

MARKET STRUCTURE

IN THIS COURSE, WE STUDY TWO TYPES:

- ① PERFECTLY COMPETITIVE MARKET (AS A BENCHMARK)
- ② MONOPOLY: MARKET W/ A SINGLE SELLER (= MONOPOLIST) SELLING GOOD W/ NO CLOSE SUBSTITUTES.

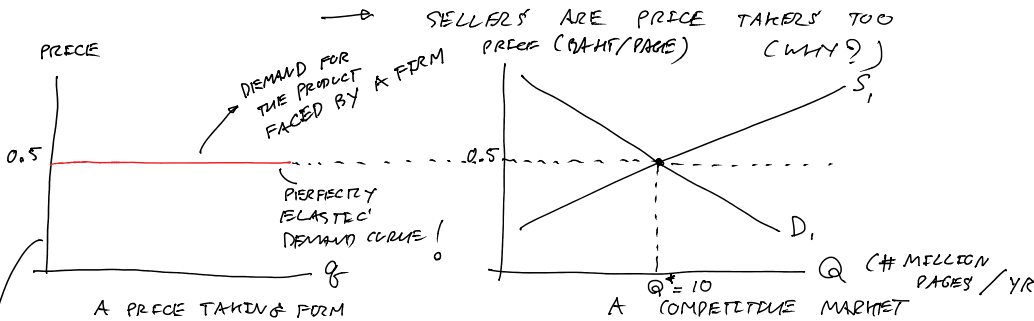
LET'S BEGIN W/ A PERFECTLY COMPETITIVE MARKET.

KEY CHARACTERISTICS

- ① LARGE NUMBER OF BUYERS & LARGE NUMBER OF SELLERS
 - ② HOMOGENEOUS PRODUCTS: ALL SELLERS PRODUCE AND SELL "NON-DIFFERENTIATED PRODUCTS" (FROM PERSPECTIVE OF BUYERS)
 - ③ FREE ENTRY AND FREE EXIT: NEW FIRMS CAN JUMP IN IF THEY SEE PROSPECT OF PROFITS AND THE EXISTING FIRMS CAN "LEAVE" OR "EXIT" IF THEY EXPERIENCE LOSSES.
 - ④ EVERY SELLERS (OR PRODUCERS) HAVE THE SAME TECHNOLOGY TO PRODUCE THE GOOD AND BUY INPUTS FROM THE SAME SOURCES.
- ① & ② IMPLY THAT BUYERS & SELLERS ARE "PRICE TAKERS."

EX: CONSIDER PHOTO COPY MARKET. ASSUME THAT WE HAVE LARGE NUMBER OF BUYERS AND SELLERS IN THIS MARKET. EVERY SHOPS OFFER "STANDARDIZED PRODUCTS".

PRICE TAKERS → YOU, AS A BUYER, TAKE PRICE AS GIVEN AND DECIDE HOW MANY PAGES YOU WANT TO USE THE SERVICES.



q = A SELLER (AN OWNER OF THIS SHOP)

- IF $P > 0.5$, I MAKE NO SALES
- IF $P < 0.5$, QUANTITY DEMANDED GOES TO ∞ (GETS EXTREMELY LARGE)
- IF $P = 0.5$, I CAN SELL AT ANY AMOUNT I WISH TO PRODUCE AND SELL. (DEPENDENT ON MY PRODUCTION CAPACITY)

IN SUMMARY DEMAND THAT I'M FACING IS "EXTREMELY SENSITIVE" TO CHANGE IN PRICE.

PRODUCTION & PROFITS

Q: TO MAXIMIZE PROFITS, HOW MANY OUTPUT THE PRICE-TAKING FIRM SHOULD PRODUCE?

BEFORE ANSWERING THIS QUESTION ABOVE, YOU MUST KNOW:

- TOTAL REVENUE (TR) = REVENUE RECEIVED BY THE FIRM FROM QUANTITY SOLD.
- AVERAGE REVENUE (AR) = REVENUE PER UNIT OF OUTPUT

$$AR = \frac{TR}{Q}$$

AR TELLS US ABOUT "ON AVERAGE", HOW MANY BAHT A PIECE OF COOKIE GENERATES."

