



# *Market Structures*

MEGA LECTURE

*A2 Economics*

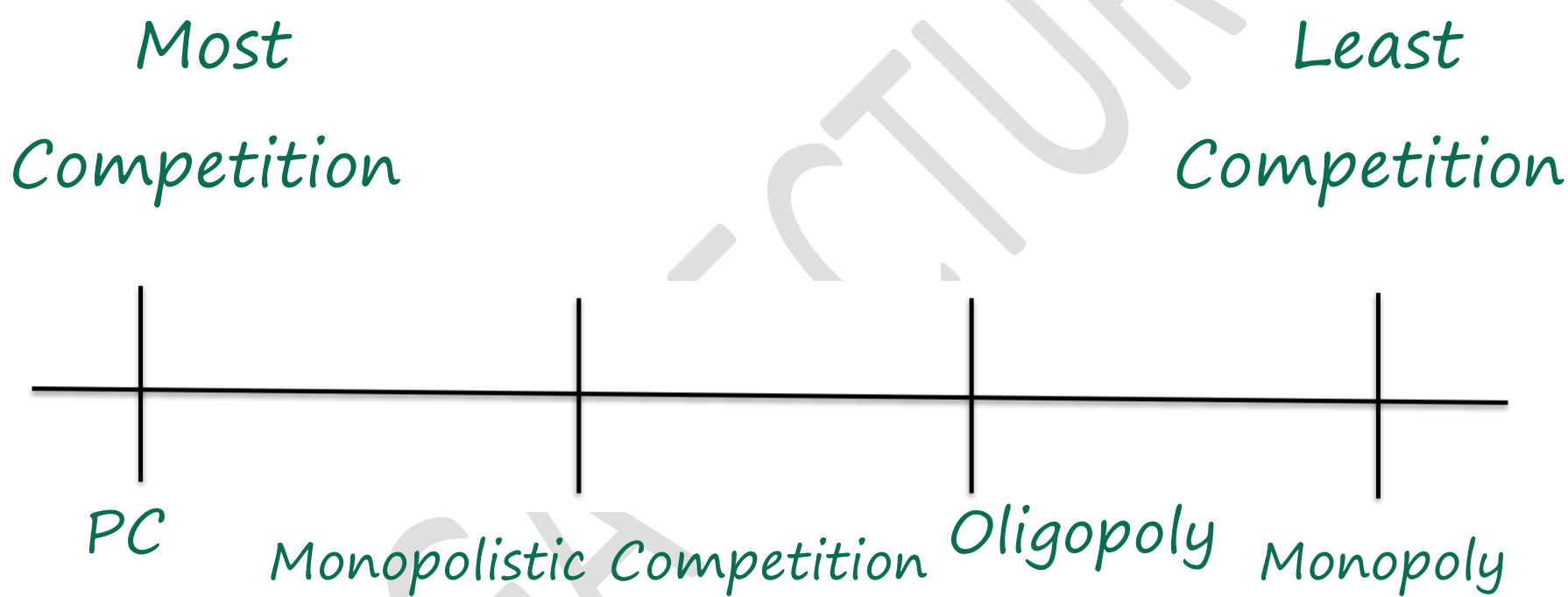
# Market Structure

- Market is collection of firms that produce the same type of product. Industry is another word that is **interchangeably used** with the word market. For instance, cell phone industry means all firms that manufacture cell phones like Apple, Samsung, Huawei etc
- Based on different economic characteristics of the market, the study of different types of markets to determine their **behavior** is known as Market Structure.

# Types of Market Structures

1. Perfect Competition
2. Monopolistic Competition
3. Oligopoly
4. Monopoly

# Spectrum of Competition



# Perfect Competition

- Perfect Competition is most competitive market structure that is **not very common**.
- However some industries like agricultural markets can be classified as Perfect Competition.
- Perfect competition is a benchmark / standard for economic efficiency that economists wish can be achieved in all markets.

# Characteristics of Perfect Competition

- Following economic characteristics are present in markets that are classified as Perfect Competition:
  1. There are many **sellers** of the product. Many means something that is not countable.
  2. The products are **homogenous** / identical without any element of branding or advertisement.

# Characteristics of Perfect Competition

3. **Firms are price takers.** Each firm is providing a small chunk of total market demand and therefore any firm's deliberate attempts to reduce supply to increase prices does not affect prevailing market price.

Hence each firm's demand curve is perfectly elastic – meaning it is a horizontal line.

4. There are **low or no barriers to entry and exit.**

5. **Consumers have complete information.**

# Entry Barrier

- Any constraint or hindrance that **restricts** the entry of new firms in the market.
- New firms wishing to enter any market face serious challenges in terms of high initial investment cost or well-established brands.

These challenges that limit entry of new firms, in any industry, are known as entry barriers.



# Exit Barriers

- Any constraint that makes it difficult for the firm to exit the market is known as Exit Barrier. One example of Exit Barrier can be Sunk Cost.
- Sunk Cost is investment made in specialized equipment that **has no alternate use** except for the purpose in which it is currently used hence such machinery / equipment has very **low resale value** and is major exit barrier in some industries.

# Entry Barriers

## 1. High Investment requirement:

the finance needed to set up a new business in any industry.

2. Patents / Copyrights: the legal protection against the theft of any product or idea.

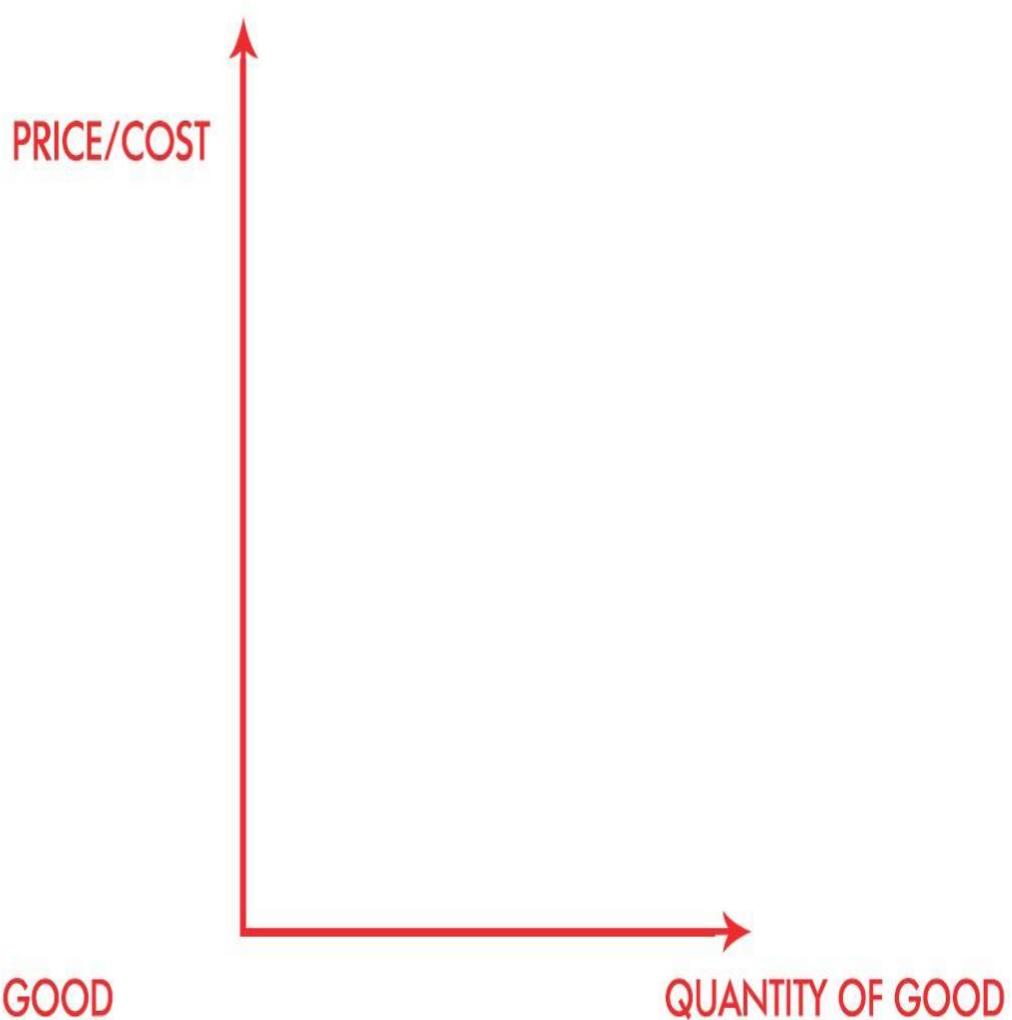
3. Well established brands: the existence of well established brands in any market will deter new firms to set up in that industry.

# Perfect Competition – Short Run



INDUSTRY

FIRM



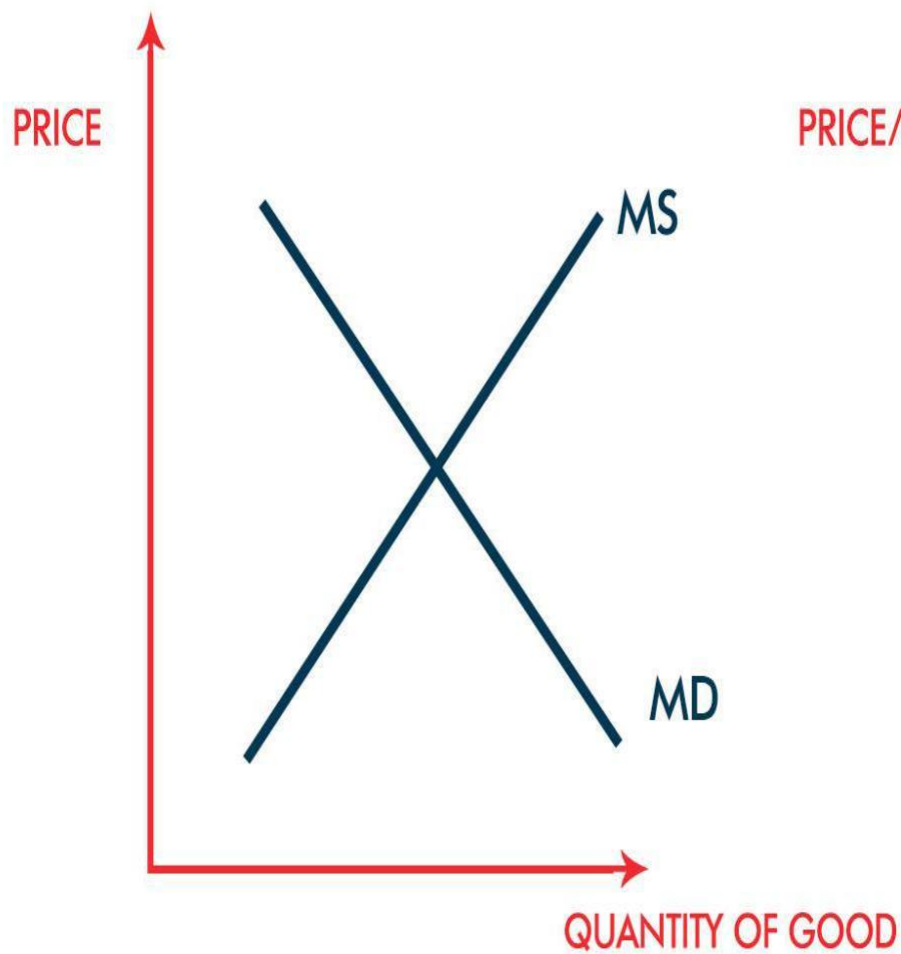
# Perfect Competition – Short Run

- The graphs on the left show the Short Run Equilibrium in Perfect Competition.
- The left graph in the picture is showing the **Industry** – all the firms that produce this product lets say Wheat and the right graph is for one single firm.

