

# **Level I of the CFA® 2025 Exam**

Study Notes - Economics

Offered by AnalystPrep

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## **Learning Module 1: Firm & Market Structures**

**LOS 1a: determine and interpret breakeven and shutdown points of production, as well as how economies and diseconomies of scale affect costs under perfect and imperfect competition**

Companies can be grouped as operating in perfect or imperfect competitive environments depending on the slope of the demand curve.

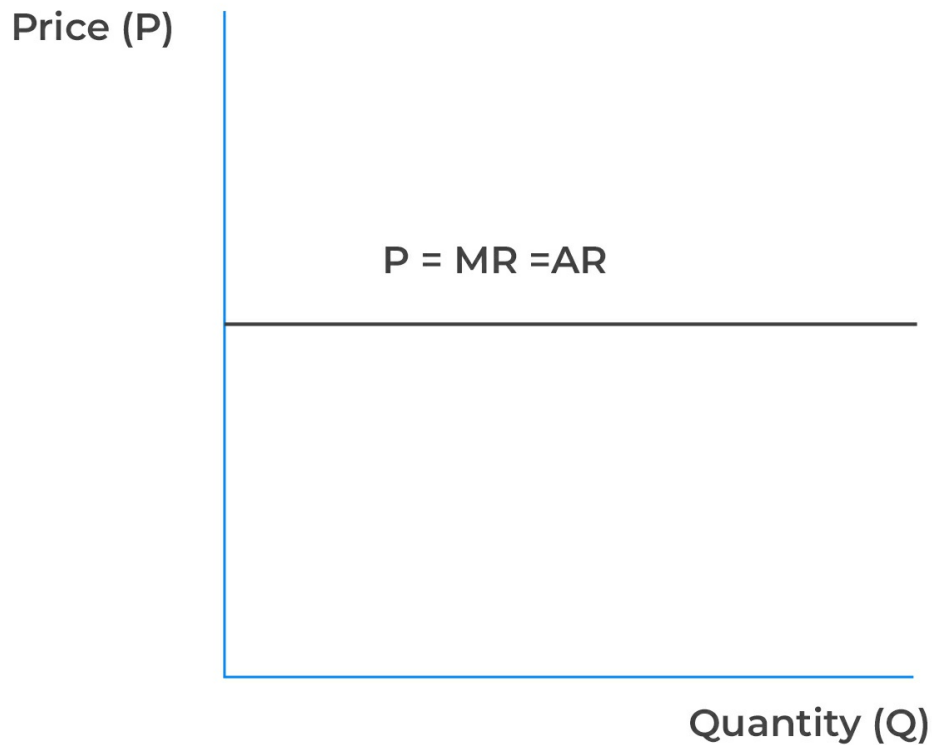
### **Perfectly Competitive Environment**

In a perfectly competitive environment, firms are the price takers. That is, it must be the market price of its output so that its demand curve is perfectly elastic and horizontal.

In a perfectly competitive environment, marginal revenue (MR) is equal to the price per unit output (P). Moreover, the average revenue (AR) is also equal to the price per unit. Put simply,  
 $P = MR = AR$



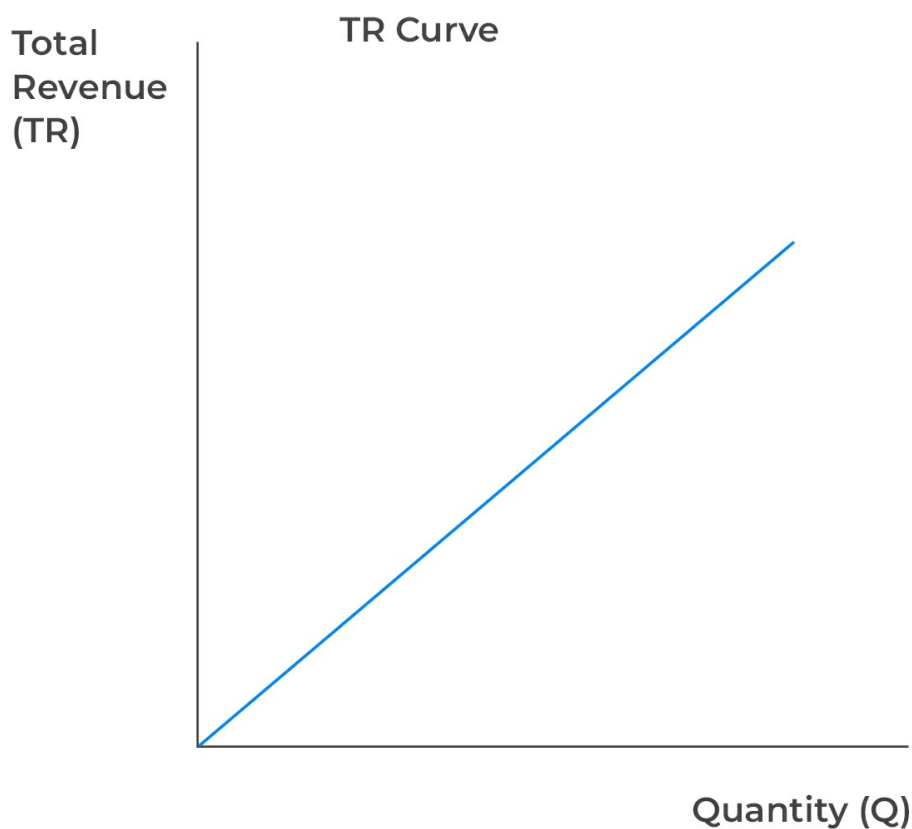
## Demand Curve under Perfect Competition



In perfect competition, total revenue (TR) is equal to price times quantity. That is,  $TR = (P)(Q)$ . However, note that in perfect competition, the market determines the price. As such, when a company sells an additional unit, TR rises by an amount equal to the price per unit (P). Consider the following graph:



## TR Curve under Perfect Competition



## Imperfectly Competitive Environment

In the case of imperfect competition, the demand curve has a negative slope.

Assume that a company is monopolistic. In this case, the firm has control over the price. Simply stated, the price is a function of the quantity. Mathematically, this is stated as:

$$P = f(Q)$$

As such, the total revenue (TR) is given by:

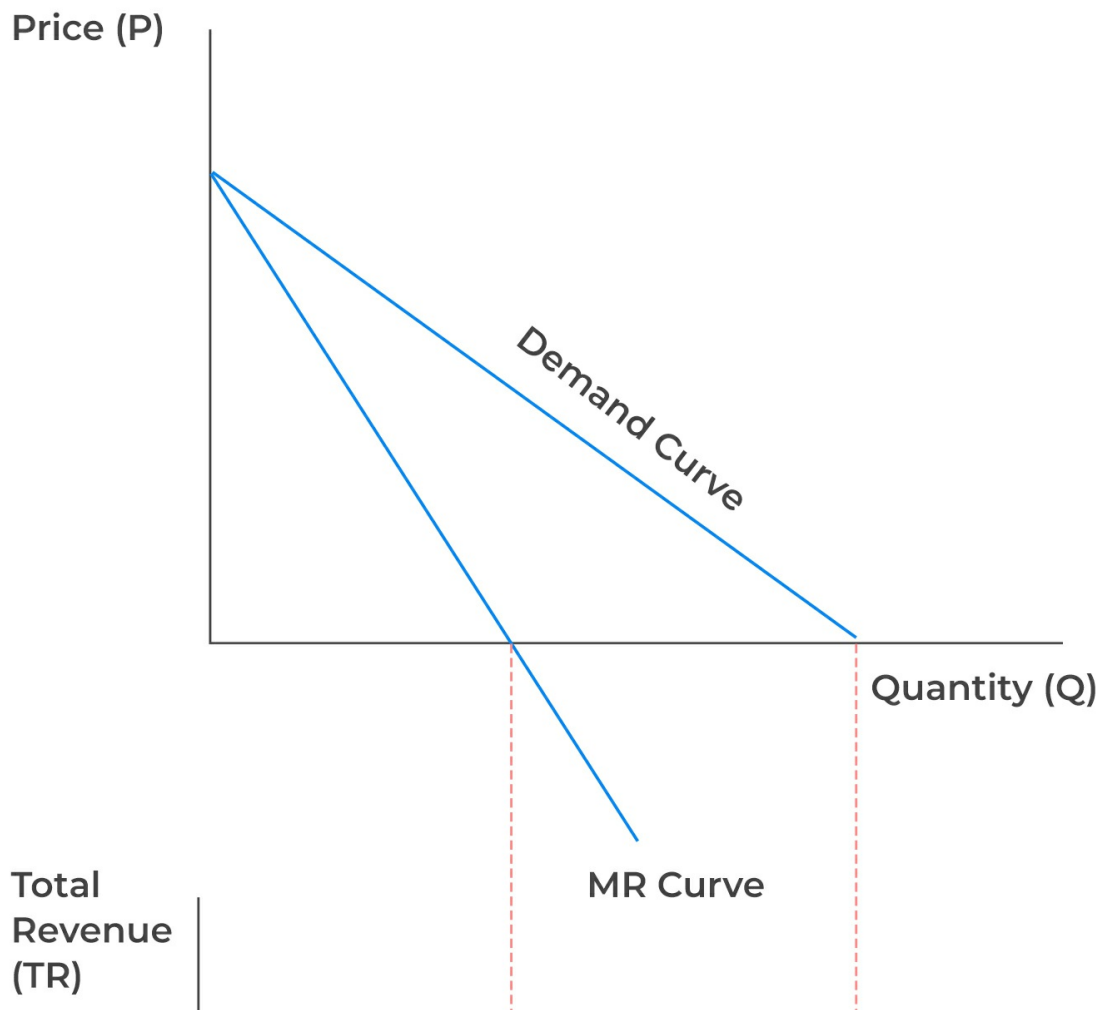
$$TR = f(Q) \times Q$$

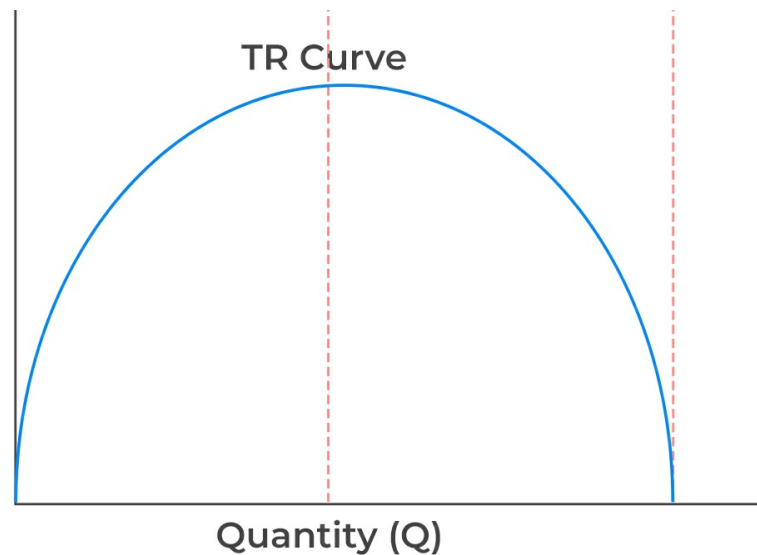
Assuming that the demand curve is linear and negatively sloped, TR is equal to the total expenditure of all the buyers in the market.

Note that a monopolist sets the price. As such, when the price decreases, the quantity sold increases. This initially increases the total expenditure by the buyers and, hence, the TR of the company because a price decrease is overpowered by the increase in units sold. This happens in the range where MR is positive, and demand is elastic. Consider the following image:



### Demand, TR and MR Curves under Monopolistic Competition





When the price drops, even though more units are sold, the total spending by buyers decreases because the price reduction has a greater impact. This happens when marginal revenue (MR) is negative and demand is inelastic.

## **Profit-Maximization, Breakeven, and Shutdown Points of Production**

We use the short-run total cost (STC) curves and its associated TR curves to show the profit maximization point. The short-term run and long run time for a company depends on the ability of the firm to adjust the amounts of the fixed resources it utilizes.

The short run is the amount of time during which at least one of the factors of production, such as technology, physical capital, and plant size, is fixed. On the other hand, the long run is the time period during which all factors of production are variable. Moreover, in the long run, companies can enter or exit the market depending on the profitability analysis.

The long run is also termed the planning horizon because the company can choose the short-run position or optimal operating size that maximizes profit. Specifically, a company always operates in the short run and plans in the long run.

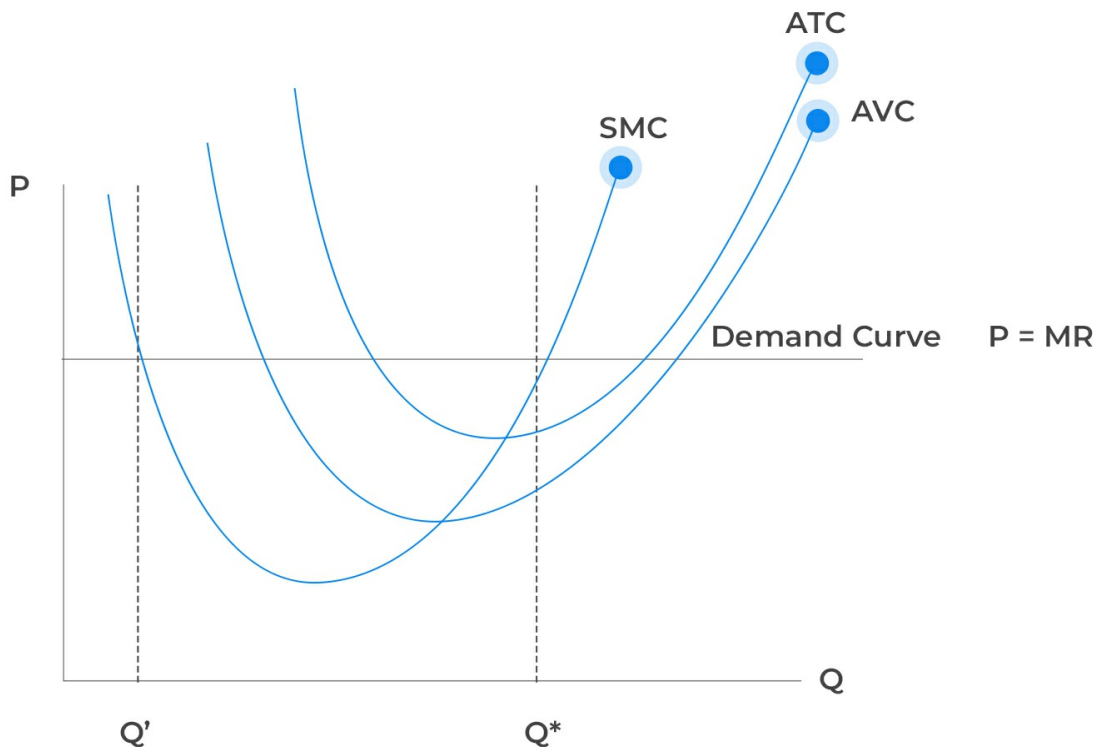
### **Profit-Maximization Point**

## Under Perfect Competition

Consider the following demand and average and marginal cost curves for the firm under conditions of perfect competition:



### Profit Maximization Point under Perfect Competition



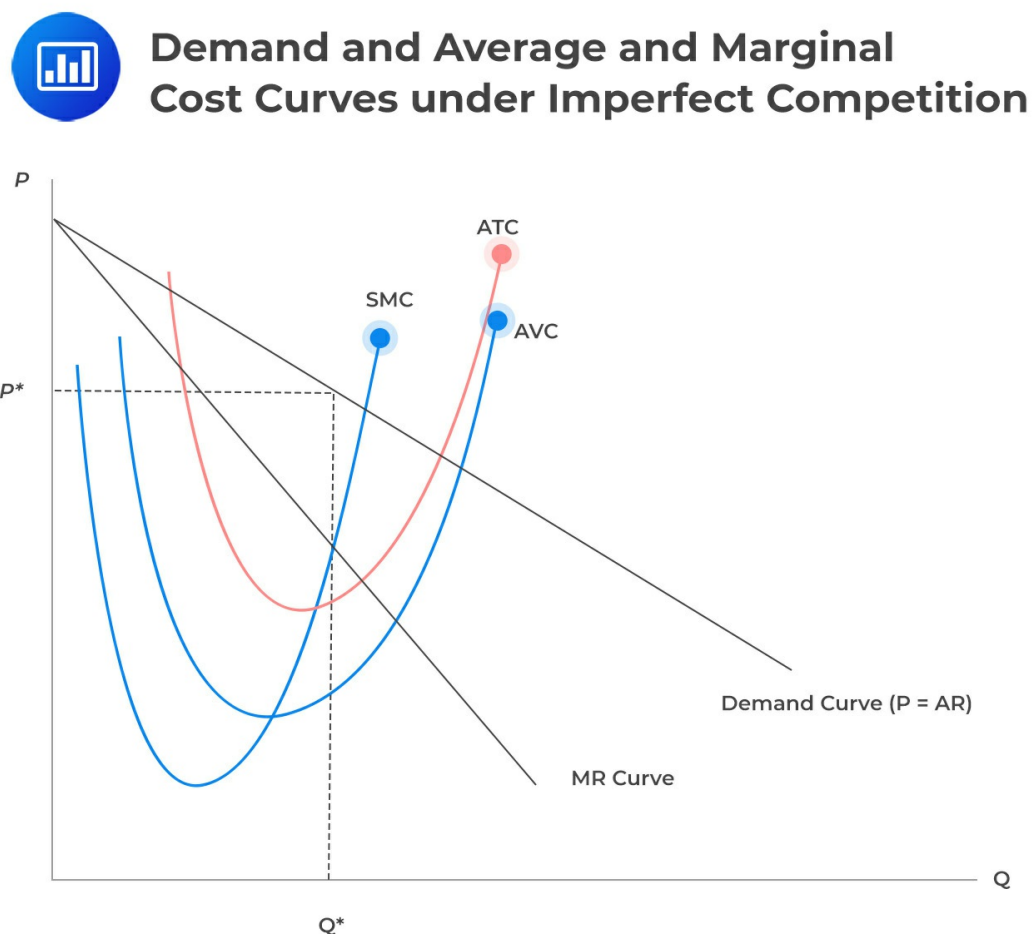
The company maximizes its profit by producing at an output level of  $Q^*$ , where the price matches the short-run marginal cost (SMC) and the SMC is increasing. However, at a different output, denoted as  $Q'$ , even though the price is equivalent to the SMC, the SMC has not yet started to increase but is still decreasing. Hence, this cannot be a point where profit is maximized.

If the market price were to increase, the company's demand and marginal revenue (MR) curve would shift upwards, leading the firm to determine a new optimal production output greater than  $Q^*$ . On the contrary, if the market price decreased, the demand and MR curve would move downward, setting a decreased profit-maximizing output.

As shown in the image, this company is realizing positive economic profits since the market price is greater than the average total cost (ATC) when producing at  $Q^*$ . This kind of profit is achievable in the short run. However, in the long run, rival companies would likely enter the market aiming to obtain some of these profits, subsequently pushing the market price down to match each company's ATC.

## Under Imperfect Competition

Consider the following demand and average and marginal cost curves for the firm under imperfect competition (monopolist) conditions.



The marginal revenue (MR) and demand curves for a monopolist are not the same. However, the rule for maximizing profits remains consistent: Identify the quantity (Q) where short-term marginal cost (SMC) equals MR, which in this instance is at  $Q^*$ .

After determining the suitable output level, the best price to set is indicated by the firm's demand curve at price  $P^*$ . The monopolistic company enjoys a positive economic profit since its price is higher than its average total cost (ATC).

The entry barriers, which grant the firm its monopolistic dominance, ensure that potential competitors cannot erode the firm's profit margins.

## **Breakeven Analysis**

A firm reaches its breakeven point when its total revenue (TR) matches its total cost (TC). Similarly, a firm is at the breakeven point when its average revenue (AR) is precisely equal to its average total cost (ATC). This holds true in both perfect and imperfect competitive environments.

While management usually aims for maximum profits, some firms can only cover all their economic costs. Economic costs include both accounting and implicit opportunity costs.

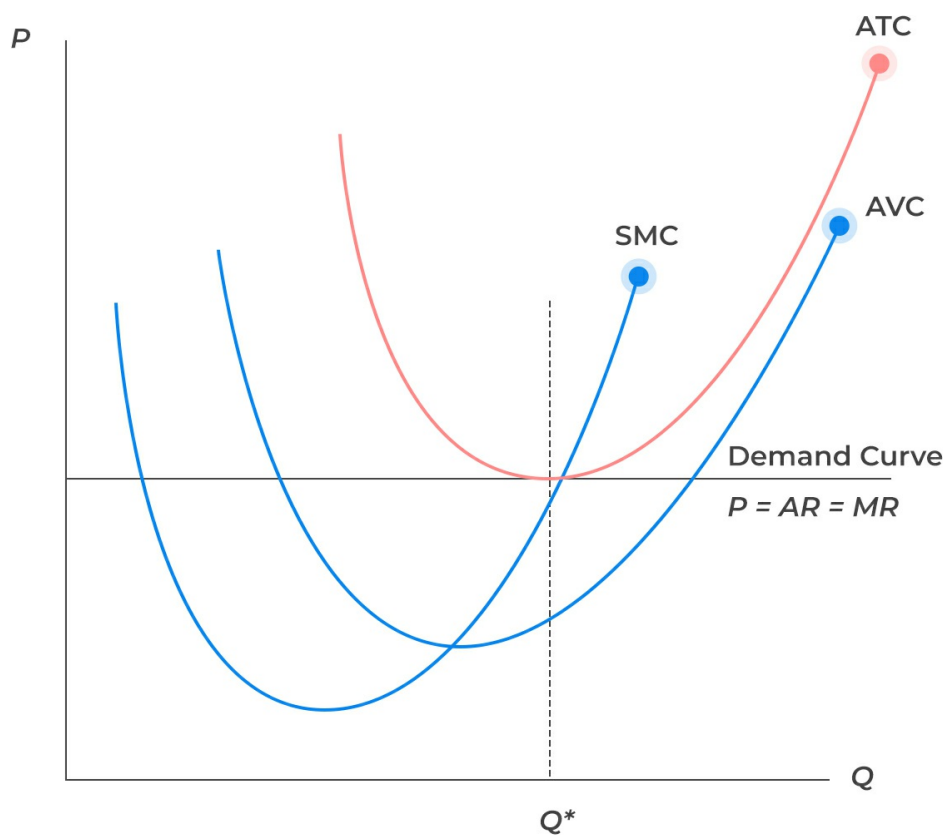
When the firm's revenue is equal to its economic costs, it implies that the company can cover the opportunity cost of all factors of production. In this case, the firm is said to be earning normal profit but not positive economic profit.

Firms operating in a perfectly competitive environment will not be able to earn a positive economic profit in the long run because an excess rate of return will lure new entrants into the market. These newcomers would increase the supply, subsequently pushing the market price down until every firm merely achieves a normal profit. It's crucial to understand that this scenario doesn't mean the firm is making zero accounting profit.

Consider the following graph of a firm under perfect competition:



## Breakeven Point under Perfect Competition

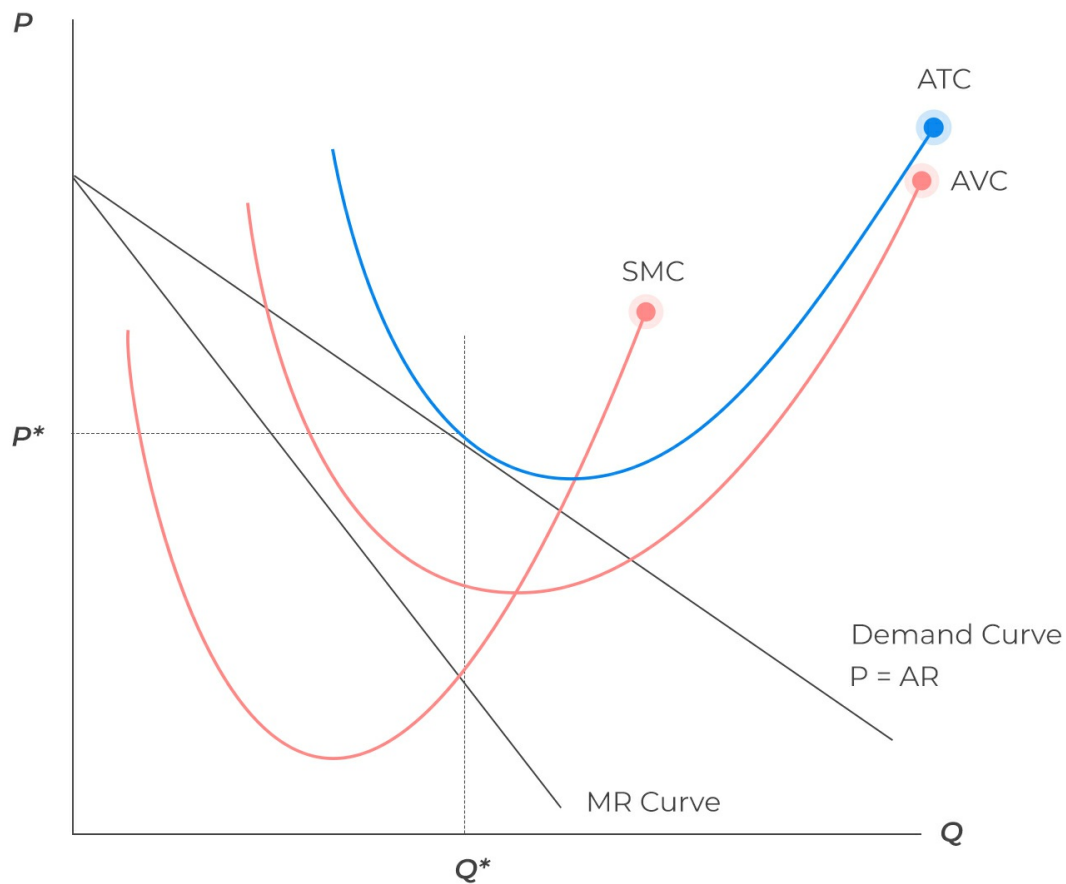


Recall that the best a firm can do is to break even. Note that in the graph above, the level of output where  $SMC = MR$  is where  $P = ATC$ . This implies that economic profit is zero, and the firm is at a breakeven point.

The equivalent graph of a monopolist firm is shown below:



## Breakeven Point under Monopolistic Market



### Shutdown Analysis

In the long run, if a firm can't make zero economic profit, it will shut down as it can't cover all its costs, including labor and capital. But in the short run, a firm might keep operating even if it doesn't make zero economic profit.

Recall that fixed costs are expenses that remain constant regardless of a company's production level, such as rent and fixed interest charges. On the other hand, variable costs are directly tied to the volume of production and include items like raw materials, wages, and other costs that

vary based on production levels.

As long as the firm's revenues cover its variable costs, it can continue operations, covering both variable and a portion of its fixed costs (essentially operating at a loss). This is possible if the price ( $P$ ) per unit is greater than the average variable cost ( $AVC$ ).

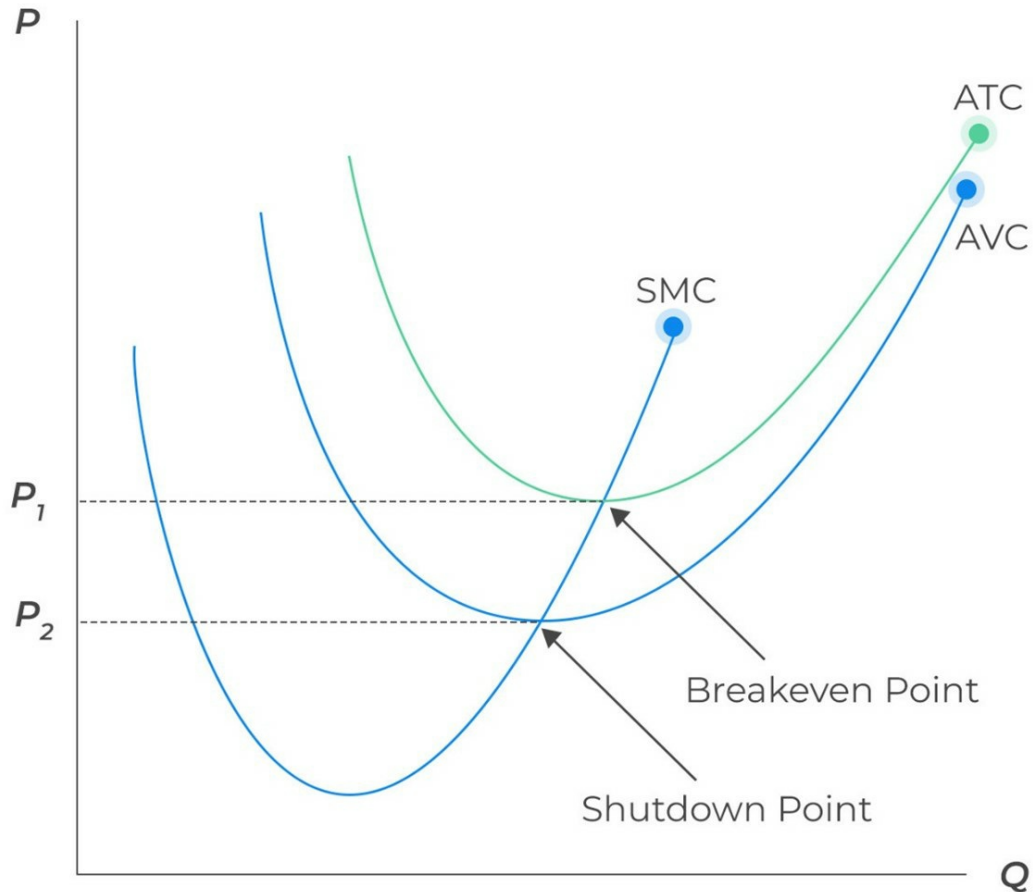
However, in the long run, the firm should exit the industry if market prices do not increase, as it becomes unsustainable to stay in the market without the potential for higher returns.

When deciding whether to continue operating in the short run, it is essential to disregard sunk costs since they have already been incurred and are irrecoverable, regardless of the firm's choice.

