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S H I V I

Economics

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Sub-topics

1. Topics in demand & supply
2. The firm & market structures
3. Aggregate output, prices, and economic growth
4. Business cycle
5. Monetary & Fiscal Policy
6. International Trade and Capital Flows
7. Currency Exchange

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1. Topics in demand & supply

Intro:

- Macroeconomics studies the whole economy.
- Microeconomics looks at a smaller part, such as an individual buyer, a company, or an industry.
- Demand is how much buyers want of a good.
- Supply is how much of a good is available.
- The two groups within microeconomics which make up a market are buyers (consumers) and sellers (suppliers).

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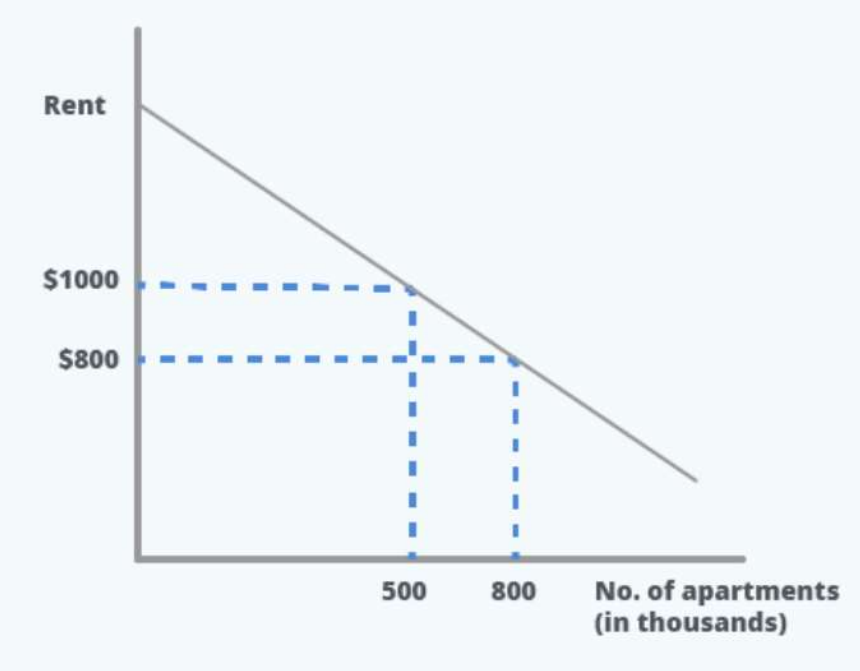
Law of Demand and Demand Function

Example: The following exhibit shows the demand for apartments in City P



The slope of this demand curve is *most likely* to be:

a) $-\frac{2}{3}$

b) $\mathbf{-\frac{1}{1500}}$

c) $\frac{2}{3}$

The slope of a curve is "rise over run."

$= \frac{1000 - 800}{500{,}000 - 800{,}000} = -\frac{1}{1500}$

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Price Elasticity of Demand

- Price elasticity of demand answers the question about how sensitive a buyer is to price changes.
- Price elasticity of demand is calculated as the percentage change in quantity demanded divided by the percentage change in price.

$$\text{Price Elasticity of Demand (PED)} = \frac{\% \Delta Q}{\% \Delta Px}$$

- As the price of a normal good increases, **quantity demanded** decreases.
- **Elastic demand:** Percentage increases in price leads to a larger percentage decrease in quantity demanded.
- **Inelastic demand:** Percentage increases in price leads to a smaller percentage decrease in quantity demanded.

