LECTURE 8: PRICE-TAKING FIRMS

Today's Topic: Price Rules, OK?

1. **A Competitive Market?** the meaning of competition, a price-taker's revenue.

2. **Profit Maximisation and the Supply Curve**: a simple example, *MC* and supply, shut-down decisions, long-run entry or exit.

3. **Competitive Supply Curves**: market supply with a fixed number of firms, supply with entry or exit, shifts in demand, upwards-sloping long-run supply?

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Three conditions for perfect competition: many buyers and sellers in the market; goods or services offered for sale largely identical; and (dynamically) firms can freely enter or exit the market.

Examples.

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The firm can sell as much as it wishes at price P or below, but nothing at higher prices.

The firm's Total Revenue, $TR = P \bullet y$, at output y/period.

Its *Average Revenue*: $AR = \frac{TR}{y} = P$

Its *Marginal Revenue*: $MR = \frac{\Delta R}{\Delta y} = P$

Remember: the firm cannot affect P by varying its output y.

EXAMPLE OF PROFIT MAXIMISATION

Output Quantity	Total Revenue	Total Cost	Profit	Marginal Revenue	Marginal Cost
y	TR	TC	π	MR	MC
	\$	\$	$= TR - TC$	$= \Delta TR/\Delta y$	$= \Delta TC/\Delta y$
0	0	10	−10		

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2	40	22	18		
				20	12
3	60	34	26		
				20	16
4	80	50	30		
				20	20
5	100	70	30		
				20	24
6	120	94	26		
				20	28
7	140	122	18		
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8	160	154	6		

(GKSM, Table 14.2, with output price P = \$20/unit.)

TC rises disproportionately: Decreasing Returns to Scale DRTS, and hence rising *MC*. Why?

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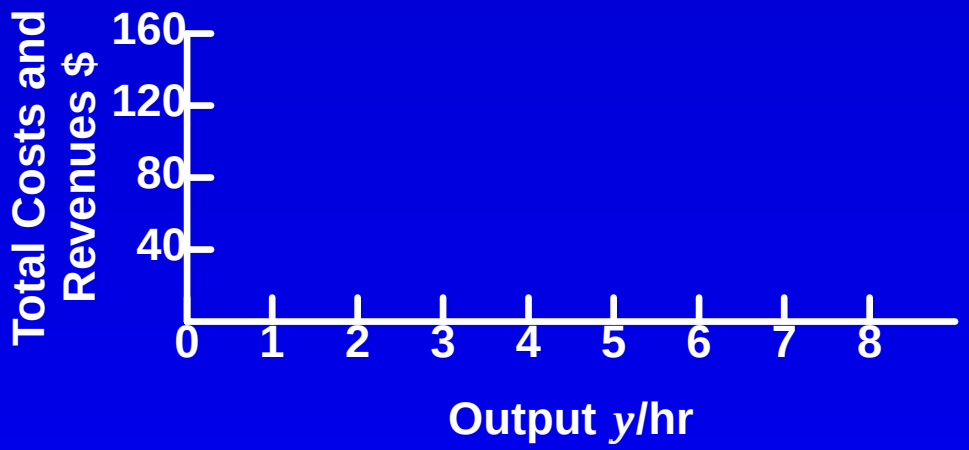
What is the profit-maximising level of output?

PROFIT-MAXIMISING GRAPHS



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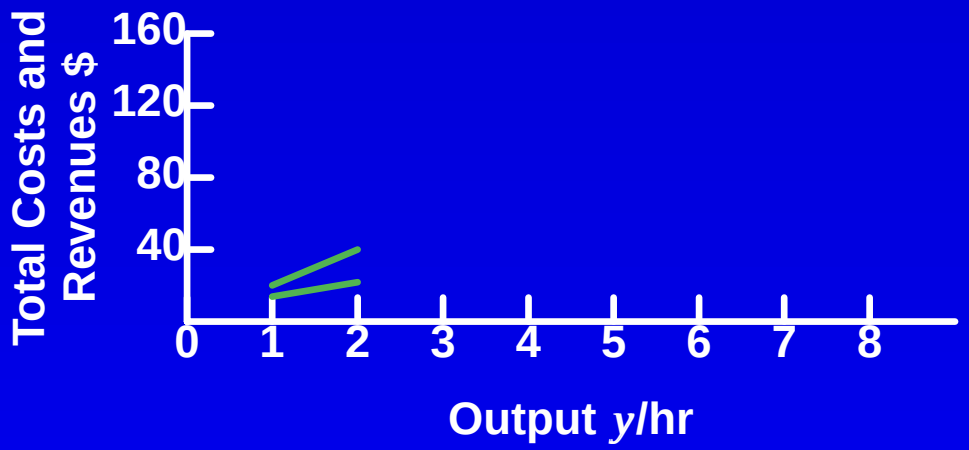

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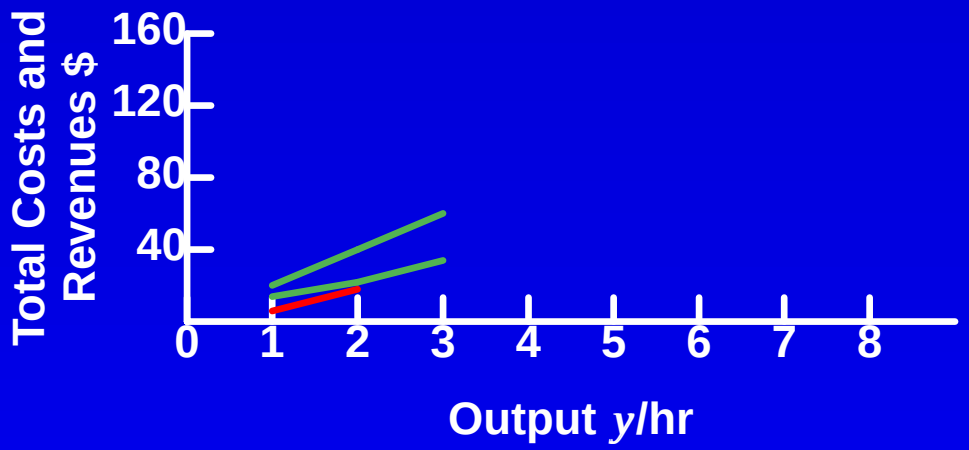

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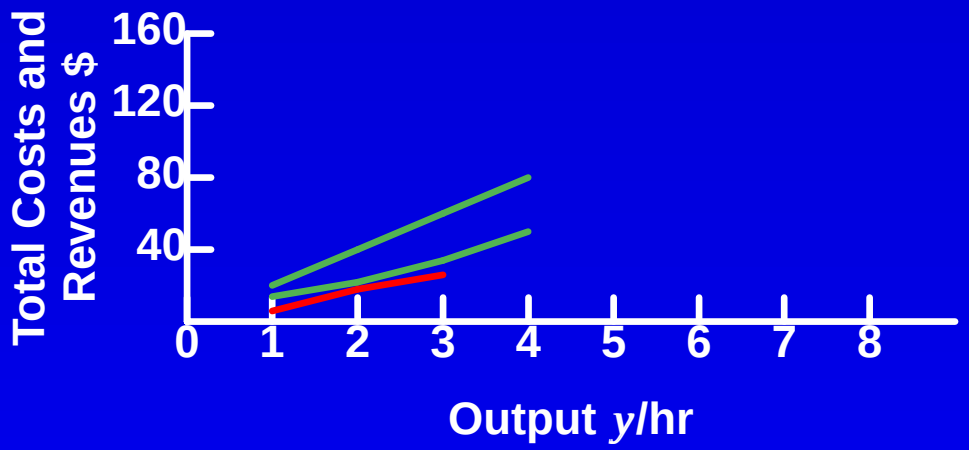

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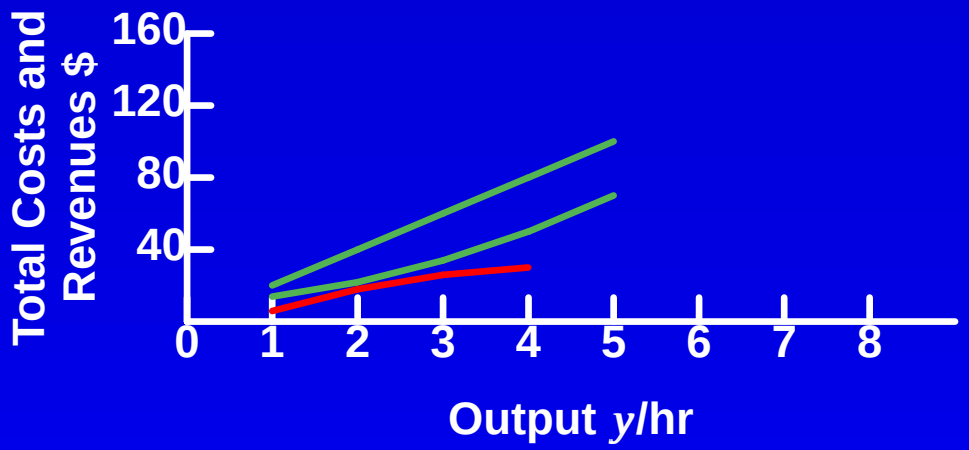