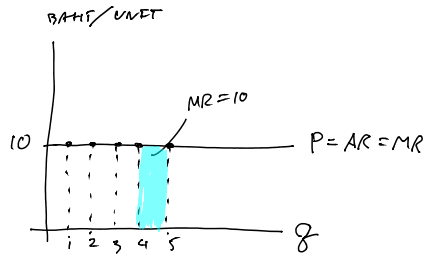
EX: TR = 10,000 BAHT / DAY
 Q = 1000 UNITS OF COOKIE.
 AR = $\frac{TR}{Q} = \frac{10,000}{1000} = 10$ BAHT / PIECE

- MARGINAL REVENUE (MR): EXTRA REVENUE FROM AN EXTRA UNIT OF OUTPUT.

$$MR = \frac{\Delta TR}{\Delta Q}$$

EXAMPLE:

Q	P	TR	MR	AR
0	10	0	10	10
1	10	10	10	10
2	10	20	10	10
3	10	30	10	10
4	10	40	10	10
5	10	50	10	10



MARGINAL REVENUE (MR) = PRICE (P)

IS ONLY TRUE FOR FIRMS OPERATING IN PERFECTLY COMPETITIVE MARKET.

PROFIT MAXIMIZING CONDITION

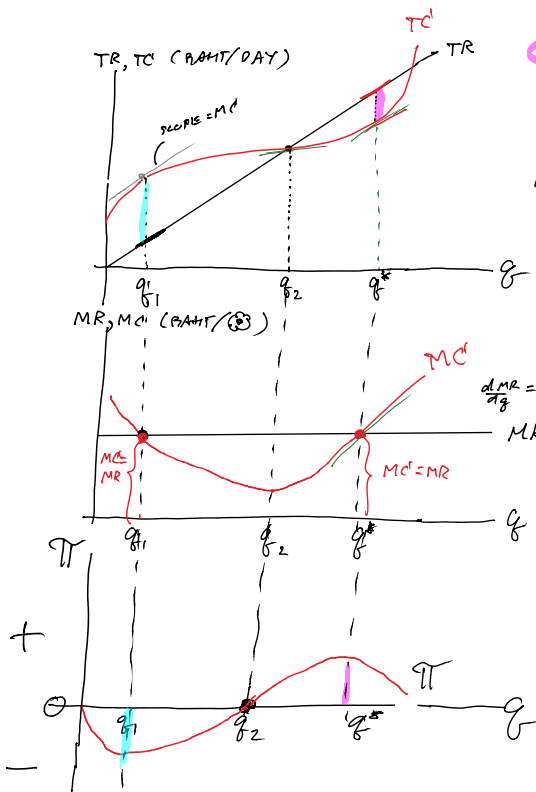
MAXIMIZE $\pi(q) = TR(q) - TC(q)$

CHOICE VARIABLE q

→ OBJECTIVE FUNCTION

2 APPROACHES OF LOOKING AT THIS PROBLEM:

- I TR - TC APPROACH
- II MR - MC APPROACH



TR-TC APPROACH: FIND THE LARGEST GAP BETWEEN TR AND TC.
 @ q_2 : $TR = TC$. SO $\pi = 0$
 @ q_1 : $TC > TR$ SO LOSSES OCCUR.
 [NOTE: LARGEST LOSSES AS THE GAP BET. TC AND TR IS LARGEST HERE.]
 @ q^* : LARGEST PROFITS OCCUR HERE.

$$MR = \frac{\Delta TR}{\Delta Q} = \text{SLOPE OF TR}$$

$$MC' = \frac{\Delta TC}{\Delta Q} = \text{SLOPE OF TC'}$$

W/ MR-MC' APPROACH, MANAGER SHOULD PRODUCE AT q WHERE MARGINAL REVENUE (MR) IS EQUAL TO MARGINAL COST (MC') & MC' MUST BE ON RISING PART

MATHEMATICALLY,

$$\text{MAX}_q \pi(q) = TR(q) - TC(q)$$

WE DIFFERENTIATE THE PROFIT FUNCTION WRT. q AND SET IT EQUAL TO ZERO

$$\frac{d\pi(q)}{dq} = \frac{dTR(q)}{dq} - \frac{dTC(q)}{dq} = 0$$

$$= MR(q) - MC'(q) = 0$$

F.O.C. : $MR(q^*) = MC'(q^*)$

PROFIT MAXIMIZING CONDITION SAYS THAT TO MAXIMIZE π , THE FIRM MUST PRODUCE AT q WHERE MARGINAL REVENUE (MR) EQUALS TO MARGINAL COST (MC').