This is shown in the graph below:



## Breakeven and Shutdown Points of Production



When the price is higher than  $P_1$ , the firm has the potential to achieve a positive profit, and it definitely should remain in operation. If the price falls below  $P_2$ , which represents the lowest average variable cost (AVC), the firm will fail to cover its variable expenses, and it should cease operations.

For prices ranging between  $P_2$  and  $P_1$ , it's beneficial for the firm to keep operating in the short term because it can meet all variable costs and contribute to covering the fixed costs.

The lowest point on the AVC curve is the shutdown point, and the lowest point on the average total cost (ATC) is the breakeven point.

The following table shows the conditions for a firm to operate, shut down, or exit the market in the short and long run.

Relationship between Revenue and Costs	Short-Term Decision	Long-Run-Decision
Total cost = Total revenue	Remain in the market	Remain in the market
Total revenue < Total costs and > Total variable costs	Remain in the market	Leave the market
Total revenue < Total variable cost	Cease production	Cease operating in the market

### Example: Shut-down Point of Production

Assume that a manufacturing company produces 1000 units and sells them at \$5 each (Total Revenue (TR) is  $5 \times 1,000 = \$5,000$ ), Average Total Cost (ATC) is \$7,000, fixed cost (FC) is \$4000, and a variable cost (VC) is \$3,000 for all units.

Evidently, this manufacturing company is operating at a loss of -\$2000 (economic loss). In economics, we assume that the FC cannot be avoided. The company is obliged to pay it up regardless of whether it operates or not. That is, if it closes its operations, the revenue will be zero, but it will still incur a \$4,000 fixed cost.

If it continues its operations, it will earn a revenue of \$5,000, pay a variable cost of \$3,000, and use \$2,000 to pay the fixed cost. In this instance, the company will lose less by continuing its operations. However, the company will exit the market in the long run unless prices increase because, eventually, the average variable costs exceed average revenue (AR). Thus, it will shut down at the point of minimum average variable cost (AVC), as seen on the graph.

## Economies and Diseconomies of Scale with Short-run and Long-run Cost Analysis

Recall that the distinction between the short run and long run for any firm depends on its capacity to modify the quantities of fixed resources it employs. In the short run, the firm experiences a time period during which at least one factor of production, such as technology,

physical capital, or plant size, remains fixed. On the other hand, the long run is characterized by a time period in which all factors of production are variable and can be adjusted.

The duration of long-run adjustments varies across industries, with capital-intensive firms generally requiring more time for adaptations compared to labor-intensive firms.

## **Short-Run Cost Curves**

In short-run curves, we assume that the capital input is constant so that the output varies depending on the level of labor, which is the variable input in this case. However, if the capital input were to vary, we would have to generate short-run cost curves for each level of capital input.

The short-run total cost (STC) often increases with output. Initially, it rises at a diminishing rate due to the economies of specialization. However, as output grows, the curve ascends at an accelerating rate due to the law of diminishing marginal returns to labor.

Total fixed cost (TFC) determines the vertical intercept of the STC curve. When there's more fixed input, the total fixed cost (TFC) is higher. However, this also means that the firm's production capacity increases.

For every short-run total cost (STC) curve, there's a related short-run average total cost (SATC) curve. Additionally, there's a corresponding long-run average total cost (LRAC) curve, which serves as the envelope curve encompassing all potential short-run average total cost curves.

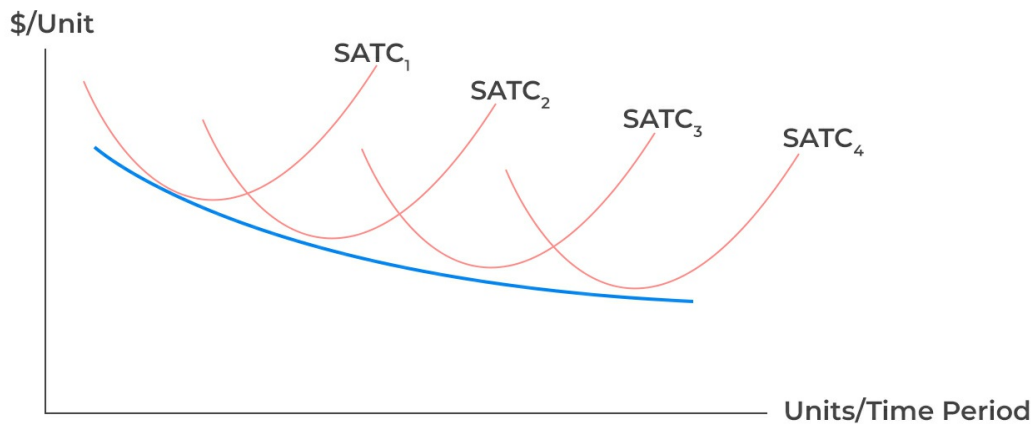
## **Economies and Diseconomies of Scale**

When a firm enhances its output by increasing all of its inputs, it is said to be scaling up production. Economies of scale come into play when the firm experiences a decrease in the cost per unit of production as it expands its output.

In the case of economies of scale, LRAC has a negative slope. Consider the following graph with SATC for each level of capital input (levels 1,2,3 and 4) in the case of economies of scale.



## Economies of Scale



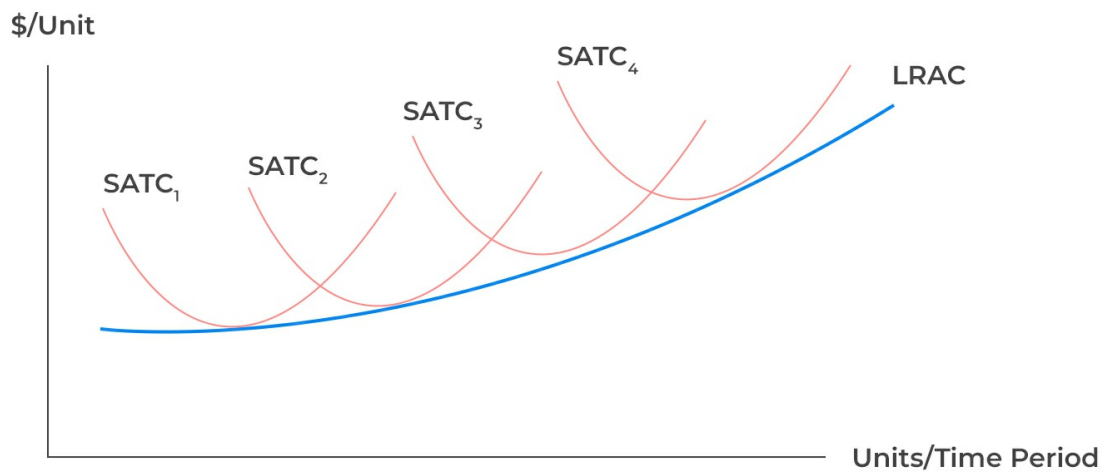
The following factors can lead to economies of scale:

- Achieving economies of scale through increasing returns to scale means the production process yields output increases proportionately larger than the increase in inputs.
- Implementing a division of labor and management to allow workers to specialize in specific tasks, leading to improved job proficiency.
- Enhancing productivity by investing in more expensive and efficient equipment.
- Effectively reducing waste and lowering costs by capitalizing on marketable by-products, reducing energy consumption, and implementing enhanced quality control measures.
- Utilizing market information and knowledge to make more effective managerial decisions.
- Capitalizing on discounted prices when purchasing resources in larger quantities.

Conversely, diseconomies of scale occur when the cost per unit rises as the firm further increases its production. This implies that LRAC has a positive slope. Consider the following graph with SATC for each level of capital input (levels 1,2,3 and 4) in the case of diseconomies of scale:



## Diseconomies of Scale



The following factors can result in diseconomies of scale:

- Experiencing diseconomies of scale due to decreasing returns, where the production process results in output increases that are proportionately smaller than the increase in inputs.
- Struggling with proper management due to excessive size.
- Encountering inefficiencies caused by overlapping and duplicating business functions and product lines.
- Facing higher resource prices due to supply constraints when purchasing inputs in large quantities.

Economies of scale and diseconomies of scale can coexist; their effect on the long-run average total cost (LRAC) depends on which one has a stronger influence.

If the economies of scale are more influential, the LRAC will decline as output increases. Conversely, if diseconomies of scale are more prevalent, the opposite happens. It's possible for the LRAC to first decrease (due to economies of scale) over a certain output range, then stabilize over another range, and subsequently increase in a range where diseconomies of scale take

effect.

Theoretically speaking, perfect competition compels a firm to function at the lowest point of the long-run average total cost (LRAC) curve. This is because, over the long term, the market price will settle at this point. If a firm doesn't operate at this optimal cost-efficiency point, its sustainability in the long run could be at risk.

### Question #1

A firm that increases the quantity it produces without any change in per-unit cost is experiencing:

- A. Economies of scale.
- B. Diseconomies of scale.
- C. Constant returns to scale.

### Solution

**The correct answer is C.**

An increase in output proportional to an increase in input would be considered a constant return to scale. This is neither an economies nor diseconomies of scale.

### Question #2

The short-term shut-down point of production for a firm operating under perfect competition will most likely occur when the price per unit is equal to:

- A. Marginal cost per unit.
- B. Average total cost per unit.
- C. Average variable cost per unit.

### Solution

**The correct answer is C.**

Any firm will shut down its production when the marginal cost is less than the average variable cost. We will see later that for a firm in perfect competition to maximize profit, marginal revenue must be equal to marginal cost.

## **LOS 1b: describe characteristics of perfect competition, monopolistic competition, oligopoly, and pure monopoly**

Market structure can be defined as the characteristics of a market, which can either be competitive or organizational. Moreover, market structure outlines the nature of the competition and the pricing procedure in a market. Therefore, it describes the number of entities producing similar goods and services in a market and whose structure is determined by the current competition in the market.

The following key factors influence market structure:

1. The quantity and relative magnitude of firms involved in supplying the product.
2. The level of product differentiation present in the market.
3. The seller's power over pricing decisions.
4. The strength of barriers regulating market entry and exit.
5. The extent of non-price competition observed in the market.

There are four types of economic market structures (organized from the least competitive to the most competitive):

1. Perfect competition.
2. Monopolistic competition.
3. Monopoly market structure.
4. Oligopoly market structure.

### **Perfect Competition**

Perfect competition refers to a market with many buyers and sellers, similar products, and substitutes. A good example is agriculture, where all rice farmers sell homogeneous products to consumers.

### **Characteristics of Perfect Competition**

1. There exist a vast number of buyers.
2. There exists a vast number of sellers willing to supply their products at given market prices.
3. No single seller or producer is large enough to influence the market price.
4. Homogeneous products: the products being sold in this market are perfect substitutes for one another. Their quality and characteristics don't vary from one another.
5. Perfect information: Every consumer and producer is aware of the market prices and the utility derived from using any of the products.
6. There are no entry barriers.

## **Monopolistic Competition**

This is an imperfect competition in which several producers sell products that are different from one another. The difference lies in branding or, in most cases, quality. This means that the goods are not perfect substitutes for one another but are close substitutes. An example of this can be clothing, where marketing and branding are the main marks of distinction among different but similar black shirts. Another example would be the fast-food industry, where a burger made by McDonald's is quite similar to a burger made by Burger King from an economic standpoint. Consumers, nevertheless, usually have a preference between the two chains.

### **Characteristics of Monopolistic Competition**

1. There are many producers and consumers in the market.
2. There is not one firm that has total control over the price of the market.
3. Consumers assume that there are non-price differences among the products of competitors.
4. Few barriers to entry and exit exist.
5. Producers have some control over prices.
6. Producers and consumers have no perfect information.

# Monopoly

A monopoly is a market consisting of a single firm that produces goods with no close substitutes. Often, this market has many entry barriers. For instance, water providers, natural gas, telecommunications, and electricity are often granted exclusive rights to service.

## Characteristics of a Monopoly

1. A monopoly is a profit maximizer.
2. Monopolies are price makers.
3. Price discrimination: Monopolies can change both the price and quality of their products.
4. There are very high barriers to entry for other firms.
5. There is a single seller that controls the whole market.
6. The government regulates pure monopolies.

# Oligopoly

An oligopoly market consists of a small number of relatively large firms that produce similar but slightly different products. Under oligopolies, there also exist some entry barriers with which other enterprises have to contend. Good examples include industries such as oil & gas, airlines, and automakers.

## Characteristics of an Oligopoly

1. Only a few firms operate in the market.
2. Profit maximization is a condition in this market.
3. Monopolies set their own prices.
4. Barriers to entry are high.
5. Firms make abnormal profits in the long run.
6. Products may be homogeneous.

7. There is a relatively small number of firms supplying the market.

## Summary of Characteristics of Market Structures

Type of Market Structure	Number of Sellers	Product Differentiation	Barriers to Entry	Pricing Power	Non-Price Competition
Perfect competition	Many	Homogeneous/standardized	Very low	None	None
Monopolistic competition	Many	Differentiated	Low	Some	Advertising Product Differentiation
Oligopoly	Few	Homogeneous/standardized	High	Some or Considerable	Advertising Product Differentiation
Monopoly	One	Unique Product	Very High	Considerable	Advertising

## Question

An industry is made up of twenty firms. These firms produce products that easily complement one another, and there are no barriers to entry. This industry can be best characterized as:

- A. An oligopoly.
- B. A monopolistic competition.
- C. Perfect competition.

## Solution

**The correct answer is C.**

Even though there are only twenty firms in the industry, there are no barriers to entry, and the products can easily complement one another (no branding or quality constraints).

Firms voluntarily choose not to enter the market.

**A is incorrect.** In an oligopoly, barriers to entry are high.

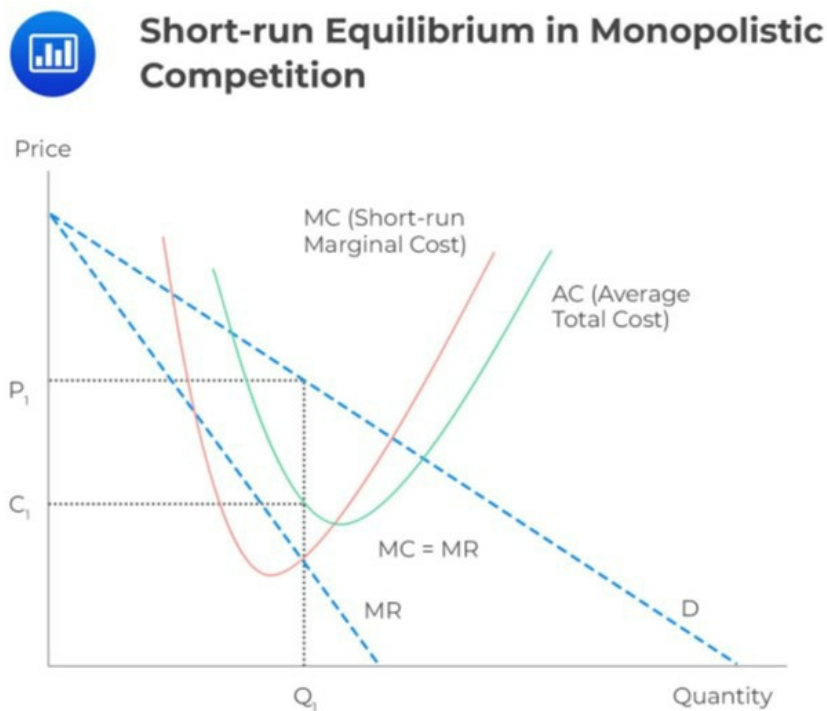
**B is incorrect.** In monopolistic competition, barriers to entry and exit exist.

**LOS 1c: explain supply and demand relationships under monopolistic competition, including the optimal price and output for firms as well as pricing strategy**

## **Demand Analysis under Monopolistic Competition**

In monopolistic competition, firms have a downward-sloping demand curve, meaning lower prices lead to more demand and vice versa. At some prices, demand is very responsive to changes (elastic), and at lower prices, demand is less responsive (inelastic).

In the short run, a firm maximizes its profit by producing the level of output where marginal revenue (MR) equals marginal cost (MC).



In the graph above, the optimal output level is represented by  $Q_1$ , while  $P_1$  represents the price consumers are prepared to pay for this quantity. The rectangle formed by  $P_1$  multiplied by  $Q_1$  represents the total revenue.

## Supply Analysis under Monopolistic Competition

In this market structure, the supply function is also not well-defined. The appropriate output level is determined by the point where the Marginal Cost and Marginal Revenue curves intersect ( $MC=MR$ ).

However, it is important to note that the price will be charged in accordance with the demand schedule of the market. The supply curve of a firm should measure the quantity that the firm is willing and able to supply at different price levels. Unfortunately, the marginal revenue and marginal cost do not include this information.

## Optimal Price and Output under Monopolistic Competition

In this market structure, the short-run profit-maximizing choice occurs when marginal revenue equals marginal cost ( $MR=MC$ ). Total revenue (TR) is a product of price and quantity:

$$TR = P \times Q$$

The average cost incurred in producing  $Q$  units of a product is taken as  $C$ . Therefore, the total cost (TC) is calculated as the product of average cost and total quantity. That is,

$$TC = C \times Q$$

The economic profit is the difference between  $TR$  and  $TC$ . We denote the economic profit by  $\pi$ . Then,

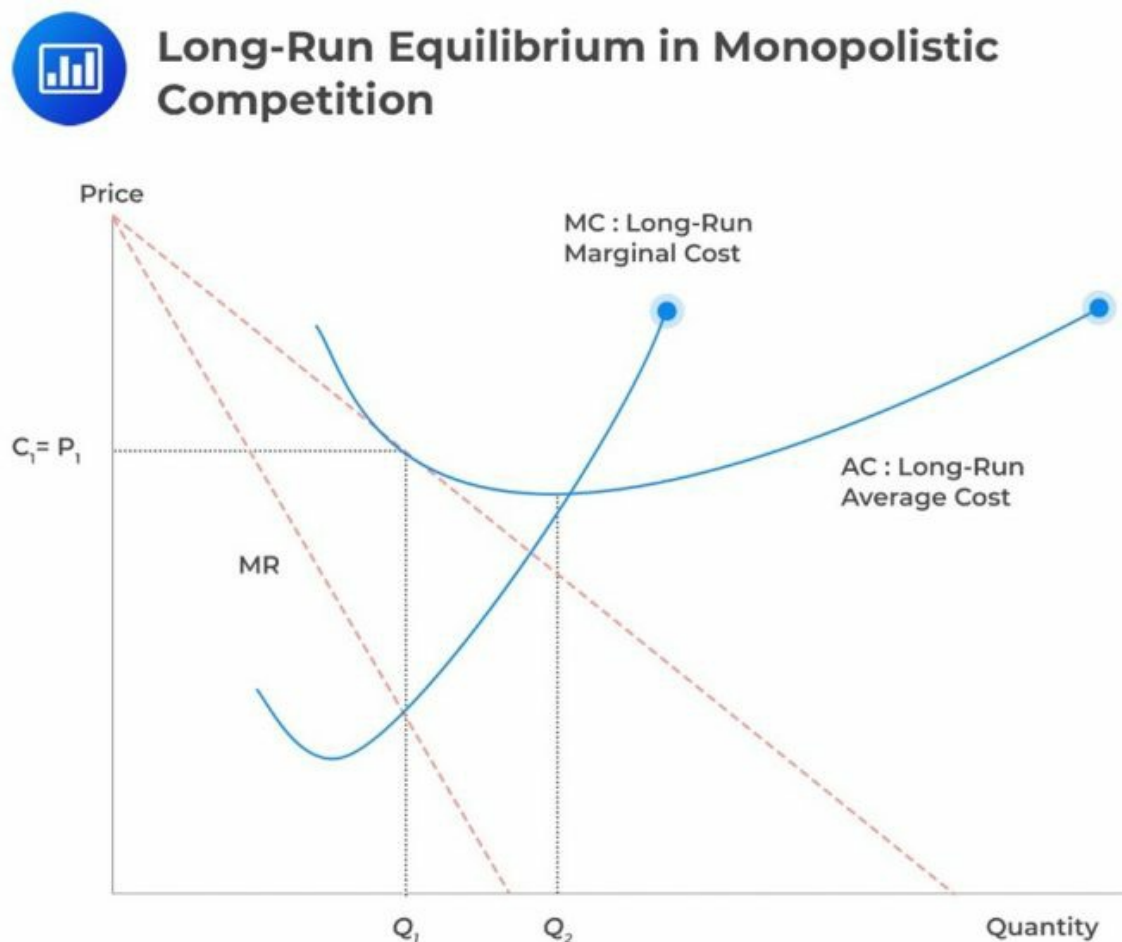
$$\pi = TR - TC$$

## Long-Run Equilibrium under Monopolistic Competition

As firms under monopolistic competition start reporting higher profits, more firms will venture into the market. Since entrant prices are low, customers will shift to buying products from these new firms. This will reduce the demand for firms that produce similar goods.

As a result, the economic profits realized by firms in monopolistic competition will fall. Further, firms will incur advertising costs for product differentiation. This can be seen in consumer products, such as clothing, with high advertising costs. For example, large sporting brands pay lucrative contracts to professional sports personalities to differentiate themselves from the competition.

Consider the following diagram:



In long-run equilibrium, the optimal output level is still determined where marginal revenue (MR) equals marginal cost (MC), represented by  $Q_1$ . The price that consumers are prepared to pay for a specific quantity of the product is derived from the demand curve, in this case,  $Q_1$ , for the price  $P_1$ .

The total revenue (TR) is represented by the area of the rectangle formed by multiplying  $P_1$  by  $Q_1$ . It's important to observe that, in contrast to the long-run equilibrium in a perfectly competitive market, the equilibrium in a monopolistic competition market is situated at a higher average cost than the output level that minimizes average cost.

The average cost does not hit its lowest point until the output reaches  $Q_2$ . In this long-run equilibrium scenario, the total cost is represented by the area of the rectangle obtained by multiplying  $C_1$  by  $Q_1$ . The economic profit can be calculated by subtracting the total cost from the total revenue.

Note that in the graph above, the economic is zero economic profit since total revenue equals total cost. Mathematically,

$$P_1 \times Q_1 = C_1 \times Q_1$$

Note that the zero economic profit is the same for both monopolistic competition and perfect competition in the long run. However, the long-run level of output in  $Q_1$  is less than  $Q_2$ , which represents the minimum average cost of production and long-run level of output in a perfectly competitive market.

## Question

A firm that is operating under a monopolistic competition maximizes its profits when:

- A. The average cost is minimized.
- B. Marginal revenue equals average cost.
- C. Marginal revenue equals marginal cost.

## Solution

The correct answer is **C**.

The firm will maximize its profit when the level of output is such that the marginal revenue equals marginal cost. In other words, it will produce a quantity such that  $MR=MC$ .

**A and B are incorrect.** From the graph given below, we can clearly see that it's neither the point where average cost is minimized nor the point where marginal revenue equals average cost.

**LOS 1d: explain supply and demand relationships under oligopoly, including the optimal price and output for firms as well as pricing strategy**

## **Demand Analysis under Oligopoly Competition**

The demand curves in oligopoly markets are influenced by the level of pricing interdependence among firms. When collusion exists in a market, the aggregate market demand curve is divided among the individual producers. In contrast, each firm faces its own demand curve in non-colluding market scenarios. Additionally, the demand characteristics in non-colluding oligopoly markets are shaped by the pricing strategies employed by the participating firms.

Three primary pricing strategies include **Pricing interdependence, the Cournot assumption, and the Nash equilibrium.**

### **Price Interdependence**

In oligopolies, price interdependence means that firms' pricing actions are linked. In these markets, it's often assumed that competitors will lower prices to keep their customers and avoid raising prices to lure customers away from rivals.

The idea is that by matching a competitor's lower price, the company won't see a drop in customer interest. On the other hand, by not raising prices like another company, they can pull in customers from the company that did.

Customers of a firm are highly responsive to price increases when its competitors offer lower prices. On the other hand, customers become less responsive to price decreases because the firm's rivals are likely to match its price changes.

As a result, there are two different demand structures:

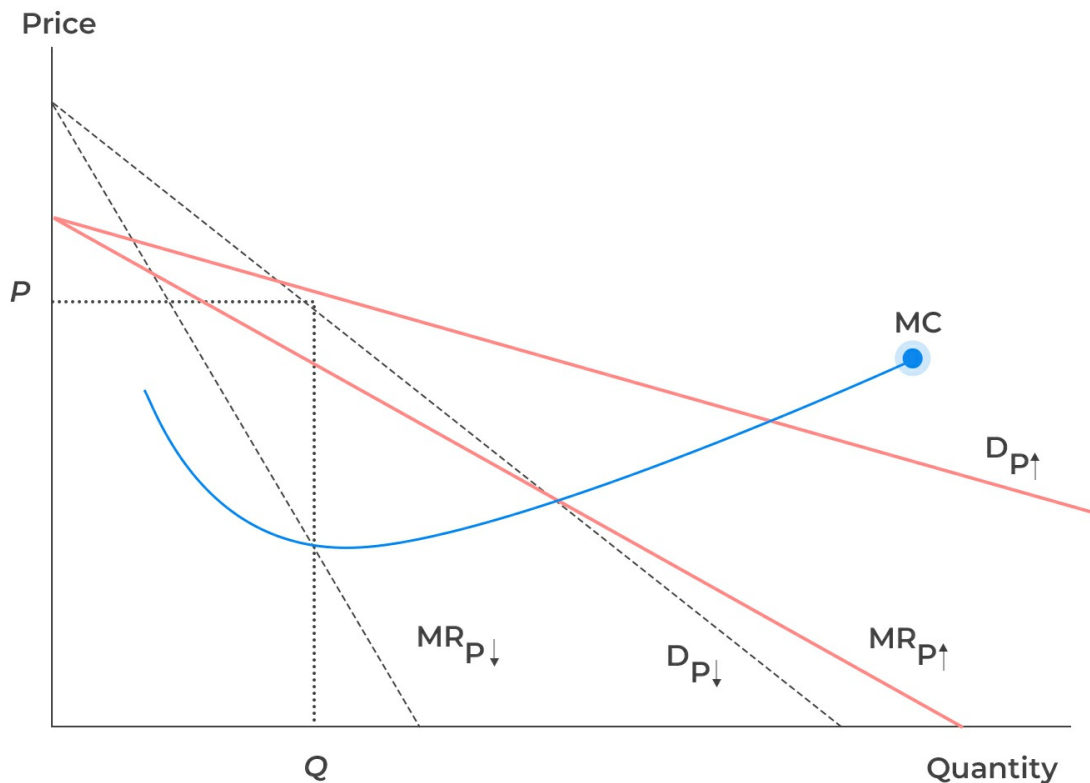
- i. One for price increases.
- ii. Another for price reductions.

Note that each demand curve will have its own marginal revenue. Denote the demand and

marginal revenue curve by  $D_{P\uparrow}$  and  $MR_{P\uparrow}$  when the price increases and by  $D_{P\downarrow}$  and  $MR_{P\downarrow}$  when the prices fall. Consider the following diagram:



## Demand and MR Curves in Oligopoly

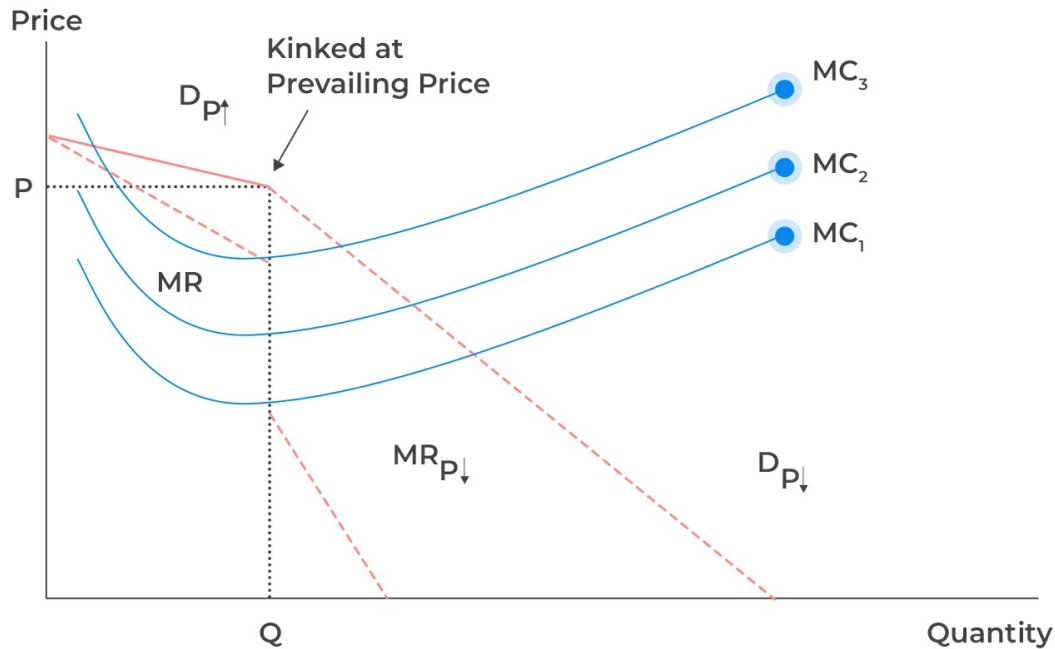


From the above diagram, the overall demand can be seen as  $D = D_{P\uparrow} + D_{P\downarrow}$ . This oligopolistic pricing strategy leads to a kinked demand curve, where the two segments represent distinct competitor reactions to price changes. The kink in the demand curve creates two parts in the marginal revenue structure. One part is connected to price increases, and the other is related to price decreases.

Observe the following kinked demand curve in the Oligopoly market:



## Kinked Demand Curve



If the company has low marginal costs, labeled as  $MC_1$ , the earlier rule of setting marginal revenue (MR) equal to marginal cost (MC) remains true even in an oligopoly. The marginal cost can increase to  $MC_2$  and  $MC_3$  before affecting the firm's profit. If the  $MC_2$  curve intersects the space in the marginal revenue, the best price-output combo stays the same at the current price and initial output level.