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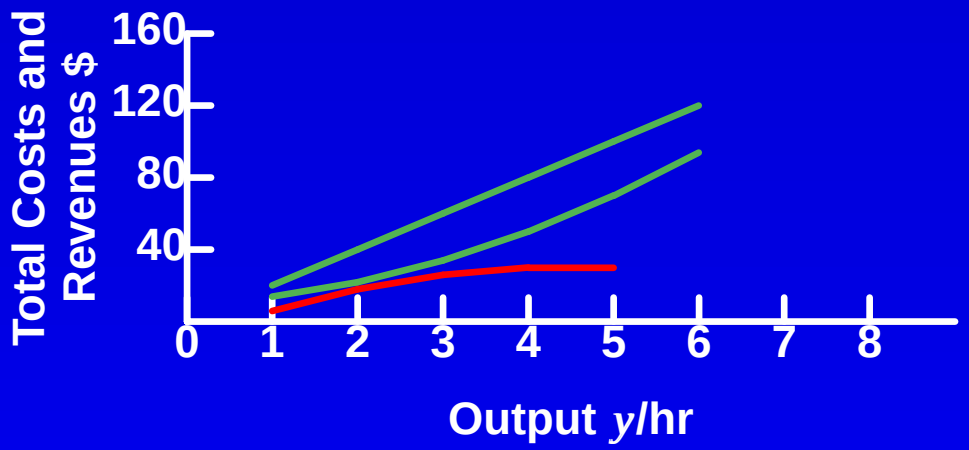

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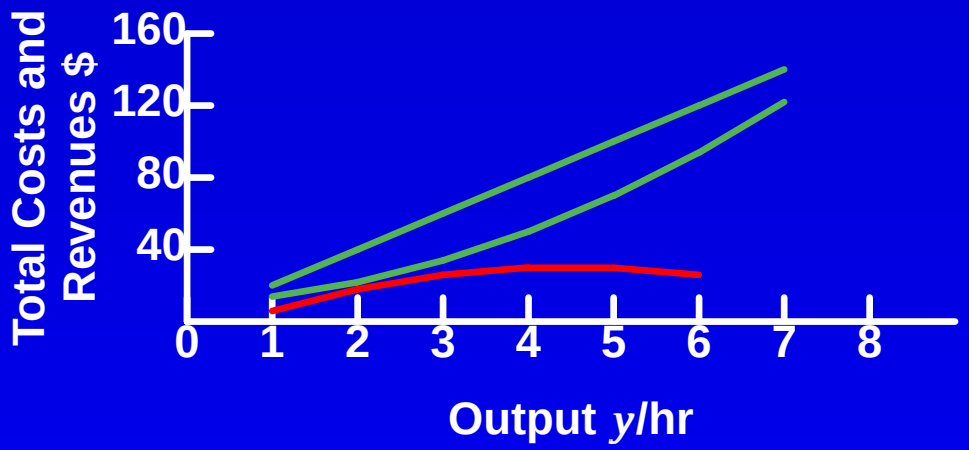

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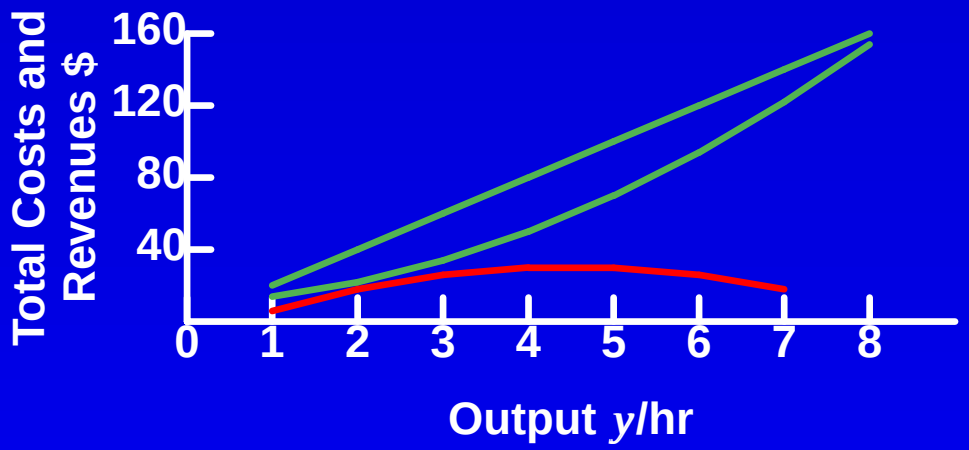

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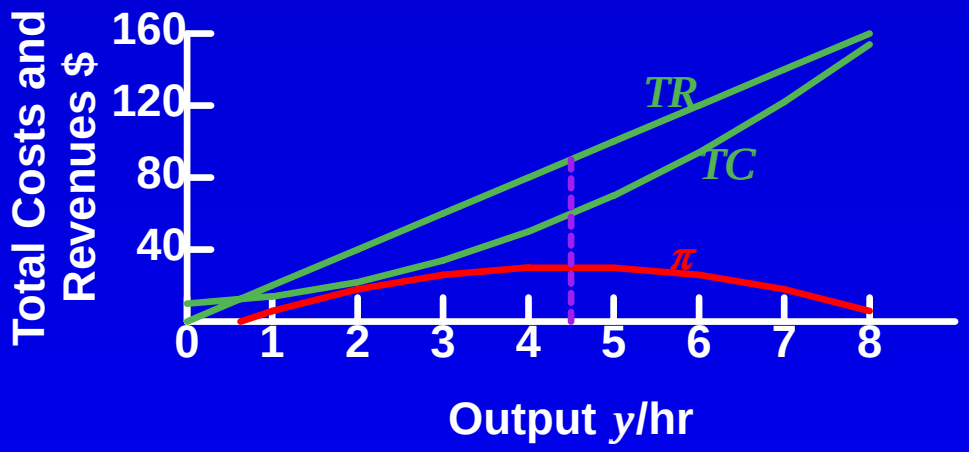

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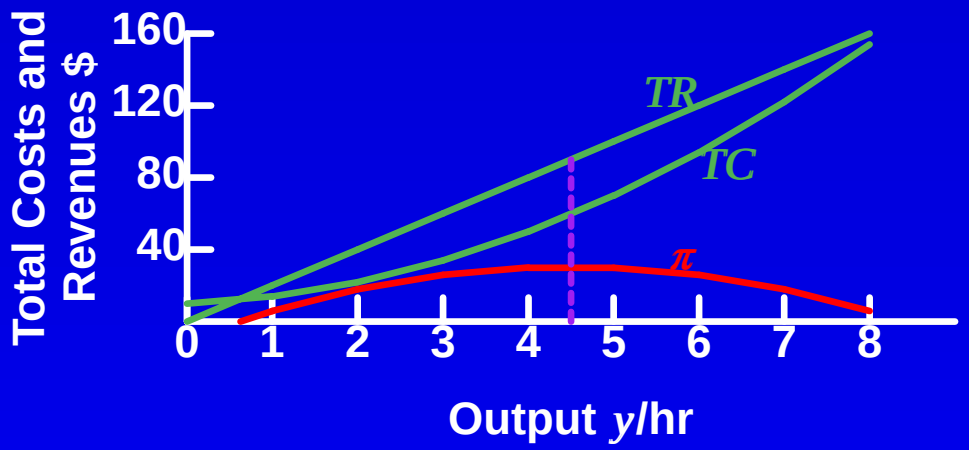

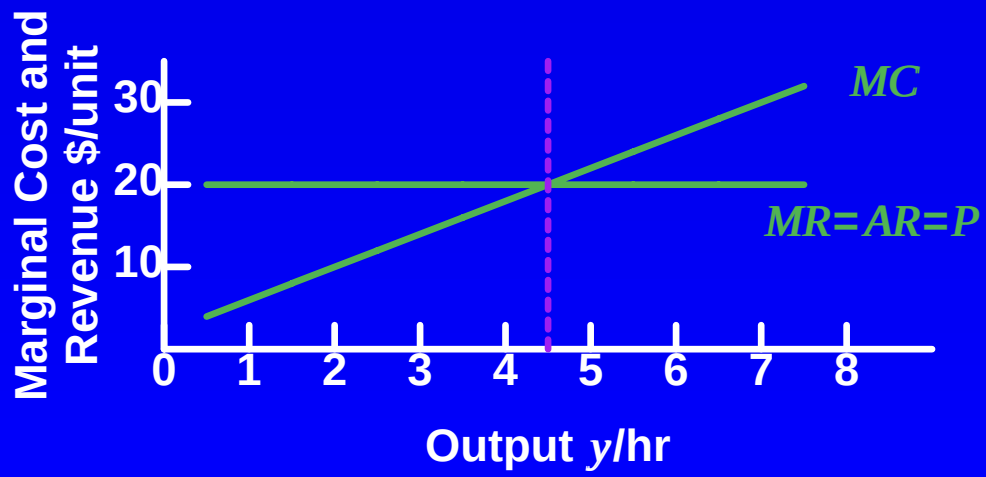

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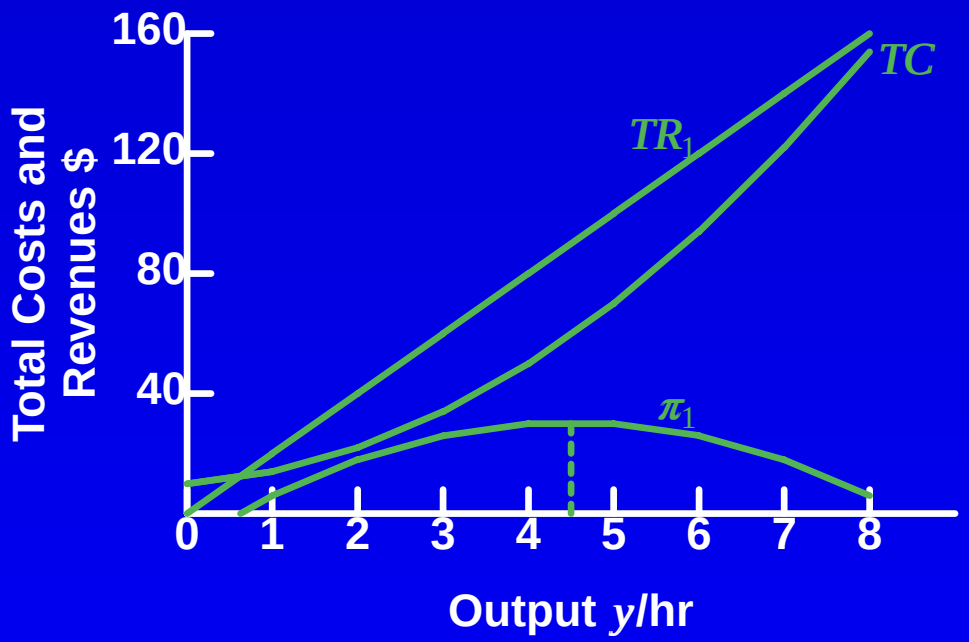