NOTE F.O.C., SOMETIME WE CALL F.O.N.C. = FIRST ORDER NECESSARY CONDITION.

HOWEVER, TO ENSURE THAT WE GET THE MAXIMUM OF π , NOT MINIMUM, AN ADDITIONAL REQUIREMENT IS NEEDED !!!

THEREFORE, WE NEED SECOND ORDER SUFFICIENT CONDITION (S.O.S.C.) FOR MAXIMUM:

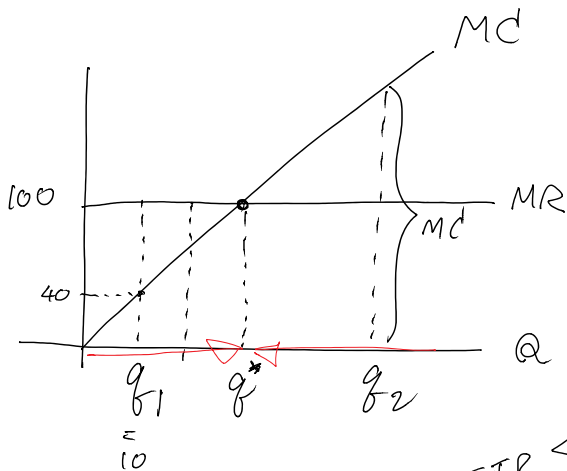
$$\frac{d^2 \pi}{dq^2} = \frac{d\left(\frac{d\pi}{dq}\right)}{dq} = \frac{d MR(q)}{dq} - \frac{d MC(q)}{dq} < 0$$

$$- \frac{d MC}{dq} < 0$$

$$\frac{d MC}{dq} > 0$$

\equiv SLOPE OF MC MUST BE POSITIVE.

INTUITION:



AS $MR > MC$, KEEP PRODUCING MORE.

AS $MC > MR$, REDUCING Q RAISES PROFITS

AT q^* , $MC = MR$, PROFIT IS MAXIMIZED.

Q: IN THE SHORT RUN, IF A FIRM FACES LOSSES, SHOULD IT STOP PRODUCING TEMPORARILY OR CONTINUE TO PRODUCE?

COMPARE

$\pi_q > 0$
(CONTINUE TO PRODUCE)

VS,

$\pi_q = 0$
(SHUT DOWN)

THE FIRM SHOULD CONTINUE TO PRODUCE IF

$$\begin{array}{ccc} \pi > 0 & \geq & \pi \\ \cancel{TR - FC - VC} & \geq & \cancel{0 - FC - 0} \\ & \geq & \\ TR - VC & \geq & 0 \end{array}$$

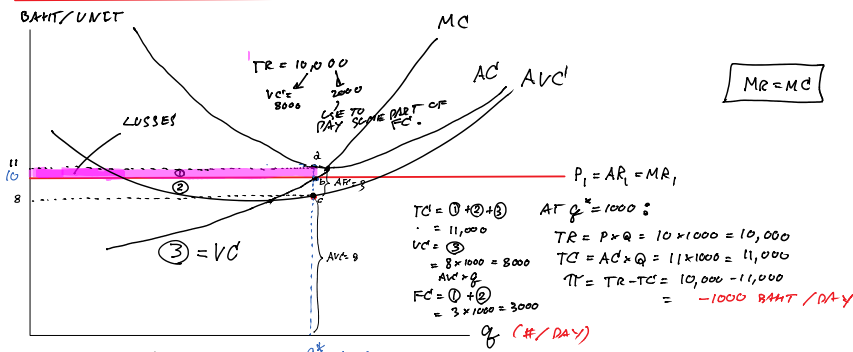
$$\boxed{TR \geq VC'}$$

IF TOTAL REVENUE GENERATED IS ENOUGH TO COVER ALL VARIABLE COSTS, THE FIRM SHOULD CONTINUE TO PRODUCE.

