Lecture 3

Cost, Supply & Competitive Markets

Economics
& Society

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Cost, Supply & Competitive Markets

Estimated duration: 100min

Lecture 3

Perfect Competition

- We have studied how consumers make their ***optimal choice*** and how firms think about ***production*** and ***cost***
- Now, we will examine how consumers and firms ***interact***
- Let's start from an ***ideal environment*** of competition
- A market is perfectly competitive when ***3 assumptions*** hold:
  1. There exists a ***large number*** of sellers
  2. The product is ***homogeneous***
  3. There are ***no barriers*** for sellers and buyers to participate in the market.
- Let's examine these assumptions ***one by one***

1. Large number of firms

* ***How large*** is "a large number" of firms?

  large enough, so firms cannot ***meaningfully interact***
* When the number of firms is ***large***, each firm holds a ***tiny market share***
* If a single firm ***increases*** its price
* If a single firm ***decreases*** its price
* In PC, the price is ***set at the market level*** and firms take it as ***given***

  so, we say that the PC firm is a ***price-taker***
* Individual buyers are also assumed to ***not have an impact*** on price

2. Product homogeneity

* All products have ***small or big differences***
* It is important how the consumer ***perceives*** the good:
  * Even when the products are physically different, they should be considered ***homogeneous*** if the consumers cannot tell the difference
  * Even when the products are physically identical, they should be considered ***heterogeneous*** if the consumers think that there is a difference.
* Heterogeneous products, such as ***brand names***, can charge higher prices because they may be ***perceived*** as better

  thus, they ***cannot be considered*** under the PC model

3. Free entry and exit

* In PC, market ***entry*** or ***exit*** must have ***no restrictions*** or barriers

  no one should be ***prohibited*** or ***prevented*** from becoming a seller
* This ***does not imply*** that a PC seller does not face ***fixed costs***

  fixed costs can be considered a barrier only when they are ***high enough*** to prevent most potential sellers from entering the industry
* Markets that ***resemble*** a PC environment can be:

  stock markets, online marketplaces, farmers markets, hawker centers etc.

Generalized profit maximization condition !

* Profit (Π) is the ***difference*** between ***revenue*** (R) and ***cost*** (C) : $\Pi = R - C$
* ***How*** do we hit the level of production (q) where this ***difference is maximum***?
* If by producing an extra unit, the revenue from that unit ***exceeds*** its cost:
  * This unit ***adds to profit*** – so, go ahead and ***produce it***
  * That is, if $MR > MC$, then ***increase*** q.
* If by producing an extra unit, the cost of that unit ***exceeds*** the revenue from it:
  * This unit ***contributes negatively to profit*** – so, do ***not produce it***
  * That is, if $MR < MC$, then ***cut down*** q.
* When $MR = MC$, output is at the ***optimal level*** under ***any market structure***

  we often ***denote*** that level of profit maximizing output by q^*

Profit maximization in PC

- In <u>every</u> market, the seller ***maximizes*** profit when

$$MR = MC$$

- However, <u>only in PC</u>, the ***revenue from each extra unit*** is the price of that unit

  each individual PC firm sells ***too little to affect*** the price in the whole market
- Thus, in PC, <u>marginal revenue</u> ***is*** always the <u>price</u>
- So, the ***profit maximizing condition*** becomes

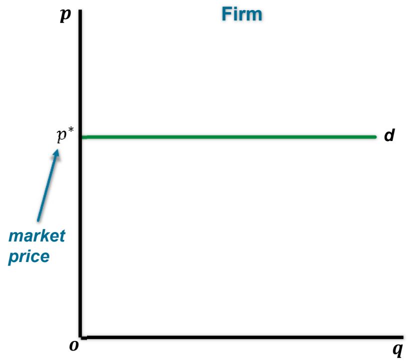
$$p = MC$$

under PC, profit is maximized when the cost for producing an extra unit equals the market price

A PC firm's demand

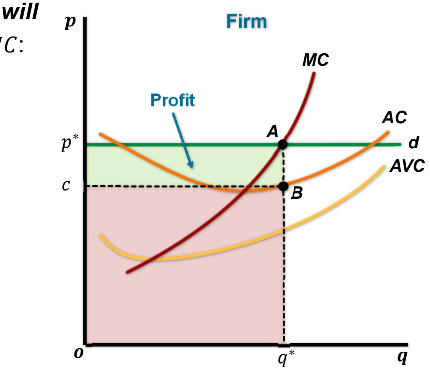
- The PC firm ***cannot set*** its own price:
  - If it charges <u>more</u> than market price, customers will shop from the ***competitors***
  - If it charges <u>less</u> than market price, it will simply ***lose money***.
- Thus, for the PC firm, price is ***fixed***

  the ***demand (d)*** for the PC firm's brand is a horizontal line at the market price