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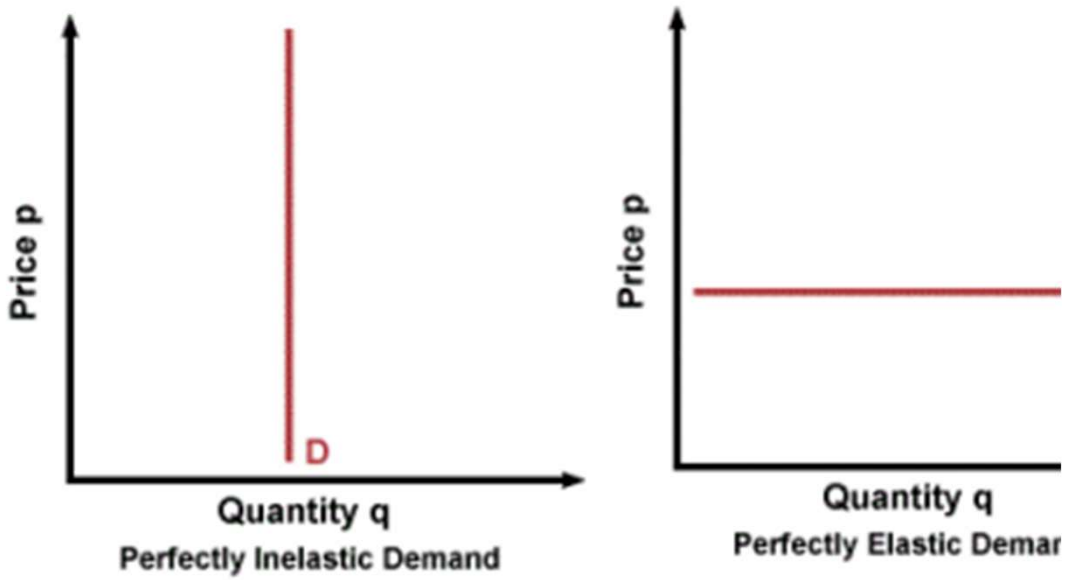
Price Elasticity of Demand



- If *elasticity* > *1*, then demand is **elastic.**
- If *elasticity* < *1*, then demand is **inelastic**.
- If it is *equal to* - *1*, then it is **unit elastic**.

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Price Elasticity of Demand

Example: If US buy 600,000 cars at a price of USD 18,000, and if each USD 1,000 drop in price raises sales by 150,000, the own price elasticity of demand for cars when the price drops to USD 16,000 is *closest* to:

a) **-2.67**
b) -4.50
c) -3.20

The slope coefficient is as follows.

$$\frac{\Delta Q_x^d}{\Delta P_x} = \frac{150,000}{-1,000} = -150$$

The point on this demand curve which you're interested in is where P = USD 16,000 and Q = 900,000. So own price elasticity of demand equals

$$E_P = -150 \times \frac{16{,}000}{900{,}000} = -2.66666$$

or approximately -2.67.

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Factors That Influence Elasticity of Demand

- Availability and closeness of **substitutes**

  $\uparrow \boldsymbol{Substitutes}: \uparrow \boldsymbol{Elasticity}$

- **Proportion of income** spent on the item

  $\uparrow \boldsymbol{Proportion\ of\ income}: \uparrow \boldsymbol{Elasticity}$

- **Time** elapsed since previous price change

  $\uparrow \boldsymbol{Time}: \uparrow \boldsymbol{Elasticity}$

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Elasticity and Total Expenditure

Considerations of price elasticity of demand and its impact on total expenditure:

- When demand is **elastic**, *price and total expenditure* move in opposite directions.
- When demand is **inelastic**, *price and total expenditure* move in the same direction.
- When demand is **unit elastic**, *changes in price* are associated with no change in total expenditure.
- For a unit elastic demand curve, with $\varepsilon=1$ over its whole length, total revenue is constant regardless of the price.
- In the case of perfectly inelastic demand ($\varepsilon = 0$), consumers will buy the same quantity regardless of the price; and with perfectly elastic demand ($\varepsilon=\infty$), customers will buy any quantity suppliers are willing to offer at a certain price.

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Cross-price Elasticity of Demand and Substitutes and Complements

Regarding cross-price elasticity of demand:

- The cross-price elasticity of demand shows how the change in the price of one good affects the demand of another good.
- If the price of one good **rises** & the demand for the other good also **rises**, they are ***substitutes***.
- If the price of one good **rises** the demand for the other good **falls**, they are **complements**.
- The cross-price elasticity of demand *is positive for substitutes* and *negative for complements.*

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Cross-price Elasticity of Demand and Substitutes and Complements

Mathematically, it is expressed as:

$$Cross\ elasticity\ of\ demand = \frac{\%\ change\ in\ quantity\ demanded\ for\ good\ x}{\%\ change\ in\ price\ of\ good\ y}$$

Symbolically, it is expressed as:

$$E_C = \frac{\Delta q_x}{\Delta p_y} \times \frac{p_y}{q_x}$$

Where, E_C= Cross elasticity of demand

q_x= initial quantity demanded for good x

Δq_x= change in quantity demanded of good x

p_y= initial price of good y

Δp_y= change in price of good y

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Cross-price Elasticity of Demand and Substitutes and Complements