# Perfect Competition – Short Run

INDUSTRY

FIRM



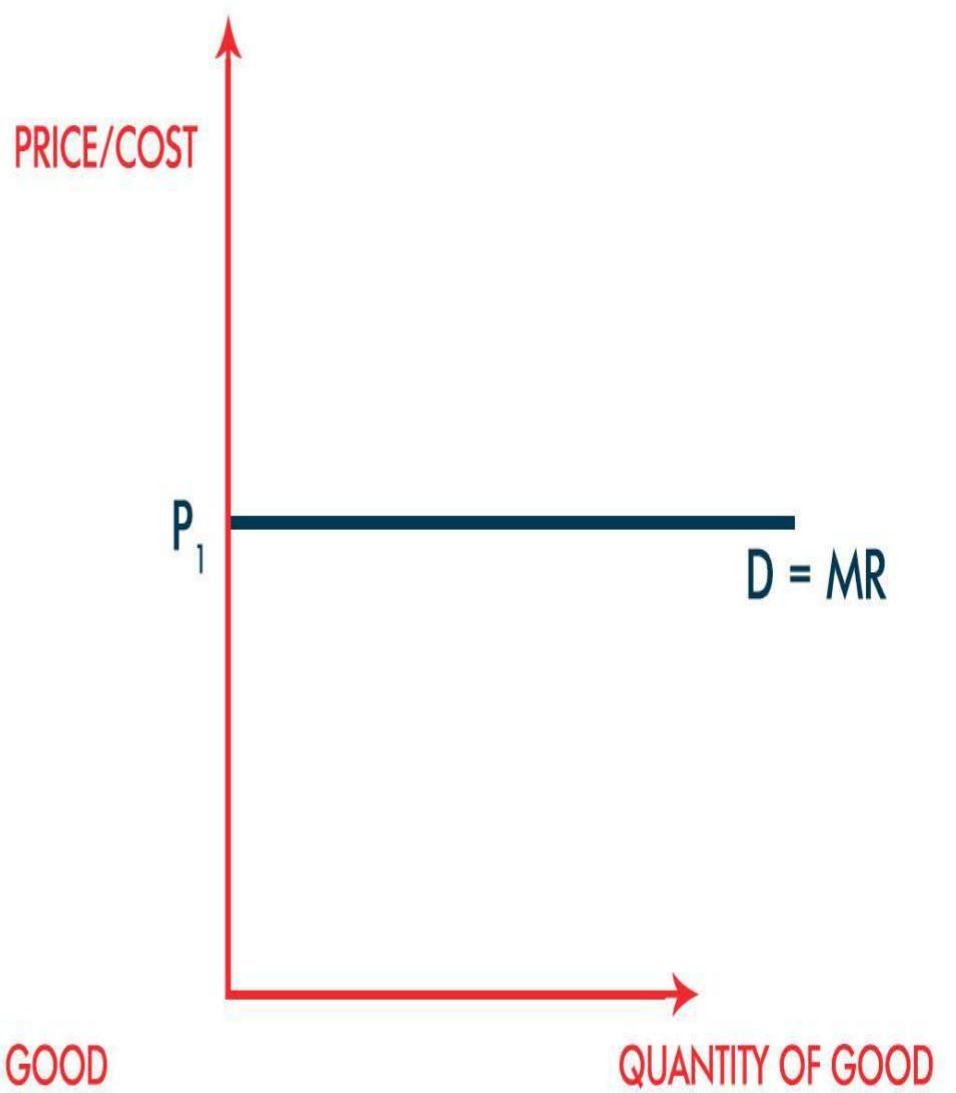
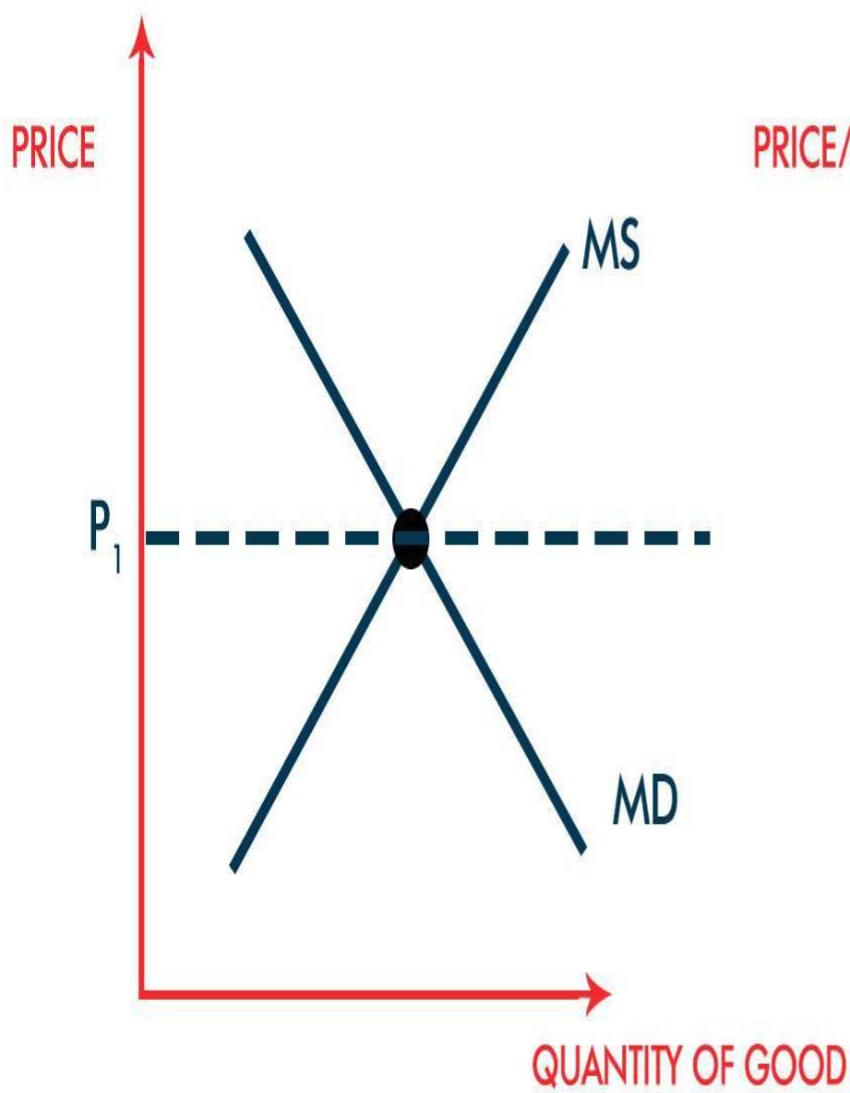
# Perfect Competition – Short Run

- Where the Market Demand which is labelled as **MD** is equal to Market Supply which is labelled as **MS** intersect that is the equilibrium in the market.

# Perfect Competition – Short Run

INDUSTRY

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The  $P_1$  equilibrium

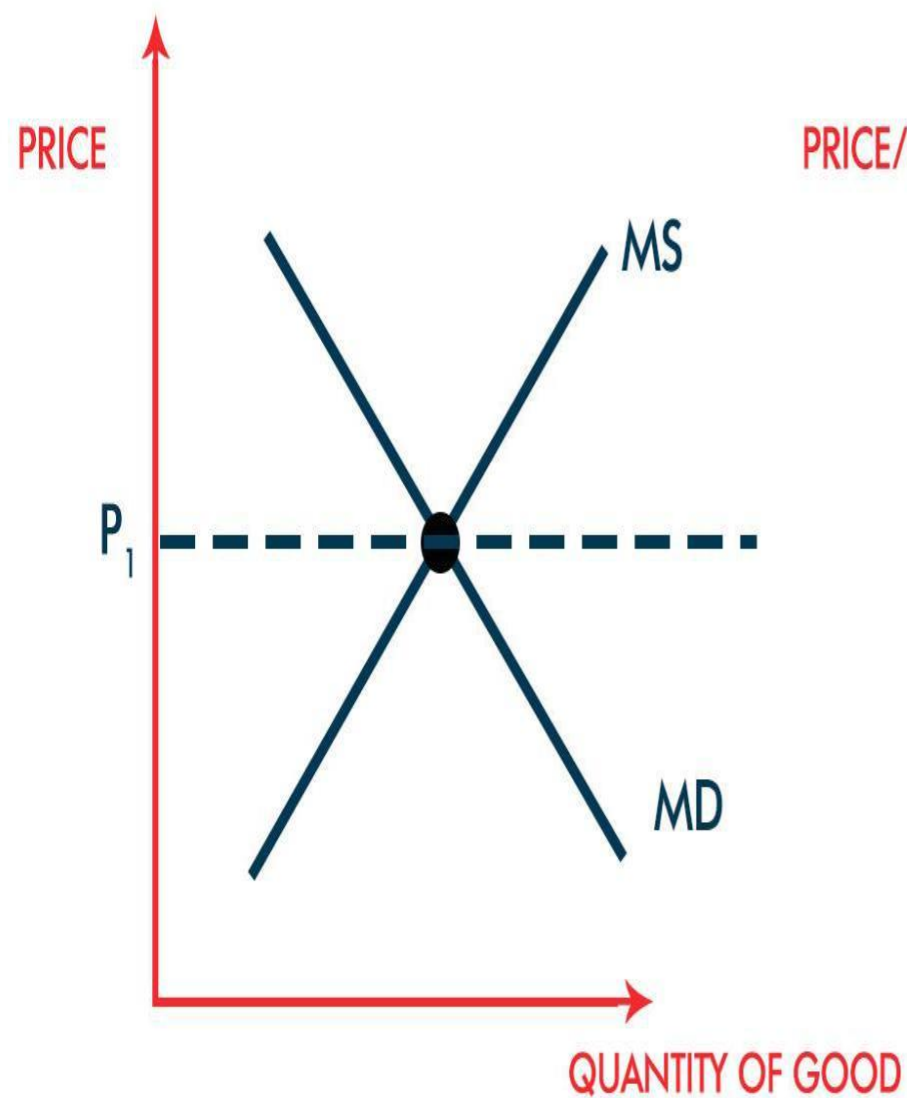
# Perfect Competition – Short Run

- price as determined by the Market Supply and Market Demand is extended to the right graph and a straight horizontal demand curve is drawn.
- Straight horizontal demand curve shows perfectly elastic demand.