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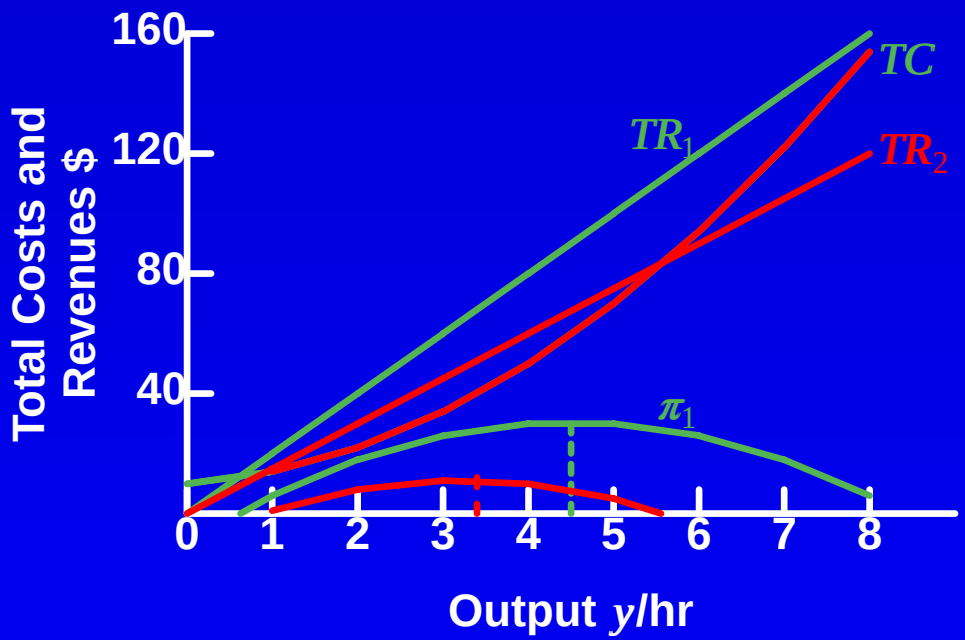

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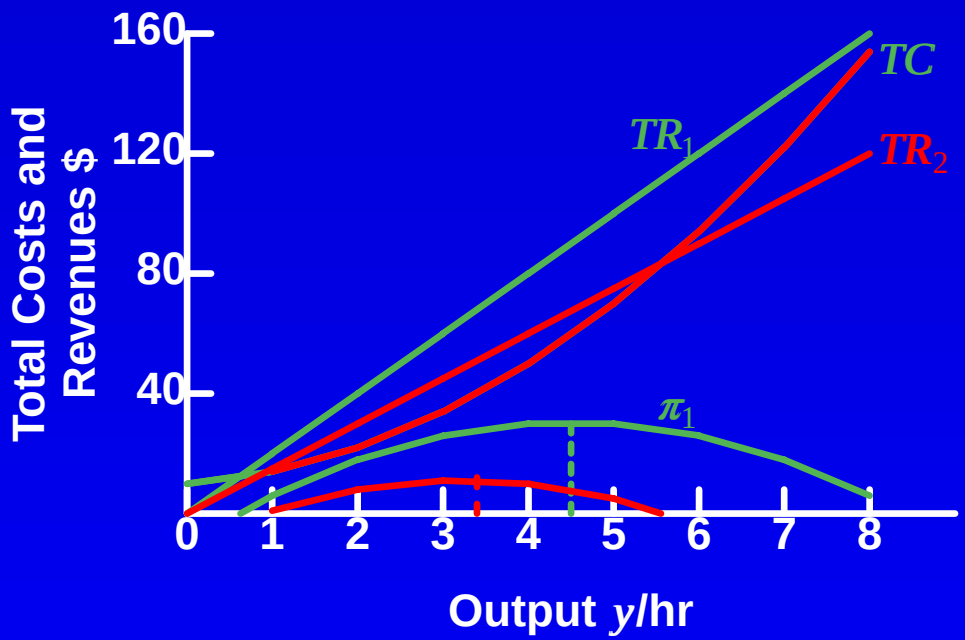

Two effects of a price fall:

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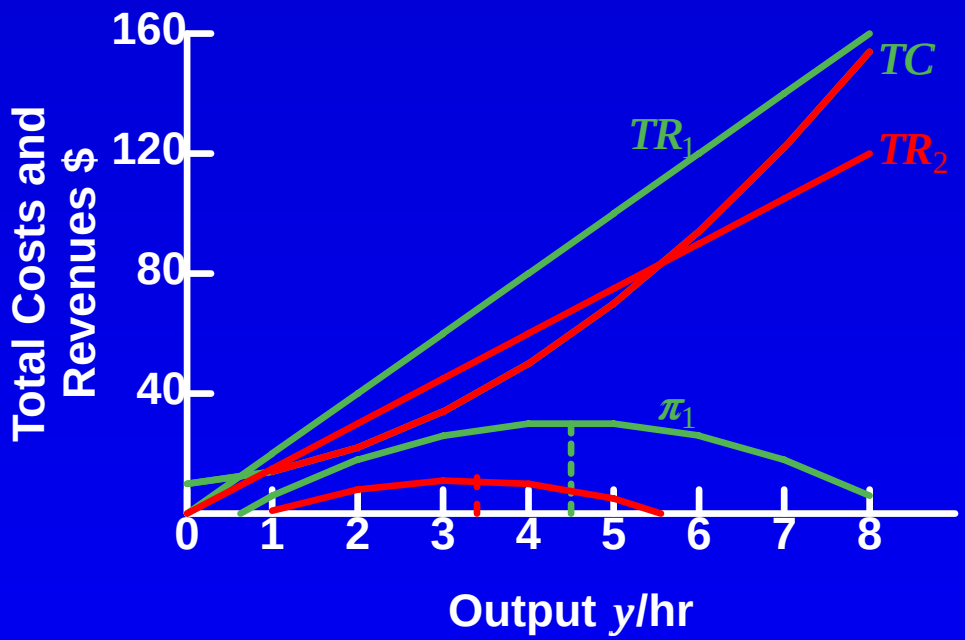

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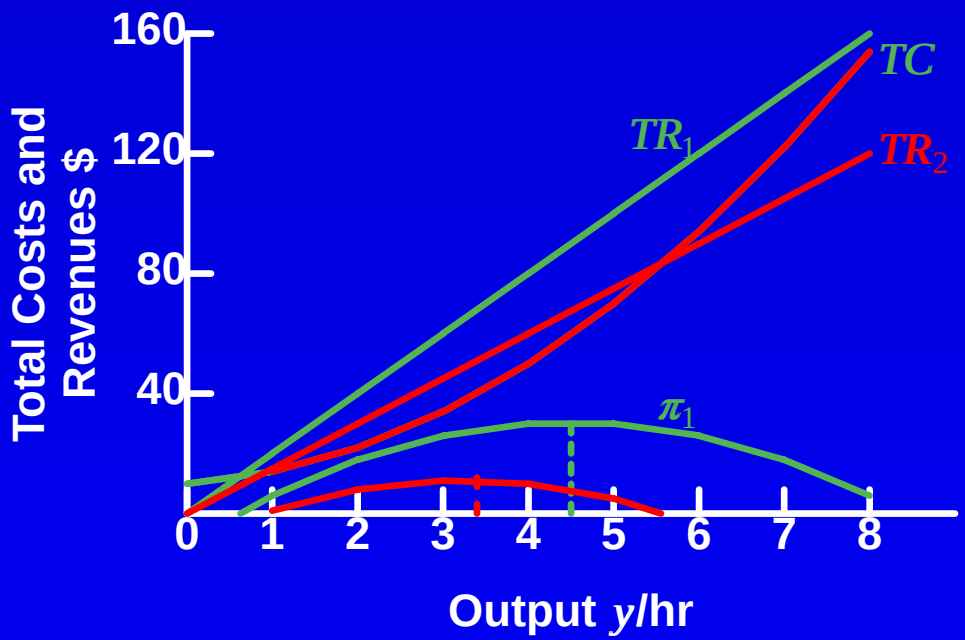