Example:

1. Price of coffee increased 16.65% and demand for tea increased 11.10%

Sol: Cross-price elasticity of demand = $\frac{11.10\%}{16.65\%} = 0.67$

Since, cross price elasticity of 0.67 > 0; the goods are *substitutes*

2. Price of pizza increased 25.0% and demand for cola decreased 10.7%

Sol: Cross price elasticity of demand = $\frac{-10.7\%}{25.0\%} = -0.43$

Since, cross price elasticity of -0.43 < 0; the goods are *compliments*

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Income Elasticity of Demand

Sensitivity of quantity demanded to change in income

$$\text{Income elasticity} = \frac{\%\ change\ in\ quantity\ demanded}{\%\ change\ in\ income}$$

The formula for point income elasticity is:

$$E_I = \frac{\Delta Q_d}{\Delta I}\left(\frac{I}{Q_d}\right)$$

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Income Elasticity of Demand

Example: When consumers earn an average of $42,900 per year, 151,000 doses of a costly medicine are sold. If consumer incomes rise (fall) in either direction by $100 per year, all else being equal, sales of this medicine will rise (fall) by 210 doses, in the same direction. The income elasticity of demand is *closest to*:

a) 0.0014
b) 0.0023
c) 0.597

Explanation: This question calls for the calculation of POINT income elasticity of demand, since it does not describe a range of possible consumer incomes, but focuses on a single level of consumer incomes, $42,900, and gives a precise description of the behavior of demand in the very immediate vicinity of this income level.

$$E_I = \frac{\Delta Q_d}{\Delta I}\left(\frac{I}{Q_d}\right)$$

Since a $100 change in consumer incomes causes a 210 dose change in sales,

$$\frac{\Delta Q_d}{\Delta I} = \frac{210}{100} = 2.1$$

Plugging this value into the formula for (point) income elasticity, along with the current values for price and average consumer income, yields:

$$E_I = \frac{\Delta Q_d}{\Delta I}\left(\frac{I}{Q_d}\right) = 2.1\left(\frac{42900}{151000}\right) = 0.597$$

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Income Elasticity of Demand and Normal vs. Inferior Goods

Considering normal versus inferior goods:

- Normal goods are what a consumer buys more of if income rises, whereas inferior goods are what the consumer buys fewer of if income rises.

- **Income elasticity of demand measures the sensitivity to the quantity demanded when there is a change in income.**

- If the *number is negative*, it is an inferior good.

- If it is *positive*, then it is a normal good.

- **Normal good:** Income ↑ Demand ↑ Elasticity > 0
- **Inferior good :** Income ↑ Demand ↓ Elasticity > 0

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Substitution and Income Effects

- Price affects quantity demanded through two channels: the income effect, and the substitution effect.

- When the price of good decreases:
  - ✓ **Substitution effect** *always* increases consumption of the good for which the price has fallen.
  - ✓ **Income effect** is positive for a normal good and negative for an inferior good

- For normal goods, these two effects operate in the same direction, both increasing quantity demanded when the price falls.

- For inferior goods, the two effects offset each other: the income effect would cause consumption to fall when the price falls, but the substitution effect usually offsets it and gives demand curves the normal downward-sloping shape.

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Substitution and Income Effects – Exception's

Considerations of Giffen and Veblen goods:

- Giffen and Veblen goods are two very different exceptions to the law of demand.
- Giffen goods are highly inferior goods for which the income effect is stronger than the substitution effect.
- Veblen goods are status related, or "conspicuous consumption" goods, whose high price is a selling point because it makes the goods more prestigious.
- In these rare cases, demand curves for Veblen goods might slope up.

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Marginal Returns and Productivity

- Productivity is the total output divided by the amount of an input being used to produce that output.
- The most discussed measure of productivity is labor productivity—the amount of output being produced by a worker or by an hour worked.
- If marginal product increases as more units are produced, increasing marginal returns are the result
- The *law of diminishing marginal returns (next slide) applies in most instances

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Marginal Returns and Productivity

Diminishing Marginal Returns

- When additional units of one factor of production are added, holding the amounts of other factors constant, the additional output (marginal product) of each additional unit will begin to decrease at *some amount* of the input.