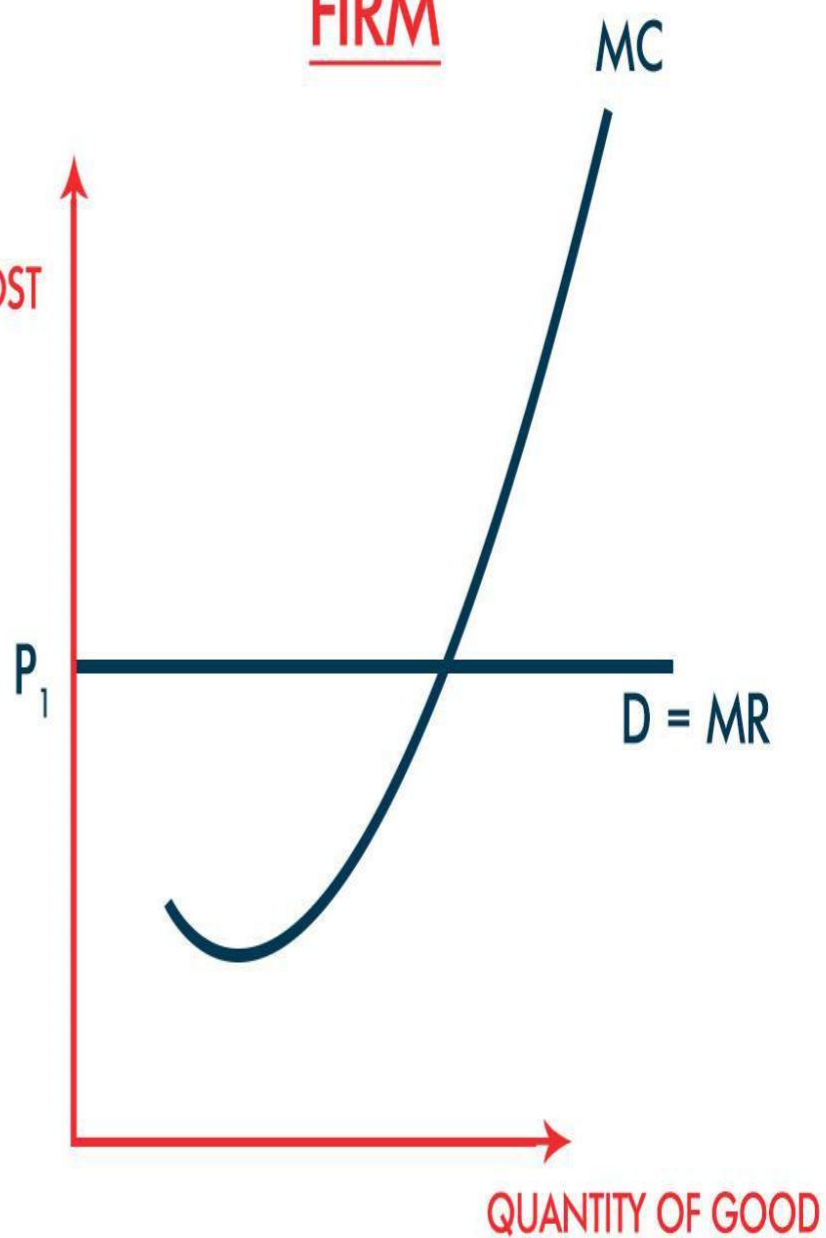


# Perfect Competition – Short Run

## INDUSTRY



## FIRM



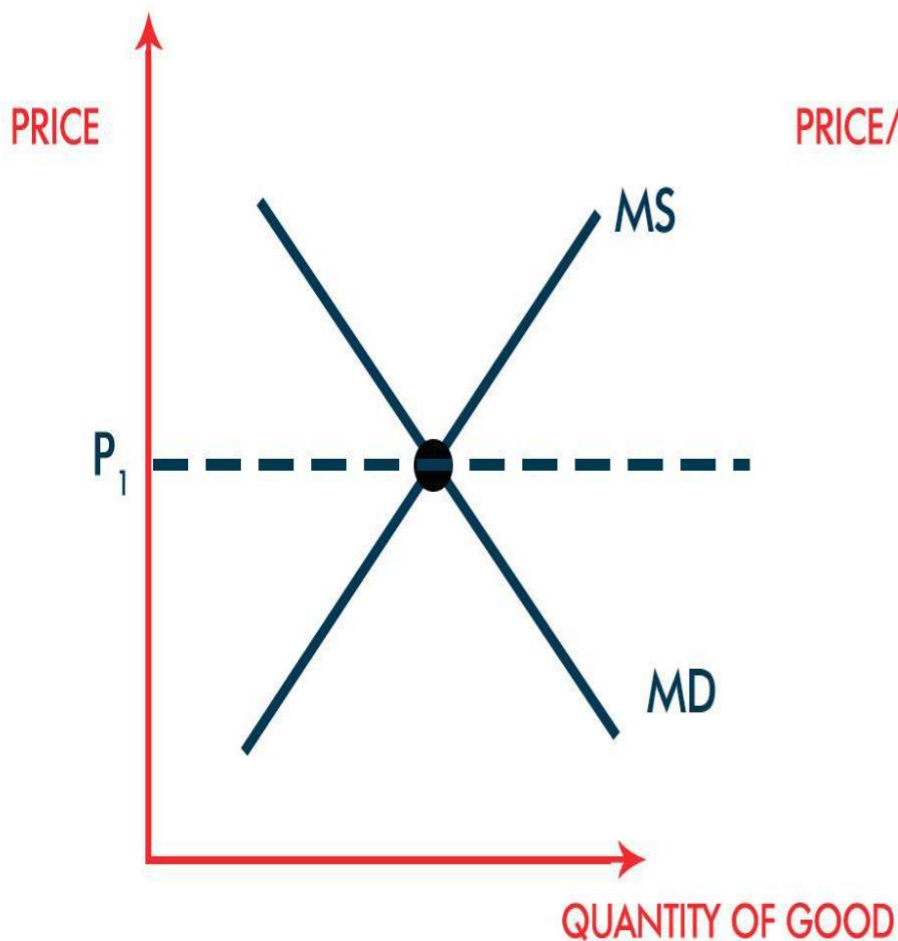
# Perfect Competition

## – Short Run

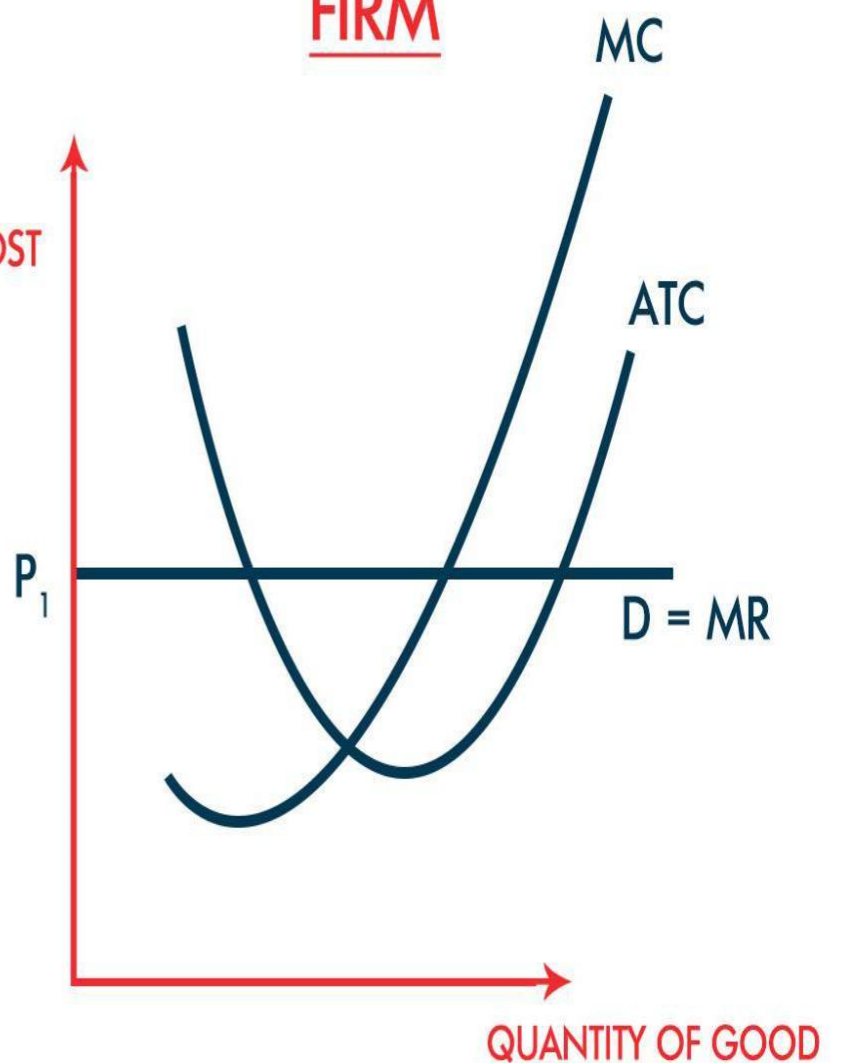
- This perfectly elastic demand curve is showing that each firm in Perfect Competition is Price Taker.
- Price Taker means that single firm has no power to influence market price of the product that is determined through market demand and market supply.