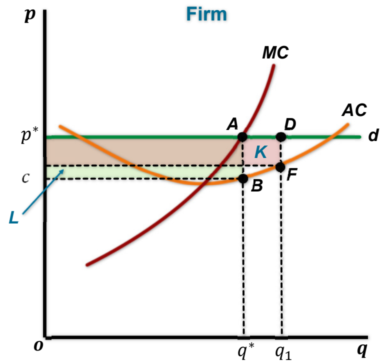
Choosing output: Short-run

- To maximize profit, the individual PC firm ***will produce*** the quantity (q^*) for which $p = MC$:
  - Revenue per unit is p^*
  - Total revenue is area p^*Aq^*o
  - Cost per unit is c
  - Total cost is area cBq^*o
  - Total profit is p^*ABc



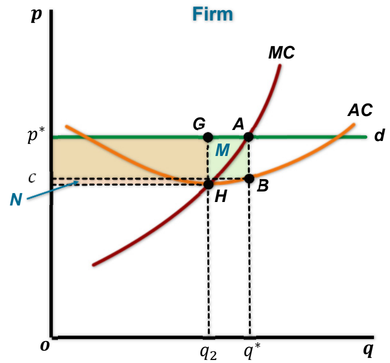
Is profit really maximum?

- ***Profit maximizing*** quantity is at q^*
- What if the firm decides to ***produce*** q_1 to increase sales?:
  - ***Gains*** profit area *K* due to higher ***sales***
  - ***Forgoes*** profit area *L* due to increase in ***cost***
  - *L* > *K*, so firm has ***lower profit*** than at q^*



What if min AC is targeted?

- ***Profit maximizing*** quantity is at q^*
- What if the firm ***produces*** q_2 to minimize AC?
  - ***Gains*** profit area *N* from ***cost*** reduction
  - ***Forgoes*** profit area *M* from loss of ***sales***
  - *M* > *N*, so firm has ***lower profit*** than at q^*

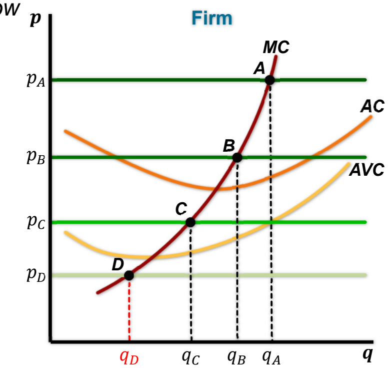


Losses and shutdown

- A firm produces ***chairs***:
  - ***Capital*** is leased for \$120 / day for 1 year
  - ***Labor*** costs \$8 per chair and the worker can make 10 chairs a day.
- Cost per chair is: $AC = {}^{\$120}/_{10} + \$8 = \$20$
- If $p = \$11$, should the firm ***shut down***?:
  - The firm makes operating loss of \$20 – \$11 = \$9 per chair or ***\$90*** per day
  - If it shuts down, losses will be ***\$120*** per day
  - If p is below AC (\$20) but above AVC (\$8) → ***keep operating*** in the S-R.
- If $p = \$7$, operating losses would be \$20 – \$7 = \$13 per chair or ***\$130*** per day:
  - If it shuts down, losses will be ***\$120*** per day
  - If p is below AVC (\$8) → ***shut down*** immediately

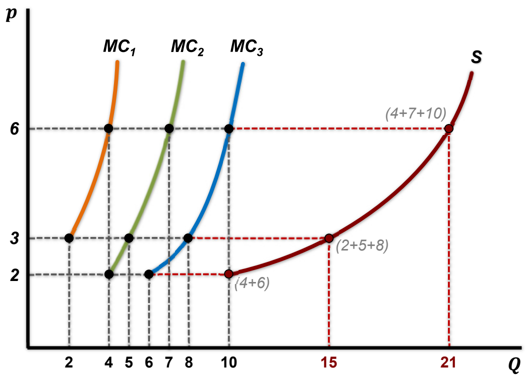
S-R supply curve

- The ***supply curve*** for a PC firm answers: *"how much q it will produce for every possible p?"*
- PC firms always ***set quantity*** where $p = MC$:
  - For price p_A, firm produces q_A
  - For price p_B, firm produces q_B
  - For price p_C, firm produces q_C
  - For price p_D, firm
- For every given price, quantity supplied is ***on the MC***
- The PC firm's ***supply curve*** is the portion of the *MC* curve above the *AVC* curve



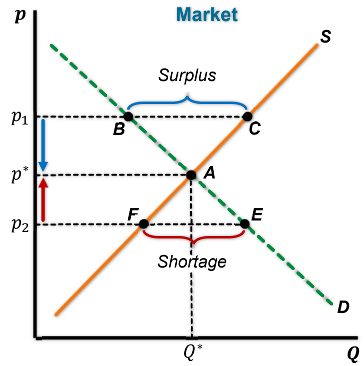
Market supply for the S-R

* Market supply shows the output the ***entire market*** will produce at every price
* Equals the ***horizontal sum*** of the supply curves of all firms in the market
  adding ***quantities*** for each price