## The Cournot Assumption

Under the Cournot assumption, each firm determines its optimal production level, assuming that the output of other firms will remain unaltered. Their goal is to maximize profits while expecting the other firm to maintain a constant output in the future.

Cournot assumption makes pricing strategy easier as there's no need to predict a competitor's response. It offers a practical way to study actions in oligopoly markets. Consider the simplest oligopoly scenario: a duopoly with two firms. When in equilibrium, neither wishes to alter

production based on the other's output. Each company tries to maximize profits, thinking the other will maintain its current production level.

The Cournot strategy approach is believed to persist until both firms reach their long-run equilibrium. In this equilibrium, both output and price stabilize, and no changes in price or output can result in increased profits for either firm.

## **The Nash Equilibrium**

The Nash equilibrium occurs when participants in a non-cooperative market choose strategies and stick to them, even after considering their opponents' strategies.

In oligopoly markets, the Nash equilibrium is characterized by the fact that no firm in the oligopoly can increase its profits by unilaterally altering its pricing strategy. The basic assumption is that each participating firm does the best it can, considering the reactions of its rivals.

In other words, each firm expects the other firms to respond to any change made by competitors by doing their best under the changed circumstances.

In the oligopoly market, firms' actions are interdependent and non-cooperative, with each firm making decisions that maximize its own profits. In other words, the firms do not collude. Equilibrium is achieved when all firms are striving to do their best in their interest, considering the actions of their rivals.

## **Example: Illustrating Nash Equilibrium**

Consider a duopoly with companies A and B. Both companies can charge high or low prices for their products. The following table gives the amount of profits each company receives if it charges a high or low price:



## Nash Equilibrium in Duopoly Market

Company A : Low Price = 60	Company A : Low = 90
Company B: Low Price = 80	Company B: High Price = 10
Company A : High Price = 400	Company A : High Price = 600
Company B: Low Price = 450	Company B: High Price = 400

The interpretation of the table is as follows: Consider the top left corner cell. The cell shows that when both companies offer the product at low prices, company A earns a profit of 60, and company B earns 80.

It is easy to see that both companies earn a maximum combined profits of 1,000 if both companies charge high prices.

Recall that according to Nash equilibrium, each firm behaves in its own best interest. In our case above, company B can improve its position by charging low prices when company A charges high prices. Specifically, in the lower left cell, company B earns a profit of 450 when company A charges a high price of 400.

Notice that company A can earn a maximum profit of 600 only if company B agrees to charge a high price. However, this is not in Company B's best interest because it can still earn a profit of 450 by charging lower prices.

## Collusion in Oligopoly Markets

In oligopolistic industries, the conditions promote collusion as there are only a few competitors, and their pricing behavior is interdependent. Collusion is motivated by several factors, such as the potential for increased profits, the desire to reduce uncertainty in cash flow, and the opportunity to create barriers that discourage new entrants.

When firms openly and formally establish collusive agreements, they form a cartel. Six factors significantly influence the chances of successful collusion:

1. **The number and size distribution of sellers:** Collusion is more likely to succeed in markets with a small number of firms or when one firm dominates the market.
2. **The similarity of the products:** Collusion has a higher chance of success when the products are homogeneous and indistinguishable.
3. **Cost structure:** Successful collusion is more probable when the participating firms have similar cost structures.
4. **Order size and frequency:** Collusion is more likely to be successful when orders are frequent, regular, and of relatively small sizes.
5. **The strength and severity of retaliation:** The fear of severe retaliation discourages firms from breaking collusive agreements.
6. **The degree of external competition:** Collusive agreements have higher chances of success when external competitors face higher production costs.

In oligopolistic markets, another notable decision-making strategy is the first-mover advantage in the Stackelberg model. This model assumes sequential decision-making, where the leader firm selects its output first, and then the follower firm chooses after observing the leader's output. The leader firm gains an advantage by being the first mover in this scenario.

## **Demand, Supply Analysis under Oligopoly Competition**

Just like in monopolistic competition, the oligopoly firm lacks a well-defined supply function. It's impossible to ascertain the oligopolist's best output and price without considering the demand conditions and competitors' moves. Still, the oligopolist possesses a cost function that indicates the optimal supply level. Thus, the previously stated rule remains true: The output level maximizing profit occurs where  $MR = MC$ .

The price charged by the oligopolist is determined by what the consumers are willing to pay. Therefore, the equilibrium price results from the demand curve, while the output levels result from the association between the MR and the MC.

A dominant firm in an oligopoly market is one that has greater capacity, a lower cost structure, is a pioneer in the market, or has secured greater customer loyalty. As such, the dominant firm becomes the price maker with similar powers as monopolists.

The other firms in the market follow the pricing strategies of the dominant firm. The followers cannot undermine the dominant firm because the leader has a lower cost of production. Surprisingly, the price followers would rather charge a higher price than the dominant firms' price.

## **Optimal Price and Output in Oligopoly Markets**

There is no optimum price and output analysis that applies to all oligopoly market scenarios. The interdependence of the few firms in an oligopoly leads to an intricate range of pricing options, which vary based on the specific market conditions.

For instance, in a kinked demand curve, the optimum price is the prevailing price at the kink on the demand function. However, when a dominant market exists, the optimum price is determined at a point where  $MR = MC$ . The profit-maximizing price is based on the output position of the part of the demand function faced by the dominant firm.

## **Factors Affecting Long-Run Equilibrium in Oligopoly Markets**

In the long run, there is a possibility for economic profits in oligopoly markets. However, the market share of a dominant firm will decline in the long run. As is always the case, profits will attract more firms to enter the oligopoly market.

Over time, marginal costs incurred by entrant firms fall due to the adoption of more efficient production methods. Likewise, the profitability of the dominant firm declines. The reactions of entrant firms are included in the optimal pricing strategy.

Some firms may decide to incorporate innovation as a way of maintaining market leadership. For example, Shell's gasoline is said to clean the engine valves and fuel injectors. However, these innovations are usually not very effective at maintaining the market share of the dominant firm.

Generally, an optimal pricing strategy, in the long run, incorporates the reactions of rival firms to changes in prices effected by competitors. However, history shows price wars are not beneficial, as market share gains are often fleeting. For instance, cutting prices to outdo rivals reduces overall earnings for everyone in the oligopoly.

## Question

Which of the following is a factor that influences the chances of a successful collusion?

- A. Similarity in cost structures.
- B. Presence of a dominant firm.
- C. Infrequent, large order sizes.

## Solution

**The correct answer is A.**

Successful collusion is more probable when the participating firms have similar cost structures.

**B is incorrect.** Collusion is more likely to succeed in markets with a small number of firms or when one firm dominates the market.

**C is incorrect.** Collusion is more likely to be successful when orders are frequent, regular, and of relatively small sizes.

## **LOS 1e: identify the type of market structure within which a firm operates and describe the use and limitations of concentration measures**

Monopoly markets and situations where companies hold pricing power can result in inefficiencies. Nevertheless, government agencies and regulators face the difficult task of assessing market power and determining if a firm has a dominant position. This requires regulators to measure whether future events that have not yet occurred might lead to excessive market power.

### **Econometric Approaches**

To gauge market power, one can estimate the elasticity of demand and supply in the market. If demand is elastic, the market exhibits characteristics similar to perfect competition. On the contrary, if it is inelastic, companies may possess market power.

A challenge arises because the observed values of price and quantity may not accurately reflect the true values of supply and demand. To calculate elasticity, a model with two equations is necessary: one for the demanded quantity and another for the supplied quantity. This, in turn, requires a substantial number of observations, leading to the additional problem of potential changes in market structure over the extended data collection period.

Alternatively, a cross-sectional regression analysis can be employed, where sales from various companies in the market are observed within a single period. Nevertheless, implementing this approach demands a significant effort in data collection.

To address these issues, we employ more straightforward metrics such as:

### **Concentration Ratio**

The concentration ratio is the sum of market shares covered by the largest N firms in a market. It is determined by finding the sales value for the largest firms and dividing it by the total market sales.

Therefore, the resulting figure lies between zero (for perfect competition) and 100 (for monopolies).

The main advantage of this concentration measure is the simplicity of its calculation. However, there are some limitations to the usage of this method.

### **Example: Concentration Ratio**

Suppose there are 10 producing companies in a market. The production percentages for the top three companies are 35%, 20%, and 10%. Calculate the concentration ratio for these three companies.

### **Solution**

The concentration ratio is the sum of market shares covered by the largest N firms. So, the concentration ratio for the first 3 companies are:

$$\text{Concentration ratio} = 35\% + 20\% + 10\% = 65$$

### **Limitations of the Concentration Ratio**

This method cannot quantify market power directly. The big question should be whether high concentration levels can be interpreted as an indication of monopoly power. An example is the case of only one sugar company in a country. This company enjoys monopoly power. However, the problem comes when there exist large wholesalers in, say, the food sector. These wholesalers may decide to import sugar alongside their range of products. As a result, this will most likely compel the sugar company to adjust its prices as if it's in perfect competition.

The concentration ratio tends not to be affected by mergers among the top market incumbents. If there exists a merger between the largest and second-largest companies, their combined pricing power is most likely to be larger than that of the two pre-existing companies, which the concentration ratio will not accurately represent.

### **The Herfindahl-Hirschman Index (HHI)**

Economists OC Herfindahl and A.O. Hirschman came up with an index that first squares the market shares of top N companies. These squares are then summed up. The Herfindahl-Hirschman Index (HHI) for a monopoly firm should equal 1.

Consequently, in the case of M firms with equal market shares, the HHI should be equal to  $\frac{1}{M}$ . This is a very useful gauge for interpreting the HHI. This measure was developed to try and overcome some issues associated with the concentration ratio.

This measure was developed to try and overcome some issues associated with the concentration ratio.

### **Example: Herfindahl-Hirschman Index (HHI)**

Using the same example as above, the HHI for the top three companies can be calculated as:

$$HHI = 0.35^2 + 0.20^2 + 0.10^2 = 0.1725$$

### **Limitations of the HHI**

The HHI does not consider the elasticity of demand; thus, it cannot approximate the potential profitability of a single company or a group of companies.

HHI does not consider barriers to entry.

## Question

Which of the following best describes a market structure with only one buyer?

- A. Monopoly.
- B. Monopsony.
- C. Monopolistic competitive market.

## Solution

**The correct answer is B.**

A monopsony has only one buyer.

**A is incorrect.** A monopoly has one seller but many buyers.

**C is incorrect.** A monopolistic competitive market has many buyers and fairly many sellers.

## Question

If a market has 5 suppliers and each of the top two suppliers holds 20 percent of the market share, which of the following best represents the concentration ratio for the top 2 suppliers and their respective HHI?

- A. Concentration ratio = 4%; HHI = 40.
- B. Concentration ratio = 40%; HHI = 0.08.
- C. Concentration ratio = 40%; HHI = 0.4.

## Solution

**The correct answer is B.**

The concentration ratio is the sum of the two suppliers' market share.

Therefore,  $20\% + 20\% = 40\%$ .

For the HHI, we take  $0.20^2 \times 2 = 0.08$ .

## Learning Module 2: Understanding Business Cycles

### **LOS 2a: describe the business cycle and its phases**

A business or economic cycle is a recurring expansion and contraction in economic activity affecting broad segments of the economy. Specifically, a business cycle has the following features:

- A business cycle depends on the enterprise.
- Business cycles have anticipated sequences of phases, alternating from expansions and contractions (or upswings and downturns).
- The phases of a business cycle occur at approximately the same time in an economy. Business cycles are recurrent. This implies that they occur repeatedly over time but not regularly or cyclically.

### **Types of Business Cycles**

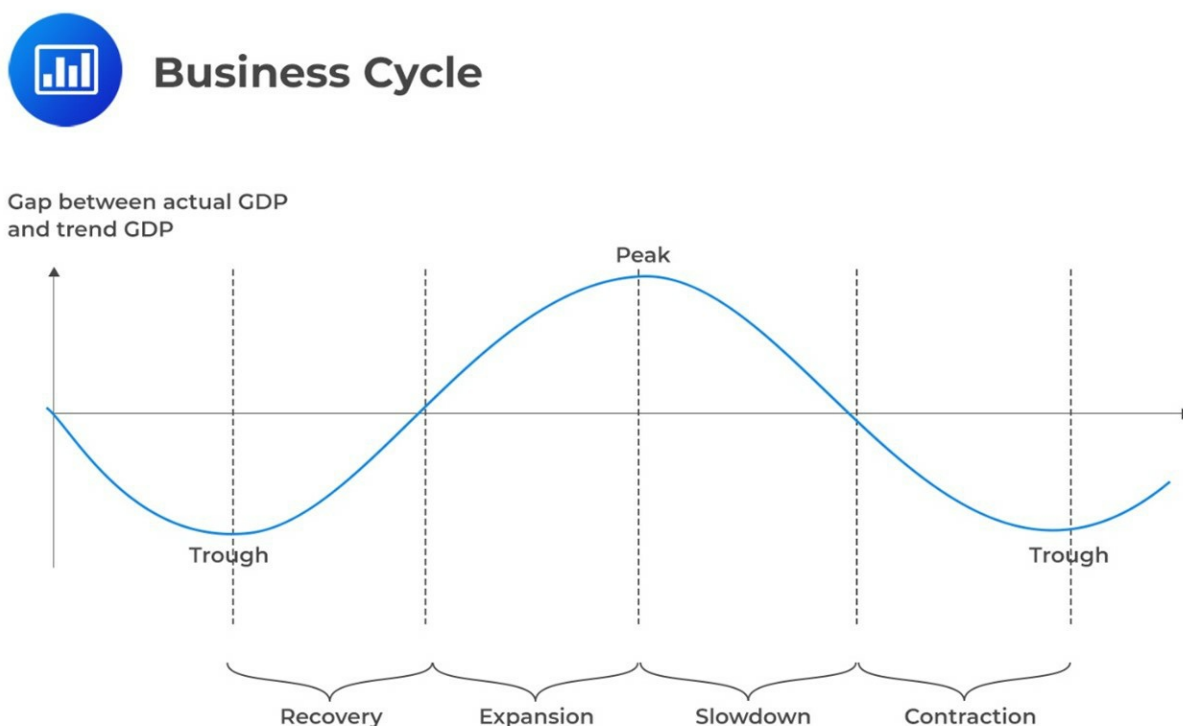
The different types of business cycles that analysts should be aware of include:

1. **Classical cycle:** The classical type of cycle shows fluctuations in economic activity, such as GDP. It has shorter contraction phases between peaks and troughs and longer expansion phases. However, it's not commonly used due to its inability to distinguish short-term fluctuations from long-term trends.
2. **Growth cycle:** The growth cycle examines fluctuations around the long-term trend and emphasizes the interaction between actual economic activity and the trend. It separates economic activity into components affected by long-term trends and short-term variations.
3. **Growth rate cycle:** The growth rate cycle is an economic cycle defined by changes in the growth rate of economic activity, such as the GDP growth rate. Contrary to the case of the classical and growth cycle, peaks and troughs are detected earlier. The benefit of this method is that it does not require the calculation of a long-term growth trajectory.

# Phases of the Business Cycle

In this section, we will focus on the growth cycle. Precisely, we'll consider the business cycle as fluctuations around the potential output.

Note that a business cycle is a series of recurring fluctuations in economic activity, consisting of expansion and contraction. These fluctuations can be divided into four phases: recovery, expansion, slowdown, and contraction. The phases can be illustrated in the figure below:



1. **Recovery phase:** During the recovery phase, the economy goes through a trough, and the negative output gap starts to narrow. Both consumers and businesses experience activity levels below their potential, but there is a noticeable increase in these activity levels. Businesses reduce layoffs, rely on overtime, and then transition to hiring, stabilizing unemployment. Inflation remains at a moderate level during this phase.
2. **Expansion phase:** During this phase, the economy experiences growth, leading to a positive output gap. Both consumers and businesses see increased growth in their activities. Businesses transition from using temporary employees to permanent hiring,

causing unemployment rates to stabilize and eventually decrease. Additionally, prices and interest rates may begin to rise. As the expansion continues, there may be shortages in production factors, and companies might reduce further investments due to overcapacity in productive resources.

3. **Slowdown phase:** During the slowdown phase, the economy reaches its peak relative to potential output, with a reduced positive output gap. Although consumers and businesses still experience above-average activity, their growth rates begin to slow, eventually dipping below average. Businesses continue to hire, but at a slower rate, leading to a further reduction in the unemployment rate, although the decline is less rapid. Inflation also picks up pace during this phase.
4. **Contraction phase:** During the contraction phase, the economy gets weaker, producing less than it could. Confidence among consumers and businesses drops. Businesses start by cutting work hours, eliminating overtime, and stopping new hires before resorting to layoffs, which makes the unemployment rate go up. In this phase, inflation decreases, but it takes some time. A recession happens when the overall economic activity shrinks, and if this reduction is substantial, it can become a depression.

## **Leads and Lags in Business and Consumer Decision-making**

To identify the cycle's turning points, we rely on the actions of businesses and consumers. Now, let's describe the market conditions and investors for each phase.

### **Recovery Phase**

When the asset markets anticipate the end of a recession and the onset of an expansion phase, the value of risky assets will be adjusted upwards. As an expansion is anticipated, markets will begin to reflect higher profit expectations in the prices of corporate bonds and stocks.

Generally, the stock market reaches its lowest point (trough) approximately three to six months before the economy bottoms out and well before economic indicators show signs of improvement.

### **Expansion Phase**

After an economy firmly establishes an expansion phase, it often enters an even more vigorous stage known as a "boom." During the boom, the economy extends its boundaries, experiences strong confidence, sees significant profit growth, and encounters expanded credit activity.

In this scenario, businesses might expand to a point where finding skilled workers becomes challenging. To attract employees, they increase wages and keep expanding their operations. Strong cash flows and borrowing as businesses compete against other employers sustain this growth.

If the government or central bank becomes worried about the economy overheating, they may intervene.

## **Slowdown Phase**

In a boom, the riskiest assets often experience significant price hikes. Meanwhile, risk-free assets like government bonds, which were in high demand during a recession, may have lower prices and, therefore, offer higher yields. Additionally, investors may worry about increased inflation, which can lead to higher nominal interest rates.

## **Contraction Phase**

In the contraction phase, investors often place more value on secure assets. They prefer government securities and stocks of companies with stable or growing cash flows, such as utility companies and essential goods producers. This preference arises because a reliable income stream becomes more valuable during times of employment uncertainty or decline.

## Question

Identify the option that is most likely to indicate an economy undergoing a recession.

- A. The central bank initiates the repurchase of treasury securities.
- B. The real GDP records negative growth for two consecutive quarters.
- C. There is a substantial decline in economic activities within the business sector.

## Solution

**The correct answer is B.** Two consecutive quarters of negative growth in real GDP is a widely recognized technical indicator of a recession. Negative GDP growth reflects a declining economic output and is a clear sign of economic contraction.

**A is incorrect:** When the central bank starts buying back treasury securities, it is usually a monetary policy measure aimed at injecting liquidity into the economy. This action is more associated with stimulating economic growth rather than indicating a recession. Therefore, Choice A is not the most likely indicator of an economy undergoing a recession.

**C is incorrect:** A notable drop in business sector activity might signal a slowdown, but it doesn't necessarily mean there's a recession. A recession is a more extended period of economic decline.

## **LOS 2b: describe credit cycles**

Credit cycles describe the changing availability and pricing of credit. They describe the growth in the private sector credit, i.e., its availability and usage of loans.

Credit cycles are tied to the real economy. When the economy is strong, lenders are eager to offer credit with good terms. However, in a weak economy, lenders are less willing to provide credit and make the terms unfavorable. This can lead to a drop in asset value, more economic problems, and increased defaults.

## **Applications of Credit Cycles**

Loose private sector credit is considered to have contributed to a number of financial crises, such as the 2008-2009 global financial crises.

Business cycles can be amplified because of changes in access to external financing. Consequently, there are linkages between business and credit cycles. Recessions accompanied by financial disruption tend to be longer and deeper, while recoveries combined with rapid credit growth tend to be stronger.

Credit cycles tend to be longer, deeper, and sharper than business cycles. Additionally, the length of credit cycles tends to be longer than that of business cycles.

## **Consequences for policy**

Investors will pay attention to the stage in the credit cycle for the following reasons:

- It helps them comprehend developments in the housing and construction markets.
- It helps them evaluate the extent of business cycle expansions as well as contractions.
- It helps them better predict policymakers' actions.

Traditional monetary and fiscal policies try to reduce business cycle ups and downs. However,

macroprudential stabilization policies are now essential to target financial booms. This is important because studies have shown that sharp increases in credit cycles are closely linked to future banking crises.

## Question

Investors will pay attention to the stage in the credit cycle least likely because:

- A. It helps them better anticipate policymakers' actions.
- B. Credit cycles tend to be longer, deeper, and sharper than business cycles.
- C. It helps them understand developments in the housing and construction markets.

## Solution

**The correct answer is B.**

Investors do not pay attention to the stage in the credit cycle because credit cycles tend to be longer, deeper, and sharper than business cycles. They do so for the following reasons:

- It helps them understand developments in the housing and construction markets.
- It helps them assess the extent of business cycle expansions as well as contractions.
- It helps them better anticipate policymakers' actions.

## **LOS 2c: describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary over the business cycle and describe their measurement using economic indicators**

The use of resources necessary for the production of goods and services fluctuates during a business cycle. Specifically, they include fluctuations in inventory management, employment, and investment in physical capital with economic fluctuations.

### **Fluctuations in Workforce and Company Costs**

#### **Recovery**

In this phase, as the economy improves, resources are used more, jobs are created, and unemployment decreases. Reduced interest rates and lower prices encourage consumers and businesses to spend more, which boosts aggregate demand.

Economic indicators reflecting recovery include **an increase in GDP** and **industrial production**, a **decrease in unemployment claims**, and an **increase in building permits**.

#### **Expansion**

Businesses switch from using overtime and temporary employees to hiring, leading to a stabilization and eventual decrease in the unemployment rate.

Economic indicators of expansion include **strong GDP growth**, **increments in consumer spending and confidence**, and a **rise in manufacturing orders**.

#### **Slowdown**

During this phase, resource use declines, hiring slows, and unemployment decreases gradually. Economic activity remains above average but decelerates, and some factor shortages may emerge as demand approaches supply levels.

Economic indicators that signal a slowdown include **decelerating growth in GDP**, a **decrease in stock market indices**, and **potential increases in inflation indicators**.

## **Contraction**

In this phase, firms reduce expenses and eliminate overtime. Companies may retain workers even if they are underutilized to save on rehiring expenses. Firms may also gain from employee loyalty, which boosts productivity.

Prolonged contractions lead to more aggressive cost-cutting, such as laying off workers beyond the strict minimum.

Moreover, in the prolonged contraction phase, there will be low capacity utilization and reduced investment in new equipment. Banks are cautious about lending.

**Economic indicators** such as a rise in the **unemployment rate**, a **decrease in GDP**, and a **fall in consumer spending** confirm the contraction phase.

## **Fluctuations in Capital Spending**

Changes in capital spending play a vital role in economic activity. It involves businesses making long-term investments in assets like property and equipment. These investments vary with economic conditions and follow the business cycle.

## **Recovery Phase**

During the recovery phase of the business cycle, excess capacity exists from the previous contraction. Companies focus on efficiency improvements rather than capacity expansion.

Capital spending begins at a low point but rises as economic conditions improve. Companies often invest in quickly advancing technology like software and hardware to modernize their operations. This helps them stay competitive and efficient.

## **Expansion Phase**

As the economy enters the expansion phase, companies benefit from favorable business conditions and increasing demand. Capacity utilization levels rise from previously low levels.

Increased earnings and cash flows give businesses the financial capacity to increase their investment spending. Customer orders and capacity utilization further grow, prompting companies to focus on expanding their productive capacity. This phase is often characterized by heavy investments in complex equipment, warehouses, factories, and infrastructure that support increased production and capacity.

## **Slowdown Phase**

During a slowdown, the economy is still growing, but the rate of growth begins to slow down. Business conditions may be at their peak, and companies might experience healthy cash flows.

However, interest rates tend to rise during this phase to prevent overheating and encourage investment slowdown. New orders intended for capacity expansion may signal the late stage of the expansion phase. Even in the slowdown phase, businesses continue to place new orders as they operate at or near their capacity limits.

## **Contraction Phase**

In the contraction phase, characterized by reduced demand, declining profits, and cash flows, companies experience a fall in business activity.

Economic downturn leads to a halt in new orders and the cancellation of some existing orders. This initial cutback can be severe and worsen the downturn. As the contraction continues, the reduction in spending on heavy equipment intensifies. It begins with cuts in technology and light equipment spending and then extends to construction and heavy equipment as the economic situation deteriorates.

## **Fluctuations in Housing Sector Activity**

The housing sector plays a crucial economic role and is closely tied to the business cycle.

Changes in housing activity can be indicative of shifts in economic conditions. Here's how the housing sector activity varies over the business cycle:

## **Recovery Phase**

During the recovery phase of the business cycle, as the economy starts to emerge from a downturn, there is an increase in consumer and business confidence. This often leads to increased demand for housing as consumers feel more secure about their financial situation. Housing construction and sales begin to pick up, and real estate prices may start to stabilize or rise moderately.

## **Expansion Phase**

As the economy enters the expansion phase, consumer incomes rise, and employment improves. This leads to further growth in housing demand as people have more disposable income to invest in homes. Home construction and real estate sales thrive during this phase, and property prices tend to rise.

## **Slowdown Phase**

In the slowdown phase, economic growth starts to decelerate. This can lead to a slowdown in the housing sector as well. While demand for housing may remain relatively strong, the pace of growth in construction and sales may start to taper off. Property price appreciation may also slow down or stabilize during this phase.

## **Contraction Phase**

In a contraction or recession, the housing sector often faces significant challenges. Economic uncertainty, job losses, and reduced consumer confidence can cause a drop in housing demand. Home sales may decrease, construction projects might be delayed, and property prices can decline. Tightened credit conditions can also play a role in the housing sector's contraction.

## **Fluctuations in External Trade Sector Activity**

External trade, also known as international trade, refers to the exchange of goods and services between different countries. The external trade sector activity is also influenced by the business cycle:

### **Recovery Phases**

During the recovery, trade volumes gradually increase as demand begins to recover. This often leads to increased domestic consumption and higher demand for goods and services.

### **Expansion Phase**

During the expansion phase, there are high levels of trade activity, with both imports and exports at elevated levels. This is mainly characterized by exports from a country rising, driven by the stronger demand abroad. This phase can contribute positively to a country's trade balance.

### **Slowdown Phase**

During the slowdown phase, economic growth starts to moderate. This can lead to a reduction in consumer spending, which in turn may impact the demand for imports. Exports may also experience a slowdown, especially if trading partners are also experiencing economic challenges. As a result, the trade balance might become more balanced or even show a surplus.

### **Contraction Phase**

In a contraction or recession, both domestic and global demand for goods and services can decrease significantly. This can lead to a substantial reduction in both imports and exports. Many countries may experience a trade deficit during this phase as both imports and exports decline. Trade-related industries, such as shipping and logistics, can also be negatively affected.

## **Fluctuations in Inventory Levels**

Inventory refers to the stock of goods and materials that a business holds in order to meet customer demand. Fluctuations in inventory levels are an important aspect of the business cycle and can have significant implications for businesses and the overall economy. Here's how inventory levels vary over the different phases of the business cycle:

## **Recovery Phase**

During the recovery phase of the business cycle, economic activity starts to pick up, and demand for goods and services begins to increase; hence, the decline in sales slows. As consumer confidence improves, businesses may start rebuilding their inventories to meet the rising demand.

As time progresses, production levels normalize as the surplus inventories accumulated during the downturn are eventually exhausted. As such, the inventory sales ratio starts to decline as the rate of sales recovery surpasses that of production.

## **Expansion Phase**

In the expansion phase, economic growth gains momentum, leading to stronger consumer spending and business investment. As a result, the demand for goods and services continues to rise. Businesses often increase their inventory levels to ensure they can meet the growing customer demand. This can include raw materials, work-in-progress, and finished goods.

At this stage, the inventory sales ratio is stable.

## **Slowdown Phase**

During the slowdown phase, economic growth starts to moderate, and consumer spending may slow down. Businesses become cautious about excessive inventory accumulation, as they don't want to be left with unsold goods if demand further decreases. As such, the sales slow at a higher rate than the production.

Companies may reduce the rate of inventory buildup and focus on managing their existing stocks efficiently. This is evidenced by the production slowdowns and order cancellations.

Intuitively, in this phase, the inventory sales ratio increases, reflecting the weakening of the economy.

## **Contraction Phase**

In the contraction phase or recession, economic activity declines, leading to reduced consumer spending and business investment. Businesses may face declining sales and excess inventory levels. As demand weakens, they may cut back on production and take steps to reduce inventory levels, including discounting prices, offering promotions, and reducing orders to suppliers.

In addition, the inventory sales ratio starts to decline back to normal.

## **Economic Indicators**

Economic indicators are numbers or statistics that give insights into how well an economy, a sector, or a specific aspect of economic activity is doing. These numbers are important for economists, policymakers, investors, and analysts because they show the current condition and potential future directions of the economy. Economic indicators cover various data, like economic growth, jobs, prices, consumer spending, business investments, trade, and more. They help in studying the business cycle, predicting economic trends, and making important decisions.

### **Types of Economic Indicators**

Economic indicators are classified based on their relationship to changes in economic activity and their predictive value. There are three main types of economic indicators: leading indicators, coincident indicators, and lagging indicators.

#### **1. Leading Indicators**

Leading indicators are economic variables that tend to change before the overall economy starts to change direction. They provide insights into potential future economic trends and turning points. Investors and analysts often use leading indicators to

anticipate shifts in economic activity. Examples of leading indicators include:

- Stock market indices.
- Consumer confidence indexes.
- Housing permits and construction.
- New orders for capital goods.
- The average workweek for manufacturing employees.

Leading indicators help in forecasting economic trends, providing early warning signals about potential economic shifts.