- The marginal product may become negative at some quantity of the input.

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Economic Cost vs. Accounting Cost

- Accounting profit is revenue minus expenses, or net income reported on the income statement.
- Economic profit is accounting profit less implicit costs.
- Normal profit is accounting profit minus economic profit, and normal profits mean zero economics profits, which is what should be expected in the long run.

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Total, Average, and Marginal Revenue

Regarding total, average, and marginal revenue:

- A perfect competitor can sell more without reducing the price, so total revenue always rises as output increases.
- Marginal revenue, the increase in revenue from selling one more unit, is equal to the price for a perfect competitor.
- An imperfect competitor faces a downward-sloping demand curve, so must reduce the price to sell more.
- Total revenue may rise or fall as output increases, but marginal revenue will always be less than the price for an imperfect competitor.

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Total, Average, and Marginal Product of Labor

Regarding product of labor:

- The total product of labor for a firm is the quantity produced.
- The average product of labor is then this quantity divided by the quantity of labor, *L*.
- The marginal product of labor is the slope of the production function when graphed with respect to labor, which is also the estimate of the production of one additional unit of labor.

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Fixed Cost, Variable Cost, and Marginal Cost

- Fixed costs are those that are paid regardless of how much output is produced.
- Variable costs are those costs that will increase as output is increased.
- Fixed cost and variable cost sum to total cost. These three are often used in averages, dividing by quantity.
- Marginal cost is the change in total cost that must be incurred in order to add one more unit of output.

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Interactions between Costs and Output

- Short-run ATC and AVC are typically *U*-shaped curves. As output increases, a rising marginal cost curve causes this to be the case, since ATC declines as fixed costs are initially spread among more units, but higher costs of later production causes average costs to eventually rise.

- The MC curve passes through the minimum of ATC and AVC.

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Profit Maximization under Imperfect Competition

- Under imperfect competition, firms face downward-sloping demand and therefore have some ability to affect price with their output decision.

- Marginal revenue is below price for imperfect competitors, and profit maximization occurs at the production level where MR = MC.

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Profit Maximization under Perfect Competition

A perfectly competitive firm is a price taker, and faces a perfectly elastic demand curve, where price is also marginal revenue. Profit maximization or cost minimization occurs by choosing the output level where MR = MC.

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Breakeven Point and Shutdown Point

- The supply curve follows the marginal cost curve from the shutdown point upward.
- The point where the marginal cost curve (MC) crosses the average variable cost curve (AVC) is the shutdown point. The company will not produce anything at a price lower than this.
- The point where the MC crosses the average total cost curve (ATC) is the breakeven point. If price is below this level then the firm loses money; above this it earns positive profits.

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Breakeven Point and Shutdown Point

Example: 1) What condition do you think of when someone says that a company is "breaking even"?

a) Revenue of zero
b) Cost of zero
c) Profit of zero

2) So a **breakeven point** is a level of production which causes profit to be zero. Thinking about the cost curves of a company, what would price have to be equal to in order for profit to be zero?