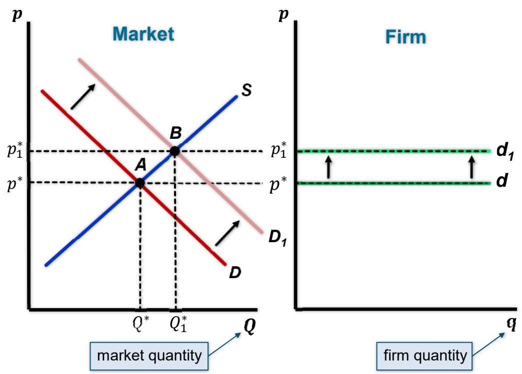
How does the market price emerge in PC?

* The price in PC results from the ***interaction*** of market demand and market supply
* YET firms ***know*** their supply decisions but ***may ignore*** the position of the market demand
  had they ***not ignored*** D, they would ***price*** at p^*
* If firms price at p_1, production (p_1C) ***exceeds*** quantity demanded (p_1B),
  firms will take this as a ***signal*** to ***lower the price***
* If firms price at p_2, quantity demanded (p_2E) ***exceeds*** production (p_2F),
  firms will take this as a ***signal*** to ***raise the price***



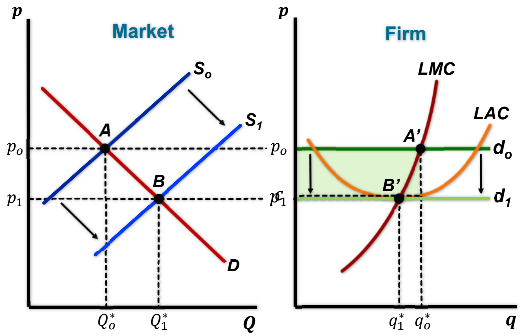
Market demand vs. Firm demand

* p^* is determined in the ***market***
* Every firm takes p^* as ***given***
* If, say, the good becomes ***more popular***
  * ***Demand*** increases to D_1
  * ***Market price*** becomes p_1^*
  * Firms who ***still sell*** at p^* will start having ***shortages*** and ***take the hint*** that price must increase to p_1^*



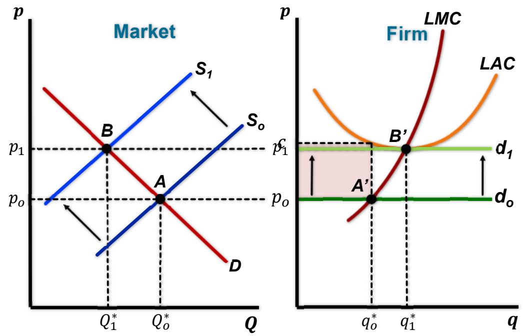
PC in the long-run: profit

- In the S-R, firms may earn ***profits***
- S-R profits, will ***attract*** new firms in the L-R:
  - The entry of new firms will ***increase*** market supply
  - Price will ***drop***
  - Till profit will be ***eliminated***



PC in the long-run: losses

- In the S-R, firms may have ***losses***
- S-R losses, will ***push*** some firms ***out*** in the L-R:
  - The exit of firms will ***decrease*** market supply
  - Price will go ***up***
  - Till losses are ***eliminated***…



Long-run competitive equilibrium

- In the L-R, the market will ***equilibrate*** once ***entry*** or ***exit stops***

  this will happen when ***profits*** or ***losses disappear***
- At the L-R equilibrium, every PC firm ***earns*** $\boldsymbol{\Pi = 0}$:
  - S-R profits vanish because of ***entry***, NOT because of doing business poorly
  - $\Pi = 0$ is the ***best-case L-R scenario*** for a PC firm
  - Any ***deviation*** from $p^* = MC$ will result to $\boldsymbol{\Pi < 0}$.
- Zero L-R profit simply means that ***profit opportunities*** do not last forever

  unless there is ***innovation***, ***differentiation***, or ***barriers of entry***

Why not exiting with zero profit? !

- A ***grab driver*** works 8 hours per day and invested $200K for the vehicle:
  - If the ***annual salary*** for a chauffeur in this market is $39K
  - And $200K ***in the bank*** would yield $3K in interest annually.
- Zero economic profit would ***NOT*** mean that he earns ***nothing***

  it would mean that he earns ***exactly $42K*** (equal to his total opportunity cost)
- Positive profit would be whatever he earned ***above $42K***
- If he earned ***below $42K***, he would be making economic losses
- $\boldsymbol{\Pi = 0}$ means that you ***earn as much as*** at your ***next best alternative***

  thus, you have ***no reason to exit***

Thank you!

(you are welcomed to stay for *consultation* or *discussion*)

40

WARNING!

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41