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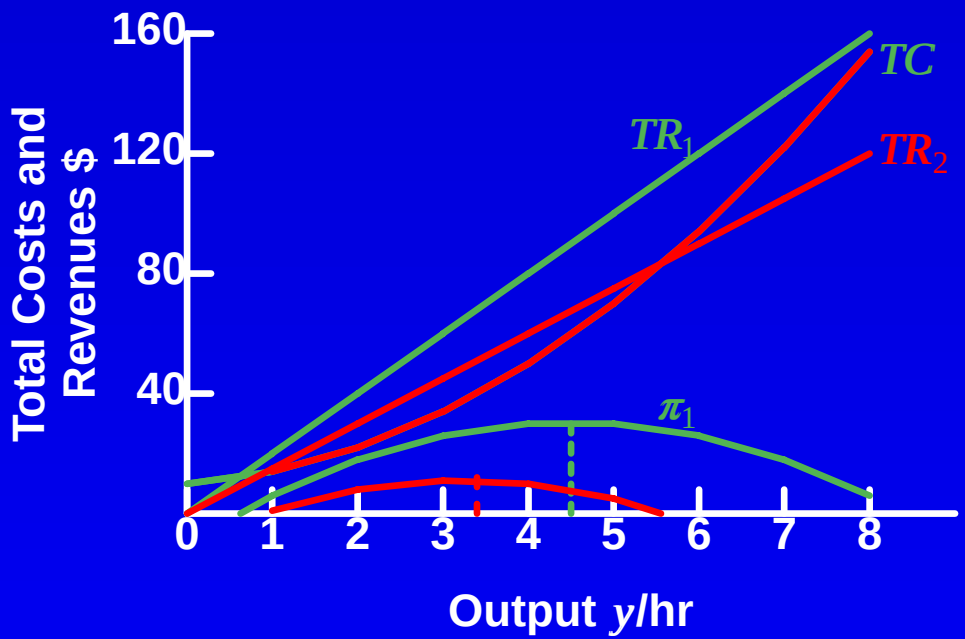

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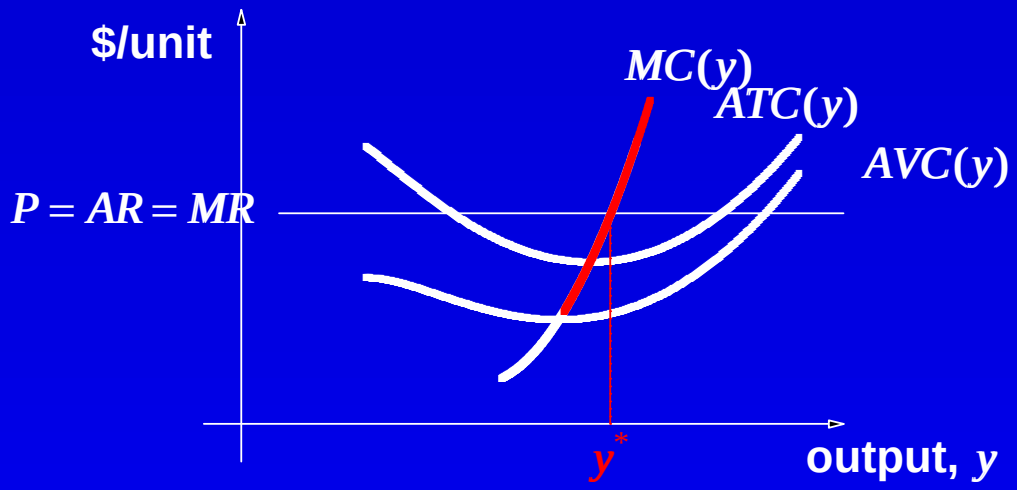
But the π-maximising output y^* is more easily seen on the *MC*-*MR* plot.

MC CURVE AND SUPPLY



Profit-maximising output y^* when $MC(y^*) = MR$.

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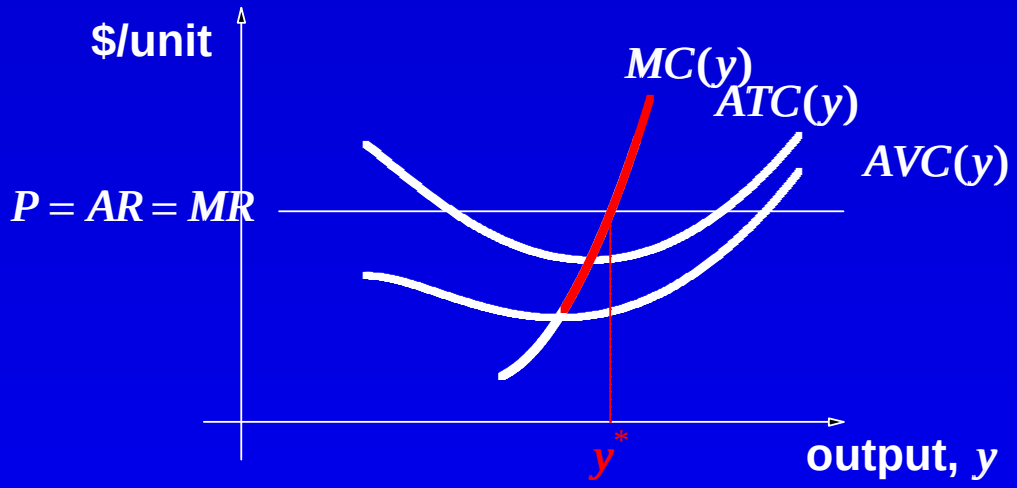

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For a price-taking firm, *MR* = *AR* = price *P*, so as *P* varies, read off the optimum y^* from the level of output where the horizontal demand curve (price *P*) cuts the upwards-sloping *MC* curve.

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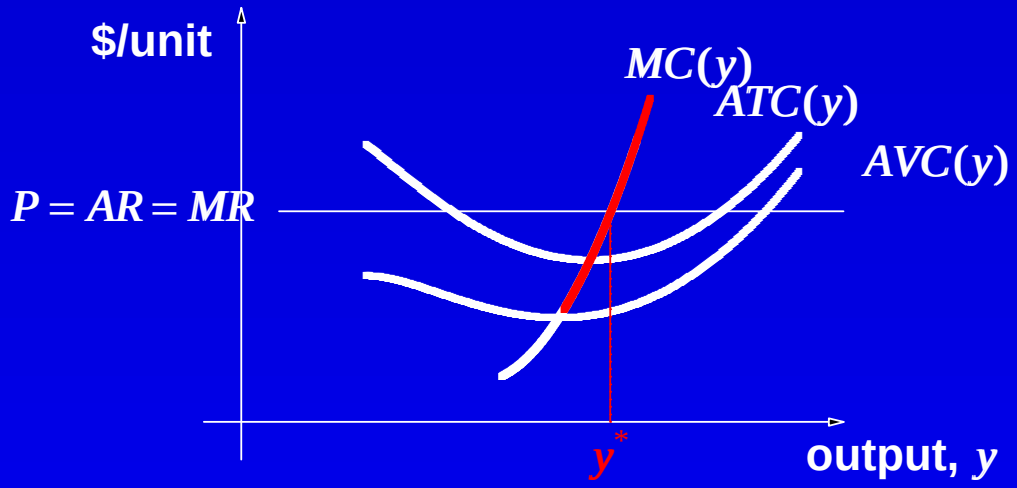

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$\therefore$ π-maximising output y^* when $P = MC(y^*)$ for a price-taking firm.

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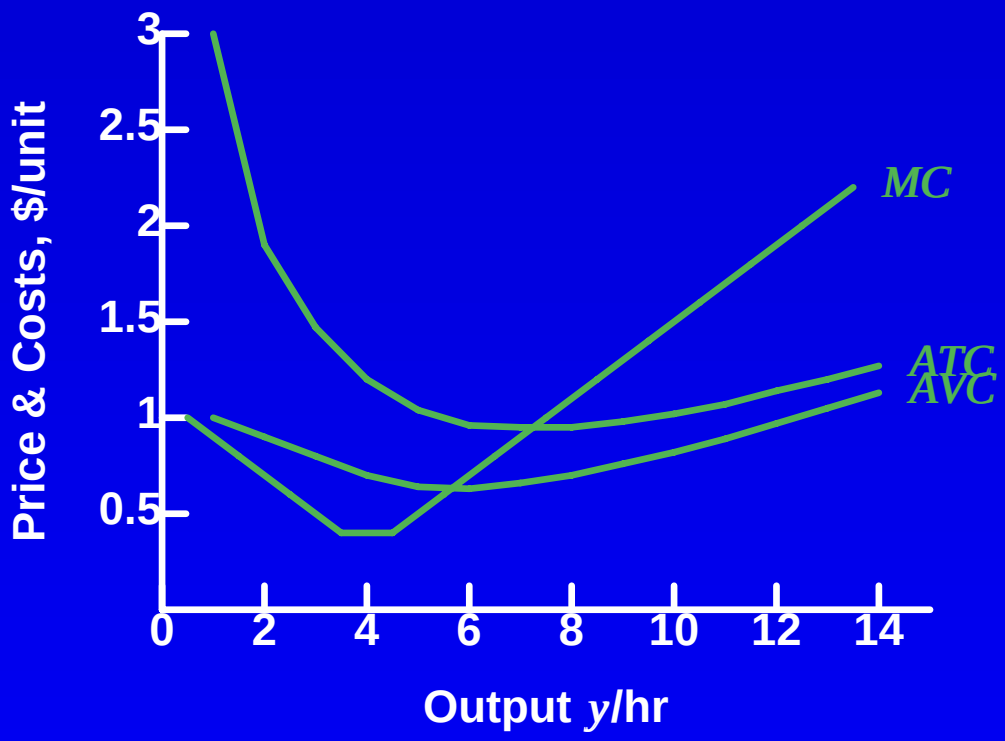
Price & Costs, $/unit
3
2.5
2
1.5
1
0.5
0
2
4
6
8
10
12
14
Output y/hr
MC
ATC
AVC

