The Meaning of Competition

- A perfectly competitive market has the following characteristics:
  - There are many buyers and sellers in the market.
  - The goods offered by the various sellers are largely the same.
  - Firms can freely enter or exit the market.

The Meaning of Competition

- As a result of its characteristics, the perfectly competitive market has the following outcomes:
  - The actions of any single buyer or seller in the market have a negligible impact on the market price.
  - Each buyer and seller takes the market price as given.

Revenue of a Competitive Firm

Total revenue for a firm is the selling price times the quantity sold.

\[ TR = (P \times Q) \]
Revenue of a Competitive Firm

**Average revenue** tells us how much revenue a firm receives for the typical unit sold.

Average revenue = \( \frac{\text{Total revenue}}{\text{Quantity}} = \frac{(\text{Price} \times \text{Quantity})}{\text{Quantity}} = \text{Price} \)

Revenue of a Competitive Firm

In perfect competition, **average revenue** equals the price of the good.

Marginal revenue is the change in total revenue from an additional unit sold.

\[ 
\text{MR} = \frac{\Delta \text{TR}}{\Delta \text{Q}} 
\]

Revenue of a Competitive Firm

For competitive firms, **marginal revenue** equals the price of the good.

<table>
<thead>
<tr>
<th>Quantity (Q)</th>
<th>Price (P)</th>
<th>Total Revenue (TR=P*Q)</th>
<th>Average Revenue (AR=TR/Q)</th>
<th>Marginal Revenue (MR=(\Delta \text{TR}/\Delta \text{Q}))</th>
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<tbody>
<tr>
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For competitive firms, **MR = P** for competitive firms.

Revenue of a Competitive Firm

- MR = \(\Delta \text{TR}/\Delta \text{Q}\)
- TR = P * Q
- P is fixed for competitive firms (firms are price takers).
- Therefore, when Q rises by 1 unit, TR rises by P dollars.
- Thus, MR = P for competitive firms.
Profit Maximization for the Competitive Firm

- The goal of a competitive firm is to maximize profit.
- This means that the firm will want to produce the quantity that maximizes the difference between total revenue and total cost.

Profit Maximization: A Numerical Example

<table>
<thead>
<tr>
<th>Price (P)</th>
<th>Quantity (Q)</th>
<th>Total Revenue (TR = P*Q)</th>
<th>Total Cost (TC)</th>
<th>Profit (TR - TC)</th>
<th>Marginal Revenue (MR)</th>
<th>Marginal Cost (MC)</th>
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</tbody>
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Profit Maximization for the Competitive Firm...

The firm maximizes profit by producing the quantity at which marginal cost equals marginal revenue. When MR > MC increase Q, when MR < MC decrease Q, and when MR = MC profit is maximized.

Profit Maximization for the Competitive Firm...

Profit maximization occurs at the quantity where marginal revenue equals marginal cost.
**The Firm's Short-Run Decision to Shut Down**

- A **shutdown** refers to a short-run decision not to produce anything during a specific period of time because of current market conditions.
- Exit refers to a long-run decision to leave the market.

**How to Maximize Profit in the Short Run**

- There is a 2 step process a firm must follow in order to maximize profit.
  1. Find the point where price equals marginal cost.
  2. If price is greater than average variable cost, produce Q units. If not, shut down in the short run.

**The Firm's Short-Run Decision to Shut Down**

The firm considers its **sunk costs** when deciding to exit, but ignores them when deciding whether to shut down.

- **Sunk costs** are costs that have already been committed and cannot be recovered.

**The Firm's Short-Run Decision to Shut Down**

- The firm shuts down if the revenue it gets from producing is less than the variable cost of production.
  
  \[
  \text{Shut down if } TR < VC \\
  \text{Shut down if } TR/Q < VC/Q \\
  \text{Shut down if } P < AVC
  \]

**How to Maximize Profit in the Short Run**

- There is a 2 step process a firm must follow in order to maximize profit.
  1. Find the point where price equals marginal cost.
  2. If price is greater than average variable cost, produce Q units. If not, shut down in the short run.

**The Firm's Short-Run Decision to Shut Down**

- The portion of the marginal-cost curve that lies above average variable cost is the competitive firm's **short-run supply curve**.
The Firm’s Long-Run Decision to Exit or Enter a Market

- In the long-run, the firm exits if the revenue it would get from producing is less than its total cost.
  - Exit if \( TR < TC \)
  - Exit if \( TR/Q < TC/Q \)
  - Exit if \( P < ATC \)

A firm will enter the industry if such an action would be profitable.
- Enter if \( TR > TC \)
- Enter if \( TR/Q > TC/Q \)
- Enter if \( P > ATC \)

How to Maximize Profit in the Long Run

- There is a 2 step process a firm must follow in order to maximize profit.
  1. Find the point where price equals marginal cost.
  2. If price is greater than average variable cost, produce \( Q \) units. If not, exit the industry in the long run.

The Competitive Firm’s Long-Run Supply Curve...

The competitive firm’s long-run supply curve is the portion of its marginal-cost curve that lies above average total cost.
The Firm’s Short-Run and Long-Run Supply Curves

- **Short-Run Supply Curve**
  - The portion of its marginal cost curve that lies above average variable cost.
- **Long-Run Supply Curve**
  - The marginal cost curve above the minimum point of its average total cost curve.

Measuring Profit in the Graph for the Competitive Firm...

![Graph showing profit maximization](image)

Supply in a Competitive Market

Market supply equals the sum of the quantities supplied by the individual firms in the market.

The Short Run: Market Supply with a Fixed Number of Firms

- For any given price, each firm supplies a quantity of output so that its marginal cost equals price.
- The market supply curve reflects the individual firms’ marginal cost curves.

The Short Run: Market Supply with a Fixed Number of Firms...

![Graph showing market supply](image)
The Long Run: Market Supply with Entry and Exit

- Firms will enter or exit the market until profit is driven to zero.
- In the long run, price equals the minimum of average total cost.
- The long-run market supply curve is horizontal at this price.

Firms Stay in Business with Zero Profit

- Profit equals total revenue minus total cost.
- Total cost includes all the opportunity costs of the firm.
- In the zero-profit equilibrium, the firm’s revenue compensates the owners for the time and money they expend to keep the business going.

Increase in Demand in the Short Run

- An increase in demand raises price and quantity in the short run.
- Firms earn profits because price now exceeds average total cost.
**Increase in Demand in the Short Run...**

- **(b) Short-Run Response**
- **(c) Long-Run Response**

**Why the Long-Run Supply Curve Might Slope Upward**

- Some resources used in production may be available only in limited quantities.
- Firms may have different costs.

**Marginal Firm**

The marginal firm is the firm that would exit the market if the price were any lower.

**Summary**

- Because a competitive firm is a price taker, its revenue is proportional to the amount of output it produces.
- The price of the good equals both the firm’s average revenue and its marginal revenue.

**Summary**

- To maximize profit a firm chooses the quantity of output such that marginal revenue equals marginal cost.
- This is also the quantity at which price equals marginal cost.
- Therefore, the firm’s marginal cost curve is its supply curve.
In the short run when a firm cannot recover its fixed costs, the firm will choose to shut down temporarily if the price of the good is less than average variable cost.

In the long run when the firm can recover both fixed and variable costs, it will choose to exit if the price is less than average total cost.

In a market with free entry and exit, profits are driven to zero in the long run and all firms produce at the efficient scale.

Changes in demand have different effects over different time horizons.