## 2. **Coincident Indicators**

Coincident indicators move in tandem with changes in the overall economy. They reflect the current state of economic activity and are useful for assessing the present economic condition. Coincident indicators provide a snapshot of the current economic environment. Examples of coincident indicators include:

- Gross Domestic Product (GDP).
- Industrial production.
- Personal income.

Coincident indicators help in evaluating the real-time performance of the economy and its present health.

## 3. **Lagging Indicators**

Lagging indicators change after the economy has already shifted. They confirm trends that have already occurred. They are used to assess the long-term effects of economic shifts. Examples of lagging indicators include:

- Unemployment rate.
- Consumer price index (CPI).
- Business spending on new equipment.
- Loan delinquency rates.

Lagging indicators provide a retrospective view of economic changes, helping to validate and understand trends that have already taken place.

## **Uses of Economic Indicators**

- They have a unique release schedule. As a result, investors can prepare and plan to access certain information at a specific time.
- They indicate the direction of the economy.
- Analysts use them to predict the possibility of investing in the future.

## **Limitations of Economic Indicators**

- They need to be correctly interpreted.
- Most of the data is somewhat inaccurate.
- Measuring gross domestic product (GDP) is almost impossible.

## **Composite Indicators**

In economics, a composite indicator can be one number, like industrial production or building permits, or it can be a mix of multiple numbers that move in the same direction. People use these composite indicators to check how the economy is doing. Usually, they collect about twelve different numbers from sources like the OECD or national research groups. The particular numbers in these indicators can be different from one place to another. However, they always gather various economic and financial facts that match how the economy is doing overall.

## OECD Composite Leading Indicator (CLI)

The OECD Composite Leading Indicator (CLI) is a powerful tool for understanding economic trends. Constructed from a blend of key variables, it offers a comprehensive view of economic dynamics. This composite indicator involves components that collectively provide a holistic perspective on economic performance. These components include:

- **M2 money supply:** A measure of the money circulating within an economy, reflecting liquidity and potential economic activity.
- **Economic sentiment index:** An aggregate sentiment gauge reflecting the outlook of businesses and consumers, influencing their spending and investment decisions.
- **Permits and orders:** Provides data on building permits and manufacturing orders, indicating future economic activity related to construction and manufacturing sectors.
- **Equity index:** Accesses performance of the stock market, often seen as a leading indicator of economic sentiment and overall economic health.
- **Interest rate spread:** Provides the difference between long-term and short-term interest rates, providing insights into future economic expectations.
- **Manufacturing and Service Sector Indicators:** Provides metrics from these sectors reflect production, output, and demand levels.

## Surveys

Economic tendency surveys conducted by central banks, research institutes, and trade associations contribute to a richer understanding of economic conditions. These surveys offer qualitative insights into various aspects:

- **Finances:** Gauging the financial health of businesses and individuals, providing clues about spending patterns and investment decisions.
- **Activity:** Measuring the level of economic activity across sectors, helping to identify growth trends or slowdowns.

- **Confidence:** Assessing the confidence of businesses and consumers in the economic outlook, influencing future behaviors.

Harmonized survey results, particularly for EU, OECD, and supranational aggregates, provide a broader view of economic sentiment across regions, facilitating international comparisons and collaborative analysis.

## Leading Indicators

The Conference Board, a US industry research organization, publishes a composite leading indicator called The Conference Board Leading Economic Index (LEI), which comprises 10 components. These components reflect the classical business cycle concept.

### Components of the LEI and Their Significance

- ISM new order index:** Measures the percentage of components in a series that are rising, reflecting widespread trend movements.
- Manufacturers' new orders for consumer goods and materials:** Anticipates upturns and downturns, capturing business sentiment.
- Average weekly hours in manufacturing:** Reflects workforce dynamics, as businesses cut overtime before layoffs and increase it before rehiring.
- Average weekly initial claims for unemployment insurance:** Sensitive indicator of initial layoffs and rehiring trends.
- Interest rate spread between 10-year treasury yields and overnight borrowing rates:** Predicts yield curve inversions, indicating changes in economic activity.
- Leading credit index:** Combines six leading financial indicators to assess the financial system's resilience to stress.
- S&P 500 index:** Reflects stock market trends, thus helping anticipate economic turning points, serving as an early signal.
- Building permits for new private housing units:** Indicates upcoming construction activity; permits are required before the construction of a new building can commence.

- ix. **Manufacturers' new orders for non-defense capital goods excluding aircraft:** Reflects business expectations, providing early insights into trends.
- x. **Average consumer expectations for business conditions:** Reflects consumer optimism and spending, offering insights into the economic direction.

## **Insights Offered by Composite Leading Indicators:**

Composite leading indicators, such as the LEI, give important hints about how the economy is moving. When economists and analysts look at all these pieces together, they can see early signs of where the economy might be going. These indicators help people like policymakers, investors, and businesses decide what to do when the economy changes.

## **Using Economic Indicators for Business Cycle Analysis**

We can use statistics using economic indicators to identify business cycle phases. This method offers valuable insights for making informed investment decisions, allowing for the anticipation of fluctuations in various sectors' cash flows. It's important to note that the sequence of steps is flexible and may vary based on the situation.

### **Step 1**

**Data Release:** The analyst observes a rise in the reported consumer installment debt-to-income ratio.

**Analysis:** This particular indicator typically lags behind cyclical upturns.

**Possible Conclusion:** Initial signs suggest the initiation of an upturn in economic activity.

### **Step 2**

**Data Release:** The Industrial Production Index and non-farm payrolls (employees on non-agricultural payrolls) exhibit an upward trend.

**Analysis:** These indicators, considered coincident, indicate a rise in economic activity.

**Possible Conclusion:** Strengthening evidence indicates an ongoing expansion.

### Step 3

**Observation:** The equity market index has displayed an ascending trajectory, acting as a leading indicator.

**Analysis:** The analyst cross-checks the aggregate Leading Economic Index (LEI).

**Scenario 1 Analysis:** If the aggregate LEI is also experiencing an upward trend, it suggests the recovery phase is in progress, confirming higher economic output.

**Scenario 2 Analysis:** If the aggregate LEI does not exhibit an upward movement, the analyst is unable to conclusively determine the recovery phase.

Following this analytical model helps experts understand the different stages of the business cycle. This understanding helps them make smart investment choices in different industries, which can affect stocks and bonds issued by various companies. The steps in this model should be adjusted as needed to fit the current situation, making sure to fully grasp the changing economic situation.

## Big Data and Nowcasting: Real-time Insights

Big data and nowcasting have transformed economic analysis by offering real-time insights. Economists can quickly assess current economic conditions by using data from various sources, such as financial market transactions and Internet searches. This approach, called nowcasting, gives timely estimates for economic indicators that aren't updated frequently. Notable examples of nowcasting applications include:

- i. **GDPNow:** An estimation tool that utilizes real-time data to forecast current-quarter GDP growth.
- ii. **EuroCOIN:** A measure that employs diverse data sources to assess the state of the Eurozone economy.

- iii. **Purchasing Managers' Indexes (PMIs):** These surveys capture current business conditions and act as leading indicators, offering an early signal of economic performance.

These innovative techniques provide analysts with a more detailed understanding of economic fluctuations. It allows for quicker and more informed decision-making in different sectors and industries.

## Question

Which of the following statements accurately describes leading, lagging, and coincident indicators?

- A. They are consistent across different economies.
- B. They are derived from historical cyclical patterns.
- C. They are based on Keynesian or Monetarist economic theories.

## Solution

**B is correct:** Leading, lagging, and coincident indicators are determined based on historical observations of how certain variables have behaved in relation to the business cycle over time.

**A is incorrect:** Leading, lagging, and coincident indicators can vary across different economies due to differences in economic structures, policies, and other factors. Economic indicators may have different relationships to the business cycle in different countries.

**C is incorrect:** Leading, lagging, and coincident indicators are not inherently tied to specific economic theories like Keynesian or Monetarist theories. Instead, they are empirical tools used to assess and predict the state of an economy.

## **Learning Module 3: Fiscal Policy**

### **LOS 3a: compare monetary and fiscal policy**

#### **Fiscal Policy**

Fiscal policy refers to government decisions on taxation and spending. These decisions affect a number of factors in the economy, including:

- Distribution of wealth and income across different parts of a country.
- The allocation of resources in all sectors of the economy.
- The aggregate demand for goods and services and, therefore, the level of economic activity.

#### **Monetary Policy**

Generally, monetary policy refers to the actions of a central bank that are aimed at determining or influencing the money supply and credit within the economy. Also, one of the major objectives of monetary policy is to ensure financial and price stability.

#### **Instruments of Monetary Policies**

Monetary policies use quite a number of instruments through central banks to accomplish their objectives. Some of them include:

- Interest rates.
- Open market operations.
- Bank reserve requirements.
- Selective credit controls.

## **Similarities Between Monetary Policies and Fiscal Policies**

- They are both macroeconomic tools.
- They are policies geared towards the attainment of economic stability and growth.
- They are both government policies.

## **Differences Between Monetary Policies and Fiscal Policies**

- While monetary policies are government policies implemented through the central bank, fiscal policies are implemented by the government's policymakers through laws.
- Monetary policies use tools such as bank rate variation policies, open market operations, changes in reserve ratios, and selective credit controls for implementation. In contrast, fiscal policies use tax and government expenditure as tools for implementation.

Monetary and fiscal policies can be seen as government policies and tools used to control macroeconomic variables and financial markets. Whenever economic activities start to slow down, these tools are used to accelerate growth. Similarly, when the economy starts to overheat, they moderate inflation.

Both monetary and fiscal policies aim to create an economic environment where growth is positive and stable. Inflation should be stable and low. In such a good economic environment, corporations can focus on their investment decisions. They can maximize profits for their shareholders. Households, on the other hand, can feel secure with their savings.

## Question

Which of the following is *least likely* an instrument of monetary policy?

- A. Open market operations.
- B. Change in reserve requirements.
- C. Decisions about taxation and spending.

## Solution

**The correct answer is C.**

Decisions about taxation and spending are tools used in fiscal policy through government policies.

**A and B are incorrect.** Changes in reserve requirements, open market operations, selective credit controls, and bank rate variation policies are all monetary policies.

**LOS 3b: describe roles and objectives of fiscal policy as well as arguments as to whether the size of a national debt relative to GDP matters**

## **Roles and Objectives of Fiscal Policies**

The primary goal of the fiscal policy is to control the economy of a given country by influencing the aggregate national output, which is basically real GDP.

### **Fiscal Policy and Aggregate Demand**

Aggregate demand is the total amount that households and businesses intend to spend. Fiscal policy can boost overall demand through:

- Decreasing corporation taxes stimulates business profits and expenditures.
- Introducing new public expenditures for social welfare and infrastructure projects.
- Reducing personal income tax resulting in increased disposable income.
- Lowering sales taxes leads to decreased prices for consumers.

Note that the effectiveness of the Fiscal policies on aggregate demand, changes over time, and economy to economy. Economists fall into two opposing categories about the effectiveness of fiscal policy: Keynesians and Monetarists.

According to **Keynesians**, fiscal policy can substantially affect aggregate demand, economic output, and employment, especially when an economy has a notable amount of unused capacity.

Monetarists hold a different view. They argue that fiscal changes provide only a temporary impact on aggregate demand. Instead, they stress that monetary policy is a more effective tool for managing or amplifying inflationary pressures.

During economic downturns, governments have the option to increase expenditures (expansionary fiscal policy) in an effort to elevate employment and production.

Conversely, during periods of economic prosperity characterized by full employment and rapid wage and price growth, governments may opt to curtail spending and enhance taxes (contractionary fiscal policy).

Recall that budget surplus is the positive difference between government revenue and expenditure for a fixed period of time, such as a fiscal or calendar year. The budget deficit is the opposite of the budget surplus: the negative difference between government revenue and expenditure.

Often, analysts analyze the fluctuations of budget surplus or deficit from year to year to ascertain whether the fiscal policy is expansionary or contractionary. Specifically, an increase in budget surplus implies contractionary fiscal policy, while an increase in budget deficit implies expansionary fiscal policy.

## **Automatic Stabilizers**

Automatic stabilizers are fiscal policies that automatically adjust tax rates and transfer payments in a manner that is intended to stabilize incomes, consumption, and business spending over the business cycle.

Note that automatic stabilizers work automatically, without the need for policymakers to identify shocks.

For instance, when the economy slows down and unemployment rises, the government's spending on social insurance and unemployment benefits will increase. This will boost aggregate demand, helping to prevent the economy from contracting further.

On the other hand, if the economy is booming, with high employment and incomes, then progressive income and profit taxes will rise. These progressive taxes take a larger percentage of income from high-income earners than low-income earners. As incomes rise, so do tax revenues. This will help to reduce the budget deficit or increase the budget surplus.

Automatic stabilizers are different from discretionary fiscal policies. Automatic stabilizers are built into the tax and transfer system and automatically adjust in response to economic changes.

On the other hand, discretionary fiscal policies are implemented by the government in response to a specific economic event or shock.

## **Deficits and the National Debt**

A government deficit occurs when it spends more than it collects in taxes and other revenue. The national debt is the accumulation of the government deficits over time.

The solvency of a country can be assessed using the ratio of debt to GDP and the ratio of interest payments to GDP.

The interpretation of the debt-to-GDP ratio is straightforward. A country's solvency is considered to be in jeopardy when its debt-to-GDP ratio reaches a level that is considered to be unsustainable.

The ratio of interest payments to GDP measures government payments to service the debt as a percentage of national output.

Is it a cause for concern if a country's national debt is large relative to its gross domestic product (GDP)? There are arguments, both opposing and supporting, whether the size of a national debt relative to GDP matters.

### **Arguments Opposing that National Debt Matters**

- The national debt is not as big of a problem as it seems because most of it is owed to people and institutions within the country.
- Some of the debt that the government borrowed was used to finance productive investments, such as infrastructure and education. These investments can lead to increased economic output and tax revenues in the future.
- Substantial fiscal deficits may call for tax reforms that eliminate distortions caused by existing tax systems.
- Ricardian equivalence: Fiscal deficits might not have a net effect as the private sector

could counterbalance it by boosting their savings, expecting taxes to rise in the future.

- When an economy experiences unemployment, debt is not necessarily redirecting activities away from productive purposes. In fact, the debt could potentially be linked to a rise in employment.

## **Arguments Supporting that National Debt Matters**

- A high debt-to-GDP ratio might result in increased tax rates as there is a search for greater tax revenues. This could cause a lack of motivation for economic activities because elevated marginal tax rates decrease labor input and entrepreneurial actions, ultimately resulting in diminished growth over time.
- If the financial markets start to doubt a government's capabilities, the central bank might be forced to print money to finance the government deficit. This is because when confidence is lost, it becomes harder for the government to borrow money by selling bonds, as investors may demand higher interest rates or be unwilling to buy the bonds.
- Government borrowing can sometimes hinder investment by the private sector, a phenomenon called 'crowding out.' If there is a limited pool of savings available for investment, increased demand from the government will result in increased interest rates, leading to decreased investment by the private sector.

## Question

Which one of the following is *most likely* a disadvantage of national debt?

- A. The national debt can cause inflation.
- B. A country acquires additional funds for growth.
- C. The national debt can stimulate economic growth in the short term.

## Solution

**The correct answer is A.**

Excessive national debt can lead to inflation, especially if the government resorts to printing money to service its debt. This is considered a disadvantage as inflation erodes the purchasing power of a currency and can lead to a host of other economic problems.

**B is incorrect.** By borrowing money, the government can acquire additional funds that can be invested in projects that promote economic growth. For example, the government can invest in infrastructure projects to create jobs and stimulate economic activity. However, it is important to manage the level of debt carefully to ensure that it does not become unsustainable. Additionally, the effectiveness of this approach depends on the government's ability to invest the borrowed funds wisely and generate a return on investment that exceeds the cost of borrowing.

**C is incorrect.** This is considered an advantage because, by borrowing funds, the government can invest in infrastructure, public services, and other projects that can stimulate economic activity, create jobs, and lead to economic growth. This can be particularly important during times of economic downturn when private sector investment is low. However, managing the debt levels carefully is crucial to ensure it does not become unsustainable in the long term.

## **LOS 3c: describe tools of fiscal policy, including their advantages and disadvantages**

The government possesses two major fiscal tools for influencing the economy. These tools can be divided into spending tools and revenue tools. Spending tools refer to the overall government spending. On the other hand, revenue tools refer to taxes collected by the government.

### **Government Spending Tools**

#### **Capital Expenditure**

Capital expenditure refers to what a government spends on amenities such as schools, roads, and hospitals. This spending adds to a country's capital stock. Besides, it affects the productivity of a country. Moreover, as the government increases its spending on such facilities, it increases the country's capital stock. Since such facilities highly encourage investment, the total productivity of a country also increases due to an increase in investments.

#### **Current Government Spending**

Current government spending includes goods and services, which it regularly provides. Such services include defense, health, and education. This expenditure aims at improving a country's labor productivity.

#### **Transfer Payments**

Transfer payments are payments that the government makes through the social security systems. Transfer payments ensure a minimum level of income for low-income individuals. Also, they provide ways in which the government can change the distribution of income in society.

These benefits include state pensions, housing benefits, income support, and tax credits. It should be stated that such payments are not included in the calculation of the GDP because they are not attached to any factor of production.

## Justifications for Government Spending

- Providing services such as defense for the benefit of all citizens.
- Enhancing infrastructure in the form of capital spending.
- Assuring the less-wealthy individuals a certain minimum income level and
- Increasing the employment level and low inflation.
- To provide funding for the creation of risky but inventive new items.

## Government Revenue Tools

### Indirect Taxes

Indirect taxes refer to taxes imposed on specific goods such as cigarettes, alcohol, fuel, and services. VAT is an example of an indirect tax. Health and education can be excluded from indirect taxes.

### Direct Taxes

Levies on profit, income, and wealth are direct taxes. Taxes charged on a deceased property can both raise revenue and distribute wealth. They include capital gains tax, national insurance tax, and corporate taxes.

## Desirable Qualities of a Tax Policy Desirable:

1. **Simplicity:** This means taxes should be easy for people to follow and for tax agencies to enforce.
2. **Efficiency:** Taxes shouldn't disrupt individual choices in the market.
3. **Fairness:** Similar situations should lead to similar tax payments, and wealthier individuals should pay more.

4. **Adequate Revenue:** Taxes should generate enough money for government needs, although it might clash with the principles of fairness and efficiency.

## Problems Related to Tax Policy

1. **Incentives:** Some economists are of the opinion that income taxes diminish the motivation to work, save, and invest and that the cumulative tax load has become too much.
2. **Fairness:** Determining the fairness of the tax system can be challenging. One approach is to measure the tax burden borne by various population segments, categorized by their income levels, and then evaluate how tax alterations impact these groups. Naturally, this approach requires extensive data collection and analysis, making it a demanding task for researchers and, hence, should be regarded as incomplete.
3. **Tax reform:** Discussions about modifying tax policies are ongoing. Various questions arise, such as: Should a uniform tax rate be applied to labor income? Should all investments be instantly deductible from corporate taxes?

## Advantages of Different Fiscal Policy Tools

- Indirect taxes can be quickly adjusted after the announcement, instantly influencing spending, and generating government revenue at little to no cost.
- Social policies such as discouraging the consumption of alcohol or tobacco can be quickly implemented by increasing taxes on these products.

## Disadvantages of Using Different Fiscal Policy Tools

- Direct taxes, such as income taxes, are challenging to alter without significant notice, often requiring several months, as payroll computer systems need adjustments.
- Plans for capital expenditures, such as infrastructure projects, typically require an extended period, often several years, to fully develop and execute. For example, constructing infrastructure like roads or hospitals involves detailed planning, securing

legal authorizations, and the actual execution, each of which takes considerable time.

## The Fiscal Multiplier

The Fiscal multiplier assists in modeling the effect of Taxes and government spending on aggregate demand.

Typically, a conventional macroeconomic model posits that government spending (G) directly increases aggregate demand (AD) while reducing it through taxes (T). Moreover, the government is increased by payment of transfer benefits (B). As such, the net effect of the government sector on the aggregate demand is mathematically expressed as:

$$G - T + B = \text{Budget Surplus or Deficit}$$

Denote the net taxes (taxes minus transfers) by NT. Also, denote the net disposable income by YD. As such, the relationship between the national income or output (Y) can be expressed as:

$$YD = Y - NT = (1 - t)Y$$

Where:

$t$  = Net tax rate.

From the above equation, net taxes can be seen as a proportion of the national output (Y) so that the total revenue net revenue is  $tY$ .

Note that Those who benefit from increased government spending will usually save a fraction  $(1 - c)$  of each extra dollar of disposable income, where 'c' represents the marginal propensity to consume (MPC) of the additional income.

If we ignore taxes, it is easy to see that  $\$c$  will be utilized by the recipients to buy more goods and services. Note that these recipients will spend a proportion of  $c^2 (= c \times c = c^2)$ . This process persists with both income and expenditure increasing at a steady rate of 'c' as it circulates from one entity to another throughout the economy, forming the sum of infinite geometric series given

by:

$$\frac{1}{1-c}, \quad 0 < c < 1$$

The above expression implies that for every additional spending, total income and spending rise by  $\frac{1}{1-c}$  (ignoring taxes).

Before moving on, we must introduce marginal propensity to save (MPS), denoted by  $s$ . It is the amount saved out of an additional dollar of disposable income. As such,

$$c + s = 1$$

So that,

$$s = 1 - c$$

Recall that fiscal policies include government spending ( $G$ ), net taxes ( $NT$ ), and tax rates,  $t$ .

Households allocate a portion ' $c$ ' of their disposable income,  $YD$ , which means they spend:

$$cYD = c(Y - NT) = c(1 - t)Y$$

Where:

$Y$  = Total income or output.

$NT$  = Net taxes (taxes minus transfers).

$t$  = Net tax rate.

Note that the marginal propensity to consume in the presence of taxes is then  $c(1 - t)$ . As such, when the government elevates its expenditure by a certain amount,  $G$ , the disposable income rises by  $(1 - t)G$ , leading to increased consumer spending by  $c(1 - t)G$ .

Assuming there are unused sources of capital and labor in the economy, the recipients of the additional consumption spending will have  $(1 - t)c(1 - t)G$  additional disposable income and will spend  $c$ .

This cumulative additional expenditure and income will persist in propagating throughout the economy at a diminishing rate, as  $0 < c(1 - t) < 1$ , forming a decreasing geometric series with a common ratio of  $c(1 - t)$  which sum to

$$\frac{1}{1 - c(1 - t)}$$

The above expression is called a multiplier:

$$\text{Fiscal Multiplier} = \frac{1}{1 - c(1 - t)}$$

The fiscal multiplier holds significant importance in macroeconomics as it informs us about the magnitude of change in output resulting from exogenous alterations in government spending or taxation. In other words, variations in government spending (G) or tax rates will impact the output of an economy via the value of the multiplier.

### **Example: Calculating and Interpreting Fiscal Multiplier**

Assume that in an economy, the tax rate is 25%, and the marginal propensity to consume is 80%; then the fiscal multiplier will be calculated as:

$$\frac{1}{1 - c(1 - t)} = \frac{1}{[1 - 0.8(1 - 0.25)]} = \frac{1}{0.40} = 2.5$$

This implies that if the government increases spending (G) by USD 1 billion, the overall incomes and expenditures will rise by USD 2.5 billion.

### **Balanced Budget Deficit**

Note that if a government increases government spending (G) by the same magnitude as it raises taxes, the aggregate output will increase. This is due to the multiplier effect.

As the marginal propensity to consume from disposable income is less than 1, a one-dollar decrease in YD causes only a \$c drop in spending. Therefore, the total reduction in spending is smaller than the tax increase by a multiple of c. Maintaining a balanced budget results in

increased output, subsequently causing more increases in both output and income due to the multiplier effect.

It may be intuitive to think that increasing government spending ( $G$ ) while raising taxes by the same amount would keep the government's budget deficit/surplus unchanged. However, the rise in output leads to additional tax revenue and further changes in the budgetary position.

It is possible that the government can modify the initial change in spending to precisely offset the total change in total revenues, at which the balance budget multiplier is 1. Note that there is an associated output with this balanced budget multiplier.

## Question

Which of the following statements is the *most accurate* regarding fiscal tools?

- A. Direct taxes are useful for discouraging alcoholism.
- B. Indirect taxes cannot be modified quickly; therefore, they are irrelevant fiscal.  
policy tools
- C. Government capital spending decisions are slow to plan, implement, and execute; thus, they are of little use for the short-term stabilization of the economy.

## Solution

**The correct answer is C.**

The implementation of capital spending is slower compared to the implementation of changes in indirect taxes.

**A is incorrect.** Indirect taxes have a greater effect on alcohol consumption as compared to direct taxes.

**B is incorrect.** Indirect taxes can be modified quickly. In fact, among all the tools, their implementation is the easiest and fastest.

## **LOS 3d: explain the implementation of fiscal policy and the difficulties of implementation as well as whether a fiscal policy is expansionary or contractionary**

Recall that fiscal policy refers to all the methods used by a government to influence the economy through tax rates and government expenditures. For example, a government may decide to reduce taxes. These moves should, in theory, stimulate the economy and, thereby, increase aggregate demand. Such policies are called discretionary fiscal policies.

## **Understanding Deficits and Fiscal Stance**

Policymakers need to know if the budget deficit truly reflects the government's fiscal stance, meaning if fiscal policy stimulates or reduces economic growth. But several factors make the actual government deficit a complex measure.

### **Fluctuations in Deficit Size**

The size of the deficit can fluctuate due to various reasons not necessarily related to intentional fiscal policy changes. For instance, automatic stabilizers, like income tax, VAT, and social benefits, can alter the budget deficit without any policy change. This automatic adjustment reduces the economy's sensitivity to shocks and stabilizes employment and output levels without any deliberate policy changes.

### **Use of Structural Budget Deficit**

Economists often use the structural budget deficit as a fiscal stance indicator, which is the deficit that would exist if the economy operated at full employment or full potential output. For example, during the 2009-2010 period, when unemployment was around 9-10% in the United States and Europe, the actual budget deficits would have been substantially lower if the economies were at full employment, as tax revenues would be higher and social transfers lower.

## **Distinction Between Real and Nominal Interest Rates**

Another factor that complicates using actual government deficits as a fiscal stance measure is the distinction between real and nominal interest rates and the role of inflation adjustment when applied to budget deficits. It is more logical to consider only the inflation-adjusted (or real) interest payments because inflation erodes the real value of the outstanding debt.

## **Use of Automatic and Discretionary Fiscal Adjustments**

Lastly, governments use both automatic and discretionary fiscal adjustments to influence aggregate demand. Discretionary adjustments involve intentional changes in taxes and/or spending to stabilize the economy. However, a pertinent question arises as to why fiscal policy cannot entirely stabilize aggregate demand, thereby ensuring full employment at all times.

## **Difficulties in Implementing Fiscal Policy**

Note that fiscal policy cannot completely stabilize aggregate demand. Below are some of the difficulties experienced in the implementation of fiscal policy.

### **Recognition Lag, Action Lag, and Impact Lag**

It may take time before noticing a slow growth in the economy. Also, policymakers may recognize a problem when it is too late (recognition lag). Consequently, action against the problem may come when it is too late to be effective (action lag). Upon implementation of a policy, there could be a time lag between the time of implementation and the time the impact of the policy manifests in the economy (impact lag).

### **Uncertainty About the Economic Future**

Another dimension of time in this process relates to the unpredictability of the economy's direction regardless of policy alterations. It is hard to rely on macroeconomic forecasting models to create policies because of their relative inaccuracy. For example, announcing fiscal adjustments will automatically lead to a change in the behavior of the private sector.

## Other Macroeconomic Issues

- **Crowding out:** Crowding out refers to a case where the consumption of goods, services, and investments reduces due to increased government spending. When the government increases its borrowing, interest rates increase. Due to crowding out, an expansionary fiscal policy – financed by debt – may sometimes end up decreasing aggregate demand.
- If the government tries to boost demand to fight unemployment and inflation, it might lead to higher wages and prices, causing inflation. Policymakers may avoid further adjusting fiscal policy to prevent this.
- When the budget deficit is already large relative to GDP, and further fiscal stimulus is necessary, increasing the deficit may be viewed as unacceptable by financial markets. This can lead to higher interest rates on government debt and political pressure to address the deficit, even when further stimulus is needed.
- Accurately measuring the level of full employment is challenging, and fiscal expansion raises demand. However, if the economy is already at full employment, which changes with shifts in productive capacity and workers' willingness to work at different wage levels, it could lead to inflationary pressures instead of increased output.
- If the lack of demand is not the reason for unused resources but rather a low supply of labor or other factors, then discretionary fiscal policy will not increase demand and will be ineffective, potentially leading to inflationary pressures.

## Determining whether a Fiscal Policy is Expansionary or Contractionary

### Expansionary Fiscal Policy

Expansionary policies are adopted to stimulate the economy during a recession. For instance, during a recession, the government employs idle resources and tries to boost economic output. This increased spending increases aggregate demand, hence a higher real GDP.

Generally, expansionary policy attempts to raise employment rates and output and often results in an increase in the budget deficit or a reduction in the budget surplus.

The expansionary policy includes:

- **Increased Government Spending:** This could be in the form of increased public works, infrastructure projects, government salaries, etc.
- **Tax Cuts:** Reducing taxes increases disposable income for households and can also reduce operating costs for businesses, thereby encouraging spending and investment.
- **Increased Transfer Payments:** This includes increasing payments for social programs like unemployment benefits, social security, etc.
- **Decreasing Interest Rates:** Though this is primarily a tool of monetary policy, it's worth mentioning that lower interest rates can also encourage borrowing and investment, which is expansionary in nature.

## Contractionary Fiscal Policy

Contractionary policy is typically adopted when the economy is overheating, i.e., growing too quickly and causing high inflation. It can be explained as a decline in government expenditure or a rise in taxes.

Contractionary policies often lead to a decrease in the budget deficit or an increase in the budget surplus. Contractionary fiscal policies include:

- **Decreased Government Spending:** Reducing spending on public works, infrastructure projects, government salaries, etc.
- **Tax Increases:** Raising taxes decreases disposable income for households and increases operating costs for businesses, thereby discouraging spending and investment.
- **Decreased Transfer Payments:** This includes reducing payments for social programs like unemployment benefits, social security, etc.