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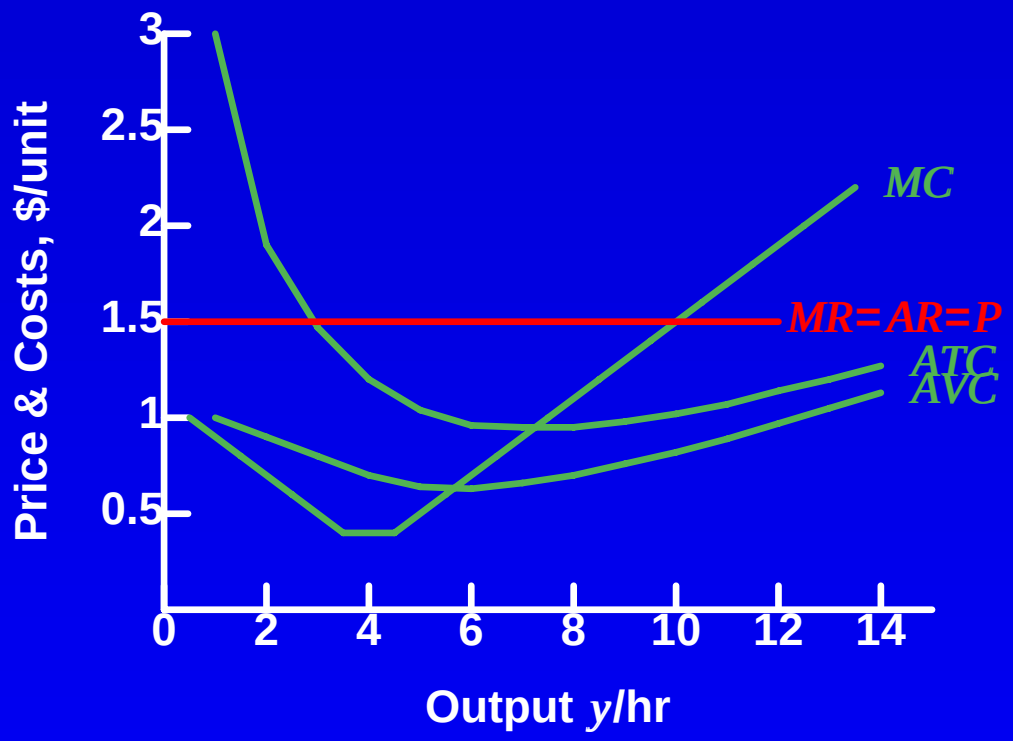
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MR=AR=P
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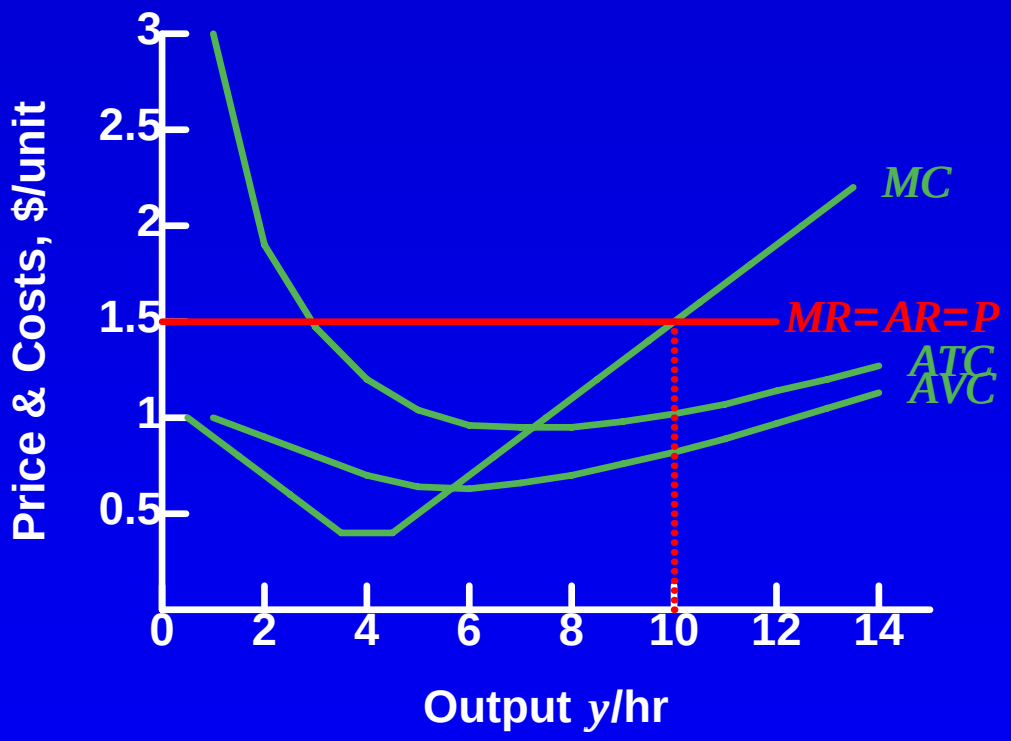
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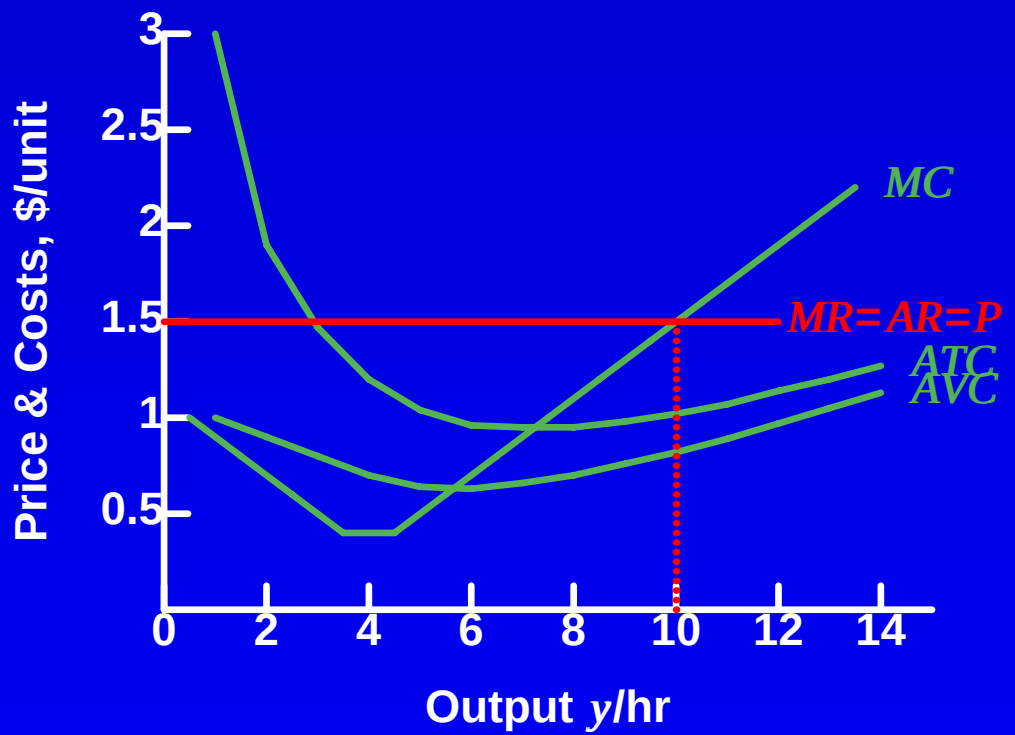

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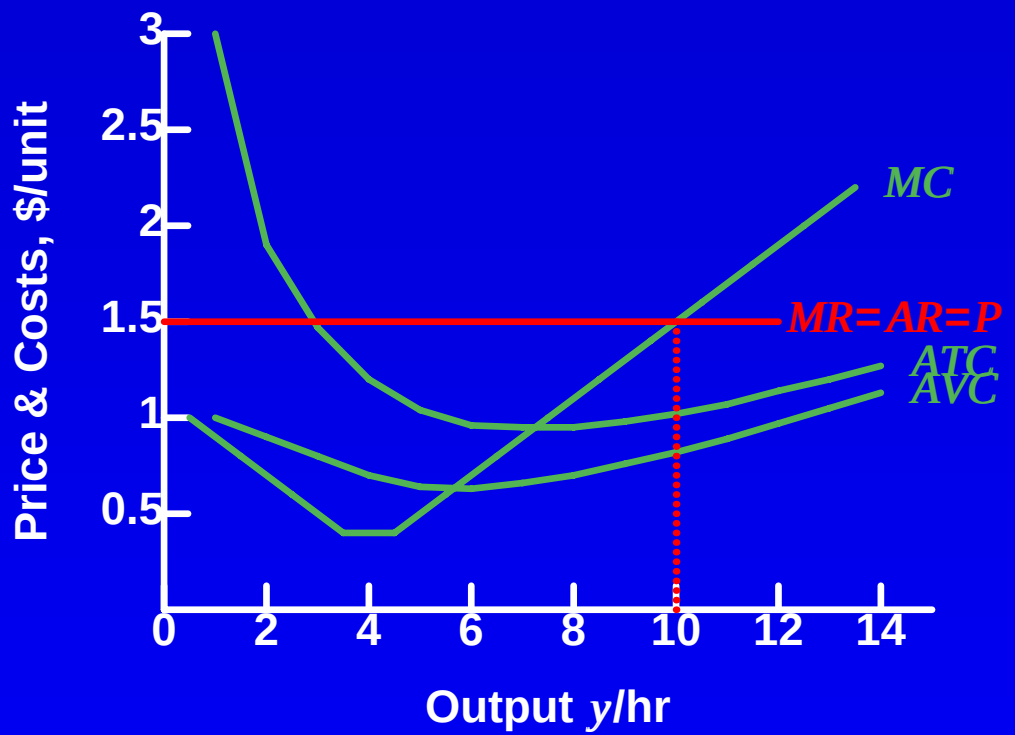
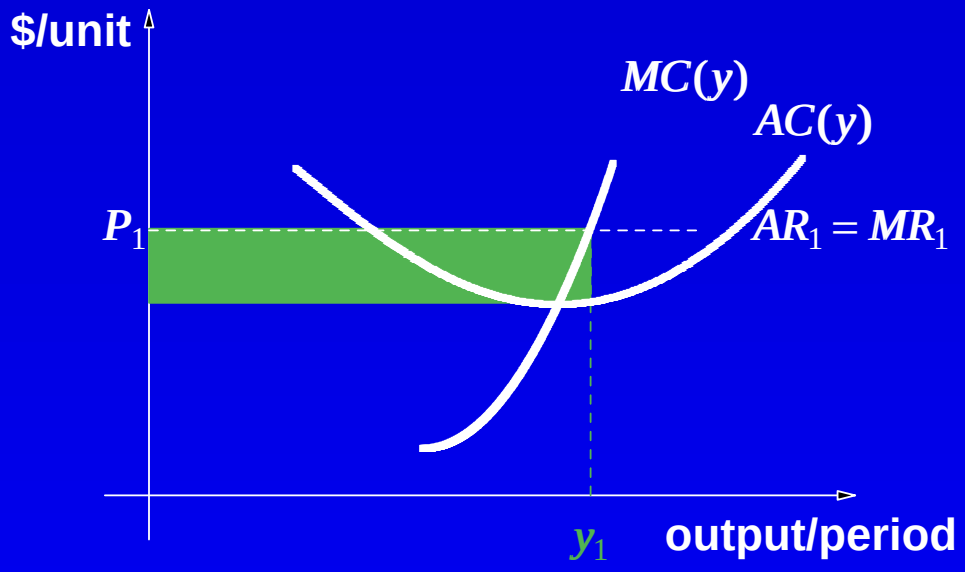