# Perfect Competition – Short Run

## INDUSTRY



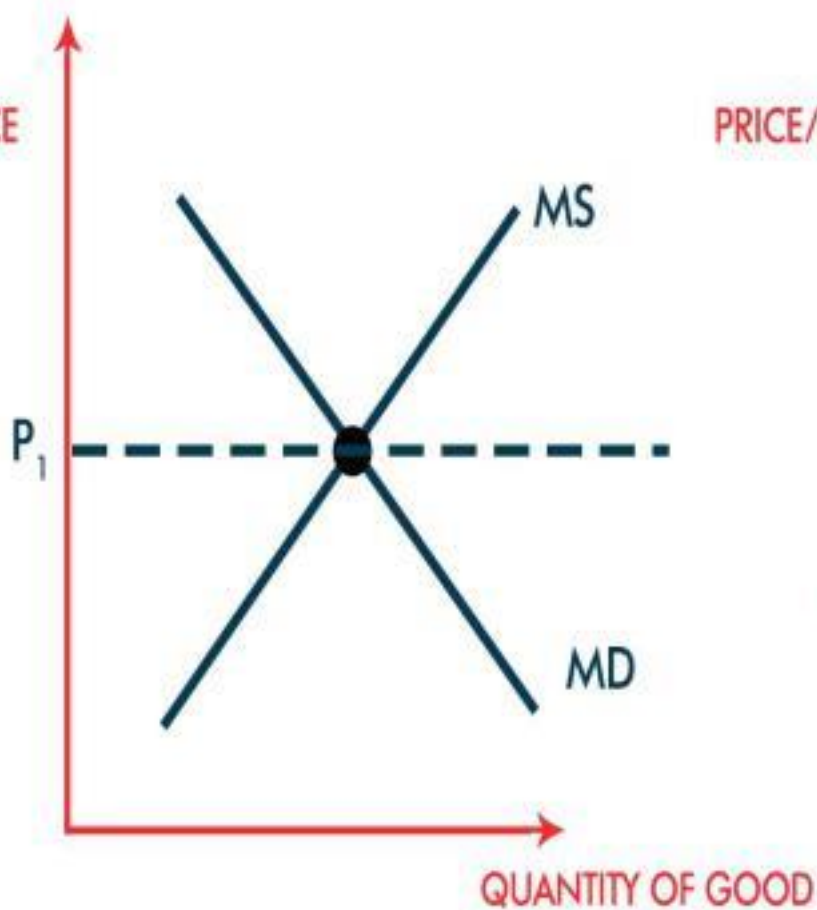
## FIRM



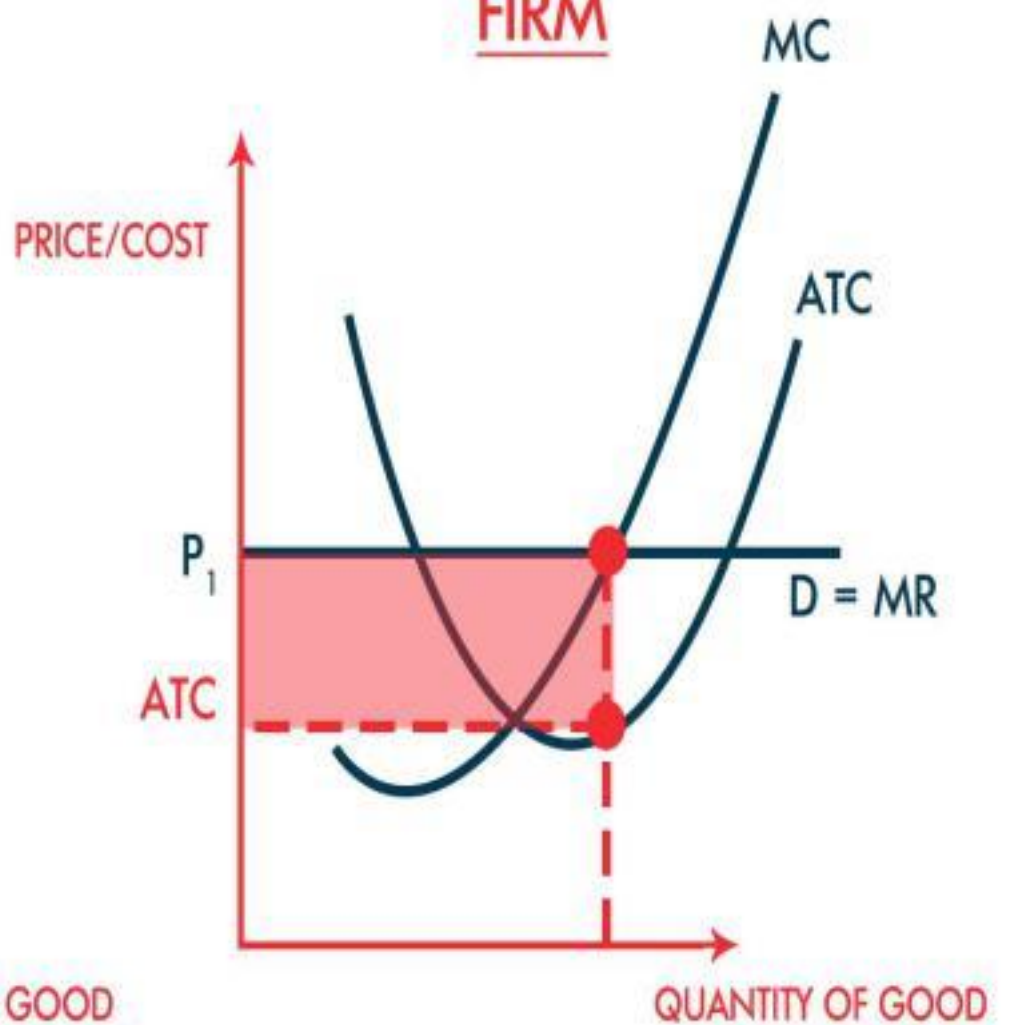
Next we have drawn the Marginal Cost and Average Total Cost on the firm graph.

# Perfect Competition – Short Run

INDUSTRY



FIRM



The Profit Maximization quantity for any firm at any point in time is where Marginal Revenue is equal to Marginal Cost.

This quantity has been labelled as  $Q_p$ .

# Perfect Competition – Short Run

- Where  $Q_p$  quantity is intersecting with the **ATC** we connect it with the **Y-axis** and label it as ATC.
- This shows the costs spent by the firm to produce a typical unit of good.

# Perfect Competition – Short Run

MEGA LECTURE

# Perfect Competition – Short Run

- The difference between  $P_1$  and ATC is the profit per unit and that multiplied with  $Q_p$ , the shaded region, shows the total amount of Abnormal Profit earned by the firm.
- Since Price which is  $P_1$  is higher than ATC this is Abnormal Profit. So firms in Perfect Competition earn Abnormal Profit in SR.

# Normal versus Abnormal Profit

- Allocatively Efficient output level is  $P=MC$
- Profit Maximization Quantity is  $MC=MR$
- Normal profit is when  $P = ATC$
- Abnormal profit is when  $P > ATC$
- It is a loss when  $P < ATC$
- Abnormal profit is the incentive for the new firms to enter the market.



# Normal Profit versus Abnormal Profit

- Normal profit means that a business is earning just enough profit that it could have earned in the alternate use of resources meaning in some other industry or business.
- Abnormal Profit is when a business is earning higher than what it could have earned in the alternate use of resources. This means that abnormal profit is above average profit.

# Perfect Competition and Profit in SR & LR

- In the SR, the Price is higher than ATC and so each firm in Perfect Competition is earning abnormal profit.
- However in the LR the price drops to the level of ATC and so each firm will earn normal profit.

# Normal Profit versus Abnormal Profit

- Whenever any industry is earning abnormal profits there are economic incentives for the new firms to enter.

- On the other hand, when the industry starts earning **normal profit** there is no incentives for new firms to enter the market and for the existing firms to leave the industry.

# Monopoly

- Monopoly being the least competitive market structure lies on the other extreme of the spectrum.
- Any market with single supplier or **one dominant firm** is known as monopoly.
- For the sake of simplicity we will assume that there is only one producer in the monopoly market. However such examples are slightly hard to find in real world except for natural monopolies.

# Monopoly

- State owned enterprises that are only firm providing certain goods or services are known as natural monopolies.

# Characteristics of Monopolistic Markets

- 1. Single firm** satisfying entire market demand for any product.
- 2. High barriers** to entry and exit. Well-established monopoly brand and high initial set-up cost limit entry of new firms. Similarly often exit barriers are also high in terms of Sunk Cost.
3. Monopolist is **price-maker**. Since entire market supply is determined by single firm hence monopoly can manipulate market price.

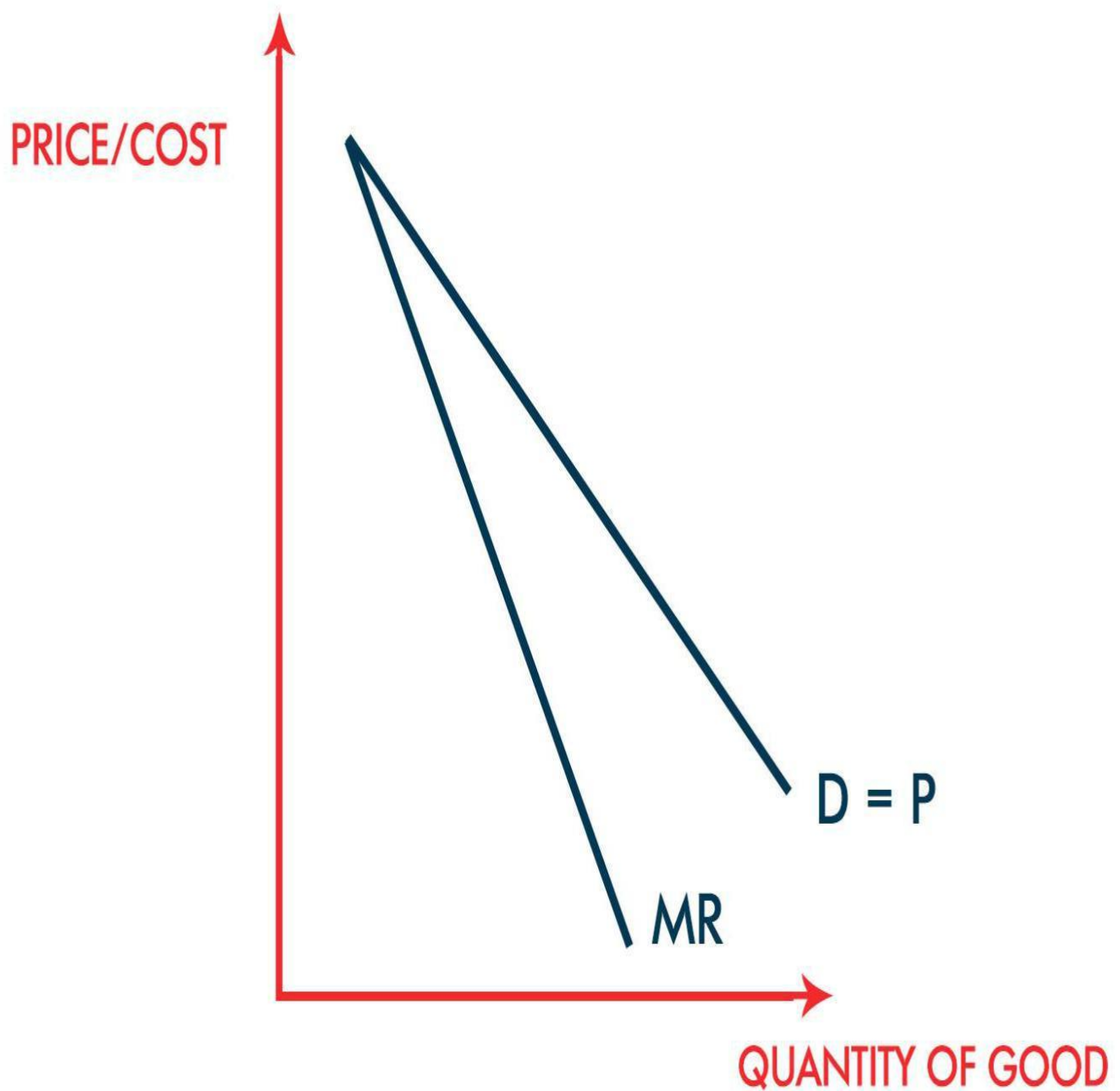
# Characteristics of Monopolistic Markets