IN OTHER WORDS, THE FIRM SHOULD SHUT DOWN IF $TR < VC'$ [\equiv REVENUE GENERATED IS LESS THAN VARIABLE COST]

\equiv "SHUT DOWN RULE"

FIRM'S DECISION TO SHUTDOWN OR TO CONTINUE (GRAPH)



IF $Q > 0$
(CONTINUE)

$$\pi = TR - FC - VC$$

$$= [10 \times 1000] - [3000] - [8000]$$

$$= -1000$$

[LOSS = AREA ①]

VS. IF $Q = 0$
(SHUTDOWN)

$$\pi = TR - FC - VC$$

$$= 0 - (0 + 3000) - 0$$

$$= -3000$$

[LOSS = AREA ① + AREA ②]

WHICH IS EQUAL TO
THE WHOLE AMOUNT OF FIXED
COST !!!

STUCE $LOSS_{Q>0} < LOSS_{Q=0}$, THEN
IT IS BETTER FOR THE FIRM TO CONTINUE TO PRODUCE.
(HERE $Q^* = 1000$)

WHEN THE FIRM GENERATES TR, IT USES TR
TO \rightarrow PAY ALL VARIABLE COST (AREA 3)
 \rightarrow PAY SOME PART OF FIXED COST (AREA 2).

THAT'S WHY $LOSS_{Q>0} < LOSS_{Q=0}$.

THE SHUT DOWN RULE CAN BE WRITTEN AS :

SHUTDOWN IF $TR < VC'$

$$\frac{TR}{Q} < \frac{VC'}{Q}$$

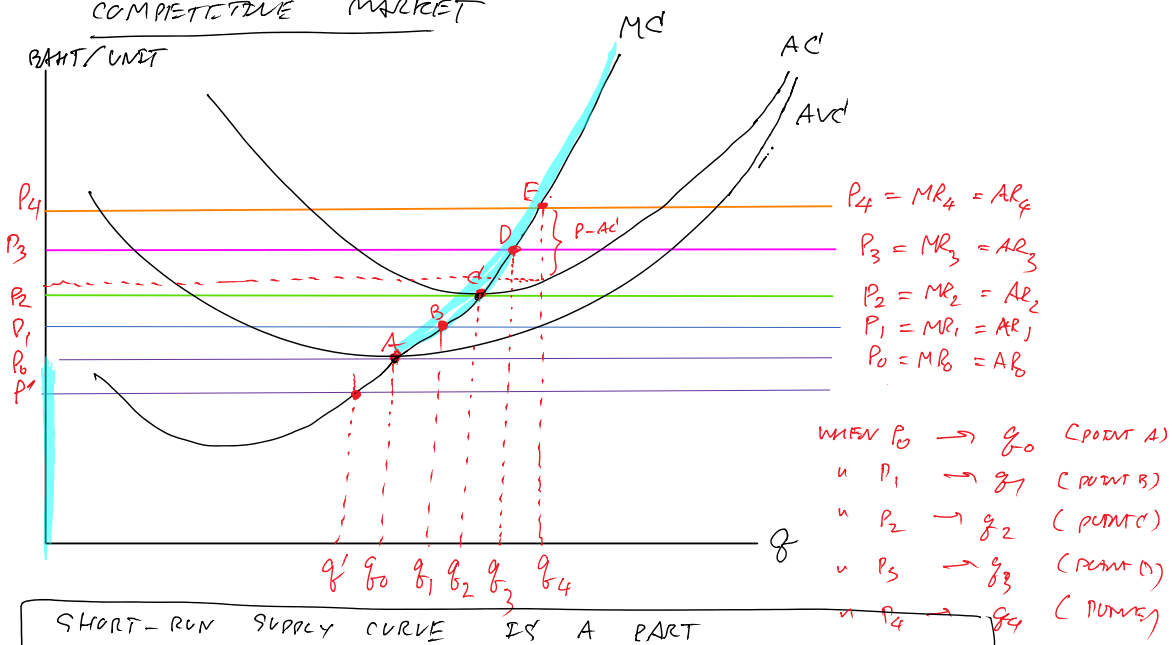
$$\frac{P \cdot Q}{Q} < \frac{VC'}{Q}$$

$$P < AVC'$$

IN THESE EXAMPLE, $P = 10$
 $AVC = 8$. SO THE FIRM SHOULD CONTINUE
TO PRODUCE.

SHORT-RUN SUPPLY CURVE OF A FIRM IN PERFECTLY

COMPETITIVE MARKET



SHORT-RUN SUPPLY CURVE IS A PART OF MC CURVE, STARTING FROM THE BOTTOM OF AVC!