a) AFC
b) AVC
c) ATC

Explanation: Next slide

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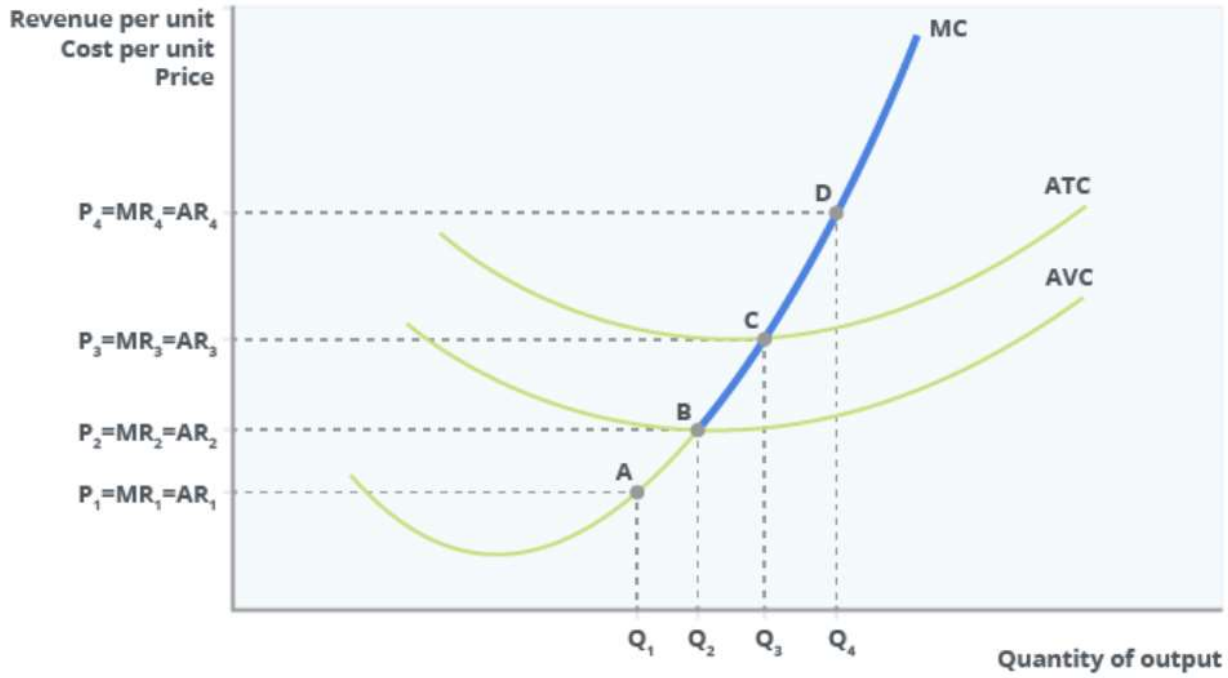
Breakeven Point and Shutdown Point

If price is the same as total costs, then profit per unit is zero. The firm is breaking even.
You can see that represented here as Point C:



- ✓ Any price above the point C, like represented by Point D: The firm makes positive profits.
- ✓ Any price below the point C (i.e. breakeven point): The firm makes a loss. But that loss is limited

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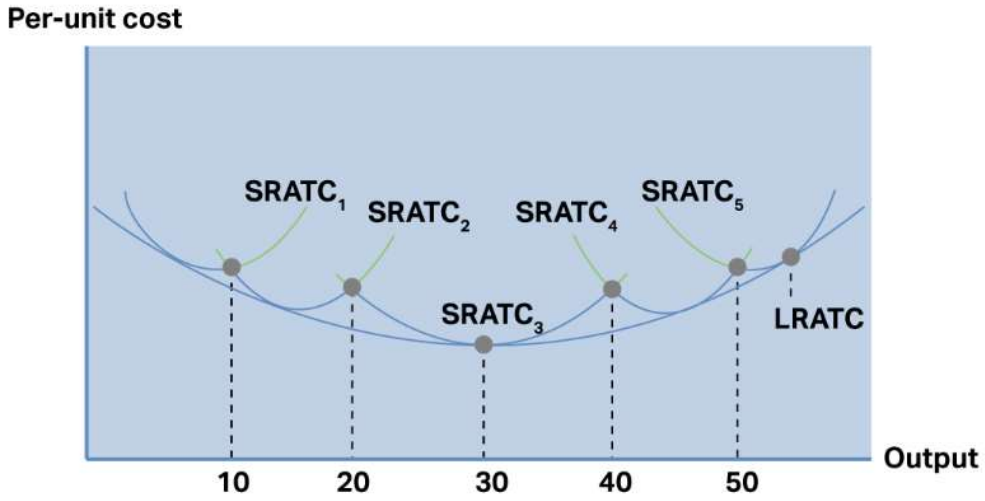
Short- and Long-Run Cost Curves

- The fixed-input constraint in the short run together with input prices, establish the firm's **short-run average total cost curve** (SRATC).