- **Increasing Interest Rates:** Again, primarily a tool of monetary policy, higher interest rates can discourage borrowing and investment, which is contractionary in nature.

## Question

Which of the following most accurately explains the term impact lag of a fiscal policy?

- A. Policymakers may recognize a problem in the economy when it is already too late.
- B. Policymakers may take action against an economic problem when it is already too late.
- C. Once the government has implemented a policy, it may take time before the impact of the policy manifests in the economy.

## Solution

**The correct answer is C.**

It may take a lot more time for the impact of an implemented policy to manifest in the economy. This is called the impact lag.

**A is incorrect.** When policymakers recognize a problem in the economy when it's too late, economists call it a recognition lag.

**B is incorrect.** Taking action against an economic problem when it is already too late is referred to as action lag.

## **Learning Module 4: Monetary Policy**

### **LOS 4a: describe the roles and objectives of central banks**

#### **Objectives of Central Banks**

The main objective of a central bank is to maintain price stability. Depending on the country, central banks might have other objectives, such as controlling inflation, unemployment, interest rates, or exchange rates. However, all these objectives align with the primary objective of ensuring financial stability.

#### **Roles of Central Banks**

Central banks are crucial in today's economies, performing various vital functions for maintaining economic stability and promoting growth. The following are the different roles of central banks, explained based on the provided information:

##### **Monopoly Supplier of the Currency**

Central banks are the exclusive institutions authorized by law to supply domestic currency, replacing the earlier system where money was exchanged for precious commodities like gold by many private banks.

Money in all major economies today is known as fiat money, which implies that it is not convertible into any other commodity. Moreover, it is deemed as legal tender, which means it must be accepted for goods, services, and debt repayment.

Central banks play a vital role as the suppliers and protectors of the value of fiat currencies, thereby maintaining confidence in the currency and preventing its arbitrary expansion.

##### **Banker to the Government and the Bankers' Bank**

Central banks serve as the principal bankers to the government and other banks, ensuring they

have the necessary liquidity to operate smoothly. This role is particularly crucial during crises when banks may face liquidity challenges. Being able to print money places central banks in a unique position to supply funds to banks in crisis, thereby preventing bank runs and maintaining stability in the financial system.

### **Lender of Last Resort**

Central banks act as the ultimate source of funds for banks facing a liquidity crisis. The knowledge that the central bank stands ready to provide the required liquidity and the trust in government bank deposit insurance helps prevent bank runs. However, as observed in recent financial crises, this central bank's role alone may not always be sufficient to avert a bank run.

### **Regulator and Supervisor of the Payments System**

Central banks often oversee, regulate, and establish standards for a country's payment system to ensure its robustness and standardization. This role includes overseeing the payments system, introducing new processes, and coordinating payment systems internationally with other central banks.

### **Supervisor of the Banking System**

Many central banks supervise the banking system or at least the banks they license to accept deposits. This role may vary from country to country, with some central banks sharing this responsibility with another authority.

### **Manager of Foreign Currency and Gold Reserves**

Even though the gold standard was abandoned in the early twentieth century, central banks still hold substantial quantities of gold and foreign currency reserves. Decisions by central banks to sell significant portions of their gold reserves could potentially affect gold prices.

### **Conductor of Monetary Policy**

This is arguably the most important role of central banks. Central banks are perfectly situated to formulate and execute monetary policy by being the exclusive issuer of the national currency.

## Question

Credit control refers to actions undertaken by central banks to:

- A. Control inflation.
- B. Control imports and exports.
- C. Control the money creation of the government.

## Solution

**The correct answer is A.**

The central bank controls the credit creation process by commercial banks to control inflationary and deflationary pressures on the economy.

## **LOS 4b: describe tools used to implement monetary policy tools and the monetary transmission mechanism, and explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates**

Central banks implement the monetary policy using a number of instruments. These affect the aggregate demand through the supply of money, cost of money, and credit availability. The three main tools central banks use to implement monetary policies are open market operations, the central bank's policy rate, and reserve requirements.

### **Open Market Operations**

Open market operations refer to cases where a central bank buys and sells government bonds from and to commercial banks or designated market makers. For instance, when the central bank sells government bonds, the commercial bank's reserves are decreased, and, therefore, they cannot be in a position to lend more to corporations and households. This leads to a decline in broad money growth through the money multiplier effect.

On the other hand, when recessionary forces get going in an economy, the central bank purchases government bonds, increasing the commercial banks' reserves. Commercial banks then tend to lend more to households and corporations, who, in turn, invest more. In this way, broad money growth expands through the money multiplier mechanism.

Clearly, the central bank uses open market operations to set appropriate levels of commercial bank reserves or interest rates for the reserves.

### **The Central Bank's Policy Rate**

The policy rate, often referred to by various names depending on the central bank, is a primary tool that central banks use to convey their monetary policy intentions. Its main purpose is to influence both short-term and long-term interest rates, affecting real economic activity. Generally, the policy rate is the interest rate at which the central bank lends money to commercial banks.

A common mechanism for this is through repurchase agreements (repos), whose maturity ranges from overnight to two weeks. For instance, if the central bank wishes to increase money supply in the economy, it buys government bonds with an agreement to resell them in the future, effectively lending money to banks.

In essence, a repurchase agreement is a form of a loan to commercial banks, and the central bank (lender) earns a repo rate.

When a central bank raises its policy rate, commercial banks typically raise their base rates in response. The base rate of a commercial bank is a benchmark for its lending rates to various customers. Banks adjust their rates based on the central bank's rate to avoid lending at rates lower than what the central bank charges them.

As such, when the policy rate rises, it becomes costlier for commercial banks to borrow. This typically leads them to decrease their lending activities, reducing the money supply.

On the other hand, a reduction in the policy rate makes borrowing cheaper for commercial banks. This often prompts them to increase their lending, consequently boosting the money supply.

Note that the central bank can compel commercial banks to take loans from it at a specific rate. This is made possible through its open market operations, which can deliberately induce a money deficit. Consequently, banks are nudged into selling bonds back to the central bank under the repurchase agreement. The repo rate is set in a way that ensures the central bank receives the standard refinancing rate from these deals.

In essence, by adjusting the policy rate, central banks can control the amount of money circulating in the market. A higher policy rate makes borrowing from the central bank costlier, potentially leading to reduced lending and slowed money growth in the broader economy.

## **Reserve Requirements**

The law requires commercial banks to keep a certain percentage of their total deposits in the central bank as a reserve. When prices rise, the central bank raises the reserve ratios, and, therefore, commercial banks are left with less money to lend to the business community.

Consequently, the volume of output, employment, and investment are adversely affected. Eventually, prices will fall.

The opposite is also true. Note that the higher the reserve requirement, the less money commercial banks can create. Hence, if the central bank wants to reduce the money creation power of commercial banks, it could easily increase the commercial bank's reserve requirements.

Setting reserve requirements as a monetary policy is not commonly used in developed market economies. Varying reserve requirements are disruptive to the banks because a sudden increase can halt a bank's lending if it lacks sufficient reserves.

However, central banks in emerging economies still use reserve requirements to manage lending.

## **The Monetary Transmission Mechanism**

The monetary transmission mechanism is the process where a central bank's interest rate is transmitted through the economy and ultimately affects the rate of increase of prices (inflation).

Consider a situation where a central bank increases its official interest rate. The implementation of the policy may be reflected on four connected channels: bank lending rates, asset prices, agents' expectations or confidence and exchange rates.

### **Bank Lending Rates**

When the central bank increases its official rate, commercial banks usually respond by increasing their base and interbank rates. This, in turn, amplifies the borrowing costs for both individuals and corporations across various time horizons. With heightened interest rates, there is a general trend among businesses and consumers to limit their borrowing activities.

### **Asset Prices**

Higher short-term interest rates can lead to an increased discount rate for estimating future

cash flows. Consequently, assets like bonds and the projected value of capital initiatives might witness a dip in their prices.

## **Agents' Expectations/ Confidence**

Market players might interpret elevated interest rates as a precursor to slower economic progress, diminished profits, and a contraction in asset-financing borrowings. The anticipation and interpretation of future interest rate trends can have a significant influence on economic decisions. If the market perceives the central bank's move as the beginning of a series of rate hikes, this could lead to reduced consumption, borrowing, and a slump in asset prices.

## **Exchange rates**

Increase in interest rates might make a country's exchange rate to appreciate. This appreciation can make domestically produced goods expensive for international buyers, potentially reducing exporters' earnings. This could further dampen the demand for local exports.

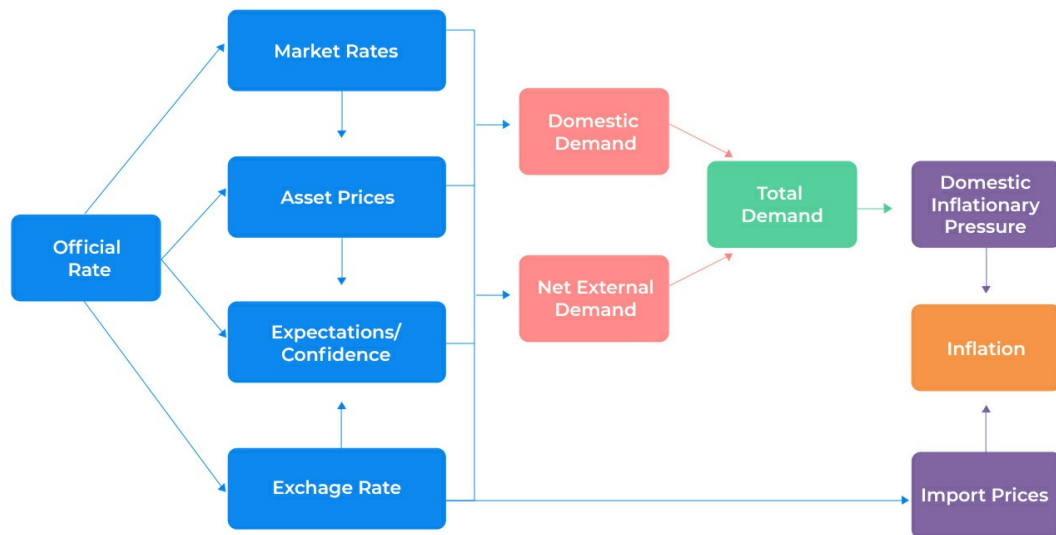
Overall, an increase in the central bank's policy rate may lead to a decrease in both domestic demand and net external demand (export consumption less import consumption), which can be decreased by an increase in the central bank's policy rate.

A weaker total demand would tend to push domestic inflation rates downward, as would a stronger currency, which would drive down the cost of imports. When these elements are considered collectively, the overall measure of inflation may start to experience negative pressure.

A monetary transmission can be represented in the following diagram:



## The Monetary Transmission Mechanism



## Question

Which of the following elements is least likely to be a component of the monetary transmission mechanism?

- A. Setting an inflation rate target.
- B. Implementing a transfer payment program.
- C. Adjusting the central bank's official interest rate.

## Solution

**The correct choice is B.**

Transfer payments are related to fiscal policy, not monetary policy.

**A is not correct.** Establishing an inflation rate target is an aspect of the monetary transmission mechanism, typically occurring later in the process.

**C is not correct.** Modifying the central bank's official interest rate is usually the initial step in the monetary transmission mechanism.

## **LOS 4c: describe qualities of effective central banks; contrast their use of inflation, interest rate, and exchange rate targeting in expansionary or contractionary monetary policy; and describe the limitations of monetary policy**

The central bank of any nation worldwide is responsible for managing the country's monetary policy. They also often have the responsibility of maintaining price stability and inflation.

Central banks need to have the significant qualities highlighted below to be more effective in their responsibilities.

### **Transparency**

It is ideal for a central bank to be transparent in its decision-making. They do this by producing reports and airing their views on economic indicators used to develop the monetary policy.

For instance, central banks produce inflation reports that provide insights into the various indicators they monitor when determining their monthly interest rate adjustments. When making their assessments, they typically address these topics in the given sequence:

- Overview of broad money trends and credit conditions.
- The state of financial markets.
- Changes in the real economy, such as employment dynamics and
- Trends in pricing.

Transparency helps central banks gain reputation and credibility, which, in turn, facilitates their ability to shape inflation expectations and more effectively achieve their inflation target.

### **Independence**

While governments can set inflation targets and instruct central banks on interest rates, there's a risk. Politicians aiming for reelection might keep interest rates artificially low, potentially leading to inflation surges. Hence, the prevailing sentiment is that monetary decisions should be

made by an entity distant from political agendas, positioning central banks as exclusive currency providers.

Yet, there are degrees of independence. Government officials often select central bank leaders. For instance, the US president appoints the US Federal Reserve Board's chair. As such, achieving total detachment from political sway might be idealistic but challenging.

Different central banks have varying degrees of independence. Some have both operational and target independence, meaning they decide interest rates, define and set the inflation rate, and choose the timeframe to meet the target. The ECB is a prime example. In contrast, others, like those in New Zealand, Sweden, and the UK, are bound by government-set inflation standards and targets, granting them only operational autonomy.

## **Credibility**

A central bank is a national institution granted the prerogative to control the printing and supply of money and credit. Central banks play important roles in the economy since they are the sole suppliers of currency to the government, bankers to commercial banks, lenders of last resort, supervisors of payment systems, and implementers of monetary policy.

For a central bank's measures to resonate and be effective, the public's trust is paramount. In an era where inflation-targeting is crucial, the credibility of a central bank isn't just about the policies they enact but about the public's unwavering confidence in those policies. Especially during volatile times, a central bank's credibility ensures stability and instills faith in the financial future.

## **Inflation and Exchange Rate Targeting**

### **Inflation Rate Targeting**

The inception of this now widely accepted inflation-targeting approach can be traced back to New Zealand. In 1988, Roger Douglas, the New Zealand Finance Minister of the time, put forth a transformative economic policy. The country aimed to curtail inflation, which stood at

approximately 6%, bringing it within a more controlled range of 0 to 2%.

This inflationary target could be a benchmark. When this is the case, other policies are implemented to ensure that the inflation rate within the economy does not grow beyond the targeted inflation rate within a given period of time.

Regardless of who sets the target, either the central bank or the government, the specific target level and the timeframe within which it should be achieved are vital elements in every inflation-targeting approach. For instance, in the UK, the Bank of England's target is CPI inflation within  $\pm 1.0$  percentage point of 2%.

While inflation-targeting strategies might differ slightly across different economies, their effectiveness is widely believed to hinge on three qualities of a central bank: independence, credibility, and transparency.

The inflation target cannot be set at 0% because it might lead to deflation, which is negative inflation. Moreover, inflation targeters do not aim at the current inflation but usually inflation two years ahead for two main reasons:

- i. The monthly headline inflation rate, targeted by central banks in many economies, represents the yearly increase in the cost of a basket of goods and services. Essentially, it reflects past price changes.
- ii. Changes in interest rates today will require time to fully impact the real economy due to the gradual process of the monetary transmission mechanism.

While the specifics of inflation-targeting mandates differ across nations, they generally include a clear inflation target within set boundaries and require transparency from the central bank in its goals and actions. Typically, these guidelines are established in laws that set formal duties for the central bank.

## **Exceptions in Inflation Targeting**

The two central banks that do not adopt inflation-rate targeting are the Bank of Japan and the US Federal Reserve System.

Japan's central bank, the BoJ, does not target an explicit measure of inflation because Japan has been battling deflation for nearly two decades. Despite measures taken, including printing money, inflation has remained weak. Inflation targeting is primarily seen as a method to combat and control inflation, making it seemingly irrelevant in an economy consistently facing deflation.

Interestingly, the US Federal Reserve does not set an explicit inflation target because a strict focus on inflation might clash with the Federal Reserve Act's mandate: “promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”

Some suggest that targeting inflation could jeopardize the objective of “maximum employment.” However, in practical terms, the Fed views core inflation around or slightly under 2% (as measured by the personal consumption expenditure or PCE deflator) as synonymous with “stable prices.” Consequently, financial markets closely monitor this US inflation metric to predict the Fed's interest rate decisions.

## **Exchange Rate Targeting**

Many emerging economies prioritize targeting their currency's exchange rate rather than focusing on domestic inflation. They establish a fixed or range-bound value for their currency relative to a major global currency and stabilize it by trading in the forex market. By linking its currency to a stable, low-inflation economy, a country can essentially “borrow” the inflation stability of the more established economy.

Consider a scenario where a developing nation wishes to peg its currency to the US dollar. Assuming similar inflation rates and consistent relative price levels, the currency should remain near its targeted value if there are no unforeseen economic disruptions, effectively inheriting the foreign nation's inflation scenario.

However, if the developing country's economy accelerates and its inflation surpasses that of the US, its currency might devalue against the dollar. To maintain the targeted exchange rate, the country's central bank would buy its currency and sell foreign reserves, leading to decreased money supply and raised interest rates.

Conversely, if its inflation rate drops compared to the US, the central bank would do the

opposite, increasing the money supply and dropping interest rates.

In real-world scenarios, a developing country's central bank intervenes regularly to maintain the stability of its currency value. However, an essential takeaway from this example is that when a monetary authority aims for a specific exchange rate, the domestic economic conditions, including interest rates and the money supply, must adjust to support this goal. As a result, these domestic economic indicators might experience greater fluctuations and volatility.

Despite potential pitfalls, several currencies are still pegged, especially to the US dollar. Such currencies with pegged currencies include Saudi Arabia, Bahamas, and Lebanon.

Some currencies have a “managed exchange rate policy,” fluctuating within a set range managed by the monetary authority.

In some cases, countries even adopt the US dollar as their official currency, completely replacing their native currency, a situation called dollarization. Such countries include Panama, Ecuador, and East Timor.

## **Contractionary and Expansionary Monetary Policies.**

Recall that central banks control liquidity in the economy by adjusting their benchmark interest rates. As such, contractionary aims to reduce the money supply's growth rate and potentially curb the economy's growth. As such, if they anticipate rising inflation due to increased economic activity, they might increase interest rates, reducing available funds in the market.

On the other hand, when the economy slows and both inflation and monetary trends appear weak, central banks can boost liquidity by reducing their target interest rate. This is known as an “expansionary” monetary policy.

## **Neutral Rate of Interest**

The terms “high” and “low” for policy rates are relative. Their point of reference is often the “neutral rate of interest,” a rate that neither stimulates nor restrains economic growth. If the policy rates exceed the neutral rate, the monetary policy is seen as contractionary. If they are below the neutral rate, it's viewed as expansionary. Ideally, over an economic cycle, the neutral

rate should be equal to the average policy rate.

The neutral rate of interest consists of:

- The real trend rate of growth of the underlying economy,
- Long-run expected inflation.

The real trend rate of growth is considered as the sustainable economic growth rate that results in stable inflation over time. If, for instance, an economy's credible inflation target is 2% annually and its sustainable long-term growth is believed to be 1.5% annually, then the neutral rate can be calculated as:

$$\text{Neutral rate} = 1.5\%(\text{Trend Growth}) + 2\%(\text{Inflation Target}) = 3.5\%.$$

Thus, a policy rate exceeding 3.5% would be considered contractionary, while one below this rate would be seen as expansionary.

## Sources of Shocks to Inflation Rate

The shock to inflation rates can be classified as demand and supply shocks.

Demand shock occurs when inflation is rising beyond its target or simply in a way that threatens price stability due to an increase in the confidence of consumers and business leaders, which in turn has led to increases in consumption and investment growth rates. In this case, it might be appropriate to tighten monetary policy to bring the inflationary pressures generated by these domestic demand pressures under control.

On the other hand, supply shock occurs when an inflation spike is due to external factors, like a significant jump in oil prices. In this situation, already-burdened consumers dealing with high fuel costs might reduce spending, potentially causing a decrease in profits and a rise in unemployment.

Therefore, it is crucial for the monetary authority to accurately pinpoint the cause of inflationary changes before deciding to either tighten or loosen monetary policy.

## **Limitations of Monetary Policy**

Monetary policy is used in the stabilization of prices and inflation control. However, monetary policy has quite a number of shortcomings and, as such, usually does not reach expectations. These shortcomings are discussed below.

### **Problems in the Monetary Transmission Mechanism**

Monetary policy actions are conveyed to the economy through channels like bank lending rates, asset prices, and expectations. Sometimes, the intended effects might not permeate the economy as expected.

For instance, raising interest rates might not always result in the desired economic slowdown if long-term rates fall due to market expectations. Bond market vigilantes play a role in affecting yields based on their perception of monetary policy's efficacy.

Extreme cases like a liquidity trap, where money injections no longer influence interest rates, can render monetary policy ineffective, especially during deflation.

### **Interest Rate Adjustment in a Deflationary Environment and Quantitative Easing as a Response**

Deflation, a continuous fall in prices, is challenging for standard monetary policy. During deflation, slashing interest rates near or below zero might not be effective, leading to a liquidity trap. This can result in reduced consumer spending, further deflation, and rising real debt, as witnessed in Japan post the 1990s property bubble collapse.

If standard policy tools fail, alternatives like quantitative easing (QE) can be utilized. QE involves large-scale asset purchases to inject money into the economy. Though it aims to stimulate lending and boost economic activity, its success is not guaranteed.

Central banks can buy a variety of assets under a QE program if permitted by the government. However, buying risky assets can be dangerous. Acquiring bad assets that incur losses might lead to a severe confidence crisis in the central bank's primary product: fiat money.

## Monetary Policy in Developing Countries

Emerging economies often encounter notable challenges in the effective implementation of monetary policy, particularly in achieving price stability. These challenges encompass:

- a lack of a well-established government bond market and a mature interbank market, essential for carrying out monetary policy.
- a history of struggles with inflation control, which undermines the credibility of their monetary policy objectives.
- an unwillingness by governments to give true independence to their central banks.
- Rapid changes in financial methodologies frequently alter the meaning of money supply.
- a constantly evolving economy, complicating the determination of the neutral interest rate and the stable connection between the money supply and the real economy.

## Question #1

While politicians and central banks may share certain economic goals, which objective is politicians *least likely* to prioritize?

- A. Promoting economic growth.
- B. Boosting employment rates.
- C. Addressing inflationary concerns.

## Solution

The correct answer is **C**.

Addressing inflationary concerns is primarily the domain of central banks. Politicians, in contrast, often prioritize boosting employment rates and promoting economic growth.

## Question #2

If a central bank raises its policy rate, how might this action alleviate inflationary pressures?

- A. By dampening consumer demand.
- B. By affecting the foreign exchange value of the domestic currency.
- C. By elevating asset prices leading to increased household wealth.

## Solution

The correct answer is **A**.

When policy rates rise, borrowing becomes costlier, leading to decreased consumer demand, which subsequently reduces inflationary pressures.

**B is incorrect.** A hike in the interest rate typically strengthens the domestic currency, making imports cheaper and potentially decreasing inflationary pressures.

**C is incorrect.** Higher policy rates often depress asset prices since banks have reduced lending to businesses and consumers, leading to decreased investment and consumption.

### Question #3

Which of the following is *least likely* considered a limitation of monetary policy?

- A. Encountering a liquidity trap.
- B. Achieving price stability.
- C. Responding to bond market vigilantes.

### Solution

**The correct answer is B.**

Achieving price stability is one of the core objectives of monetary policy, not a limitation. Both A and C, liquidity trap and bond market vigilantes, respectively, pose challenges to the efficacy of monetary policy.

## **LOS 4d: explain the interaction of monetary and fiscal policy**

Monetary and fiscal policies are tools used to influence the broader economy. However, the effectiveness of monetary policy on aggregate demand can vary based on the fiscal policy in place and vice versa.

Even though both policies can influence aggregate demand, they work differently and affect its composition in varying ways. They cannot simply replace one another.

Recall that the central bank applies monetary policy to change the cost, demand, and availability of credit. It controls credit through open market operations, bank rates, selective methods of credit control, and variable cash reserve ratio.

On the other hand, Fiscal policy focuses on the government in relation to taxation, borrowing, and expenditure. These three elements mostly influence aggregate spending.

## **The Relationship Between Monetary and Fiscal Policy**

Consider the following assumptions, assuming wages and prices remain fixed:

### **Easy fiscal policy/tight monetary policy**

With reduced taxes or increased government spending, aggregate output will rise. However, with reduced money supply counteracting the fiscal boost, interest rates increase, diminishing private sector demand. As a result, there's a rise in output and interest rates, with government spending becoming a more significant part of the national income.

### **Tight fiscal policy/easy monetary policy**

With fiscal reductions paired with an accommodating monetary stance leading to decreased interest rates, the private sector gets a boost and grows a share of GDP, while the public sector diminishes.

## Easy monetary policy/easy fiscal policy

When both fiscal and monetary stances are accommodating, the combined effect is highly stimulative. This results in a spike in aggregate demand, potentially reduced interest rates, and expansion of both private and public sectors.

## Tight monetary policy/tight fiscal policy

Interest rates potentially increase, suppressing private demand. Simultaneously, elevated taxes and reduced government expenditure result in decreased aggregate demand from both the public and private sectors.

## Factors Influencing the Interaction of Monetary and Fiscal Policies

- **Promotion of Potential Output Growth:** Governments aim to stabilize aggregate demand near full employment and grow potential output. Encouraging private investment can be achieved via accommodative monetary policy (low interest rates) and tight fiscal policy to ensure resources for a growing private sector.
- **Infrastructure and Workforce Quality:** Sometimes, the absence of quality infrastructure or a trained workforce can hinder growth. The government may prioritize spending in these sectors. If not balanced by increased taxes, this can lead to an expansionary fiscal stance. Paired with a loose monetary policy, it may induce inflation.
- **Political Context:** Policy decisions are influenced by politics. A weak government might increase spending to appease specific vested interests. To counteract potential inflation, restrictive monetary policy (higher interest rates, limited credit) might be employed.
- **Data Limitations:** Both policies are hampered by imprecise current economic data due to revisions and time lags. However, fiscal policy, compared to monetary policy, has

additional challenges. It's slower to implement and politically easier to expand than a contract.

- **Monetary and Fiscal Policy Interplay:** The relationship between these policies influences decisions. For instance, if tax cuts don't impact spending because of anticipated future taxes, policymakers might lean towards monetary tools.
- **Empirical Considerations:** The IMF's study highlighted the interaction between monetary and fiscal policies. They explored global fiscal loosening scenarios and how monetary policy responded. Key findings include:
  - **Without monetary accommodation:** Government spending has a significantly larger effect on GDP than social transfers. Targeted transfers to the poorest have a greater effect than non-targeted ones.
  - **With monetary accommodation:** Fiscal multipliers are generally larger. The impact of government expenditure and social transfers on GDP grows substantially, except for labor tax cuts.

### Question

Which one of the following will *most likely* have important effect on aggregate demand?

- A. Government expenditures.
- B. Increased transfer benefits.
- C. A reduction of personal income tax at all income levels.

### Solution

**The correct answer is A.**

Direct spending by the government has a greater impact on GDP than taxes and transfer benefits.

## **Learning Module 5: Introduction to Geopolitics**

### **LOS 5b: describe geopolitics and its relationship with globalization**

Globalization is the interaction and integration of individuals, organizations, and governments on a global scale. It is characterized by the cross-border movement of goods, information, employment, and culture.

Globalization allows businesses to find the most optimal inputs for their products, whether in relation to quality or cost-efficiency. Moreover, globalization paves the way for global investors to engage in various aspects like engineering, production, supply chain management, and logistics.

### **Features of Globalization**

Recall that political cooperation and non-cooperation serve as a perspective to evaluate geopolitical entities, mainly those at the national or state level. However, globalization emerges primarily from economic and financial collaborations, driven predominantly by non-state actors like corporations, individuals, and organizations.

Globalization is characterized by economic and financial cooperation, such as active trade of goods and services, capital flows, currency exchange, and cultural and information exchange. Actors involved in globalization are inclined to look outside their country for access to new markets, talent, or education.

Anti-globalization or nationalism is the promotion of a country's economic interests at the expense of or in opposition to those of other nations. Nationalism is characterized by limited economic and financial collaboration. Actors under this umbrella tend to prioritize domestic production and sales, minimize cross-border investments and capital movements, and limit foreign currency transactions.

Collaboration and globalization frequently go hand in hand (correlated). This means that political cooperation can promote or hasten globalization. Nonetheless, globalization also occurs in isolation.

## Motivations for Globalization

Three potential gains from participating in globalization are:

- i. **Increasing profits:** There are two ways in which this can happen:
  - **Increasing sales:** This can be done by selling one's products or services in new geographical regions.
  - **Reducing costs:** This can be done by sourcing cheaper inputs from different countries.
- ii. **Access to resources and markets:** Companies looking for long-term access to resources such as people or raw materials may need to work together. They eventually end up globalizing to have access to these resources.
- iii. **Intrinsic gain:** An activity's intrinsic gain is a byproduct or consequence that results in a benefit that overlaps profit. Accelerated productivity as a result of learning new techniques is a good example.

## Costs of Globalization

Potential disadvantages of globalization include:

### Unequal Accrual of Economic and Financial Gains

Jobs are created in a foreign country if a company moves a manufacturing plant to that country. Consequently, this may occasion job losses in the home country. In addition, the foreign country's businesses may have to compete with the corporation for workers and resources.

### Lower Environmental, Social, and Governance Standards

Companies that operate in low-cost nations frequently adhere to the local regulations in those nations. Globalization can deplete human, administrative, and environmental resources if

standards are lower in one country than in another. Under such circumstances, businesses ultimately lower their production standards.

## Political Consequences

Globalization can lead to income and wealth inequality, as some countries gain jobs while others lose them due to businesses moving abroad. This inequality can reduce political and economic cooperation.

## Interdependence

Increased economic and financial cooperation could make businesses more reliant on foreign resources for their supply chains. This, in turn, could make countries more reliant on foreign countries for certain resources.

## Threats of Rollback of Globalizations

There has been an international threat of deglobalization since 2008, when America started a series of “America First” initiatives. These policies have their roots in nationalism, isolationism, and worries for the security of the country and the economy. Multinational firms are reluctant to alter their procedures in the face of immediate conflicts brought about by these policies that might be settled in the long run.