4. Monopolist earns Abnormal Profit both in **SR** and **LR**.

5. Being the only producer Monopolist has inelastic demand which is shown as steep downward sloping demand curve.



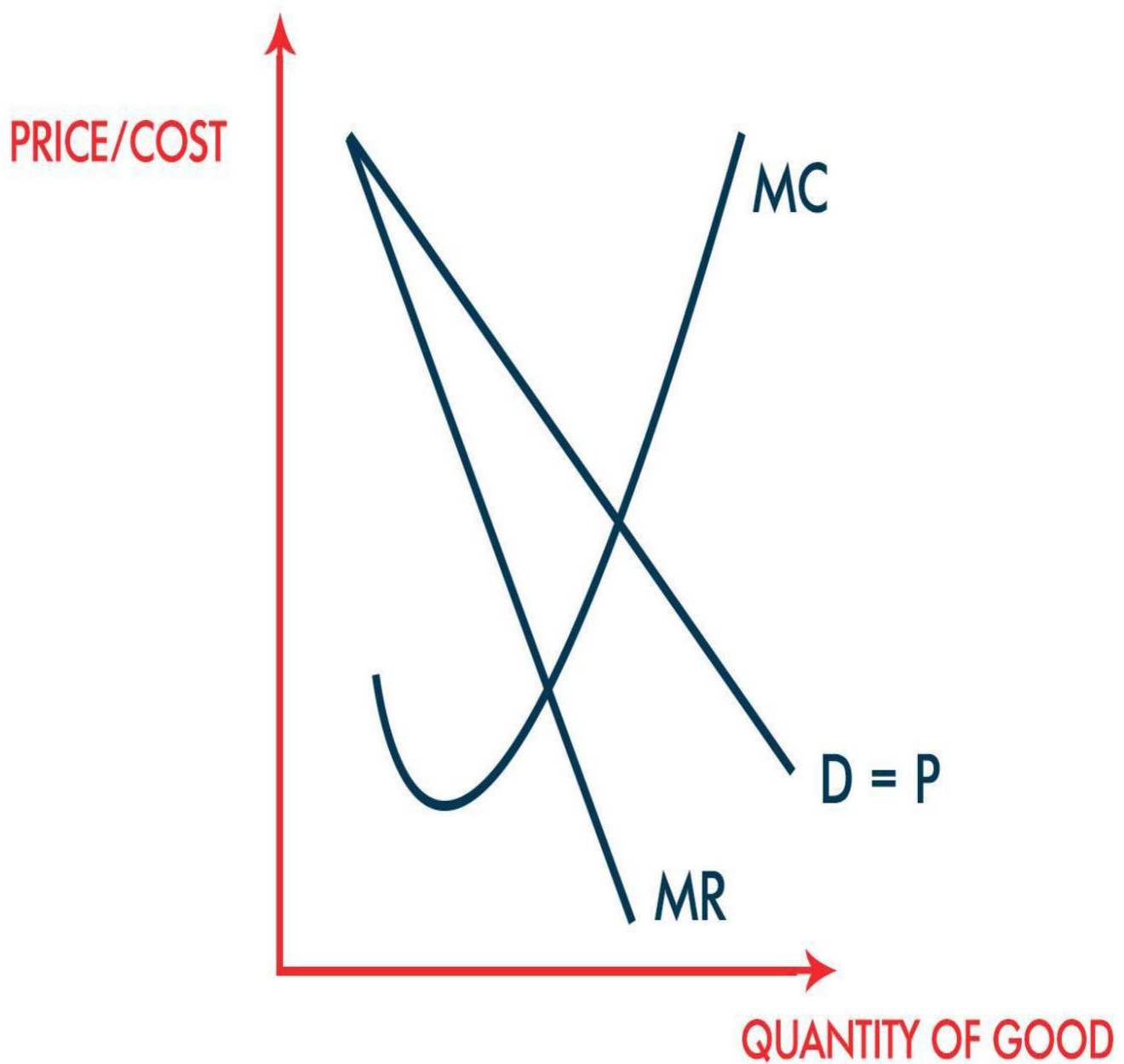
# Monopoly - SR & LR Equilibrium



# Monopoly - SR & LR Equilibrium

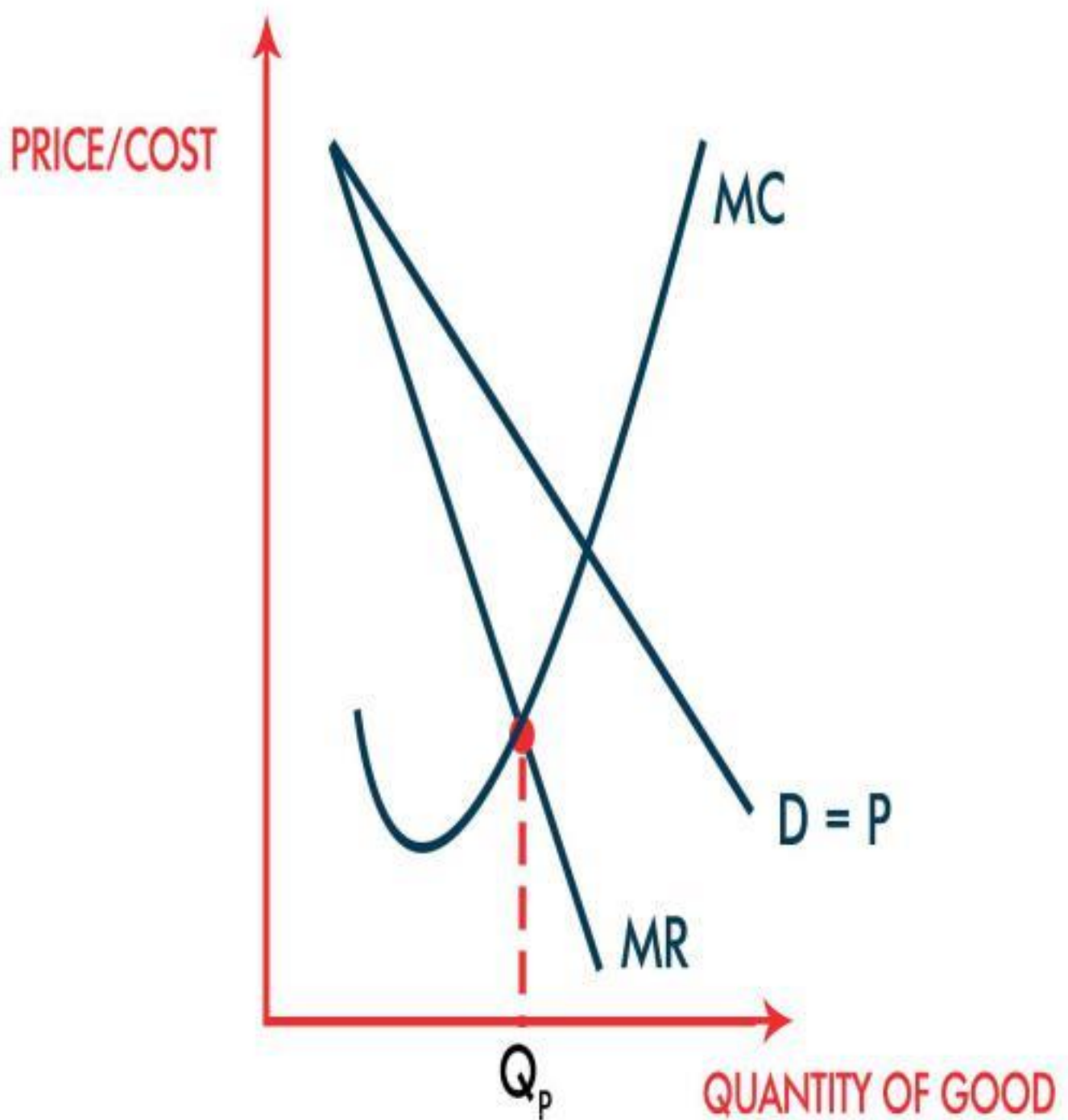
- As mentioned earlier, the demand curve of a monopoly is **downward sloping**.
- To the left of demand curve lies Marginal Revenue curve.

# Monopoly - SR & LR Equilibrium



The Marginal Cost curve is upward sloping just like any other business.

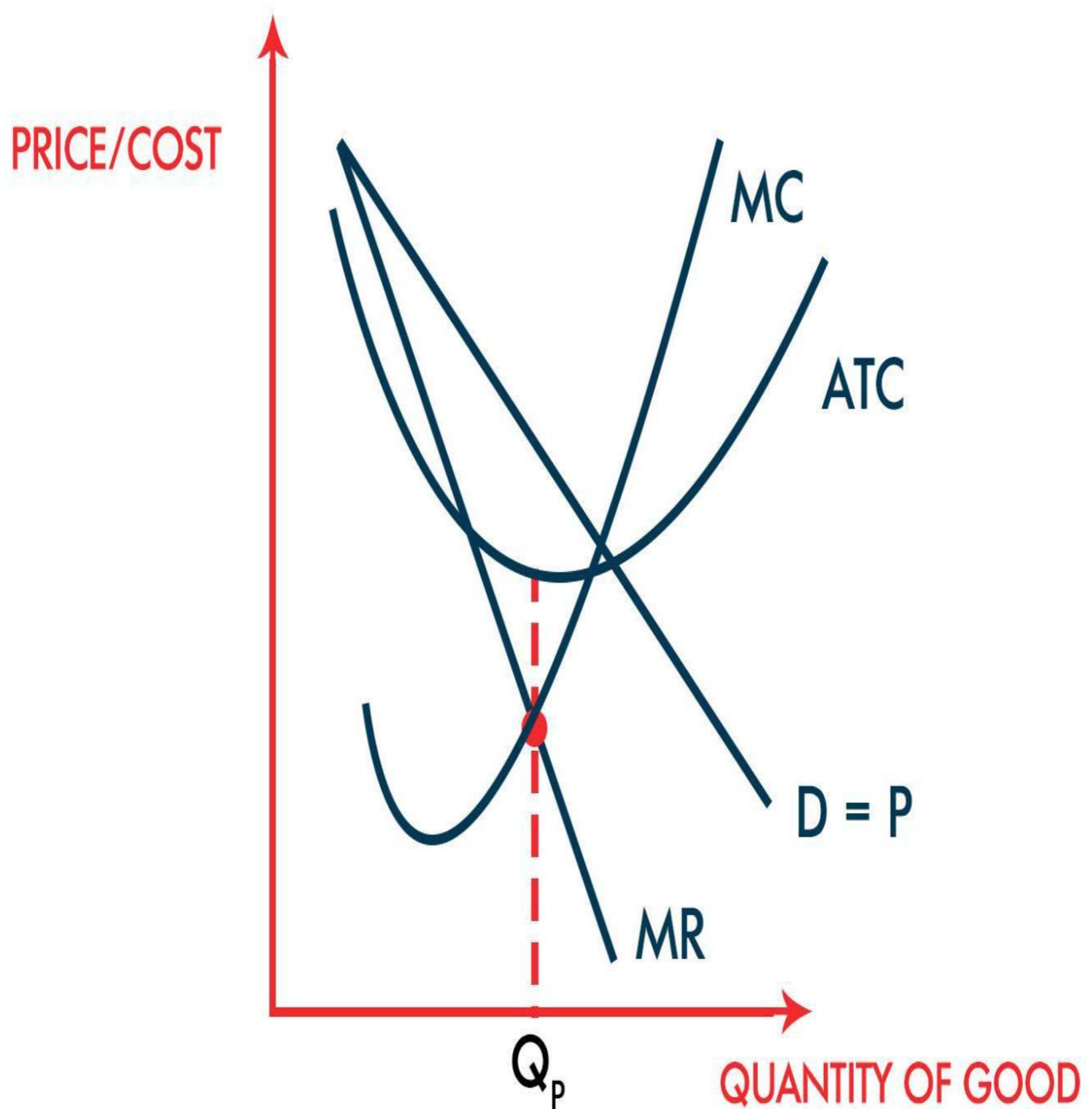
# Monopoly - SR & LR Equilibrium



# Monopoly - SR & LR Equilibrium

- The Profit Maximization quantity for any business is where Marginal Revenue is equal to Marginal Cost.
- This point is extended to the **X-axis** and is labelled as **Qp**.

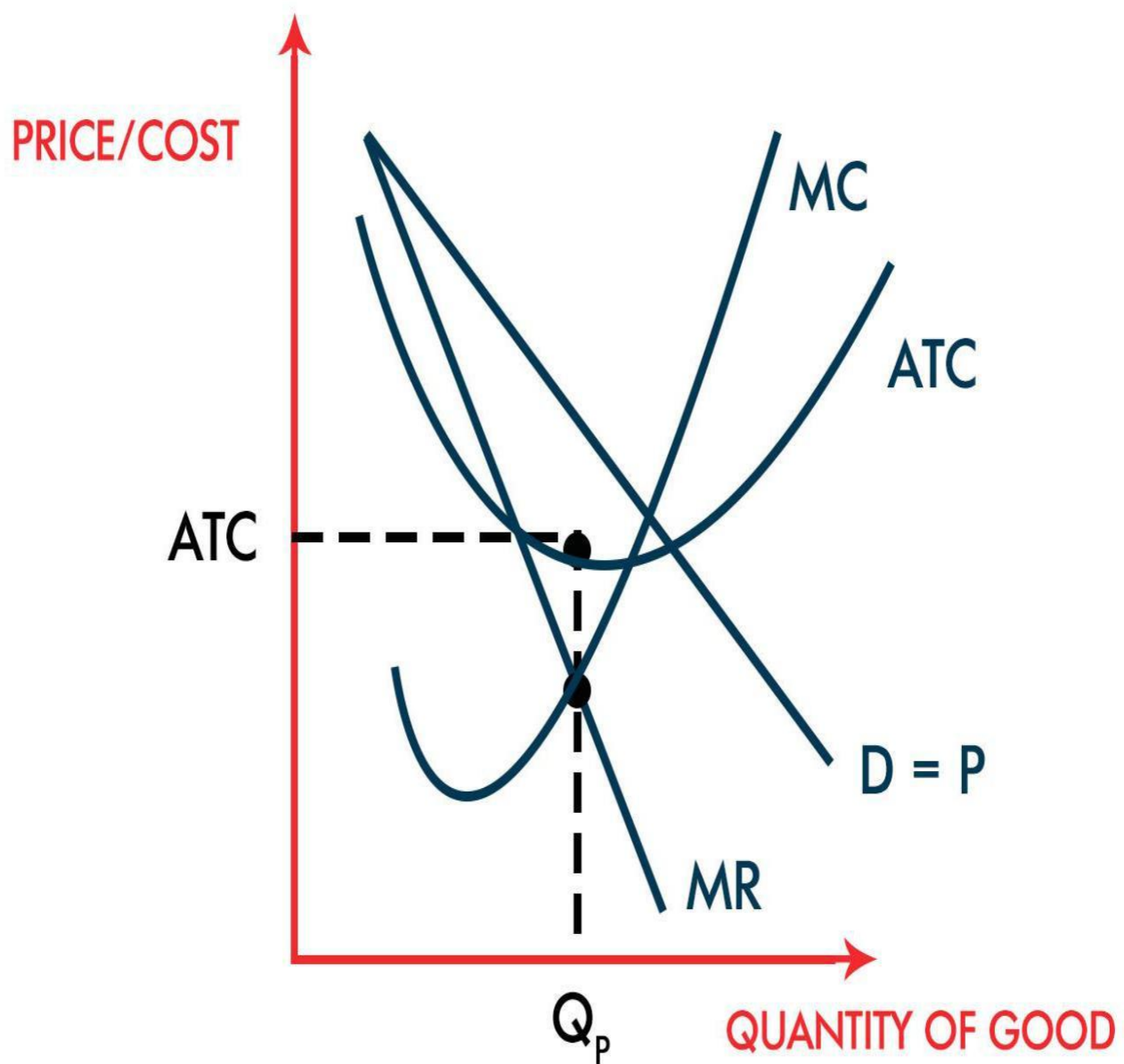
# Monopoly - SR & LR Equilibrium



# Monopoly - SR & LR Equilibrium

- The Profit Maximization quantity is extended upwards till it touches the **ATC curve** and then connected with the Y-axis to see how much is the ATC.