- The **long-run average total cost curve** (LRATC) shows the lowest cost per unit at which output can be produced over a long period of time when the firm is able to make technology, plant size, and physical capital adjustments



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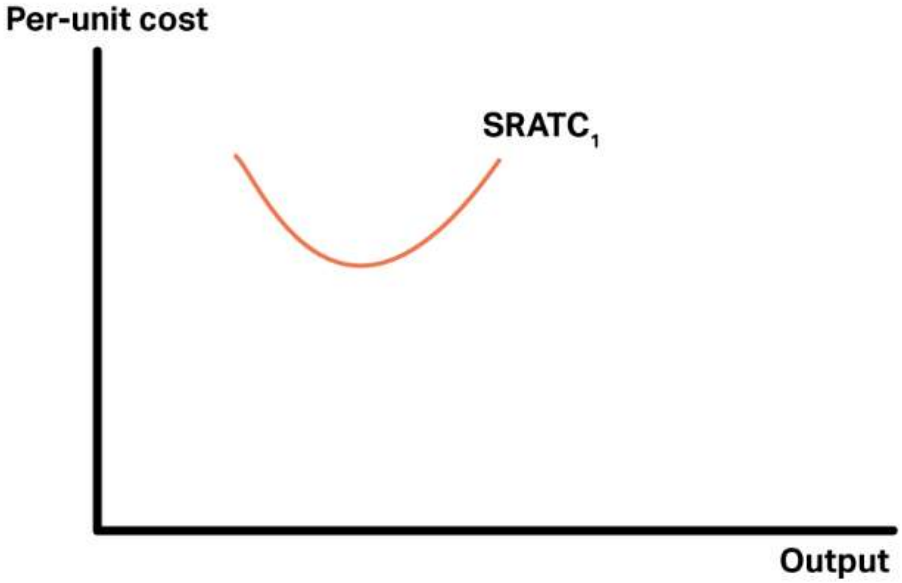
Short- and Long-Run Cost Curves

- **Example:** Assume that a firm has a typical short-run average total cost (SRATC) curve that's is U-shaped. Most do.
- This assumes that a single variable is adjustable: labor. In the short-run, you can send employees home, or pay them overtime to do extra work. But most other costs are fixed.

- **Question 1**: In the long run, what do you think is fixed?



Answer: NOTHING

In the short run, most things are assumed to be the same. A firm has a building, machines, and a certain technology. But in the long run, things can change. Everything, really. The business can decide to close a plant, open a new one, or can adopt a new technology.

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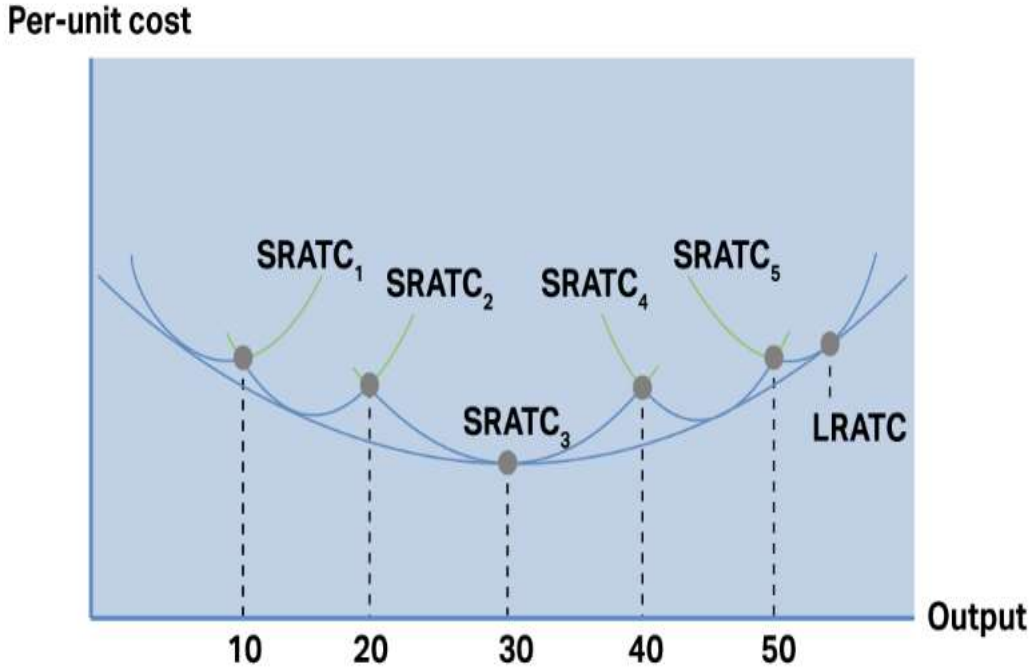
Short- and Long-Run Cost Curves

- **Question 2:** So this has implications on the long-run average total cost curve for a firm. If a firm really wants to increase production in coming years, it may choose to build a new, higher capacity facility. There are many sizes to choose from. If it chose a larger production facility, what do you think the new, U-shaped SRATC curve would look like after construction?