The competitive firm's supply curve is its *MC* curve. At price *P* =$1.50, optimum output $y^* = 10$ units/hr, and profit $\pi = y^* \bullet (AR - ATC) = 10(1.5-1) =$ $5/hr .

ECONOMIC PROFITS: +VE & −VE



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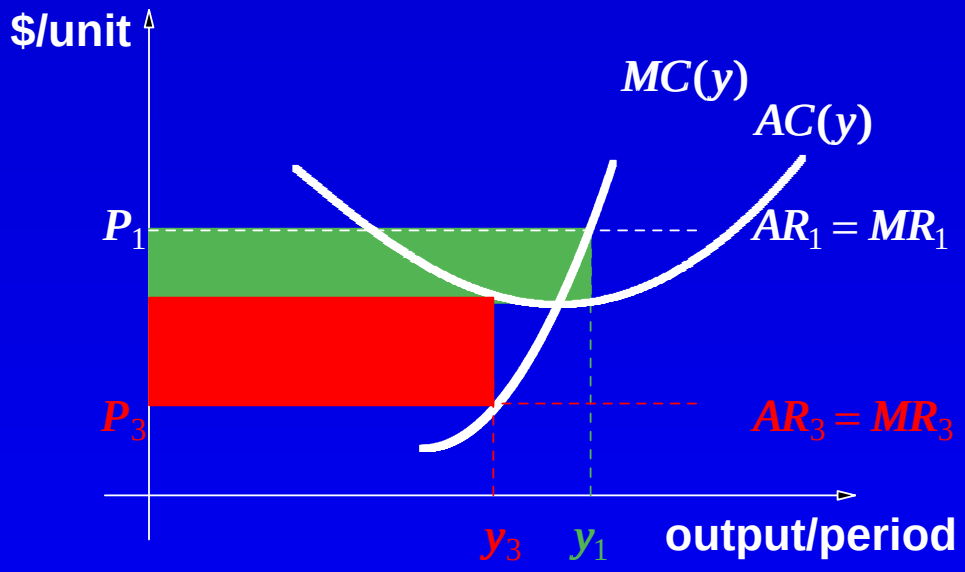

Green rectangle = positive profit = $y_1 \bullet (AR_1 - AC_1)$
Red rectangle = negative profit: $P_3 = AR_3 < AC_3$.

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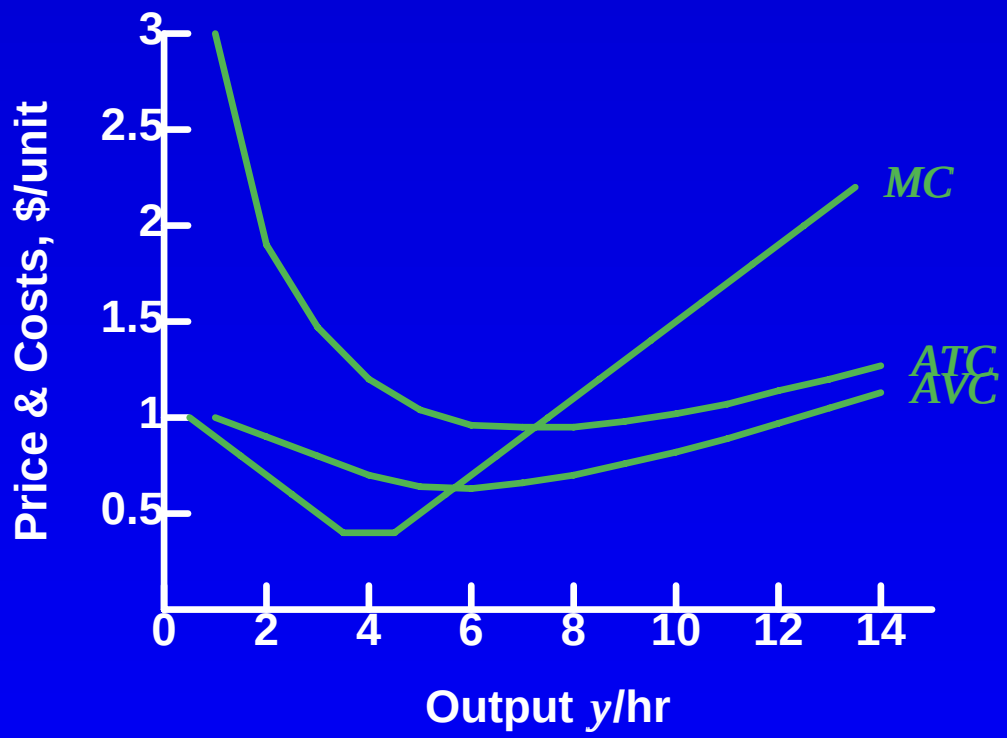
How long can it supply while $AVC < P = AR < ATC$? Depends.

SHORT-RUN SUPPLY CURVE



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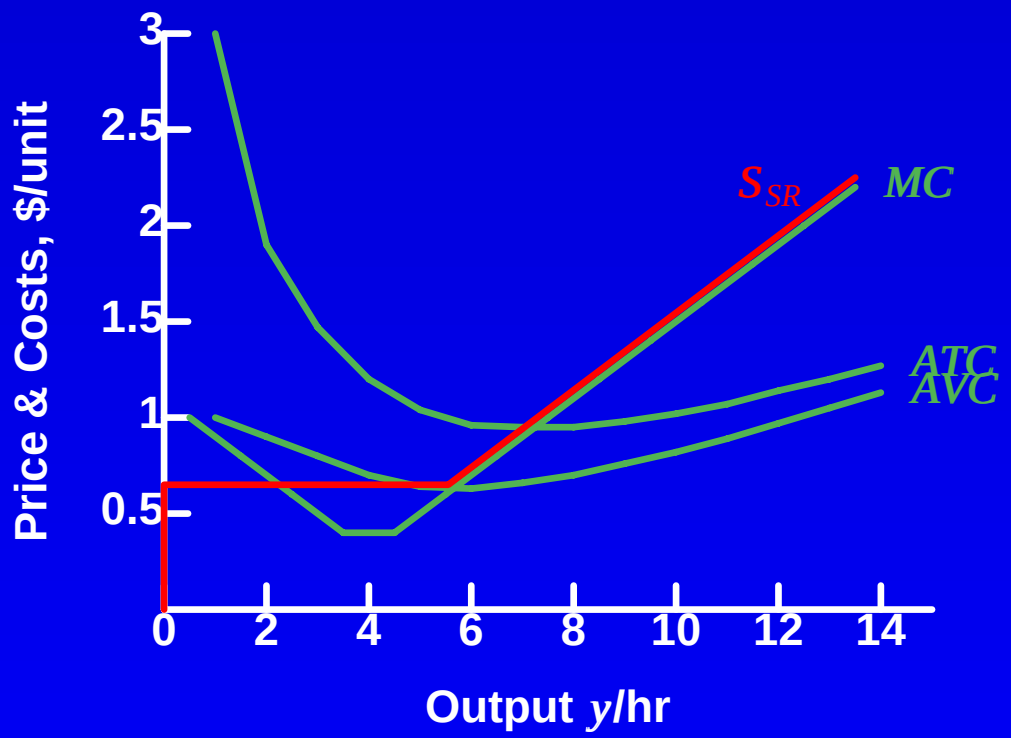
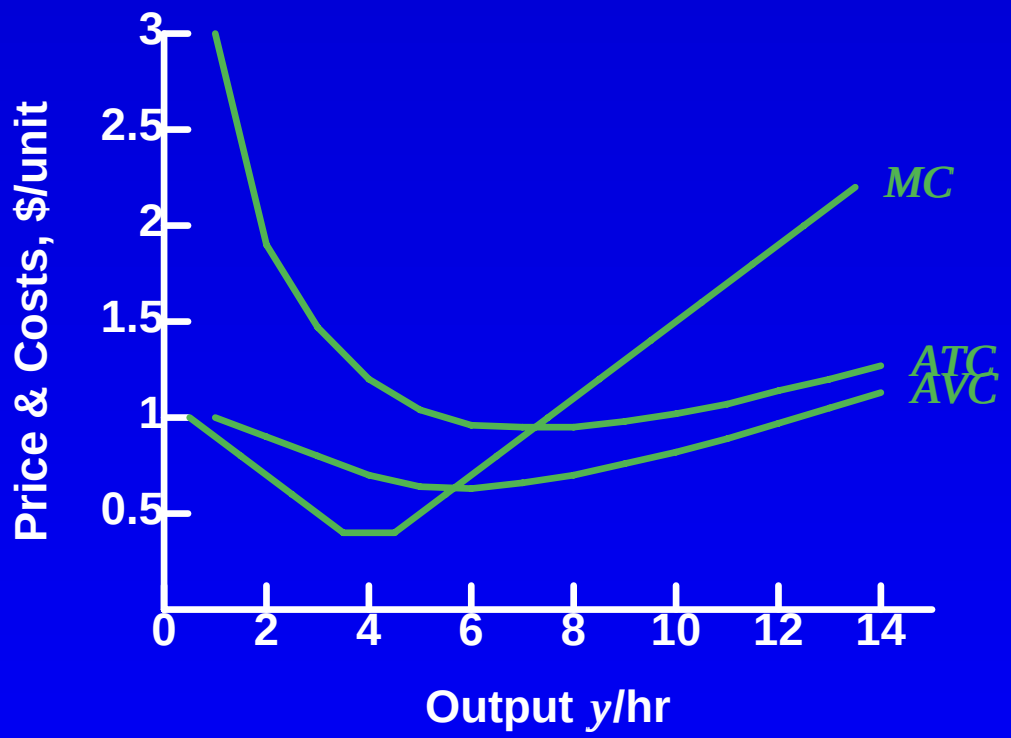


