

OUTLINE — September 25, 2017

- Firms' Supply Decisions, continued
 - Costs of Production (this is where we ended 9/20)
 - Perfect Competition
 - Produce q where $MR=MC$ to maximize profit
 - Calculating Profit
 - If planning to exit in LR, Shut down or Produce in SR?
 - Supply curve is sum of MC curves above minimum AVC
- Profit = 0 in the Long Run in Perfect Competition

*Midterm #1: Wed 9/27, 7 pm.
Read Thurs 9/21 email. Watch videos. Breathe.*

Costs: Marginal & Average

- $ATC = \frac{TC}{q}$
- $MC = \frac{\Delta TC}{\Delta q}$
- Marginal > Average? Then average is increasing
- Marginal < Average? Then average is decreasing
 - *You know this. Think about your grades. If you start the term with a gpa of 3.0, and earn A- in all classes, your gpa goes up because marginal grades (3.7) > average (3.0.)*

Review Slides Costs Perf. Comp. Profit Shut Down S curve LR Profit=0

Marginal & Average Cost Curves



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Type of industry?

- Until now, it doesn't matter
- Assume
 - **PERFECTLY COMPETITIVE** Industry
 - 1) Lots of firms
 - 2) Homogeneous product
 - 3) No barriers to entry or exit

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Perfectly Competitive Industry

- **Key idea:** Each firm faces a horizontal demand curve at the market equilibrium price



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Market determines the price

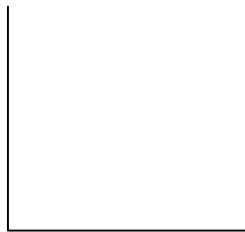
- Perfectly competitive firm can sell as much as it wants at market price
- Sell more? Additional revenue per unit = price
- Sell less? Lost revenue per unit = price

When price is constant, $MR = AR = p$

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Profit Max: choose q where $MR=MC$

- If $MR > MC$,
- If $MR < MC$,
- If $MR = MC$,



- **RULE:**
To maximize profit, produce q so that $MR = MC$

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Perfectly Competitive Industry

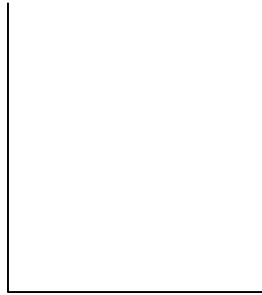


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How much Profit?

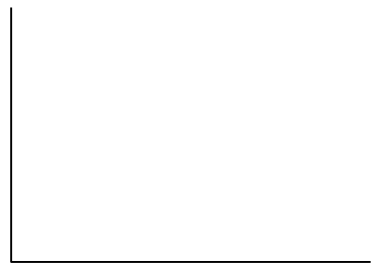
$$\pi = TR - TC$$

$$\pi = p \times q - ATC \times q$$



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Economic Loss



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Long Run

- Technique can be changed
- Entry & exit are possible

- Decision



Short Run

- Technique is fixed
- Entry & exit are impossible
- Decision (if planning to exit)
 - Produce
 - Shut Down
- Decision (if planning to stay, or if not shutting down): how much to produce?

Shutdown Point

- *Relevant decision only if incurring economic loss*
- If **revenue > variable costs**, then **produce**
 - Firm is covering all its variable costs, and more
- If **revenue < variable costs**, then immediately **shut down**
 - Firm loses less by not producing & just paying fixed costs

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Shutdown Point

Each month, a profit-maximizing business has

- TR = \$70,000
- Total Economic costs = \$105,000
- TFC = \$75,000
- TVC = \$30,000

What should this business do in the long run? In the short run?

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Supply Curve is Sum of MC Curves

- Produce when $p > AVC$
- Profit-max quantity: quantity where $p = MC$



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Entry & Exit in the Long Run

- $\pi = 0$: "Normal profit" $\pi > 0$: "Abnormal profit"

- Short-run $\pi > 0$
 - Firms enter industry *in the long run*
- Short-run $\pi < 0$
 - Some firms exit industry *in the long run*

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Free Entry Drives Profit to 0

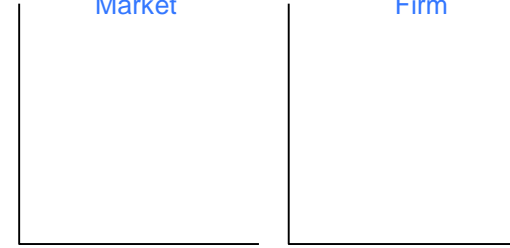


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Example: Increase in Demand

Market

Firm



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Typical firm earning profit?

- Abnormal profit?
- More firms will enter industry
 - Result?
 - Prices fall
 - Total quantity sold increases
 - Existing firms produce **less** than before
 - New firms produce **more** than 0

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Increase in demand

- Short run
 - Price rises
 - Existing firms produce more
 - Profit > 0
- Long run
 - Firms enter
 - Price returns to p_1
 - Market quantity increases
 - Existing firms cut production back to q_1
 - New firms produce $q > 0$
 - Profit = 0

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Example: Increase in Input Costs

Market

Firm



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Increase in input costs

- **Short run**
 - MC and ATC rise, shifting market supply
 - Price rises to p_2
 - Existing firms produce less
 - **Profit < 0**
- **Long run**
 - Firms exit
 - Price rises to fully cover additional costs, to p_3
 - Market quantity decreases
 - Existing firms return production to q_1
 - Fewer firms produce
 - **Profit = 0**

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Example: Increase in Fixed Cost



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