Even with the ongoing discussions about deglobalization, it seems implausible to completely undo globalization. The following techniques are employed by these businesses to strengthen their supply chains:

- i. **Reshoring Essentials:** Encompasses the creation of local supply chains for vital goods to address emergencies effectively.
- ii. **Reglobalizing Production:** Involves replicating and bolstering supply chains to ensure greater robustness in production networks.
- iii. **Doubling down on Key Markets:** Involves expanding production in countries with

significant market presence while concurrently integrating external supply chains.

## Question

Which of the following is least likely a motivation for globalization by non-state actors?

- A. Intrinsic gain.
- B. Currency exchange.
- C. Access to resources and markets.

The correct answer is **B**.

Currency exchange is a characteristic of globalization but not necessarily a motivation for globalization by non-state actors.

**A is incorrect.** Intrinsic gain is a motivation for globalization by non-state actors. It is a side effect of an activity that generates a benefit beyond the profit itself. An example of an intrinsic gain is accelerated productivity that stems from learning new methods. Other motivations include increasing profits and access to resources and markets.

**C is incorrect.** Access to resources and markets such as talent and raw materials is a motivation for globalization by non-actors. Non-actors may also globalize to access market and investment opportunities.

## **LOS 5c: describe functions and objectives of the international organizations that facilitate trade, including the World Bank, the International Monetary Fund, and the World Trade Organization**

The global trade decline in the 1940s had some negative impacts. The living standards of people fell, and unemployment became a chronic issue. Because of this, there was a need to create international organizations to oversee economic relationships among countries.

As a result of the July 1944 conference, two main multinational organizations emerged: the World Bank and the International Monetary Fund (IMF). Later, the International Trade Organization was formed to handle the trade side of the international economic organization.

### **International Monetary Fund**

The IMF lends foreign currencies to its members to aid them during periods of crisis or important external deficits. The pool of gold and currencies contributed by members enabled this operation to succeed. The IMF's main job is to maintain the stability of the international monetary system. This system allows countries to trade goods and services by managing exchange rates and international payments.

Other objectives include:

- Acts as a platform for discussing international monetary issues.
- Encourages the expansion of global trade and champions job creation, economic development, and the reduction of poverty.
- Advocates for stable exchange rates and a transparent international payment system.
- Offers foreign currency loans to its members on a short-term basis with appropriate protections, assisting them in managing balance of payments challenges.

The IMF has expanded and redefined its operations since the global financial crisis of 2008 by:

- **Strengthening lending facilities:** The IMF has increased member nations' access to

funding resources and simplified its lending approach to mitigate the negative perception of borrowing for countries seeking financial assistance.

- **Enhancing global, regional, and country economic monitoring:** The IMF has refined its oversight of worldwide, regional, and national economies, enhancing its ability to guide member states.
- **Addressing Global Economic Disparities:** The IMF facilitates discussions among nations using a shared framework to tackle global economic imbalances.
- **Evaluating Capital Market Trends:** The IMF has allocated more resources to scrutinizing global financial markets and delivers training to national officials on effective financial system management.
- **Identifying Financial Sector Weaknesses:** Through its assessment program, the IMF alerts countries to vulnerabilities and potential risks in their financial sectors.

## The World Trade Organization

The World Trade Organization is unique because it's the only organization regulating cross-border trade relationships globally. Consequently, it replaced the General Agreement on Tariffs and Trade (GATT ) of January 1995. However, the GATT still exists in the form of its 1994 version.

The functions of WTO include:

- Administrate, implement and operate individual agreements, solve disputes, and act as a platform for negotiations.
- Ensure transparency of trade policies by supervising global policy settings.
- Provide training and cooperation to low-income, least-developed countries. As a result, this helps them adjust to the rules of the WTO.
- Act as a source of economic analysis and research.

## World Bank Group

World Bank Group's main objective is to enhance a good environment for normal economic growth and help developing countries curb poverty.

For growth and business appeal in developing nations, it's essential to:

- Enhance governmental structures and train their officials.
- Establish legal and judicial frameworks that are conducive to business.
- Safeguard personal and property rights and uphold contractual agreements.
- Build strong financial infrastructures to cater to needs from micro-loans to substantial corporate financing.
- Address and mitigate corruption.

Given the above requirements, the objectives of the World Bank Group include:

- Provide funds for projects in developing countries and financial and technical expertise aimed at helping those countries fight poverty.
- Ensure the capabilities of its partners, people in developing countries, and its own staff.
- Provision of analysis, advice, and information to its member countries to enable them to achieve the Lasting economic and social improvements their people need.
- Help create economic infrastructures to set up domestic financial markets and a well-functioning financial industry in developing countries.

## Question

Among these trade organizations, which one regulates cross-border trade relationship.

across the globe?

- A. World Bank Group.
- B. World Trade Organization.
- C. International Monetary Fund.

## Solution

The correct answer is **B**.

The World Trade Organization is the only organization that is in charge of cross-border trade.

## LOS 5d: describe geopolitical risk

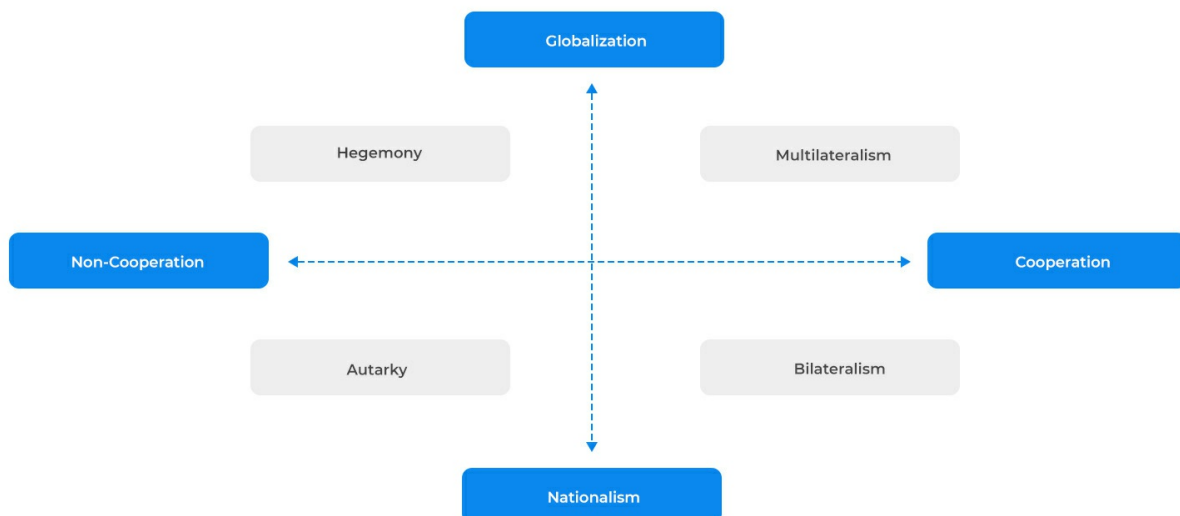
Geopolitical risk is the risk posed by tensions or acts between parties that impact the regular and peaceful development of international relations. When the geographic and political elements influencing country relations change, geopolitical risk increases. A change in legislation, a natural disaster, a terrorist attack, a heist, or a conflict could all result in a geopolitical risk shift.

## Archetypes of Country Behavior

Based on political cooperation versus non-cooperation and globalization versus nationalism, there are four archetypes of country behavior: Autarky, Hegemony, Multilateralism, and Bilateralism.



### Geopolitical Actors and Risks



### Autarky

This refers to nations with little foreign trade or financing and seeking political independence.

Since they are self-sufficient, autarkic nations can exert complete control over the flow of products, services, and technology. This makes them politically stronger.

During times of autarky, a nation's political and economic growth can advance more quickly. A case in point is China in the 20th century. However, it can also result in a gradual loss of economic development. North Korea qualifies as a good example in this regard.

## **Hegemony**

Hegemonic nations often lead regions or the world, exerting political and economic control to secure resources. Countries aligning with the hegemon gain access to the benefits it provides.

A country with a hegemonic system can influence global affairs, while countries aligning themselves with the hegemon's rules may enjoy rewards from the global leader. However, as a hegemon's influence dwindles, it may become more competitive and consequently increase geopolitical risk. An example is Russia's influence on natural gas supply, which influences countries that rely on its natural gas.

## **Multilateralism**

These are nations that engage in rule harmonization and mutually beneficial trade agreements. Their businesses have several trading partners and are totally linked to global supply chains. A good example is Singapore. Among other benefits, multilateralism allows a country to access resources and markets globally.

However, such a country may become highly dependent on international cooperation for its economic growth. This makes them more vulnerable to geopolitical risk.

## **Bilateralism**

Bilateralism is the practice of two nations cooperating in the political, economic, financial, or cultural spheres. Even though bilateral agreements are made one at a time, governments that engage in bilateralism may have relationships with several distinct nations.

Japan was once a bilateral country that built a strong export market for its products. Bilateral

agreements are not enough to deal with global issues such as global tax avoidance.

## LOS 5e: describe tools of geopolitics and their impact on regions and economies

Geopolitical tools refer to methods used by geopolitical actors to pitch their interests before others. The tools an actor chooses to use are ultimately the sources of geopolitical risk.

Tools of geopolitics may be separated into:

- i. **National Security Tools:** Tools for national security are those that are used to exercise direct or indirect control over a state actor's access to resources, citizens, or borders. National security tools can either be active (used at the time of analysis) or threatened (not currently used, but their use is likely sufficient to call for concern). Armed combat is one example. This has two primary effects:
  - The destruction of physical infrastructure.
  - The migration from areas of armed conflict.
- ii. **Economic Tools:** These are the steps used to support cooperative or non-cooperative positions through economic means. Common markets, global tariff rule harmonization, and multilateral trade agreements are examples of economic tools. Economic instruments may also be inherently non-cooperative. A non-cooperative strategy for establishing economic power is nationalization.
- iii. **Financial Tools:** These are the measures taken to support cooperative or non-cooperative positions using financial mechanisms. They include enabling international investment and free currency exchange across borders, as well as restraining foreign investment and limiting access to local currency markets.

Financial instruments may lower geopolitical risk if they promote collaboration. These same instruments may also lead to weaknesses in the global system by rendering other nations susceptible to changes in other nations' policies. An example would be the vulnerability to US monetary policy changes of countries that trade internationally using the USD.

## Multi-Faceted Approaches

It is possible to combine cooperative political, economic, and financial systems. An example is cabotage. Cabotage allows a foreign firm to transport goods and passengers within a country. Numerous nations, even those that have multilateral trade agreements, place limitations on cabotage in all areas of transportation since cabotage requires coordination in areas like economic coordination and physical security.

International organizations may utilize a variety of geopolitical tools to achieve their goals. Many geopolitical actors are more likely to use cooperative tools and not non-cooperative tools/ initiate conflicts with other actors.

## Question

Which of the following would *least likely* be classified as a geopolitical tool?

- A. Natural tools.
- B. Financial tools.
- C. Economic tools.

The correct answer is **A**.

Natural tools are not geopolitical tools. Geopolitical tools are devices used by geopolitical actors to reinforce their interest with respect to others. There are three types of geopolitical tools that geopolitical actors use: national security, economic, and financial.

**B is incorrect.** Financial tools are geopolitical tools used by geopolitical actors. They are used to reinforce cooperative and non-cooperative stances via financial mechanisms such as free exchange of currencies across borders or limiting access to local markets.

**C is incorrect.** Economic tools are geopolitical tools used by geopolitical actors. They include multilateral trade agreements or common markets

## **LOS 5f: describe the impact of geopolitical risk on investments**

The degree to which investors consider geopolitical risk when making decisions will significantly depend on their investment goals and risk appetite. While certain investors may welcome geopolitical risk, it may also be shunned by others in their decision-making process.

### **Types of Geopolitical Risks**

The three primary types of geopolitical risk are:

#### **i. Event Risk**

Event risk is based on predetermined dates, such as elections, the enactment of new laws, or other date-based events, such as festivals or political anniversaries. Investor expectations frequently shift as a result of political events. Political timelines are a common starting point for risk analysts when evaluating event risk.

#### **ii. Exogenous Risk**

Exogenous risk is an abrupt or unplanned risk that affects a nation's willingness to cooperate and non-state actors' capacity to globalize. Unexpected revolutions, invasions, or the aftermath of natural calamities are a few examples.

#### **iii. Thematic Risks**

Thematic risks are risks that are known, and they grow and evolve with time. Examples include the persistent danger of terrorism, climate change, migratory patterns, the emergence of populist movements, and cyber threats.

### **Evaluating Geopolitical Threats**

In the financial environment, geopolitical risk is constantly present and has various effects on assets. An investor evaluates geopolitical risk in terms of the following three categories:

#### **i. Likelihood It will Occur**

The likelihood of the occurrence of risk is the possibility that it will materialize. The procedure of measuring likelihood is, however, difficult.

More collaborative and globalized nations are generally less likely to incur geopolitical risk due to higher political, economic, and financial costs incurred by the partners inflicting those risks. However, the same countries may also be more vulnerable to certain risks. For instance, risks that affect the countries they cooperate with may also affect them.

Internal political stability, economic need, and governmental actors' motivations all contribute significantly to the likelihood of disruptive action.

## ii. **Velocity (Speed) of its Impact**

This is the rate at which geopolitical risk affects an investor's portfolio. We will look at short-term or "high velocity", medium-term, and long-term or "low velocity".

Short-term or high velocity may have an impact on the entire market. Exogenous or "black swan" events will likely fall under this classification. Black-swan events are unusual, unpredictable incidents that have a significant impact, for example, a world war.

Risks that have a medium-term impact may affect business operations, expenses, and investment prospects, resulting in reduced valuations. They often target particular industries and affect some businesses more than others.

Long-term risks might significantly affect the environment, society, government, and other areas. Long-term risks may make investors change their asset allocations. Their immediate effect on portfolios is, however, likely to be less significant.

**Note:** Some risks may affect investments with more than one speed of impact.

## iii. **Size and Nature of that Impact**

The effects of risk on investor portfolios might take many different forms. When evaluating the significance of a risk to the investing process, investors should consider the magnitude of the risk's impact. A high risk may require a deep analysis of its drivers

and motivations whereas a low impact risk may not require as much analysis.

The nature of the impact might be discrete or broad. A discrete impact is one that only affects one business or industry at a time. A broad impact, on the other hand, affects an entire industry, a nation, or the whole global economy.

Investors should consider all three geopolitical risk factors—likelihood, velocity, size, and nature of impact (together)—when evaluating geopolitical risk for portfolio management.

**Note:** A risk that is extremely probable but has minimal effect on a portfolio may not warrant in-depth research and investor attention. However, a risk that is less likely to occur but whose impact will be high may necessitate building a scenario for response, but without regular monitoring and assessment

## Impact of Geopolitical Risk

The effect of risks on investment portfolios can present itself in numerous ways. As such, investors need to evaluate the magnitude of a risk's influence when determining its relevance in the investment process. High-impact risks warrant extensive study, while low-impact risks do not. External factors may also increase the size of a risk's impact, for instance, risk will have more impact on markets experiencing contraction or economic downturn.

The impact of geopolitical risks can be classified as **discrete** (impacting a specific company or sector) or **broad** (affecting larger sectors, countries, or the global market).

In managing portfolios with geopolitical risks in mind, investors should collectively consider all three geopolitical risk factors (likelihood, velocity, and size and nature of impact). A risk that's very probable but has minor implications might not require detailed scrutiny. Conversely, a risk with substantial consequences but a low occurrence chance might necessitate response planning without constant oversight.

Because geopolitical risks rarely develop in a linear fashion, we use scenario analysis and signposting (and not a single-point forecast) to monitor their likelihood, velocity, and impact on a portfolio.

## Scenario Analysis

Scenario analysis is the analysis of portfolio outcomes across various situations or states of the world to help teams understand their position with respect to a risk that might affect them. By understanding their positions, teams can make good investment decisions at opportune times.

Scenario analysis might be qualitative, quantitative, or a combination of the two.

Creating a base case for an event is the first step in a simple qualitative scenario development. Investors can then think about the positive and negative possibilities from there to create best and worst-case scenarios.

The complexity of quantitative scenarios might vary greatly. A stylized scenario is a type of simple quantitative scenario in which a portfolio's sensitivity is evaluated in relation to one important aspect that is significant to it. Such an aspect could be interest rates, asset prices, or exchange rates.

Scenario construction is a great technique for tracking risks and determining valuable portfolio actions to take. However, it requires investors to consistently commit their time and efforts.

## Tracking risks using signposts

A signpost is an indicator, a piece of data, or an event suggesting that risk is becoming more or less likely.

A signpost is analogous of a traffic light. If both quantitative and qualitative data indicate that a risk is minimal in terms of likelihood, velocity, or impact, then the signposts display a green signal, implying no immediate action is necessary. If the color changes to amber (suggesting a moderate level of risk in terms of likelihood, speed, or impact) it might be prudent to exercise increased caution and readiness for that specific risk. If a risk increases in terms of likelihood, velocity, or impact (turns red), it might be essential to formulate a response strategy.

The ability to recognize signposts should enable a team to distinguish between signal and noise and respond when signposts indicate increased risk. It might be difficult to find the correct

signposts without some trial and error. It is therefore important for investors to differentiate between policy and politics. For instance, two leaders can differ politically but the policies they enact are the ones that will create a more durable portfolio impact.

Certain combinations of economic and financial market conditions can act as clear indicators of impending trouble. For instance, increased inflation and declining employment may indicate political turmoil.

## **Manifestations of Geopolitical Risk**

Geopolitical risk can have different impacts on investor portfolios. High-velocity risks will manifest in market volatility through prompt changes in asset prices such as commodities, foreign exchange, stocks, and bond prices.

Low-velocity risk can lead to extended effects on investor inputs. Persistent disturbances can cause reduced revenue, increased expenses, or a combination of both, potentially diminishing a company's valuation.

Investors require higher compensation for their investments in countries or sectors perceived to be more prone to geopolitical risk.

## **Acting on Geopolitical Risk**

Assessing a risk's likelihood, velocity, and impact might assist an investor in isolating the risks that may be the most significant.

Asset allocators can use a top-down approach to consider geopolitical risk in their asset allocation strategy. Risks' likelihood, velocity, and impact may impact key capital market assumptions and an asset allocator's positioning in some countries or regions.

Investors might consider geopolitical risk in multi-factor models at the portfolio management level.

The importance of geopolitical risk to an investment process is dependent on an investor's objectives, risk tolerance, and time horizon.

## Question

Which of the following geopolitical risks is most likely a known risk that evolves and expands over a period of time?

- A. Event risk.
- B. Thematic risk.
- C. Exogenous risk.

**The correct answer is B.**

Thematic risk is a type of geopolitical risk that is known, evolves, and expands over a period of time. Examples include climate change and ongoing threats of terrorism.

**A is incorrect.** Event risk is a type of geopolitical risk that revolves around set dates or date-driven milestones such as elections or political anniversaries.

**C is incorrect.** Exogenous risk is a type of geopolitical risk. It is a sudden or unanticipated risk that impacts a country's cooperative stance or the ability of non-state actors to globalize. Examples include invasions and sudden uprisings.

## **LOS 5a: describe geopolitics from a cooperation versus competition perspective**

Geopolitics examines how geography influences national and international relations. Analysts in this field examine actors, including individuals, organizations, companies, and national governments, that engage in political, economic, and financial activities and their interactions.

### **State and Non-State Actors**

The two main types of actors relevant to geopolitics are:

1. State actors.
2. Non-state actors.

#### **State Actors**

State actors often exercise authority over a nation's national security and resources. They do so through national governments, political groups, or country leaders. State actors include presidents, heads of government, and political parties.

#### **Non-State Actors**

Non-state actors engage in international political, economic, or financial activities without direct access to a nation's resources or security. Examples of non-state actors include non-governmental organizations (NGOs), multinational corporations, charitable groups, and even influential people such as corporate executives or cultural celebrities.

State and non-state actors are influenced by their relationships and factors impacting their allies and foes. As such, the international landscape consists of complex relationships that impact events, decisions, and financial trends. While there is no universal model for geopolitical actors, identifying and classifying a country's challenges and prospects can assist in predicting potential geopolitical risks.

Moreover, we may be able to estimate the possibility of geopolitical risk by comprehending and classifying the risks and opportunities a nation faces. Economic, financial, and national security concerns, as well as social, cultural, and non-state actors, significantly impact nations and their governments.

## Features of Political Cooperation

**Cooperation** is the process by which nations get together to collaborate toward attaining a common objective. Political cooperation is the degree to which countries work toward agreements on rules and standardization for the activities and interactions between them.

At the most fundamental level, interactions between nations or national governments (State actors) can either assume a **cooperative** or **competitive/non-cooperative** form.

A cooperative nation participates in and supports international accords on commerce, immigration, and regulation. In addition, such a nation embraces standardization of laws, tariff harmonization, and the free flow of information, including technology transfer.

On the other hand, a **non-cooperative** nation has erratic, often arbitrary policies and limits cross-border trade in capital, goods, and people. Aside from all these, a non-cooperative nation engages in retaliation and contributes little to technological exchange.

## Reasons for Cooperations

Reasons why a country may cooperate with others include:

1. **National Security or Military Interest:** National security means safeguarding a country and its people, economy, and institutions from external threats like terrorism and natural disasters. Geographical factors play a significant role in a nation's approach to national security and its level of cooperation. For example, countries with strong trade connections, like Singapore, or those serving as trade hubs, like Panama, can impact global dynamics due to their strategic locations.

2. **Economic Interest.** Social stability, another crucial element of national security, can be enhanced by increasing national wealth and reducing income disparity. It is becoming more vital for national companies to operate globally than before. Countries collaborating for economic gains usually have two main goals: they want to create fair opportunities for their businesses worldwide or secure essential resources through trade.
3. **Geophysical Resource Endowment:** Geophysical resource endowment, like favorable geography and climate, along with access to food and water, is crucial for sustainable growth. Different countries have varying levels of these resources, with some being self-sufficient and others heavily reliant on others. These disparities can create power imbalances. Nations with plenty of these resources might gain political influence over those in need. But if these resources benefit only certain groups, it can lead to unrest within the resource-rich country.
4. **Standardization:** Standardization is the process of defining protocols for the manufacture, marketing, delivery, or usage of a good or service. There is a great need for governments to work with others on the harmonization of the norms of engagement. The agreement of all concerned parties to abide by these protocols amounts to standardization. Standardization can take a variety of shapes, including operational synchronization, process standardization, and regulatory collaboration.
  - An example of operational synchronization is containerization, in which case standards are set for containers to ensure uniformity in size and shape. This increases international trade by reducing costs and time of shipping goods.
  - An example of process standardization is the Society for Worldwide Interbank Financial Telecommunication (SWIFT ), established to provide a global financial infrastructure. The fact that financial transactions across borders had become costly necessitated the establishment of SWIFT.
  - An example of regulatory collaboration is the Basel Committee on Banking Supervision (BCBS), established to facilitate better supervision of the global banking sector and international capital flows.

5. **Cultural Considerations and “Soft Power”.** Cultural factors may bind countries together. These include enduring political relationships, migration trends, common experiences, or cultural affinities. Countries may use soft power, a nonviolent method of swaying the actions of another nation, in their international engagements. Soft power can be developed gradually through initiatives such as cultural programs, advertising, travel scholarships, and university exchanges.

## **Hierarchy of Interests**

The national interest of a country encompasses its goals and ambitions. For some countries, geography plays a major role in defining their national interests. This can include seeking self-determination, striving for independence, establishing clear national boundaries, or desiring territorial expansion.

Meanwhile, other countries perceive national interest in a broader context, factoring in the economic and social aspects mentioned earlier. This holistic perspective may lead to conflict among a nation's multiple critical priorities, making the analysis of geopolitical players and their intentions more complex.

A country's national interest can be thought of as a hierarchy with survival as the top priority and less crucial factors below. Governments use this hierarchy to guide their decisions, choosing cooperation when it benefits the nation. When conflicting interests arise, the higher-ranked interest takes priority.

As an illustration, while tariff alignment might favorably impact a nation, the collaboration could come at a significant price if the countries involved have military disagreements. Should military objectives rank higher in these countries' interest hierarchies, they might find it against their national interest to collaborate, notwithstanding any possible advantages.

## **Power of the Decision Maker**

The national interest hierarchy may become less consequential in a scenario where the priorities of a new government differ from those of the government that preceded it. Further, the duration of a nation's electoral cycle significantly affects priority classification. Each of the political parties and individuals making decisions at the national level has its own set of interests and influences. It is crucial to appreciate that the motivations of decision-makers can influence a nation's cooperative and non-cooperative decisions.

## **The Role of Institutions**

Institutions are established organizations in a society. They can manifest as formal entities, like universities and legal organizations. Conversely, they can also be informal, such as customs or behavioral patterns important to a society.

Not all institutions are born from government initiatives; they can also emerge from NGOs, charities, spiritual rituals, familial structures, the media sphere, political factions, and educational methodologies.

Solid and robust institutions often lead to a more predictable political climate both domestically and abroad. This predictability fosters a conducive environment for nurturing collaborative alliances.

Countries with robust institutions that focus on government transparency, the rule of law, and property rights gain more respect and independence on the global stage. These institutions not only strengthen alliances but also ensure the longevity of these partnerships.

## Question

Which of the following is *least likely* a reason why a country may want to cooperate with others?

- A. National security.
- B. Economic interest.
- C. Political self-determination.

The correct answer is **C**.

Political self-determination is a reason why a country may be non-cooperative. Countries where political self-determination is more important than the benefits of any cooperation take a non-cooperative stance.

**A is incorrect.** National security is a motivation for cooperation. It involves protecting the country from such external threats as military invasion, cyber-security, and natural disasters.

**B is incorrect.** Economic interest is another motivation for cooperation. Countries choose to cooperate to secure essential resources through trade or to level the playing field for their companies or industries.

## Learning Module 6: International Trade

### **LOS 6a: describe the benefits and costs of international trade**

Most economists agree that the advantages of international trade outweigh the disadvantages. Below are the main benefits and costs associated with international trade.

### **Benefits of International Trade**

- **Countries gain from exchange and specialization:** Countries receive high prices for exports and pay lower prices for imports (instead of producing them at a higher cost), which in turn enables a more efficient resource allocation as a country will increase its production of the goods it exports and reduce its production of the goods it imports.
- **Trade liberalization increases real GDP:** efficient resource allocation, learning by doing, higher productivity, knowledge spillovers, and trade-induced changes in policies that affect incentives for innovation are all factors that can increase a country's GDP.
- **International trade offers a platform for exchanging ideas and for the free flow of technical expertise.**
- **International trade can lead to the development of better-quality institutions and policies that encourage domestic innovations.**
- **Greater efficiency** in that countries that have a comparative advantage in the production of a specific commodity will specialize in the production of the said commodity.
- **Industries experience economies of scale:** Many industries, for instance, the automobile industry in Europe, experience economies of scale. As these industries grow and have larger market sizes, their average production costs per unit decrease.
- **Increased competition:** Foreign competition can reduce the monopoly power of

domestic firms, pushing them to become more efficient.

## Costs of International Trade

- **Loss of jobs and inequality in income in developed countries** caused by competition from importing from other countries.
- **Less efficient firms may exit the market** as a result of resource reallocation in an industry depending on whether it is exporting(expanding) or facing import competition(contracting). As the less efficient farms exit the market, unemployment rates increase in developed countries and there may be need to retrain the displaced workers for jobs in expanding (exporting) industries.

## Question

Among the following, which one is *least likely* a cost of international trade?

- A. Loss of jobs.
- B. Inequality in income.
- C. Availability of products.

## Solution

The correct answer is **C**.

Due to the removal of tariffs and restrictions, companies produce and ship various goods across the globe. The consumer can then choose among all of these products.

**A and B are incorrect.** Some costs, such as inequality in income and unemployment, can be incurred. This has been seen in the past few decades, where most manufacturers have moved from Western to Eastern countries. Westerners have been able to buy goods at cheaper prices, but many manufacturing firms have closed shop simultaneously, leaving workers unemployed.

## **LOS 6b: compare types of trade restrictions, such as tariffs, quotas, and export subsidies, and their economic implications**

Governments may enact policies that limit the free exchange of goods and services between countries. Such policies are known as trade restrictions or trade protections and include tariffs, import quotas, voluntary export restraints (VER), subsidies, embargoes, domestic content requirements, and capital restrictions.

Trade restrictions are used to: Protect already established domestic industries from foreign competition, protect new domestic industries from foreign competition until they get established, protect and increase domestic employment, generate income from imposed tariffs, retaliate against the restrictions imposed by another country, and to protect certain industries/sectors for national security purposes.

Different trade restrictions are discussed below:

### **Tariffs**

A tariff is a type of tax that imposes additional costs on imports. Tariffs primarily aim to protect the domestic industries that produce similar goods and to reduce trade deficits.

The economic impact of tariffs is reduced demand for imported goods as they will be trading at a price above the free trade price.

We need to define “small” and “large” countries in the context of tariffs. A small country is a price taker and cannot influence market prices whereas a large country is a large importer of goods and can influence the world market price.

Tariffs imported by large countries will force exporters to reduce the price of goods/services to retain their market share in the importing country, thereby altering the terms of trade and redistributing income from the exporting to the importing country.

As such, theoretically, a large country can only increase its welfare through tariffs if its trading partner does not retaliate and if the benefits of improving the terms of trade are greater than the

deadweight loss resulting from the tariff.

In summary, the net welfare effects of tariffs are:

- Loss of consumer surplus due to price increase.
- A gain in producer surplus as local producers can sell their output at higher prices.
- Gain of tariff revenue to the government.

**Note:** The loss in consumer surplus is greater than the gain from producer surplus and increased tariff revenue to the government, thereby resulting in a deadweight loss to a country's welfare.

## Import Quotas

Import quotas refer to the regulations set by a country that restrict the amount of a specific good that can be imported into the country, usually for a specified period. On the other hand, import licenses specify the quantity of goods that can be imported into a country.