The competitive firm's (Bob's Bagels) short-run supply curve is its *MC* curve above *AVC*.

LONG-RUN SUPPLY CURVE



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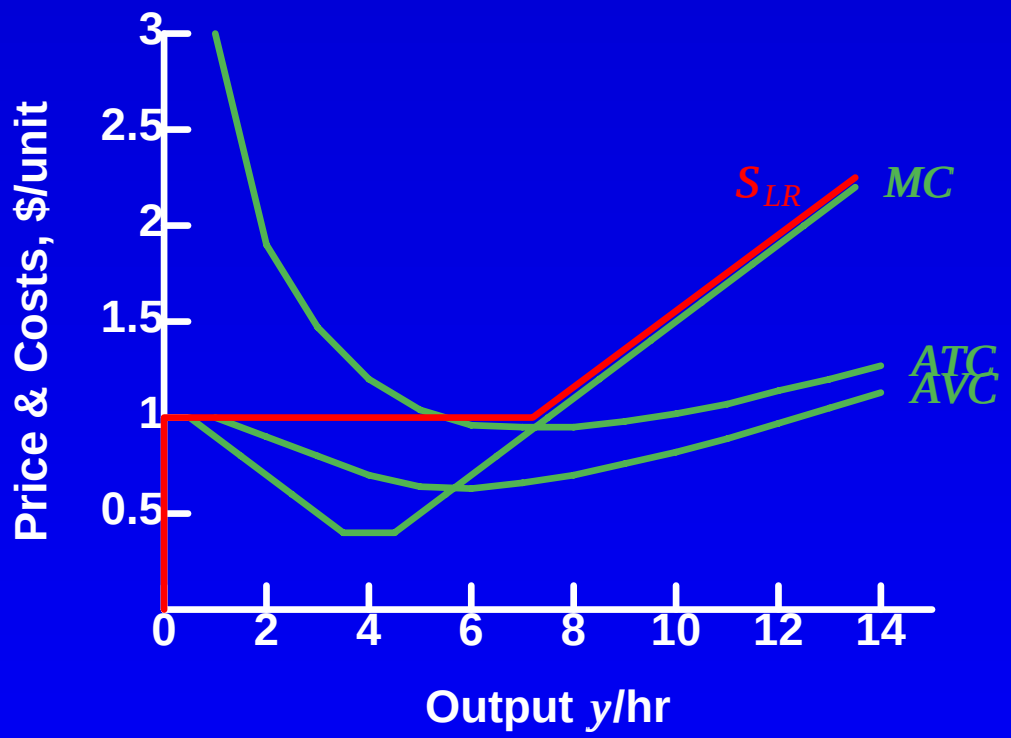

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Recall: *TC* includes the opportunity cost of capital used.

SUPPLY WITH NO ENTRY OR EXIT

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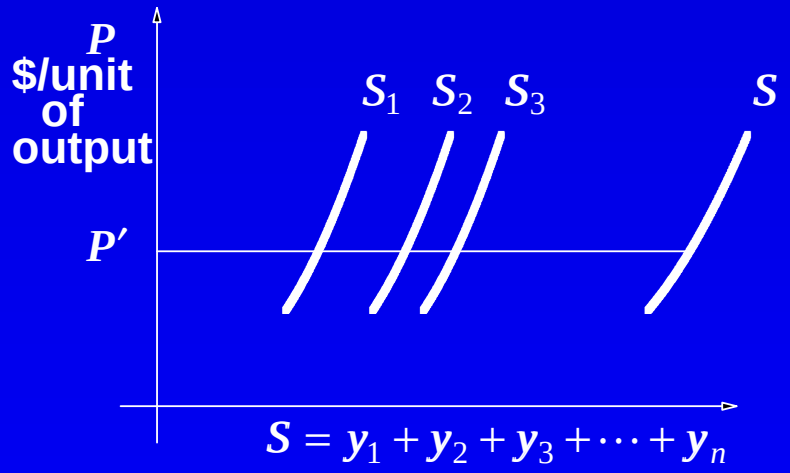

At price *P′*, how much will each firm offer to supply?

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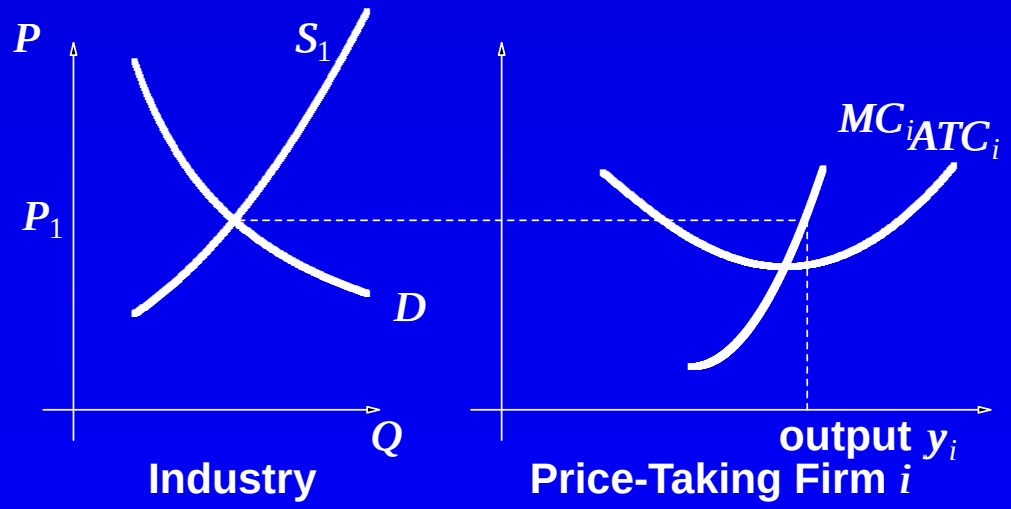

SUPPLY WITH ENTRY AND EXIT

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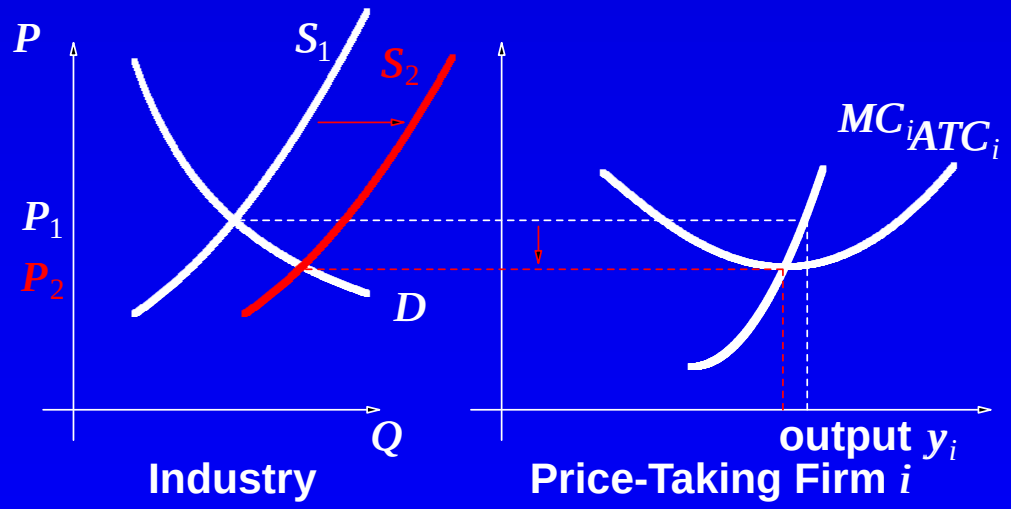