# Monopoly - SR & LR Equilibrium

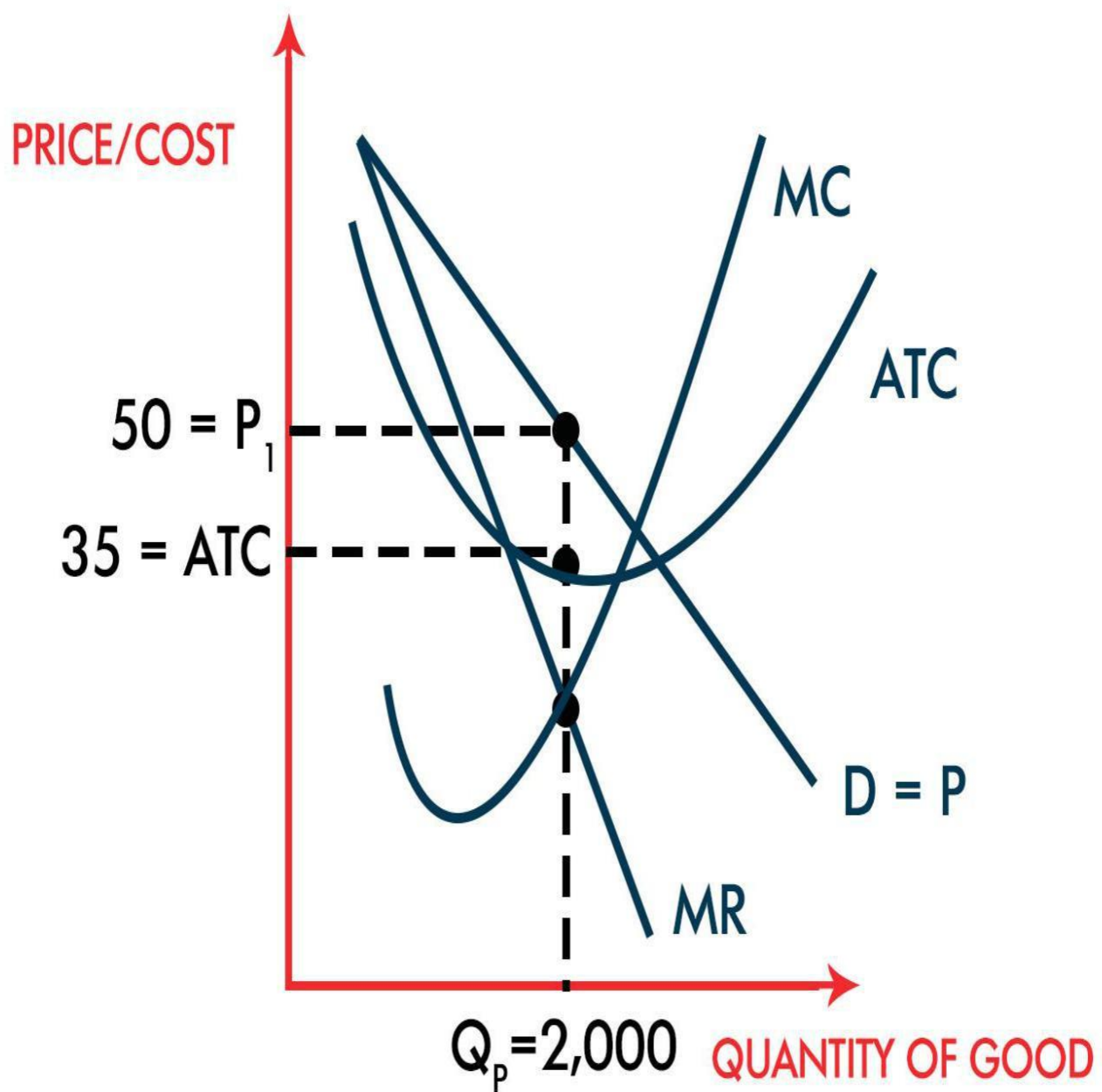




# Monopoly - SR & LR Equilibrium

- The Profit Maximization quantity is extended upwards till it touches the ATC curve and then connected with the Y-axis to see how much is the ATC.
- This line is further extended till it touches the demand curve and then connected to the Y-axis to determine the price of each unit of good sold.

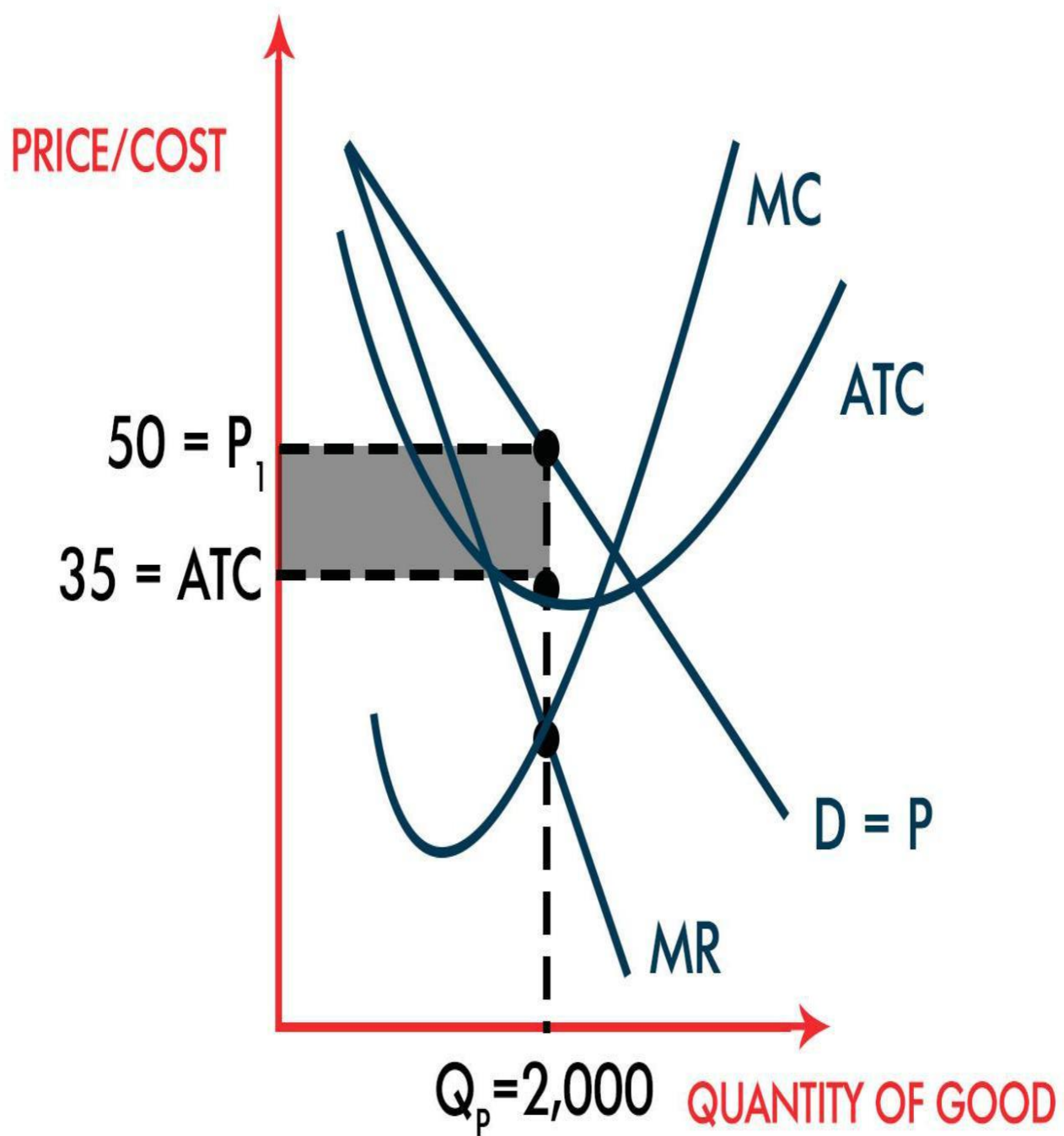
# Monopoly - SR & LR Equilibrium



# Monopoly - SR & LR Equilibrium

- As can be seen from the graph, the Price per unit is Rs 100 and average cost to produce a typical unit of good is Rs 80.
- This makes per unit profit equals to Rs 20.

# Monopoly - SR & LR Equilibrium



# Monopoly - SR & LR Equilibrium

- If we assume the profit maximization quantity to be equal to 50,000 units then Rs 20 multiplied with 50,000 units which the shaded region shows the Abnormal Profit earned by Monopolist.

# SR versus LR Equilibrium in Monopoly

- In both SR and LR the monopoly earns Abnormal Profit. This is because of high entry barriers that prevent new firms from entering the market.

# Monopolistic Competition

- Industries where there are decent number of firms each producing slightly different version of same product. Branding and advertisement are prominent features of such markets.
- Clothing, consumer goods including electronics, hygiene products, cars etc are some markets that can be classified as Monopolistic Competition.

# Characteristics of Monopolistically Competitive Markets

1. There are decent number of firms (but less than perfect competition).
2. The entry barriers exist but they can be **overcome** by new firms through their constant struggle. Well-established brands are major deterrent for entry of new firms.



# Characteristics of Monopolistically Competitive Markets

3. Firms have **some control** over prices of their products but since close substitutes exist hence firms are not price-makers as Monopolies.
4. Firms earn abnormal profit only in **short-run**. In long run firms' abnormal profit change to normal profit.

# Monopolistic Competition – SR Equilibrium

MEGA LECTURE

$$D=P$$

# Monopolistic Competition

## – SR Equilibrium

- The demand curve for any firm in Monopolistic Competition is usual **downward sloping curve**.
- Since there are multiple firms in the industry the demand curve faced by any firm in Monopolistic Competition is less steep showing more price elastic demand.