As compared to tariffs where the government of the country imposing the tariff gains tariff revenue, the effect of quotas on the government is uncertain. Foreign producers can raise their prices after a country imposes a quota to gain higher profits than they would without the quota. These profits are known as quota rents.

The welfare loss to an importing country after imposing import quotas is greater than that under an equivalent tariff. However, the loss can be similar to that of an equivalent tariff if the government of the importing country can capture the quota rents by auctioning import licenses at a fee.

## Voluntary Export Restraints (VER)

As opposed to an import quota that is created by the government of an importing country, a VER is created by the government of the exporting country to limit the number of goods it can export to its trading partner. A VER allows the quota rent resulting from the decrease in trade to be

captured by the exporting country, resulting in a welfare loss to the importing country.

## **Export Subsidies**

An export subsidy is when the government pays a firm for each unit it exports in a bid to stimulate exports.

Export subsidies disrupt the functioning of the free market and distort trade away from comparative advantage, thereby reducing welfare.

Importing Countries may impose countervailing duties, which are taxes levied by an importing country on subsidized goods entering the country.

Export subsidies may create an incentive for domestic producers to shift their sales from the domestic to the export market to benefit from higher prices (international price plus the export subsidy), increasing the price of the goods in the domestic markets by the amount of the subsidy for a small country.

For a large country, the world price will decline as the large country increases exports. As such, the net effect in both the large and small countries is negative, with large countries experiencing a higher decline.

## **Capital Restrictions**

Capital restrictions refer to the measures a government or central bank takes to control the flow of capital. This could be capital flowing in and out of the economy. Controls include taxes, tariffs, volume restrictions, etc., whereas regulations include foreign exchange, tax regulation, credit regulation, and investment restrictions.

They have similar effects as trade restrictions – protect domestic industries – but capital restrictions can slow growth, and more restrictions can mean higher domestic prices for goods.

Controls are useful when they enable a government to deal with currency exchange rates and

interest rates. The government benefits from tariffs since they are a type of revenue (tax).

Industries benefit from reduced competition since import prices are high. On the flip side, consumers do not benefit because the increase in import prices means higher prices. The most apparent difference between trade restrictions and capital restrictions is that trade restrictions limit access to a wide range of goods and services. In contrast, capital restrictions limit access to financial markets.

## Other Restrictions

- **Domestic content provisions** specify that some proportion of the value added or components used in production should be of domestic origin.
- **Embargo** is a government order that restricts trade or commerce with a specified country or the exchange of specific goods. Embargoes are typically enacted due to unfavorable political or economic circumstances between nations.

Summary of Effect of Trade Restrictions  
on Producer and Consumer Surpluses

	Tariff	Import Quota	Export Subsidy	VER
Impact on	Importing Country	Importing Country	Exporting Country	Importing Country
Producer Surplus	Increases	Increases	Increases	Increases
Consumer Surplus	Decreases	Decreases	Decreases	Decreases
Price	Increases	Increases	Increases	Increases
Domestic Consumption	Decreases	Decreases	Decreases	Decreases
Domestic Production	Increases	Increases	Increases	Increases
Trade	Imports decrease	Imports decrease	Exports decrease	Imports decrease

Summary of Effect of Trade Restrictions on  
Government Revenue and National Welfare.

	Tariff	Import Quota	Export Subsidy	VER
Government Revenue	Increases	Mixed (depends on whether quota rents are captured by the importers or exporters)	Decreases	No change
National Welfare	Decreases in small countries and increases in the larger country.	Decreases in small countries and increases in the larger country.	Decreases	Decreases

## Question

Which of the following trade restrictions will *most likely* increase the revenue of the country imposing the restriction?

- A. Tariffs.
- B. Import Quotas.
- C. Export subsidies.

## Solution

**The correct answer is A.**

The government of the country imposing tariffs (taxes that impose additional revenue on imported goods) gains the tariff revenue.

**B is incorrect.** Import quotas will only benefit the government if it sells import licenses. Import quotas majorly benefit foreign producers as they sell their produce at a higher price to capture the quota rent.

**C is incorrect.** Export subsidies decrease revenue to the government as the government spends to pay firms for each unit they export.

## **LOS 6c: explain the motivations for and advantages of trading blocs, common markets, and economic unions**

A trading bloc is a group of countries that have mutually agreed to reduce and progressively eliminate barriers to trade and the movement of factors of production among the members of the bloc.

Regional barriers to trade, such as tariffs, within members of a trading bloc are usually low or non-existent. Examples of trading blocs include the Asia-Pacific Economic Cooperation (APEC) and the Association of Southeast Asian Nations (ASEAN).

### **Types of Trading Blocs**

#### **Free Trade Area (FTA)**

In FTA, all barriers to the flow of goods and services among the members have been removed. Each member within the FTA retains its trade policies against non-members.

An example of an FTA is the United States-Mexico-Canada Agreement (USMCA).

#### **Customs Union**

The Customs Union is an improvement of the FTA. It allows the free flow of goods and services among the members and has a common trade policy against non-members. An example of a customs union is Belgium, the Netherlands, and Luxemburg (Benelux) of 1947.

#### **Common Markets**

Common markets incorporate all features of the customs union and also allow the free movement of factors of production among its members. Examples include the East African Common Market and The Southern Cone Common Market (MERCOSUR) of Argentina, Brazil, Paraguay, and Uruguay.

## Economic Union

The economic union has a higher economic integration level than the common market. It includes all features of the common market and additionally incorporates common economic institutions and coordination of economic policies among members.

If the members of the economic union agree to have a common currency, then it is also called the monetary union. An example of an economic union (also a monetary union) is the European Union (EU).

## Regional Integration

We can view regional integration as a move towards freer trade, where members get preferential treatment as compared to non-members. Members eliminate or reduce trade barriers against each other, resulting in a more efficient resource allocation.

Trade creation and trade diversion are the two static effects directly resulting from the creation of the customs union.

**Trade creation:** This is when regional integration results in member countries replacing higher-cost domestic production with lower-cost imports from other members.

**Trade diversion:** This is when member countries replace lower-cost imports from non-member countries with higher-cost imports from member countries. The higher-cost imports from member countries will be cheaper because of the elimination of trade barriers (tariffs on imports) between member countries.

The net welfare to a country is positive if trade creation is larger than trade diversification.

## Advantages of Trading Blocs

- **Improved specialization based on comparative advantage:** Trading blocs allow member countries to focus on producing goods where they have a cost advantage,

leading to efficient resource utilization.

- **Reduction in monopoly power due to foreign competition:** With more players in the market, monopolistic power diminishes, leading to competitive prices and enhanced product quality.
- **Economies of scale from larger market size:** larger markets provided by trading blocs enable firms to produce on a larger scale, leading to reduced costs per unit.
- **Learning by doing:** As countries trade and produce more, they gain experience and expertise, resulting in improved production methods and efficiencies.
- **Technology transfer:** Trading blocs facilitate the sharing of technology between member nations, leading to modernization and improved production capacities.
- **Knowledge spillovers:** Ideas and innovations are easily shared within a trading bloc, promoting creativity and fostering innovation.
- **Greater foreign investment:** Member countries often see an influx of foreign investment due to the attractive and larger market provided by the bloc.
- **Better quality intermediate inputs at world prices:** Trading blocs often provide access to high-quality raw materials and intermediate goods at competitive global prices.
- **Higher interdependence among members of the regional trading bloc results in reduced potential conflicts:** As countries trade more with each other, their economies become intertwined, making conflicts less likely due to mutual economic interests.

## Disadvantages of the Trading Blocs

- **Potential Harm to Low-skilled Workers:** There can be negative impacts on low-skilled workers, especially if there's an influx of low-skilled labor-intensive imports from other member countries.

- **Adjustment Costs:** As import competition might cause inefficient firms to shut down, workers in these firms may become temporarily unemployed until they find new opportunities.
- **Long-term Employment Losses:** Workers displaced due to regional integration might face enduring wage losses if they don't secure jobs that pay as much as their previous ones or if they remain unemployed for extended periods.
- **Concerns Over National Sovereignty:** There are apprehensions about national sovereignty, especially when countries of varying sizes and economic strengths are part of the same trading bloc. This can create power imbalances and challenges in decision-making.

## Challenges to Greater Integration

- **Cultural and Historical Barriers:** Cultural differences, along with historical considerations such as wars and conflicts, can interfere with the social and political processes required for deeper integration.
- **Restrictions on Independent Economic and Social Policies:** A significant degree of economic integration can restrict member countries from pursuing their economic and social policies independently. With free trade, as well as the mobility of labor and capital, policies aimed at controlling relative prices or quantities within a country can be countered. Moreover, in a monetary union, countries can't control monetary policy, and currency devaluation or revaluation isn't an option to address persistent imbalances. When such imbalances occur, they can lead to crises that have repercussions for other countries, as seen in the Greek fiscal crisis in 2010.

## Investment Implications

From an investment perspective, regional integration offers new opportunities for trade and investment. However, differences in culture, tastes, and competitive conditions that exist within

member countries may limit the potential benefits of investments within a trading bloc. Problems faced by individual members within a trade bloc may also rapidly spread to other members within the bloc.

## Question

If Columbia and Ecuador have free trade between themselves and a common policy excluding non-members from this free trade, then they are a part of a:

- A. Customs union.
- B. Free trade area.
- C. Common market.

## Solution

**The correct answer is A.**

Customs unions allow free movement of goods and services and also form a mutual policy against non-members.

**B is incorrect.** A free trade area is a grouping of countries where trade barriers are abolished.

**C is incorrect.** A common market is a free trade area with relatively free movement of capital and services.

## **Learning Module 7: Capital Flows and the FX Market**

**LOS 7a: describe the foreign exchange market, including its functions and participants, distinguish between nominal and real exchange rates, and calculate and interpret the percentage change in a currency relative to another currency**

The foreign exchange (FX) market is the world's largest market, with a daily turnover of approximately USD 6.6 trillion in 2019. It operates 24 hours daily, facilitating international trade and cross-border capital flows with participants from various backgrounds.

### **Functions of the Foreign Exchange Market**

1. **Facilitating international trade:** The FX market enables the exchange of goods and services in foreign currencies, essential for companies and individuals engaged in cross-border transactions.
2. **Accounting for financial market transactions:** Financial market transactions are a big part of FX market turnover. When investors move money into or out of foreign assets, they often have to convert currencies, which means they might face exchange rate risk. For example, if a Canadian investor buys Apple stocks in US dollars, they risk losing money if the stock value and the US dollar weaken compared to the Canadian dollar.
3. **Providing flexibility for financial goals:** The FX market offers products such as spot transactions, FX swaps, options, and forward contracts, providing flexibility for diverse financial objectives, including speculation and risk hedging.

### **Basic Conventions**

Currencies are often referred to by **standardized three-letter codes** (e.g., USD for US Dollar, EUR for Euro) agreed upon through the **International Organization for Standardization (ISO)**.

It is crucial to distinguish between individual currencies and exchange rates. One can possess an individual currency, say, USD 100. On the other hand, an exchange rate is the price of one

currency in terms of another.

The exchange rate can be seen as the number of units of one currency (price currency) that one unit of another currency (base currency) will buy. As such, the exchange rate can be viewed as the cost of one unit of the base currency in terms of the price currency. For example, EUR/USD refers to the exchange rate between the euro and the US dollar.

Note that the three-letter code can be used to signify an individual currency or an exchange rate. For instance, EUR in a professional FX market is the exchange rate between the euro and the US dollar (EUR can also signify an individual currency). As such, it is important to understand the context in which the three-letter codes are used.

For the sake of avoiding this confusion, the exchange quoting convention is given by "A/B," which implies the number of units of currency A that one unit of currency B will buy.

## Nominal and Real Exchange Rates

**Nominal exchange rates** are the actual exchange rates in the market, expressed as the price of one currency in terms of another. It is expressed in the convention of "A/B," referring to the number of units of currency **A** that one unit of currency **B** will buy. For example, a USD/EUR exchange rate of 1.1650 means 1 euro will buy 1.1650 US dollars.

The purchasing power parity (PPP) theory suggests that nominal exchange rates adjust to equalize the prices of identical goods in different markets. However, due to factors such as trade barriers, transaction costs, and differences in goods and services, nominal exchange rates often deviate from PPP.

**Real exchange rates** are indexes constructed by economists and other market analysts to assess changes in the relative purchasing power of one currency compared with another. In other words, real exchange rates adjust nominal rates using price levels in each country to compare relative purchasing power.

The real exchange rate goes up when the nominal exchange rate (how much domestic currency you get for one unit of foreign currency) and the foreign price level increase. It goes down when the domestic price level increases.

As such, the higher the real exchange rate is, the lesser foreign goods, in real terms, an individual can buy, and the lower that individual's relative purchasing power will be compared with the foreign country.

Mathematically, the real exchange rate is the relative price levels in the domestic and foreign countries. The formula for the real exchange rate between domestic (d) and foreign (f) currencies is given by:

$$\text{Real exchange rate (d/f)} = \frac{S_{d/f} \times P_f}{P_d} = S_{d/f} \times \left(\frac{P_f}{P_d}\right)$$

Where:

$S_{d/f}$  = The spot exchange rate (quoted in terms of the number of units of domestic currency per one unit of foreign currency).

$P_f$  = The foreign price level quoted in terms of the foreign currency.

$P_d$  = The domestic price level in terms of the domestic currency.

### **Example: Calculating Real Exchange Rate**

An analyst is studying the effects of exchange rates on purchasing power. She comes across the following data:

- Nominal spot exchange rate (USD/EUR) = 1.15
- Eurozone Consumer Price Index ( $CPI_{eur}$ ) = 110
- US Consumer Price Index ( $CPI_{US}$ ) = 100

The real exchange rate for an American consumer wanting to buy goods made in the Eurozone is *closest to*:

### **Solution**

We know that:

$$\text{Real exchange rate (d/f)} = S_{d/f} \times \left( \frac{P_f}{P_d} \right)$$

Therefore, for an American consumer, the real exchange rate is given by:

$$\begin{aligned} \text{Real exchange rate (USD/EUR)} &= S_{\text{USD/EUR}} \times \left( \frac{\text{CPI}_{\text{EUR}}}{\text{CPI}_{\text{USD}}} \right) \\ &= 1.15 \times \frac{110}{100} = 1.2650 \end{aligned}$$

## Change in Real Exchange Rate

The formula for the Change in the real exchange rate, which considers changes in both domestic and foreign price levels and the nominal spot exchange rate, is as follows:

$$\left( 1 + \frac{\Delta S_{d/f}}{S_{d/f}} \right) \times \frac{\left( 1 + \frac{\Delta P_f}{P_f} \right)}{\left( 1 + \frac{\Delta P_d}{P_d} \right)} - 1$$

Where:

$S_{d/f}$  = Spot exchange rate (quoted in terms of the number of units of domestic currency per one unit of foreign currency).

$\Delta S_{d/f}$  = Change in spot exchange rate.

$P_f$  = Foreign price level quoted in terms of the foreign currency.

$\Delta P_f$  = Change in foreign price levels.

$P_d$  = Domestic price level in terms of the domestic currency.

$\Delta P_d$  = Change in the domestic price level.

## Example: Change in Real Exchange Rate

Consider two countries: Canada and the United States of America, where the US is the domestic country. The nominal exchange rate is CAD/USD = 1.25. If the price level in the USA increases

by 4% and the price level in Canada increases by 2%, what is the new real exchange rate, assuming the nominal exchange rate remains unchanged?

## Solution

Price level increase in the USA: 4%

Price level increase in Canada: 5%

Using the formula:

$$\left(1 + \frac{\Delta S_{d/f}}{S_{d/f}}\right) \times \frac{\left(1 + \frac{\Delta P_f}{P_f}\right)}{\left(1 + \frac{\Delta P_d}{P_d}\right)} - 1$$

Using the values from the example:

$$\Delta S_{USD/CAD} = 0$$

$$S_{USD/CAD} = \frac{1}{1.25} = 0.8$$

$$\Delta P_{CAD} = 2\% = 0.02$$

$$P_{CAD} = 100\% = 1$$

$$\Delta P_{USD} = 4\% = 0.04$$

$$P_{USD} = 100\% = 1$$

Plugging in the values:

$$\begin{aligned} &= \left(1 + \frac{0}{0.8}\right) \times \left(\frac{1 + 0.02}{1 + 0.04}\right) - 1 \\ &= (1) \times \left(\frac{1.02}{1.04}\right) - 1 \\ &\approx 0.98077 - 1 = -0.01923 \end{aligned}$$

So, the Change in the real exchange rate is approximately -1.923%, which means the real exchange rate decreased by approximately 1.923%.

A decrease in the real exchange rate means that the value of the domestic currency (in this case, the USD) has decreased relative to the foreign currency (CAD) after adjusting for changes in price levels.

In this example, the price level in Canada (CAD) went up by 2%, while in the United States (USD), it increased by 4%. Although the nominal exchange rate remained the same, the varying inflation rates between the two countries caused the real exchange rate to decline, signifying a real depreciation of the USD against the CAD.

This real depreciation of the USD could be due to the higher inflation in the United States compared to Canada. When a country has a higher inflation rate relative to another country, the purchasing power of its currency decreases, which leads to a decrease in the real exchange rate. This is consistent with the Purchasing Power Parity (PPP) theory, which suggests that in the long term, exchange rates adjust to equalize the purchasing power of different currencies.

## Market Participants

The foreign exchange (FX) market consists of various participants ranging from multi-billion-dollar investment funds to individuals. These participants can be broadly categorized into the buy and sell sides.

### Buy Side Participants

- **Corporate accounts:** These comprise businesses of all sizes participating in FX transactions when they buy and sell goods and services across borders, engage in international mergers and acquisitions (M&A), invest in foreign assets, and borrow in foreign currencies.
- **Real money accounts:** These are investment funds managed by insurance firms, mutual funds, pension funds, endowments, ETFs, and other institutions. They typically have limitations on using leverage or financial derivatives.
- **Leveraged accounts:** This category includes hedge funds, proprietary trading firms,

CTAs, high-frequency algorithmic traders, and bank trading desks that actively manage FX risks to generate profits.

- **Retail accounts:** This category includes private individuals, smaller hedge funds, active traders, and households utilizing electronic trading platforms for currency conversion or speculative activities.
- **Governments:** These include government bodies requiring FX for transactions or to achieve public policy objectives, such as purchasing military equipment, maintaining foreign bases, and administering public pension plans and insurance schemes.
- **Central banks:** These entities intervene in FX markets to impact domestic currency values, manage foreign reserves, or address unstable and dysfunctional market situations.
- **Sovereign Wealth Funds (SWFs):** These are government-owned entities primarily focusing on investment activities rather than public policy objectives and managing international capital inflows resulting from current account surpluses.

## Sell-Side Participants

- **Large money center dealing banks:** These are the largest multinational banks, such as Deutsche Bank, Citigroup, UBS, and HSBC, which provide competitive price quotes across a broad range of FX products.
- **Second and third-tier banks:** These are regional or local banks lacking the economies of scale, global client base, or IT expertise required to offer competitive pricing across a wide range of currencies and FX products. They often outsource FX services to larger tier-one banks.

Note that the FX market is highly dynamic and complex, with participants having a mix of hedging and speculative motives. In the case of public sector participants, public policy motives may also be a factor. This dynamic and complex interaction of participants and trading objectives makes it difficult to precisely predict movements in FX rates or describe the FX market with

simple characterizations.

## Market Composition

The global foreign exchange (FX) market encompasses spot transactions, forward transactions, and FX swaps. The Bank for International Settlements (BIS) conducts a triennial survey to analyze the size and distribution of global FX market flows.

### Key Components of the FX Market

- **Spot transactions:** Involve the immediate exchange of currencies at the prevailing exchange rate.
- **Forward transactions:** Entail the exchange of currencies at a specified future date and a pre-agreed exchange rate.
- **FX swaps:** These are the combination of spot and forward transactions utilized for hedging purposes and securing foreign currency at more advantageous rates.

## Exchange Rate Quotations

Exchange rates represent the value of one currency in terms of another and can be quoted in two ways: **direct** and **indirect**.

A direct quote involves the domestic currency as the **price currency** and the foreign currency as the **base currency**, while an indirect quote is the reverse.

For instance, if we quote the currency exchange rate as A/B, it implies that one unit of currency B buys a certain number of units of currency A. In this case, currency A is the price currency, and B is the base currency.

A direct currency quote considers domestic currency as the price currency and foreign currency as the base currency. For instance, a French investor will view EUR/USD as the direct euro-US

dollar exchange rate quoted in terms of the number of euros per dollar. Specifically, if  $\text{EUR/USD} = 1.2310$ , implies that 1 USD costs 1.2310 EUR.

In the case of the indirect quote, the domestic currency is the base currency, and the foreign currency is the price currency. For instance, the direct quote  $\text{EUR/USD} = 1.2310$  has a corresponding indirect quote of  $1/\text{EUR/USD} = \text{USD/EUR} = 0.8123$ . It implies that 1EUR costs 0.8123 dollars.

The **professional FX market** does not use the terms 'direct' or 'indirect' due to the varying domestic and foreign currencies based on one's location.

Instead, a set of market conventions has been developed, where major currencies and their exchange rate quote conventions are standardized.

Note that there is always a mix of direct and indirect quotes in common market usage, and a market participant must get familiar with how the conventions are used.

## Two-sided Price

The professional FX market operates on a two-sided price mechanism, which includes banks providing a "**bid**" (*buying price*) and an "**offer**" (*selling price*) when a client asks for an exchange rate quote. As we already know, exchange rates involve two currencies, and the terms "base currency" and "price currency" clarify the transaction.

The two-sided price reflects buying or selling the base currency:

- It shows how much of the price currency the client would receive for one unit of the base currency (bid).
- It also indicates how much of the price currency the client needs to give to the bank to get one unit of the base currency (offer).

For instance, consider the bid/offer quote of  $\text{CHF/EUR} = 1.160-1.1622$ . In this case, the euro (EUR) is the base currency. A quote of 1.1620-1.1622 implies that the client will receive CHF1.1620 for selling EUR1 to the dealer and pay 1.1622 to buy EUR1.

Usually, banks profit by buying currencies at a lower price and selling at a higher price, while electronic FX systems efficiently connect global buyers and sellers, reducing **bid/offer spreads** due to competition.

The majority of primary spot exchange rates are often expressed to four decimal points. However, the yen is an exception among the main currencies, with its spot exchange rates usually given to just two decimal points. For instance, while a USD/EUR rate might be displayed as 1.1601, a JPY/EUR rate would show as 1311.88.

### **Example: Calculating Bid/Offer Quote**

If the bid/offer quote from the trader were 25.6250–25.6300 INR/USD, then the bid/offer quote in USD/INR terms would be closest to:

1. 03901–0.03902.
2. 03902–0.03901.
3. 039015–0.039015.

### **Solution**

The correct answer is **A**.

An INR/USD quote represents the amount of Indian rupees the trader is bidding (offering) to purchase (sell) USD1. The trader's bid to buy USD1 at INR25.6250 is similar to the trader handing over INR25.6250 to buy USD1. When you divide both terms by 25.6250, it means the trader is handing over (i.e., selling) INR1 to buy USD0.03902. This becomes the offer in USD/INR terms. The trader is willing to sell INR1 for a price of USD0.03902.

In USD/INR terms, the trader's bid for INR1 is 0.03901, determined by inverting the offer of 25.6300 in INR/USD terms ( $1/25.6300 = 0.03901$ ). It's crucial to remember that in any bid/offer quote, irrespective of the base or price currencies chosen, the bid is always lesser than the offer.

### **Percentage Appreciation/Depreciation of Exchange Rates**

When describing exchange rate changes as a percentage appreciation or depreciation, it's crucial to determine the price currency and the base currency.

For example, if KSH/USD =145, it implies that one unit of US dollar will buy 145 units of Kenyan shillings. Intuitively, if KSH/USD decreases, it implies that USD costs less or fewer KSH is needed to purchase the USD dollar. In this case, the decline in KSH/USD implies that KSH appreciates against the USD, or, in other words, the USD is depreciating against KSH.

### **Example: Appreciation and Depreciation of Exchange Rates**

To calculate the percentage change, one must clearly understand the base and price currencies. Take the Chinese Yuan (CNY) and South African Rand (ZAR) example. Assume that the ZAR/CNY exchange rate increased from 1.6459 to 1.8356. Therefore, the percentage appreciation will be:

$$\frac{1.8356}{1.6459} - 1 = 11.5256\%$$

This represents an 11.5256 percent appreciation in the Chinese Yuan against the South African Rand. The ZAR/CNY exchange rate is expressed with the Chinese Yuan as the base currency and the South African Rand as the price currency. In other words, you now need more South African Rands to buy one Chinese Yuan.

The appreciation of the Chinese Yuan against the South African Rand can also be expressed as a depreciation of the South African Rand against the Chinese Yuan. However, in this case, the depreciation percentage will not be equal to the previous appreciation percentage of 11.5256%.

To invert a currency exchange rate, we have to divide 1 by the exchange rate. If

$$\text{ZAR/CNY} = 1.6459$$

Then,

$$\text{CNY/ZAR} = \frac{1}{1.6459} = 0.6076$$

To calculate the depreciation percentage of the South African Rand when the exchange rate

ZAR/CNY increased from 1.6459 to 1.8356, we need to invert the exchange rate from ZAR/CNY to CNY/ZAR, making the Chinese Yuan the price currency and the South African Rand the base currency. Here's how you do it:

$$\frac{\frac{1}{1.8356}}{\frac{1}{1.6459}} - 1 = 0.544806076 - 1 = -10.3358\%$$

## Question

Which of the following *best describes* a 4% appreciation in the ZAR/CNY exchange rate?

- A. This represents a 4 percent appreciation in the South African Rand (ZAR) compared to the Chinese Yuan.
- B. This represents a 4 percent appreciation in the Chinese Yuan (CNY) compared to the South African Rand.
- C. This represents a 4 percent depreciation in the Chinese Yuan (CNY) compared to the South African Rand.

## Solution

The correct answer is **B**.

A 4% appreciation in the ZAR/CNY exchange rate represents an appreciation of the base currency against the price currency. In this case, the Chinese Yuan appreciates against the South African Rand. Therefore, the appreciation represents a 4 percent increase in the Chinese Yuan relative to the South African Rand.

## **LOS 7b: describe exchange rate regimes and explain the effects of exchange rates on countries' international trade and capital flows**

An exchange rate regime is the framework a country's central bank or government employs to determine its currency's relative value in the international market. This regime influences the country's trading relationships and capital flows.

The chosen regime is based on factors such as the country's relative economic stability, efficiency, and trading volatility. For example, countries experiencing higher volatility might adopt a different exchange rate regime compared to those with more stable economies.

The design and implementation of the exchange rate regime framework is essential as it can impact real economic activity, investment decisions, and the risk profile of foreign assets.

### **The "Ideal" Currency Regime and Its Challenges**

The concept of an "ideal" currency regime involves three primary attributes.

1. Establishing **credibly fixed exchange rates** between currencies, thereby reducing uncertainties related to pricing in terms of goods, services, and financial assets.
2. Allowing **full convertibility of currencies** and facilitating unrestricted capital movement.
3. It envisions each country having the **autonomy to pursue independent monetary policies** in line with its domestic objectives, such as economic growth and inflation control.

Achieving all three conditions simultaneously is complex because they are inconsistent. If the exchange rate between currencies is credibly fixed and all currencies are convertible, then there would be a single global currency. In such a context, converting one national currency to another would be as simple as choosing between carrying coins or paper money in your pocket.

Under these conditions, attempts to control interest rates, asset prices, or inflation by manipulating the supply of one currency relative to another are ineffective. As a result, the

concept of an independent monetary policy is unworkable. In conclusion, there is no one-size-fits-all currency regime.

## **Currency Regime Impact on Independent Monetary Policies**

The interplay between currency regimes and a country's ability to implement independent monetary policies is a central issue in open-economy macroeconomics. In a hypothetical scenario with perfectly mobile capital, attempting to decrease interest rates independently in one country could trigger an outflow of capital seeking higher returns elsewhere. This movement of capital would necessitate central banks to buy back domestic currency and sell foreign currency to maintain fixed exchange rates. Such actions could undermine the effectiveness of independent monetary policies.

## **Flexibility of Floating Exchange Rates**

A floating exchange rate system provides greater flexibility in responding to economic changes. If a country decreases its domestic interest rates, the resulting depreciation of its currency can boost exports and decrease imports, thereby reinforcing the expansionary impact of the interest rate change. Similarly, raising interest rates can lead to currency appreciation, affecting trade dynamics. This flexibility allows countries to adjust to economic shifts more effectively.

## **Enhancing Central Bank Effectiveness through Exchange Rate Flexibility**

Allowing exchange rates to fluctuate and imposing controls on convertibility can empower central banks to pursue macroeconomic objectives more effectively. Central banks can better address domestic economic challenges by having the freedom to adjust exchange rates and enact monetary policy measures. While greater exchange rate flexibility enhances a central bank's efficacy, it also brings potential drawbacks, which include:

- One significant concern is the increased exposure to exchange rate risk faced by businesses engaged in international trade or investment.
- Additionally, excessive exchange rate volatility can lead to misallocation of financial

capital, potentially impacting economic efficiency and stability.

Achieving the right balance between policy effectiveness and potential economic distortions is a key challenge in managing exchange rates and their impact on economies.

## **Historical Perspective on Currency Regimes**

Throughout history, different currency exchange systems have existed alongside each other, with one usually emerging as the dominant system. This has significantly influenced how the world economy approaches the valuation and exchange of currencies.

### **The Classical Gold Standard and Price-Specie-Flow Mechanism**

During the 19th and early 20th centuries until World War I, the "classical gold standard" prevailed. Major currencies like the US dollar and the British pound were tied to fixed gold quantities. Gold acted as the standard unit for pricing goods and assets through the "price-specie-flow mechanism." Trade surpluses led to increased gold reserves, expanding money supply and prices, while deficits caused gold outflows, decreasing prices and boosting exports. National currencies were backed by gold, maintaining supply limitations.