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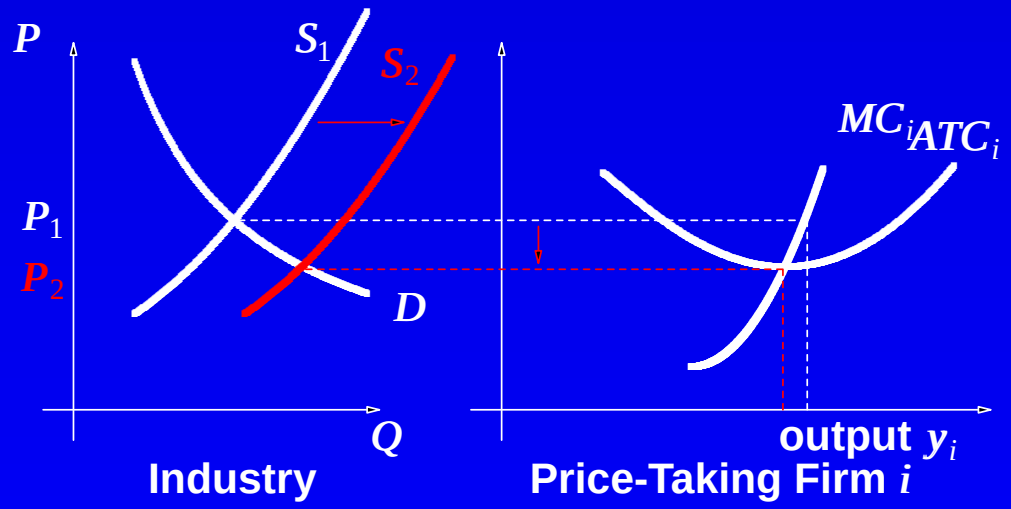

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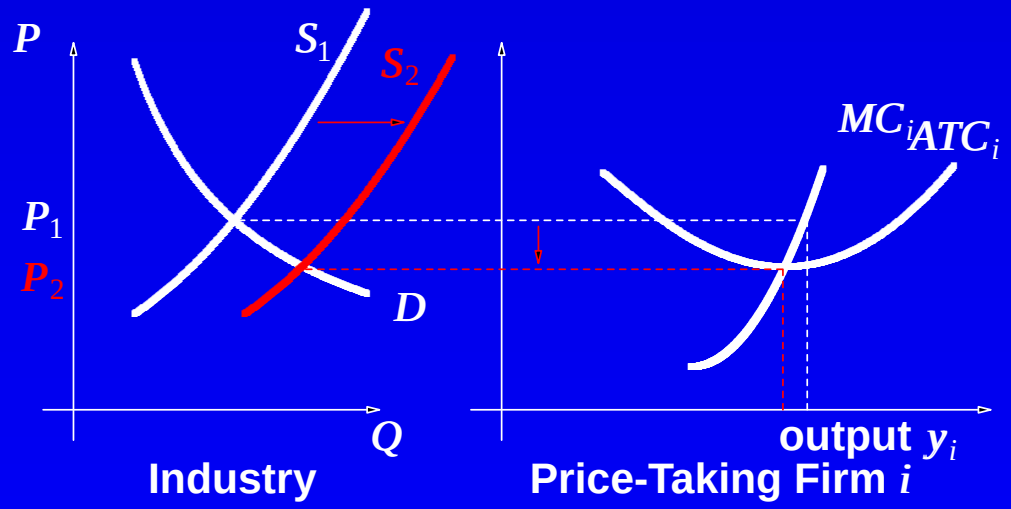

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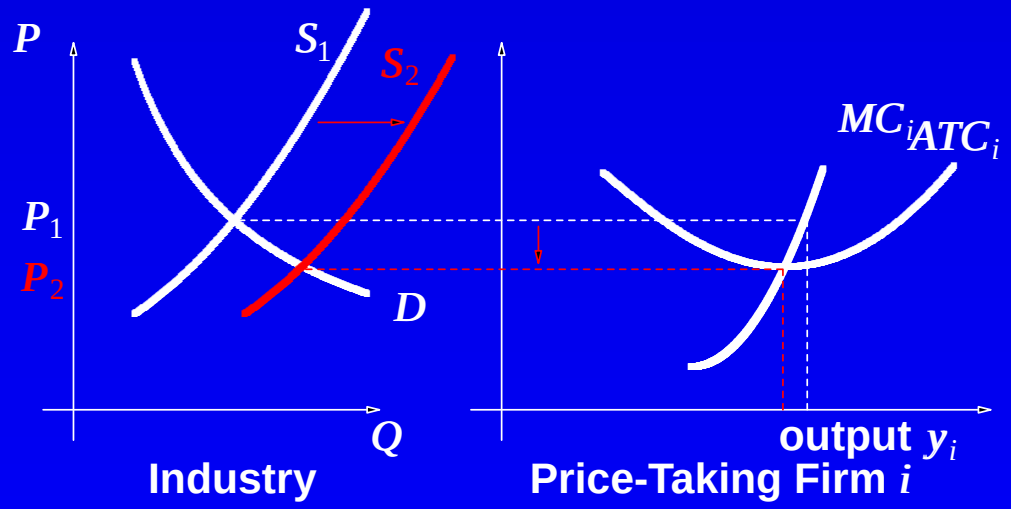
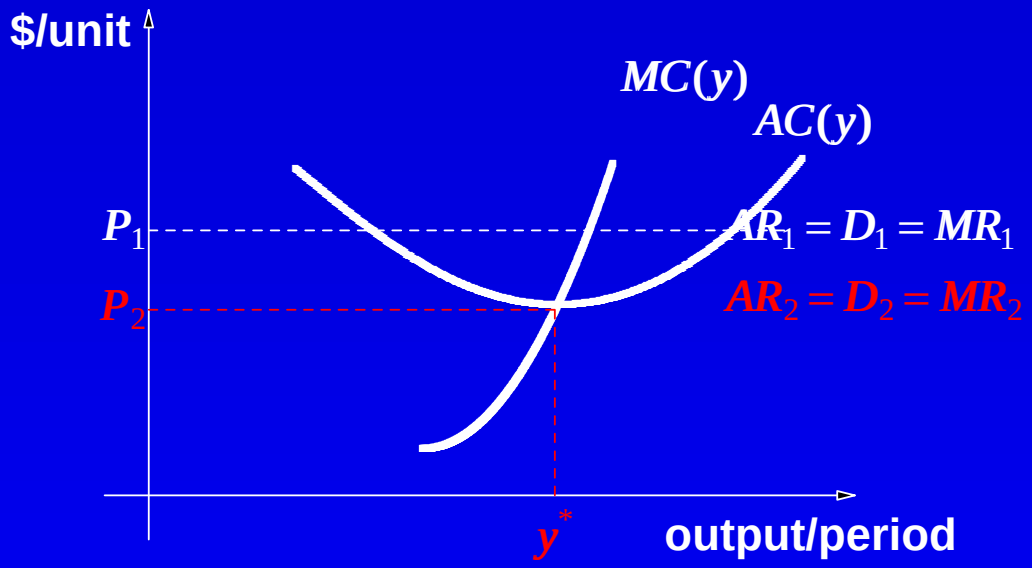


Positive profit ($AR = P_1 > ATC$) induces entry. Equilibrium price P falls as supply shift right. The marginal firm's profit falls to zero: $P_2 = MC = AC$

THE MARGINAL PRICE-TAKING FIRM



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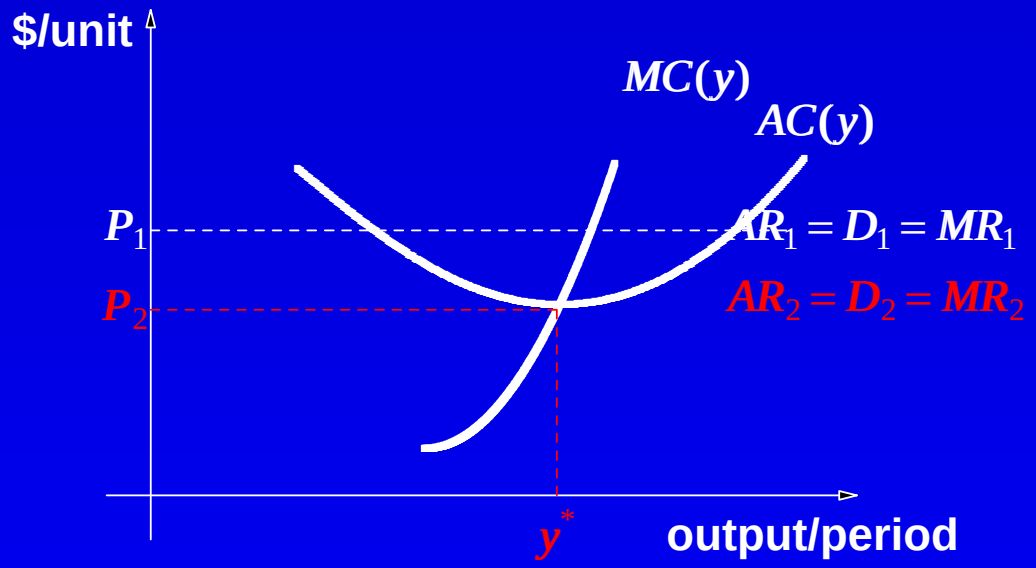

The *marginal firm*: the first to exit if long-run price P falls below P_2 (zero-profit). For this firm, new entrants have competed away any positive economic profits.

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Firms with lower costs will still have positive profits at P_2 and will operate above their Efficient Scales of Production.

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New equilibrium: price falls to minimum *AC* on the LR supply curve.

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Firms' costs vary: lower-cost firms might have limited capacity to supply, and the marginal firm is one with higher costs, making zero long-run profit at a market price which provides the lower-cost firms with positive profits.

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4. Industry (or market) supply curves are horizontal (CRTS) or rising (DRTS).