UTILITY AND ELASTICITY

Demand

Utility: The satisfaction gained from consuming a good or service. A consumer's **total utility** can be positive or negative.

Utils: Theoretical units used to measure satisfaction.

Marginal utility: Utility gained from consuming one more unit of a good.

When the increase in price of one good increases demand for another, they are **substitute goods** (e.g., cookies and cupcakes).

When the increase in price of one good decreases demand for another, they are **complementary goods** (e.g., flashlights and batteries).

Independent good: A good unaffected by the increase in price of another (e.g., paper and laundry detergent).

Sellers often use **Price Elasticity of Demand (PED)** to determine the potential loss of customers if prices are raised.

$$\text{Price Elasticity of Demand (PED)} = \frac{\%\ \text{Change in Q}}{\%\ \text{Change in P}}$$

PED is a measure of how demand for a good changes in relation to a change in price. If a good is:

Elastic: Demand changes greatly in response to price changes (PED will be greater than 1 if demand is elastic).

Unit elastic: When the percentage change in quantity demanded is equal to that in price.

Inelastic: Demand changes slightly in response to price changes (PED will be less than 1 if demand is inelastic).

Cross-price elasticity is a measure of the effect a price change for one substitute good can have on the demand for another.

Profit = total revenue − total cost

Total cost = fixed costs + variable costs

Q: Quantity demanded
P: Price

Percent change using mid-point method:

$$\%\ \text{Change in P} = \frac{P_2 - P_1}{\frac{P_2 + P_1}{2}}$$

$$\%\ \text{Change in Q} = \frac{Q_2 - Q_1}{\frac{Q_2 + Q_1}{2}}$$

Elastic Demand:

$\%\ \text{Change in Q} > \%\ \text{Change in P}$

Inelastic Demand:

$\%\ \text{Change in Q} < \%\ \text{Change in P}$

Cross-Price Elasticity of Demand (CPED):

$$\frac{\%\ \text{Change in Q (Good X)}}{\%\ \text{Change in P (Good Y)}}$$

Fixed costs: Costs that do not change as the quantity produced changes.

Variable costs: Costs that do change as the quantity produced changes.

Production function: The relationship between the quantity of inputs and the quantity of outputs.

Marginal product: The increase in output resulting from adding one more unit of input.

Diminishing marginal product: When marginal product begins to decrease for each new unit of input.

Marginal profit: Profit earned on each subsequent unit sold.

Marginal profit = marginal revenue – marginal cost

Marginal cost: The cost of producing one additional unit of a good.

Marginal revenue (MR): The revenue generated by each unit sold.

Average revenue: Total revenue ÷ total number of units sold.

Profit maximization: The quantity produced at which marginal revenue equals marginal cost.

If marginal revenue > marginal cost, increase production.

If marginal revenue < marginal cost, decrease production.

La-Z-Bots/ day	Total Cost	Fixed Cost	Variable Cost	Avg. Total Cost	Marginal Costs
2	$300	$100	$200	$150	
3	$400	$100	$300	$133	$100
4	$500	$100	$400	$125	$100
5	$617	$100	$517	$123	$117
6	$733	$100	$633	$122	$117
7	$850	$100	$750	$121	$117
8	$967	$100	$867	$121	$117
9	$1,117	$100	$1,017	$124	$150

Supply

Price elasticity of supply (PES): PES is **inelastic** if a price change has little effect on the quantity supplied of a good. It is **elastic** if a price change has a large effect on the quantity supplied.

For some goods (e.g., cars, apartments) the market is inelastic in the short run but elastic in the long run.

For others (e.g., aquarium fish that become endangered) market supply is elastic in the short run but inelastic in the long run.

The **supply elasticity curve** graphs PES values from price point to price point.

$$\text{PES} = \frac{\%\ \text{Change in Q}}{\%\ \text{Change in P}}$$