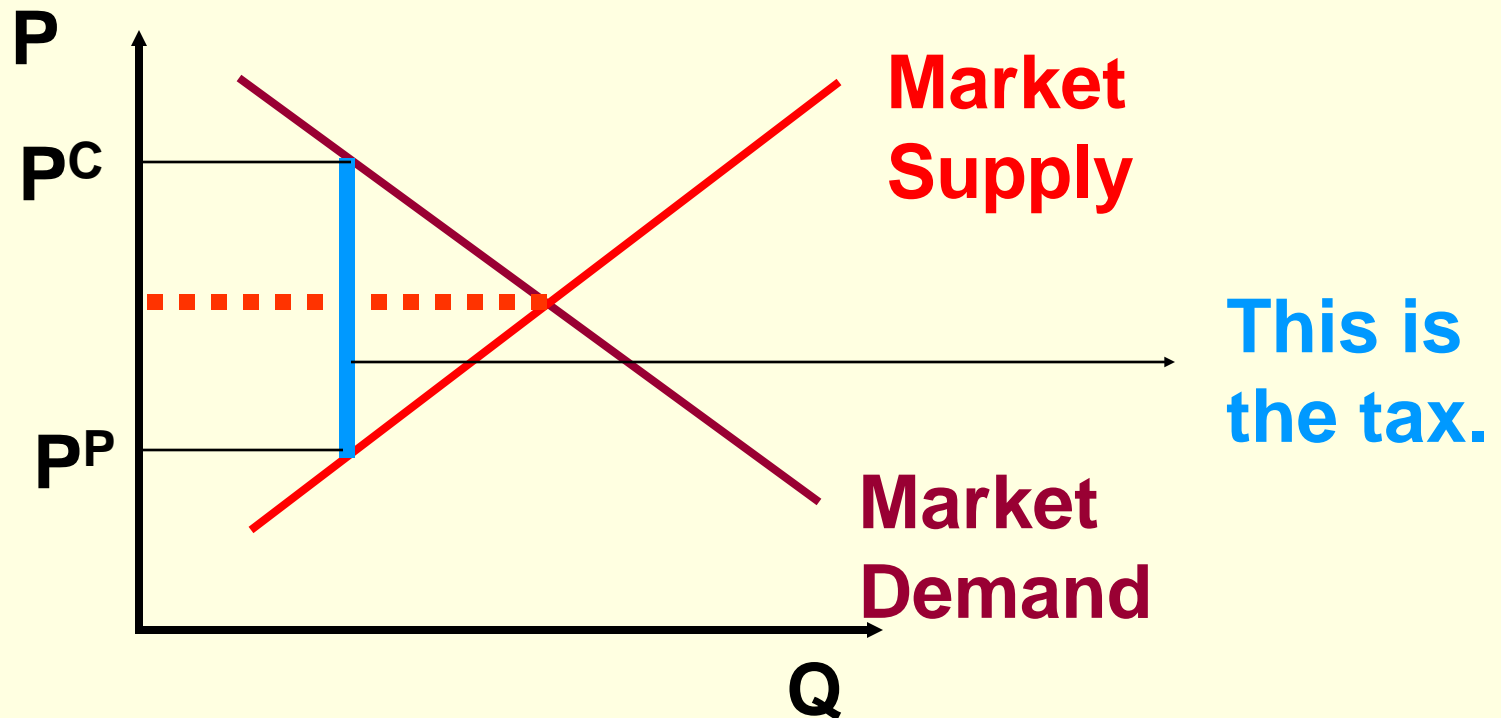
No tax:  $P^C = P^P$

# Application: Tax Incidence In Perfect Competition



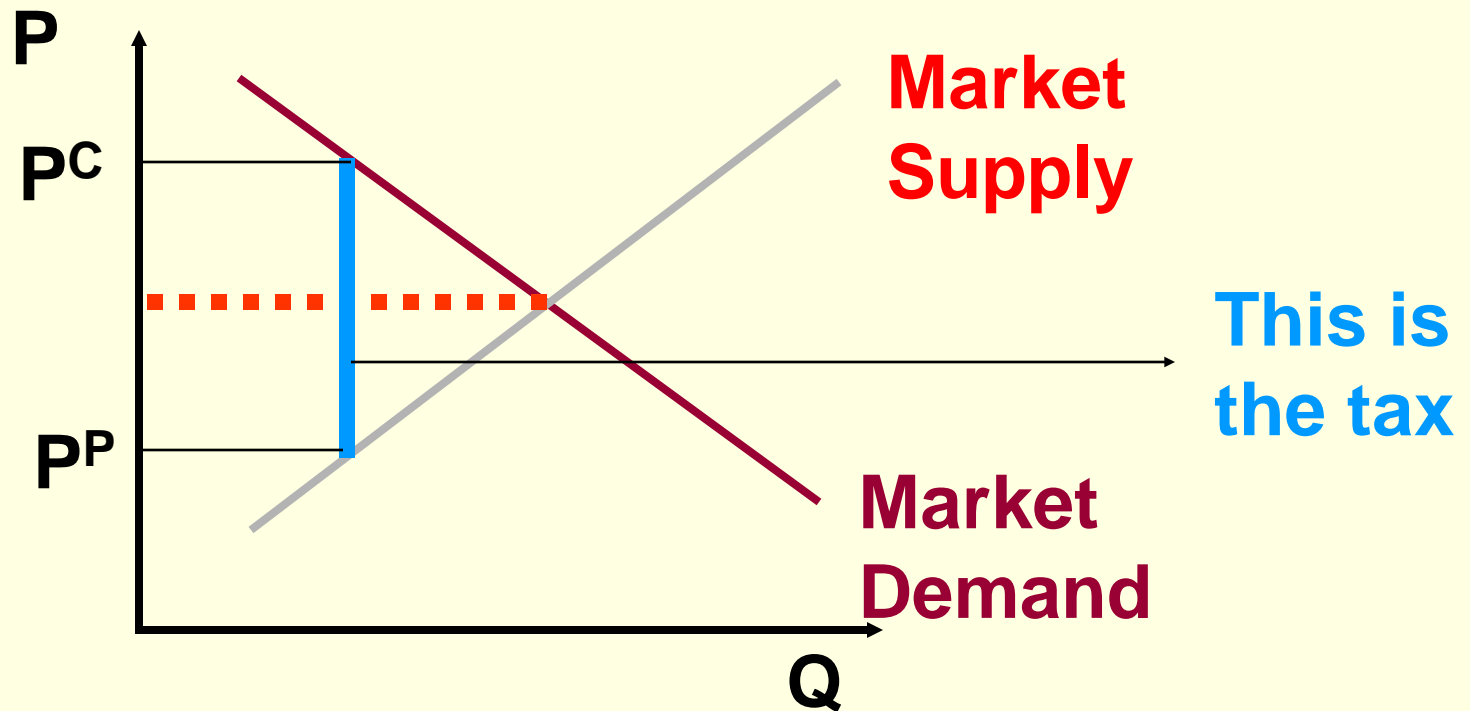
A tax is introduced.

# Application: Tax Incidence In Perfect Competition



The tax creates a wedge between the price firms receive and the price consumers pays. The difference is the tax.

# Application: Tax Incidence In Perfect Competition



In the short run, the burden of the tax is shared (not necessarily on a 50/50 basis) between consumers and producers.

# Application: Tax Incidence In Perfect Competition

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In the short run,

- The producers receives less for the product.
- Some firms will continue to produce output at a loss once they are covering their average variable costs.
- Some firms will experience losses and so exit the market.
- The supply curve shifts to the left and the prices consumers and producers face increases.

# Application: Tax Incidence In Perfect Competition

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In the Long Run,

- Consumers pay all of the tax (100%)
- Producers pay none of tax (0%)
- There are no firms making losses