# Monopolistic Competition – SR Equilibrium



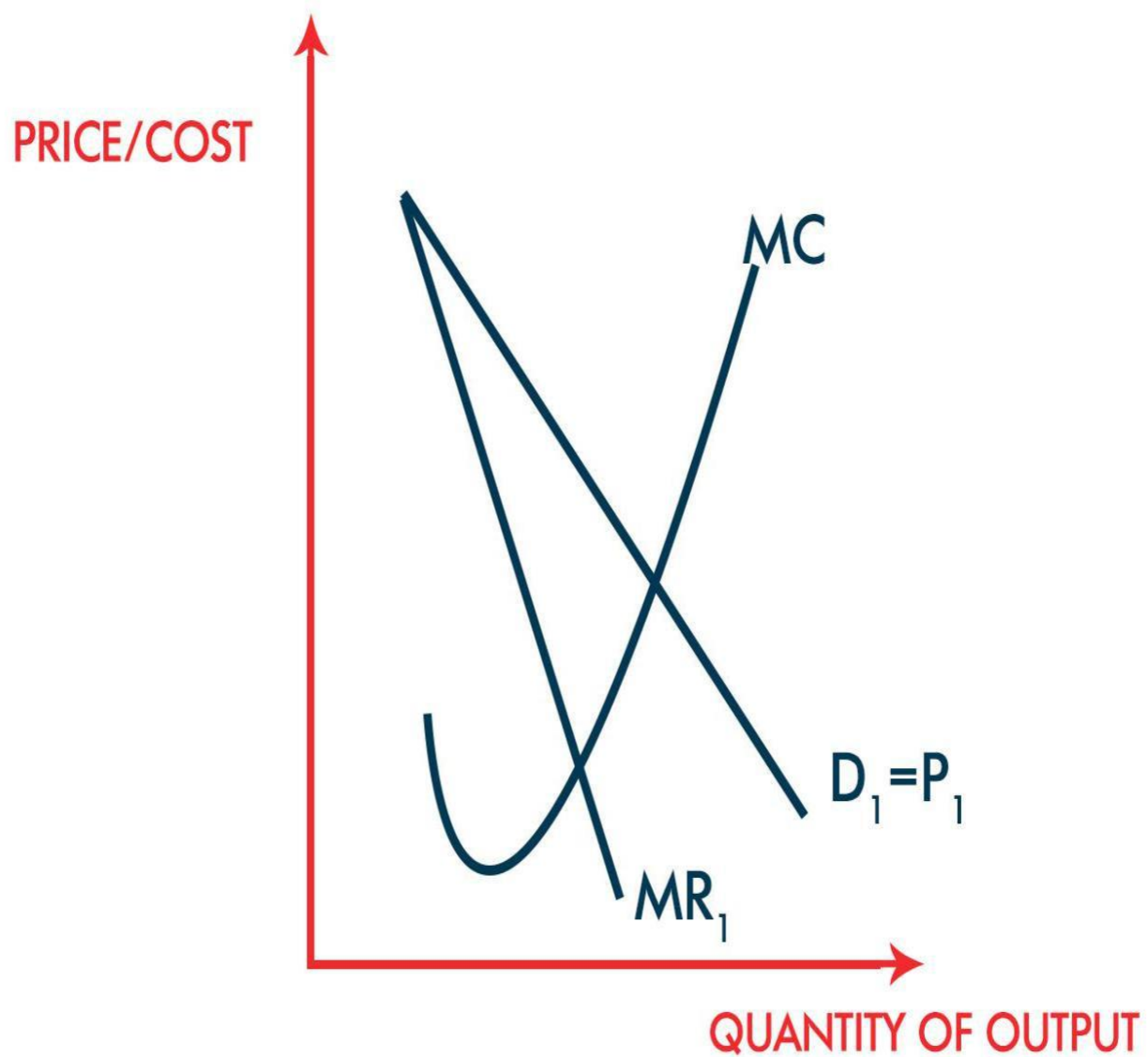
# Monopolistic Competition

## – SR Equilibrium

- The Marginal Revenue curve is as usual and **lies to the left** of firm demand curve.

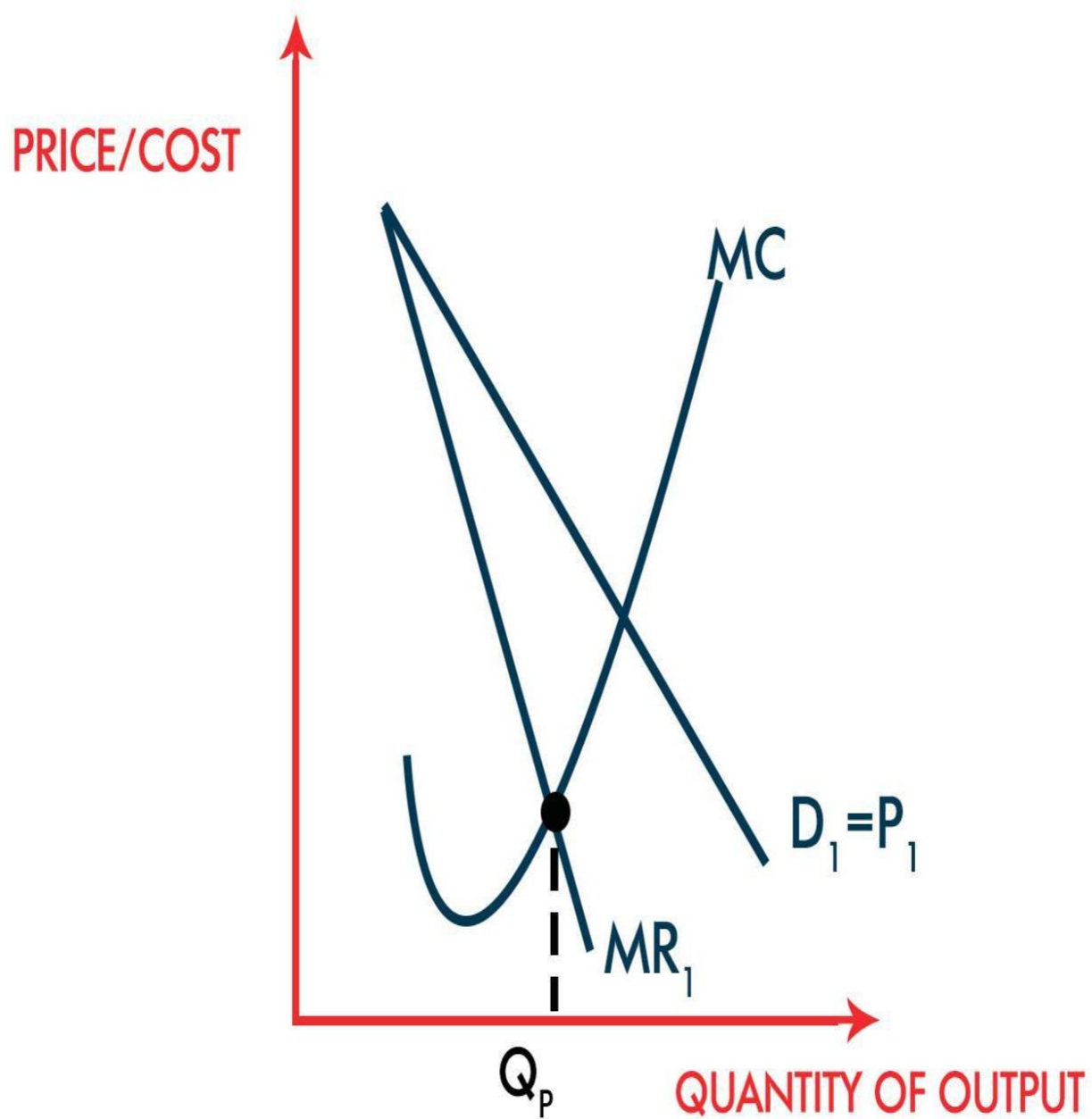
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# Monopolistic Competition – SR Equilibrium



The Marginal Cost curve is as usual and is *J shaped* curve.

# Monopolistic Competition – SR Equilibrium



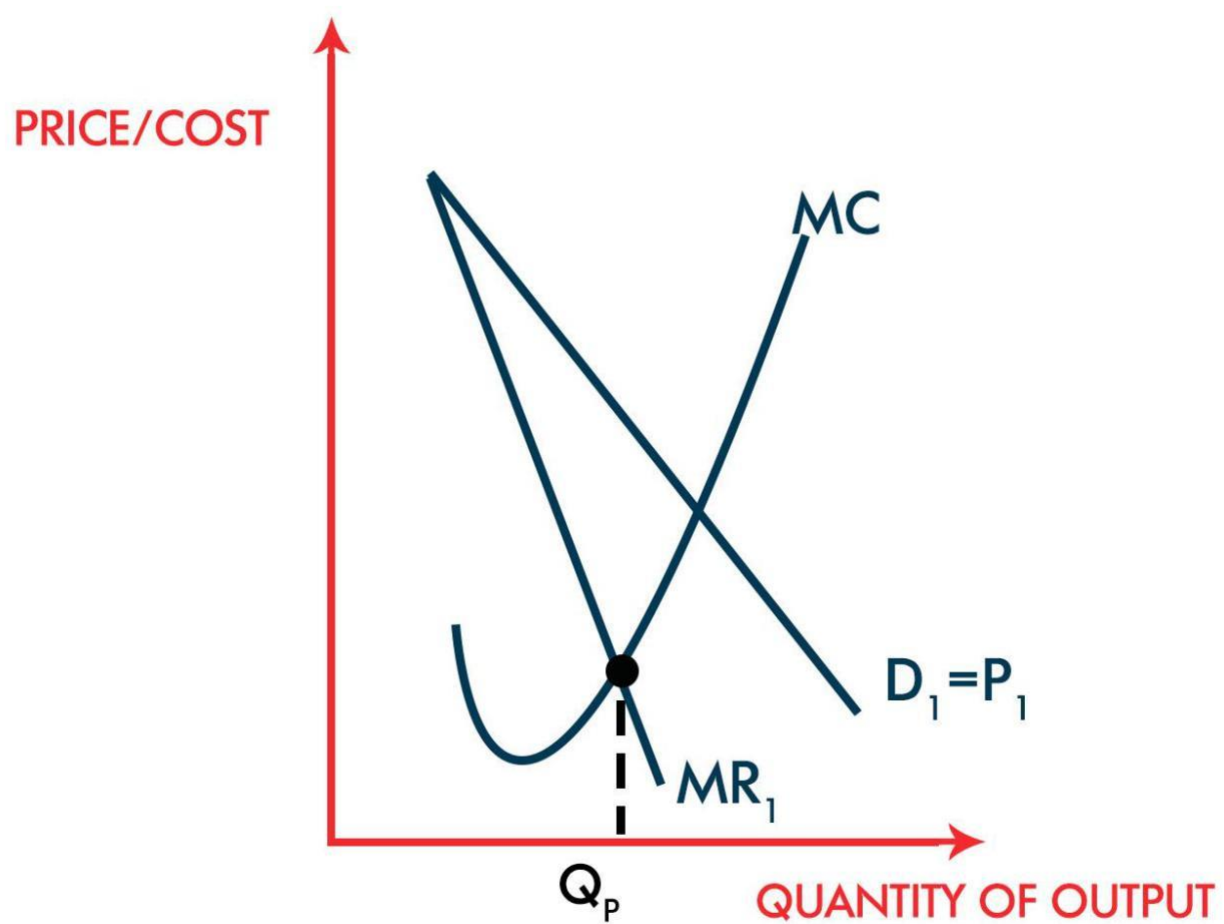
# Monopolistic Competition

## – SR Equilibrium

- Where Marginal Cost and Marginal Revenue curve intersect that is profit maximization quantity and is labelled as  $Q_p$ .