Answer: It would have a lower ATC at higher production levels

That's the whole point of building a new, larger production facility: to efficiently produce more. So there has to be some part of the newer SRATC curve that is lower than the old one as you move to the right. Here is the current technology as well as four options for expansion

Once those bottom segments are connected, that thick line then becomes the firm's long-run average total cost curve (LRATC).

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Economies of Scale and Diseconomies of Scale

- As the firm increases production, initially average cost falls, a phenomenon known as economies of scale or increasing returns to scale.

- As the firm grows, scarcity of resources and management difficulties drive up the average cost in a region known as diseconomies of scale, or decreasing returns to scale

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Minimum Efficient Scale

- Companies continually scale the size of their operations up and down in search of the optimal level of production.

- The minimum efficient scale is the minimum point on the LRATC curve, it is where the firm has constant returns to scale and is where competitive firms end up. These changes can occur slowly, as the process of scaling up or down takes time.

Example:

- ✓ Consider Wal-Mart, which was able to realize operational efficiencies by scaling up while also allowing workers greater specialization, providing itself more bargaining power, and receiving supplies at lower costs by buying in larger quantities. These are all powerful advantages in scaling up a business.

- ✓ There are also *disadvantages* of getting too large. For example, General Motors found that it was producing too many similar cars at one point, where the fixed costs of design were then spread over insufficient sales numbers.

- ✓ Bigger firms are also more difficult to manage. The largest firms are often a target for labor unions and competitors, and they typically end up as scapegoats in certain news stories.

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What next?

- Please complete the **Quiz** via ***your student access portal*.**
- We will next cover "**The firm & market structures"**…. In coming video lectures in your CFA Level I Prep course.

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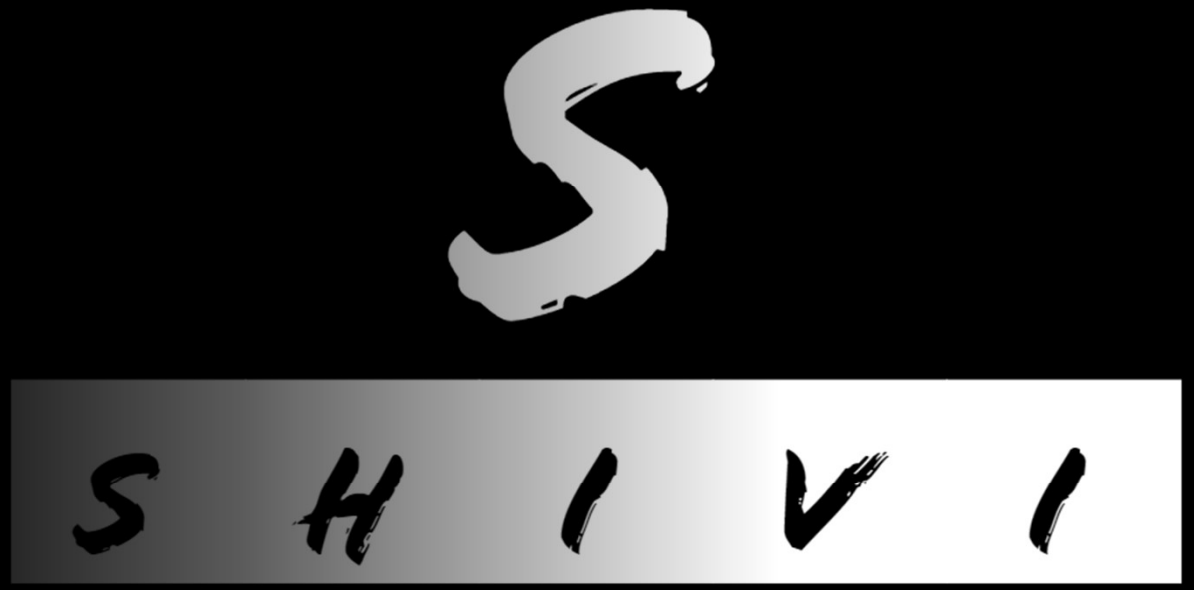
Thank you!



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