### **Bretton Woods System and Transition to Flexible Rates**

After World War II, a new system called the Bretton Woods system was introduced in 1944. This system featured fixed exchange rates with occasional realignments. The United States, Japan, and many European industrial countries adhered to this framework. When exchange rate parities deviated significantly from supply-demand equilibrium, periodic realignments were executed to correct the imbalances. These realignments were integrated into standard monetary policy practices.

The system collapsed due to chronic inflation, transitioning to flexible exchange rates in 1973—this shift, influenced by economists like Milton Friedman, aimed to counter speculator disruptions. Flexible rates led to unforeseen exchange rate volatility, partly due to investment-

driven foreign exchange transactions.

However, the transition to flexible exchange rates brought unforeseen consequences, including heightened exchange rate volatility. This was attributed to investment-driven FX transactions, both for long-term investments and short-term speculation. These transactions played a more substantial role in determining spot exchange rates than previously acknowledged.

## **European Exchange Rate Mechanism (ERM) and Euro Creation**

The European Economic Community introduced the European Exchange Rate Mechanism (ERM) to instill a degree of stability in exchange rates. Initially, currency values were expected to fluctuate within a narrow range known as "the snake."

However, the ERM's vulnerability became apparent in the early 1990s. Speculative attacks and macroeconomic disparities led to deviations from the ERM's framework, ultimately culminating in the UK's forced exit from the system.

Despite challenges, the euro emerged in the late 20th century for Western European countries, enhancing transparency and competition. This aimed to streamline pricing transparency, encourage market competition, and optimize resource allocation. However, it also led to trade-offs as member states surrendered independent exchange rate control for economic integration.

## **Continuing Exchange Rate Historical Evolution**

The historical shifts in currency regimes have been driven by a complex interplay of economic, geopolitical, and policy factors. These transitions have shaped how countries value and exchange currencies, often reflecting a delicate balance between stability, policy objectives, and market forces.

## **Taxonomy of Currency Regimes**

In the ongoing discussions about fixed and flexible exchange rates, many countries have adopted intermediary systems that sit between these two extremes.

## **Drivers for Intermediate Regimes**

- In some cases, a lack of credibility in terms of sound monetary policy drives the adoption of intermediate regimes. Nations with a history of hyperinflation might resort to a form of fixed-rate regime due to credibility concerns in maintaining a stable currency under a floating regime.
- In other cases, political motivations influence currency regime choices. For instance, the creation of the euro aimed to foster political unity among European Community members with a history of conflicts.

As of April 2008, the IMF categorized exchange rate regimes into eight distinct categories, each representing a different approach to managing a nation's currency value. These categories encompass a spectrum of currency arrangements. They include:

### **1. Arrangement with No Separate Legal Tender**

According to the IMF, countries with no legal tender can be seen in two ways. One is dollarization, where countries don't have their own currency and use foreign currencies. The other is when a country is part of a monetary union. Countries with no separate legal tender currency arrangement cannot carry out their own monetary policies.

Dollarization involves adopting another nation's currency as the medium of exchange, granting currency credibility but not creditworthiness. Note that a country can adopt any currency, but the obvious choice might be the US dollar since it is the main reserve currency. Examples of dollarized countries include East Timor, El Salvador, Ecuador, and Panama.

The European Economic and Monetary Union (EMU) exemplifies a monetary union where member countries share the euro. A monetary union alone does not guarantee creditworthiness, as evident from the 2010 EMU sovereign debt crisis.

Member countries cannot perform independent monetary policy. The monetary union determines the monetary policy through their representatives in the European Central Bank.

## **2. Currency Board System (CBS)**

A CBS, or Currency Board System, is a monetary arrangement where the government commits to exchanging its domestic currency for a specified foreign currency at a fixed rate. It comes with restrictions to make sure the government can meet this commitment. In this system, the local currency is only issued when there's an equivalent amount of foreign currency held in reserves, making it fully backed by foreign assets.

The currency board system is seen in Hong Kong, where US dollar reserves back the entire Hong Kong dollar monetary base.

Similar to the gold standard, CBS links monetary base expansion and contraction to trade and capital flows, assuming flexible domestic prices and limited non-traded sectors.

## **3. Fixed Parity**

A fixed parity system involves pegging the exchange rate to a single currency or a basket of currencies but without any legislative commitment to maintain it, allowing a country to adjust or abandon the parity if necessary.

The fixed parity regime system allows the central bank to perform traditional functions while maintaining a discretionary level of foreign exchange (FX) reserves. Private sector demand for the country's currency can affect the fixed parity, with excess demand leading to an increase in FX reserves and inflation and deficient demand leading to a depletion of FX reserves and deflation. A speculative attack can occur if market participants believe that FX reserves are insufficient to sustain the parity, draining the reserves and forcing an immediate devaluation. Hence, maintaining an adequate level of reserves is crucial for the credibility of a fixed exchange rate regime.

## **4. Active and Passive Crawling Pegs**

Active crawl is when the exchange rates are pre-announced for the coming weeks with the changes taking place in small steps to manipulate the expectations of inflation.

On the other hand, passive crawl is when exchange rates are frequently adjusted (on a daily or weekly basis), usually against a single currency such as the US Dollar, to keep pace with the inflation rate.

## **5. Fixed Parity with Crawling Bands**

A country may initially peg its currency to a foreign currency to stabilize inflation expectations. Over time, it can introduce more flexibility by gradually widening a pre-defined range around this fixed rate. This system provides an incremental way to transition away from a fixed currency rate, especially if the country is not yet equipped for full monetary flexibility due to a lack of credibility or financial infrastructure.

## **6. Target Zone Regimes**

A target zone system maintains a set parity but comes with broader intervention bands, potentially extending up to  $\pm 2$  percent around the established parity, compared to a basic fixed parity model. This expanded bandwidth allows the monetary authority increased flexibility for discretionary actions.

## **7. Managed Float**

A managed float involves policy interventions to achieve internal or external targets, potentially creating instability in FX markets. Exchange rate targets may not be explicitly defined.

## **8. Independently Floating Rates**

Independently floating rates leave exchange rates to market determination, allowing the central bank to pursue autonomous monetary policy goals while also acting as a lender of last resort.

## **Effects of Exchange Rates on Countries' International Trade**

## **and Capital Flow**

There are many effects of exchange rates on countries' international trade and capital flow. Most of them are listed below.

### **Changing Prices of Currencies**

While shifts in supply and demand of products change the prices of those products, constant shifts in supply and demand for foreign currencies cause changes in the prices of currencies. Likewise, as prices of money change, demand for foreign currencies changes.

### **Increase in Demand for Imports**

An increase in the demand for imported goods happens when products of a foreign nation sell at lower prices than domestic products. When domestic income rises, demand for imports rises. Moreover, in capital markets, when returns on a nation's investments are higher than the domestic interest rate, individuals choose to invest in other nations' securities.

### **Expensive Products**

Many countries depend more on imports than domestically produced goods. This is because exchange rates play a significant role in the determination of the prices of imported products. If the domestic currency is weaker, consumers will have to pay higher prices in domestic currency for foreign goods.

### **They are Self-correcting over Time**

When the supply of dollars in the international market grows, their values depreciate. As time goes by, imports become unattractive, and exports become more attractive. The converse is also true.

### **Development of a Trade Deficit**

If the interest rates of other nations are higher than those of dollar nations, the demand for foreign countries automatically falls. However, a stronger dollar means decreased exports because they seem expensive to foreign consumers. This leads to a trade deficit.

## **Effect on Standard of Living**

Differences in currency values affect our ability to buy imported goods and export domestic goods. A currency crisis affects the lives and well-being of the citizenry in significant ways. For example, take Argentina, a country that has defaulted on its debt five times in the last 200 years. Every time this happens, their currency gets devalued. As a result, Argentineans cannot import goods from other countries cheaply for a few years. This hurts Argentina's economic growth and its citizenry's standard of living.

## **Exchange Rates and the Trade Balance**

A nation's trade balance and capital account are interrelated; a trade deficit/surplus must correspond to a capital account surplus/deficit. Factors affecting trade balance have an equal and opposite impact on the capital account and vice versa, highlighting their interdependence.

Consider the following fundamental equation from macroeconomics:

$$X - M = (S - I) + (T - G)$$

Where:

X= Exports.

M= Imports.

S= Private savings.

I= Investment.

T= Taxes net of transfers.

$G$  = Government expenditure.

From the above equation, it's evident that a trade surplus ( $X > M$ ) necessitates either a fiscal surplus ( $T > G$ ), a surplus of private savings over investment ( $S > I$ ), or both. Given that fiscal surplus can equate to government saving, it can be concisely stated that a trade surplus indicates a nation's savings surpasses what's needed for its infrastructure investments ( $I$ ). This surplus in savings is then channeled towards accumulating financial claims from other countries.

On the flip side, a trade deficit signifies the country's savings fall short of its investment requirements ( $I$ ), leading to a decrease in its financial holdings from other countries.

While this equation connects real expenditure and savings decisions with financial asset flows, it doesn't specify the type or currency of exchanged assets. Asset prices and exchange rates adjust to align with investors' preferences. Anticipated exchange rate changes drive capital flows, but adjustments primarily occur in financial markets due to their faster pace compared to goods prices.

Fixed exchange rate regimes involve central bank intervention to maintain pegs adjusting other asset prices. Floating exchange rates entail rapid exchange rate shifts that affect investor conviction. In the short to intermediate term, capital flows mainly drive exchange rate movements, with trade flows becoming increasingly influential over the long term.

## Question

In which of the following currency arrangements does a nation adopt another nation's currency as its medium of exchange?

- A. Fixed Parity.
- B. Dollarization.
- C. Fixed Parity with Crawling Bands.

## Solution

The correct answer is **B**.

Dollarization is a currency arrangement in which a nation adopts another nation's currency as its medium of exchange.

**A is incorrect.** A fixed parity system involves pegging the exchange rate to a single currency or a basket of currencies but without any legislative commitment to maintain it, allowing a country to adjust or abandon the parity if necessary.

**C is incorrect.** A fixed parity with crawling bands is when a country that had initially pegged its currency to a foreign currency to stabilize inflation gradually widens a pre-defined range around the fixed rate to introduce more flexibility.

## **LOS 7c: describe common objectives of capital restrictions imposed by governments**

Capital restrictions are the measures that governments or central banks take to control the flow of foreign money in and out of a country's economy.

### **Objectives of Capital Restrictions**

#### **Economic Stability and Growth**

Governments impose capital restrictions to steer their economies towards desired trajectories. Such measures help achieve objectives related to employment and regional development. Government regulations on foreign investments allow them to control key sectors vital to their growth plans. They can direct necessary funds to these sectors or protect them from potentially damaging foreign influences.

#### **Protecting Strategic Industries**

Some industries hold significant importance not just economically but also strategically. Industries like defense, telecommunications, and sometimes even energy are crucial for national security and sovereignty. By limiting foreign ownership or investments in these sectors, governments can ensure that they remain predominantly under national control, thereby protecting them from foreign influences that might not align with national interests.

#### **Preventing Capital Flight**

During economic downturns or political instability, there's a heightened risk of capital flight - a massive and sudden outflow of capital from the country. Such outflows can exacerbate economic problems, causing currency devaluations and draining national reserves. Capital restrictions help manage and mitigate the risks associated with these sudden, large-scale outflows.

#### **Monetary and Fiscal Policy Implementation**

Achieving desired macroeconomic outcomes in an environment of uncontrolled capital mobility can be challenging. Standard monetary and fiscal tools might fall short of influencing the economy in the desired direction. By introducing capital controls, governments can better manage external pressures and achieve a balance between domestic and external policy objectives.

## **Revenue Generation and Government Financing**

Historically, capital restrictions have been a tool for revenue generation, especially in times of war or significant national crises. By limiting capital outflows, governments can keep more capital within the domestic economy, making it easier to tax wealth and generate interest income. This not only aids in immediate revenue generation but also helps maintain low interest rates, reducing government borrowing costs.

## **Managing External Balance**

External balance means balancing payments between a country and the world. Governments can control capital coming in and going out to maintain a healthy balance, preventing excessive external debt and long-term economic stability.

Yet, imposing these constraints poses certain challenges. They result in substantial administrative expenses and potential delays in critical policy changes and can create unfavorable market perceptions. The impact of these controls differs, and effective, vigorous enforcement is typically essential to achieve the intended results.

## Question

Which of the following trade controls is *most likely* to cause the biggest economic gain for an importing country?

- A. Tariffs.
- B. Import quotas.
- C. Export subsidies.

## Solution

The correct answer is **A**.

A tariff is a tax imposed on imported goods and services. Tariffs provide immediate revenue for the government imposing them. Additionally, they can protect domestic industries by increasing the price of imported goods, which can make domestically produced goods more competitive in the market.

Compared to import quotas and export subsidies, tariffs offer direct fiscal benefits to the government and can also have the secondary benefit of boosting domestic production.

**B is incorrect.** An import quota is a limit a country sets on the quantity of a good that can be imported. While quotas can protect domestic industries by limiting foreign competition, they do not generate direct revenue for the government.

Quotas might lead to economic gain by fostering domestic industry, but this is more indirect and potentially less substantial than the revenue generated from tariffs. Additionally, they can lead to inefficiencies and a lack of competition, which might harm the economy in the long run.

**C is incorrect.** An export subsidy is a government policy to encourage the export of domestic goods. Export subsidies are generally used by countries to increase exports, not to regulate imports. They do not generate revenue for the importing country and

do not directly affect imports.

## **Learning Module 8: Exchange Rate Calculations**

### **LOS 8a: calculate and interpret currency cross-rates**

It is possible to back out the cross rates given two exchange rates involving three currencies. Consider a foreign exchange market with the exchange rate between the South African rand and the Chinese yuan. This market can also quote the exchange rate between the South African rand and the Russian ruble (RUB). It is, therefore, possible to back out the cross-rates between the Chinese yuan and the Russian ruble, which is quoted as (RUB/CNY) according to market conventions and can be represented as follows:

$$\frac{\text{RUB}}{\text{ZAR}} \times \frac{\text{ZAR}}{\text{CNY}} = \frac{\text{RUB}}{\text{CNY}}$$

For example, the RUB/ZAR exchange rate is 1.4876, and the ZAR/CNY exchange rate is 1.6459. We can calculate the RUB/CNY exchange rate using sample spot exchange rates as follows:

$$\frac{\text{RUB}}{\text{ZAR}} \times \frac{\text{ZAR}}{\text{CNY}} = 1.4876 \times 1.6459 = 2.4484 \text{ Russian Rubble per Chinese Yuan}$$

### **Inversion**

Sometimes, it is important to invert one of the quotes to get the intermediary currency to cancel out the equation and get the cross rate. For example, to get the Russian ruble–Japanese yen (JPY/RUB) quote, we first invert the South African rand–Russia ruble (RUB/ZAR) quote before multiplying it by the South African rand–Japanese yen (JPY/ZAR).

### **Example: Currency Cross-Rates**

Let's assume we have spot exchange rates of RUB/ZAR = 1.4876 and JPY/ZAR = 70.74. The South African rand–Russia ruble (RUB/ZAR) ruble exchange rate of 1.4876 inverts to:

$$\left(\frac{\text{RUB}}{\text{ZAR}}\right)^{-1} = \left(\frac{\text{ZAR}}{\text{RUB}}\right) = \frac{1}{1.4876} = 0.6722$$

Multiplying this figure with the JPY/ZAR quote of 70.74 gives us the JPY/RUB.

$$\left(\frac{\text{ZAR}}{\text{RUB}}\right) \times \left(\frac{\text{JPY}}{\text{ZAR}}\right) = 0.6722 \times 70.74 = 47.5531 \text{ JPY per RUB}$$

## Triangular Arbitrage in Cross Rate Calculations

Market participants can access both cross-rate quotes (e.g., JPY/CAD for Japan yen–Canada) and the underlying component exchange rate quotes (e.g., CAD/USD for dollar–Canada and JPY/USD for dollar–yen). These cross rates must align with their respective calculations; if not, traders will exploit the discrepancy through arbitrage. This type of profit-seeking, termed **triangular arbitrage** (given its involvement with three currencies), would persist until the price imbalance is corrected.

### Example: Illustrating Triangular Arbitrage

To illustrate, consider a JPY/CAD rate derived at 85.98 based on the underlying CAD/USD and JPY/USD rates of 1.3020 and 111.94, respectively:

$$\frac{\text{JPY}}{\text{CAD}} = \left(\frac{\text{CAD}}{\text{USD}}\right)^{-1} \times \left(\frac{\text{JPY}}{\text{USD}}\right) = (1.3020)^{-1} \times 111.94 = 85.98$$

If a misinformed dealer simultaneously offers a JPY/CAD rate of 86.20, it presents a different price for the same service, which, in this case, is converting yen to Canadian dollars. A savvy trader could purchase CAD1 for JPY85.98 and immediately sell it for JPY86.20, making a risk-free profit of JPY0.22 per CAD1.

In practice, such discrepancies in cross-rates are infrequent. Both human traders and automated trading algorithms vigilantly monitor the markets for any pricing inefficiencies, ensuring swift corrections.

## Question

A forex trader noticed the USD/EUR spot rate is 1.3960. Similarly, the CHF/USD spot rate is 0.9587. Calculate the spot CHF/EUR cross-rate.

1. 1.7422.
2. 1.3383.
3. 1.4561.

## Solution

The correct answer is **B**.

The spot rate is:

$$\frac{\text{CHF}}{\text{EUR}} = \frac{\text{CHF}}{\text{USD}} \times \frac{\text{USD}}{\text{EUR}} = 1.3960 \times 0.9587 = 1.3383$$

## **LOS 8b: explain the arbitrage relationship between spot and forward exchange rates and interest rates, calculate a forward rate using points or in percentage terms, and interpret a forward discount or premium**

This section will consider the relationships between spot and forward rates, interest rates, and maturities based on market efficiencies.

### **Spot and Forward Rates**

In the professional FX market, forward exchange rates are commonly quoted in terms of 'points' or 'pips.' These points represent the difference between the forward and spot exchange rate quotes. The scale is adjusted so that these points correspond to the last decimal place in the spot quote.

If the forward rate is higher than the spot rate, the points are positive, indicating that the base currency trades at a forward premium. On the other hand, when the forward rate is below the spot rate, the points are negative, suggesting the base currency trades at a forward discount. Notably, when the base currency is at a forward premium, the price currency will be at a forward discount, and vice versa.

To understand this argument, let's look at a scenario in 2023. The spot USD/CAD exchange rate was 1.3845, and the six-month forward rate was 1.38475. This suggests that the CAD (base currency) was trading at a premium compared to the spot rate. The six-month forward points were quoted as 2.5, and this can be calculated as follows:

$$1.38475 - 1.3845 = 0.00025$$

We multiply by 10,000 to reach the desired result. This scaling ensures the points align with the final digit of the spot exchange rate quote, which is usually the fourth decimal place. Additionally, it's noteworthy that while points are usually quoted to at least one decimal place, the forward rate might extend to five or even more decimal places.

Among major currencies, the yen stands as an exception. Its spot rates are typically quoted to just two decimal places. Therefore, the difference between its forward and spot rates is

multiplied by 100 to adjust for its two-decimal-place precision.

## Forward Points and Maturity

Forward rate quotes are typically presented as the number of forward points for each specific maturity, which refers to the time interval between the spot settlement and the forward contract settlement. Often, these forward points are also termed 'swap points' since an FX swap encompasses both a spot and a forward transaction executed simultaneously.

To convert forward quotations into an outright forward quotation, let's use an example with the RUB/CNY currency pair. We'll use a table that shows maturity and forward or spot rate points.

Maturity	Spot rate or forward points
Spot	1.6459
One week	−0.2
One month	−0.1
Three months	−5.6
Six months	−12.7
Twelve-month	−25.3

From the table above, notice that the absolute number of points increases with maturity. This trend emerges because the number of points is directly proportional to the yield differential between the two involved countries (in this case, Russia and China). This differential is then adjusted based on the term to maturity.

As the term to maturity extends, the absolute number of forward points increases. In the same vein, for a fixed term to maturity, a greater interest rate differential results in a higher absolute number of forward points.

## Calculating Forward Exchange Rates

To calculate forward exchange rates using forward points, you divide the points by 10,000. This scales down the fourth decimal place found in the spot rate. Then, you add the result to the spot exchange rate quote.

We can take the case of the six-month forward rate in the above table. Here we have:

−12.7

$$1.6459 + \frac{-12.7}{10000} = 1.6459 - 0.00127 = 1.64463$$

Often, the forward rate points are represented as a percentage of the spot and not as an absolute number of points. As such, the six-month forward rate for RUB/CNY can be shown as follows:

$$\frac{1.6459 - 0.00127}{1.6459} - 1 = -0.077\%$$

To convert this percentage into a forward rate, we simply need to multiply the spot rate by one plus the percentage forward premium or discount:

$$1.6459 \times (1 + (-0.00077)) = 1.6459 \times 0.99923 = 1.64463$$

## Arbitrage Relationships between Spot and Forward Rates

To understand the arbitrage relations between spot and forward exchange rates, we need to consider interactions between spot rates, forward rates, and interest rates.

Note that forward exchange rates are derived from an arbitrage principle that ensures equal investment returns on two alternative yet equivalent investment opportunities.

Using a single-period analogy, an investor who has funds to invest in treasury securities has two alternatives:

1. Invest at the domestic risk-free rate ( $r_d$ ).
2. Invest at the foreign risk-free rate ( $r_f$ ).

### Option i:

If the investor takes the first option, the fund held at the end of the period would be  $(1+i_d)$ .

### Option ii:

Alternatively, the investor could convert the domestic currency to be invested in a foreign

currency using the spot rate  $S_{f/d}$ . It is important to note that (f/d) is the currency quoting convention that expresses the number of foreign units per single domestic unit.

At the end of the investment period,  $S_{f/d} (1 + r_f)$  units of foreign currency would be held by the investor. Then, the funds would have to be converted back into the domestic currency using the initial (pre-agreed) forward rate.

Note that the two investment alternatives are risk-free because they are invested in risk-free assets.

Since these investment alternatives are equal by considering the risk characteristics, the returns must also be equal. As such, we have the following relationship:

$$1 + r_d = S_{f/d} (1 + r_f) \left( \frac{1}{F_{f/d}} \right)$$

This formula above outlines two alternative investments (represented on either side of an equation) expected to yield equal returns. Should the returns differ, a risk-free arbitrage opportunity arises. An investor can capitalize on this by short-selling the lower-yield investment and directing those funds into the higher-yield one.

Note that is the number of units of domestic currency for each unit of foreign sold forward. The relationship above can be rearranged to get the formula for a forward rate as illustrated below:

$$F_{f/d} = S_{f/d} \left( \frac{1 + r_f}{1 + r_d} \right)$$

Where:

$S_{f/d}$  = Current spot exchange rate.

$F_{f/d}$  = Current forward exchange rate.

$r_d$  = Domestic risk-free rate.

$r_f$  = Foreign risk-free rate.

## Example: Calculating the Forward Exchange Rate

Given that the spot exchange  $S_{f/d}$  is 1.502, the domestic risk-free rate for 12 months is 4%, and the 12-month foreign risk-free rate is 6.2%, the forward rate  $F_{f/d}$  is:

$$\begin{aligned} F_{f/d} &= S_{f/d} \left( \frac{1 + r_f}{1 + r_d} \right) \\ &= 1.502 \left( \frac{1 + 0.062}{1 + 0.04} \right) = 1.5338 \end{aligned}$$

## Forward Rate as a Percentage of the Spot Rate

We can rearrange the no-arbitrage equation between the spot and exchange rates as follows:

$$\frac{F_{f/d}}{S_{f/d}} = \frac{1 + r_f}{1 + r_d}$$

Intuitively, from the above equation, under an f/d quoting convention, if foreign interest rates exceed domestic rates, the forward rate will be priced at a premium relative to the spot rate.

Generally speaking, without considering the quoting convention, the currency with the higher (lower) interest rate will always trade at a discount (premium) in the forward market.

We can interpret the forward exchange rate as the expected future spot rates. If we let  $F_t = F_{f/d}$ ,  $S_t = S_{f/d}$  and finally  $F_t = S_{t+1}$  then the above equation can be written as:

$$\begin{aligned} \frac{S_{t+1}}{S_t} &= \frac{1 + r_f}{1 + r_d} \\ \Rightarrow \% \Delta S_{t+1} &= \frac{S_{t+1}}{S_t} - 1 = \left( \frac{r_f - r_d}{1 + r_d} \right) \end{aligned}$$

As such, if we interpret forward rates as expected future spot rates, the expected percentage change in the spot rate is proportional to the interest rate differential ( $r_f - r_d$ ).

Interpreting forward rates as expected future spot rates have some setbacks. For instance, the relationship between spot and forward exchange rates is influenced by any factor affecting the yield curve in either the domestic or foreign market. Consequently, FX markets are

interconnected with global events, reflecting influences from other global markets.

As such, in real-world trading, currency traders and strategists do not rely solely on forward rates for their currency expectations or strategies.

However, it is useful to understand forward exchange rates simply as a product of the arbitrage equation and forward points as being related to the interest rate differential between the two countries.

## **Forward Discount Premiums based on Spot and Interest Rates**

Recall that a forward discount is when the domestic current spot exchange rate is traded at a higher level than the current domestic future spot rates. On the other hand, A forward premium is a situation when the forward exchange rate is higher than the spot exchange rate. Conversely, a forward discount is when the forward exchange rate is lower than the spot exchange rate.

The analysis of the expectations from the market depends mostly on discounts and premiums. Also, they enable one to know the currencies that should appreciate and those that will depreciate in the near future.

## **Calculation**

Recall the arbitrage formula:

$$F_{f/d} = S_{f/d} \left( \frac{1 + i_f}{1 + i_d} \right)$$

Where:

$S_{f/d}$  = Current spot exchange rate.

$F_{f/d}$  = Current forward exchange rate.

$r_d$  = Domestic risk-free rate.

$r_f$  = Foreign risk-free rate.

Note that in the above formula, we assumed a single-period analogy. Suppose the investment term is a fraction,  $\tau$ , of the period for which the interest rates are quoted. Consequently, the interest earned in the domestic and foreign markets would be  $r_d\tau$  and  $r_f\tau$  respectively.

As such, the arbitrage formula transforms into:

$$F_{f/d} = S_{f/d} \left( \frac{1 + r_f\tau}{1 + r_d\tau} \right)$$

Intuitively, if we wish to calculate the forward premium or discount, we find the difference between the forward and spot exchange rates:

$$\begin{aligned} F_{f/d} - S_{f/d} &= S_{f/d} \left( \frac{1 + r_f\tau}{1 + r_d\tau} \right) - S_{f/d} \\ &= S_{f/d} \left[ \left( \frac{1 + r_f\tau}{1 + r_d\tau} \right) - 1 \right] \\ &= S_{f/d} \left( \frac{r_f - r_d}{1 + r_d\tau} \right) \tau \\ \therefore F_{f/d} - S_{f/d} &= S_{f/d} \left( \frac{r_f - r_d}{1 + r_d\tau} \right) \tau \end{aligned}$$

Therefore, forward points, when appropriately scaled, are proportional to the spot exchange rate and the interest rate differential. They are approximately, but not exactly, proportional to the horizon of the forward contract.

The common day count (for example, LIBOR deposits) is actual/360. Consider the following example.

### **Example: Forward Discount or Premium**

Let's say we have a 31-day forward exchange rate. The domestic 31-day risk-free interest rate is 2.5% per year, and the foreign 31-day risk-free interest rate is 3.5%. The spot exchange rate is 1.5630. We can calculate the forward premium or discount using two methods:

#### **Method 1:**

We first calculate the forward exchange rate, and then we subtract the spot exchange rate from

it:

$$\begin{aligned} F_{f/d} &= S_{f/d} \left( \frac{1 + r_f \tau}{1 + r_d \tau} \right) \\ &= 1.5630 \left( \frac{1 + 0.035 \times \frac{31}{360}}{1 + 0.025 \times \frac{31}{360}} \right) = 1.56434 \end{aligned}$$

Hence, the forward trading premium is:

$$F_{f/d} - S_{f/d} = 1.56434 - 1.5630 = 0.00134$$

Since forward premiums or discounts are usually quoted in pips or points, multiplying the result by 10,000 will give us  $0.00134 \times 10,000 = 13.4$  pips, which is the forward trading premium quoted in pips or points.

## Method 2:

Inserting the data directly into the formula:

$$\begin{aligned} F_{f/d} - S_{f/d} &= S_{f/d} \left( \frac{r_f - r_d}{1 + r_d \tau} \right) \tau \\ &= 1.5630 \left( \frac{0.035 - 0.025}{1 + 0.025 \times \frac{31}{360}} \right) \times \frac{31}{360} \\ &= 0.00134 \approx 13.4 \text{ pips} \end{aligned}$$

## Question #1

An Italian company has secured a contract with a US client, expecting a payment of USD 40 million in 45 days. The finance manager of the Italian firm wishes to hedge the FX risk of this deal and gets the following rates from a broker:

USD/EUR spot rate: 0.9220

One-month forward points: +2.0

According to the exchange rate information provided, the finance manager could hedge the FX risk by:

1. Buying euro (selling US dollars) at a forward rate of 0.9222.
2. Buying euro (selling US dollars) at a forward rate of 0.9200.
3. Selling euro (buying US dollars) at a forward rate of 0.9200.

## Solution

The correct answer is **A**.

The Italian company would aim to change the US dollar to its home currency, the euro (it intends to sell US dollars and buy euros), using a forward rate calculated as  $0.9220 + (+2.0/10,000) = 0.9222$ .

By doing this, the company is able to protect itself against any unfavorable movements in the foreign exchange rate over the next 45 days (before payment is received). In other words, the company wants to lock in the exchange rate of USD/EUR = 0.9222 now. This can be achieved using a forward contract, which allows the company to exchange currencies at a predetermined rate in the future.

## Question #2

When is a foreign currency *most likely* trading at a forward premium?

1. When the forward rate expressed in the domestic currency is below the spot rate.
2. When the forward rate expressed in the domestic currency is above the spot rate.
3. When the forward rate expressed in the foreign/domestic currency is at equilibrium.

**Solution**

The correct answer is **B**.

A foreign currency is at a forward premium if the forward rate expressed in domestic currency is above the spot rate.