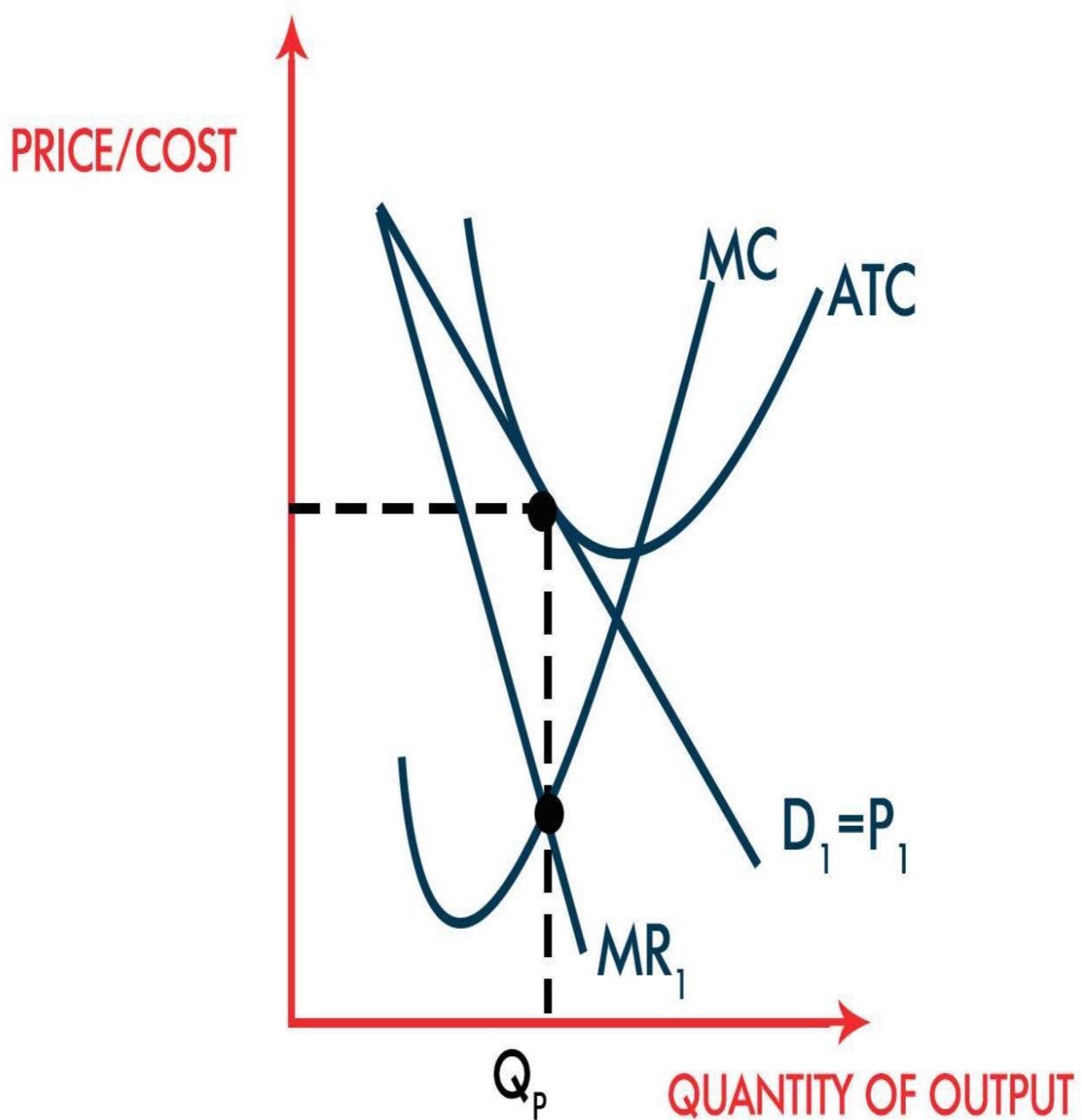


# Monopolistic Competition – SR Equilibrium



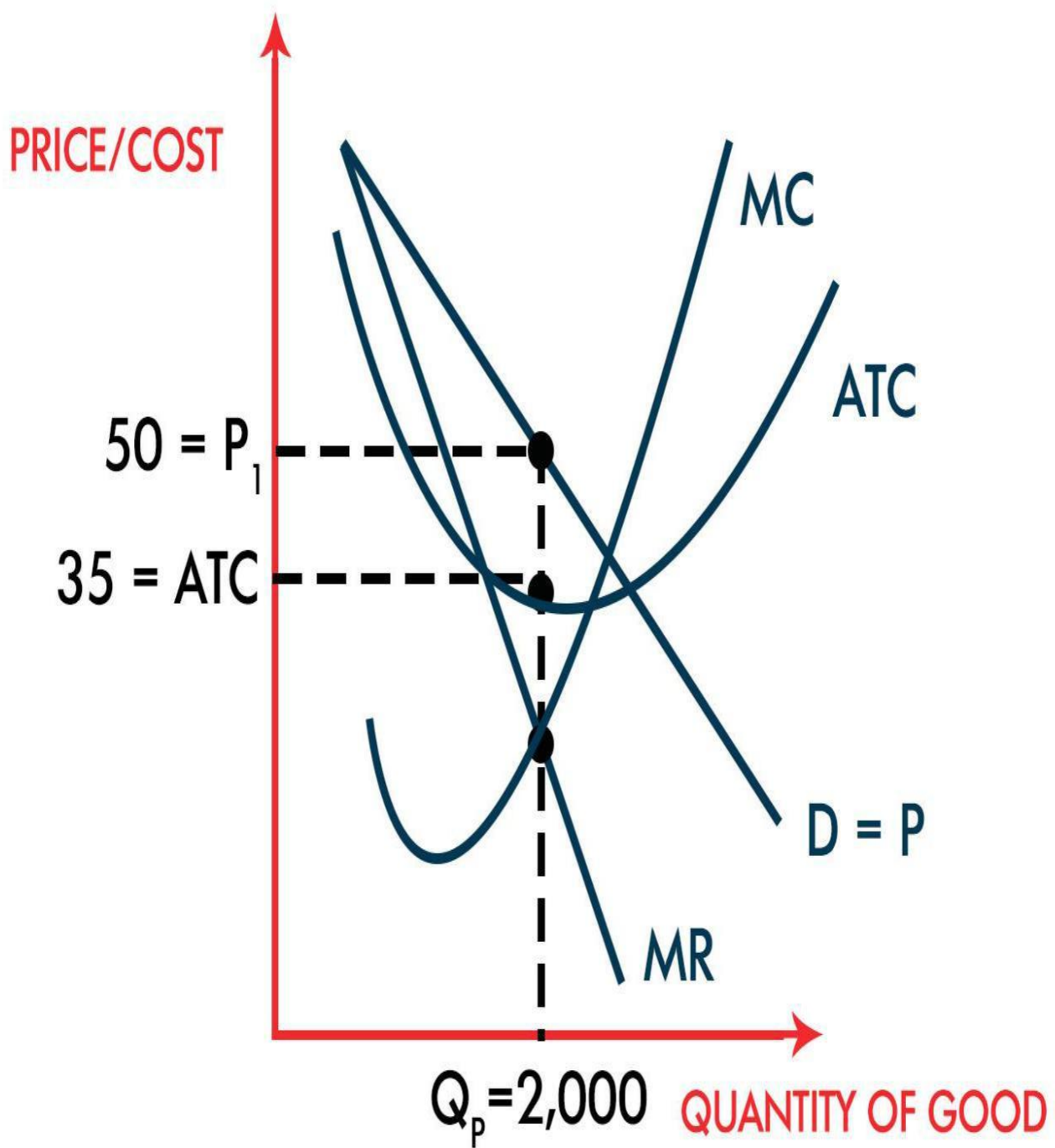
The Average Total Cost (ATC) is U shaped graph as always.

# Monopolistic Competition – LR Equilibrium



*ATC shows cost spent by the business to produce a typical unit of the good.*

# Monopolistic Competition – SR Equilibrium

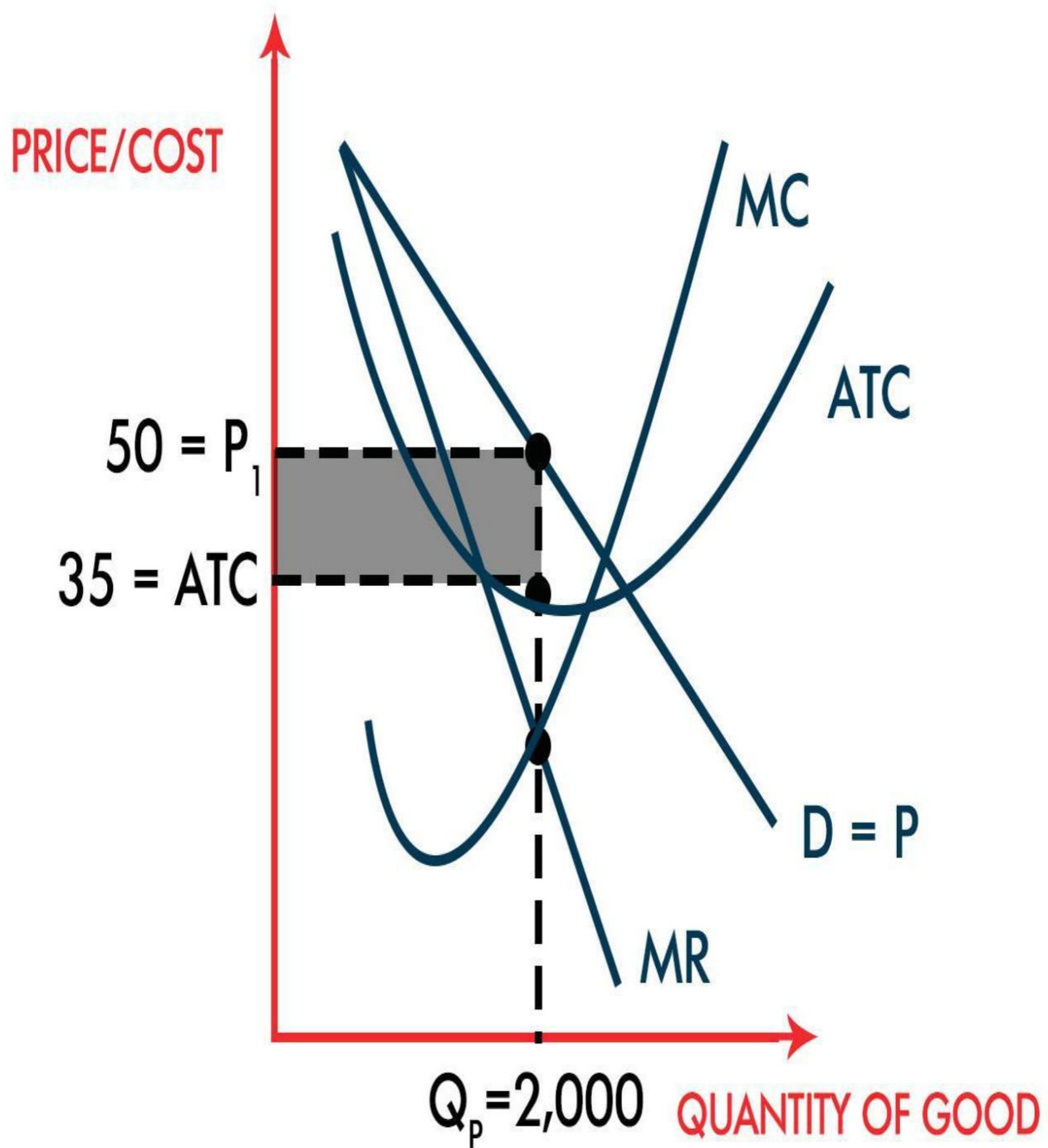


# Monopolistic Competition

## – SR Equilibrium

- The difference between  $P_1$  and ATC shows profit per unit which in this case is Rs 15.
- The profit per unit multiplied by profit maximization quantity which is 2,000 units in this case shows total amount of **Abnormal Profit** made by the business.

# Monopolistic Competition – SR Equilibrium



# Monopolistic Competition

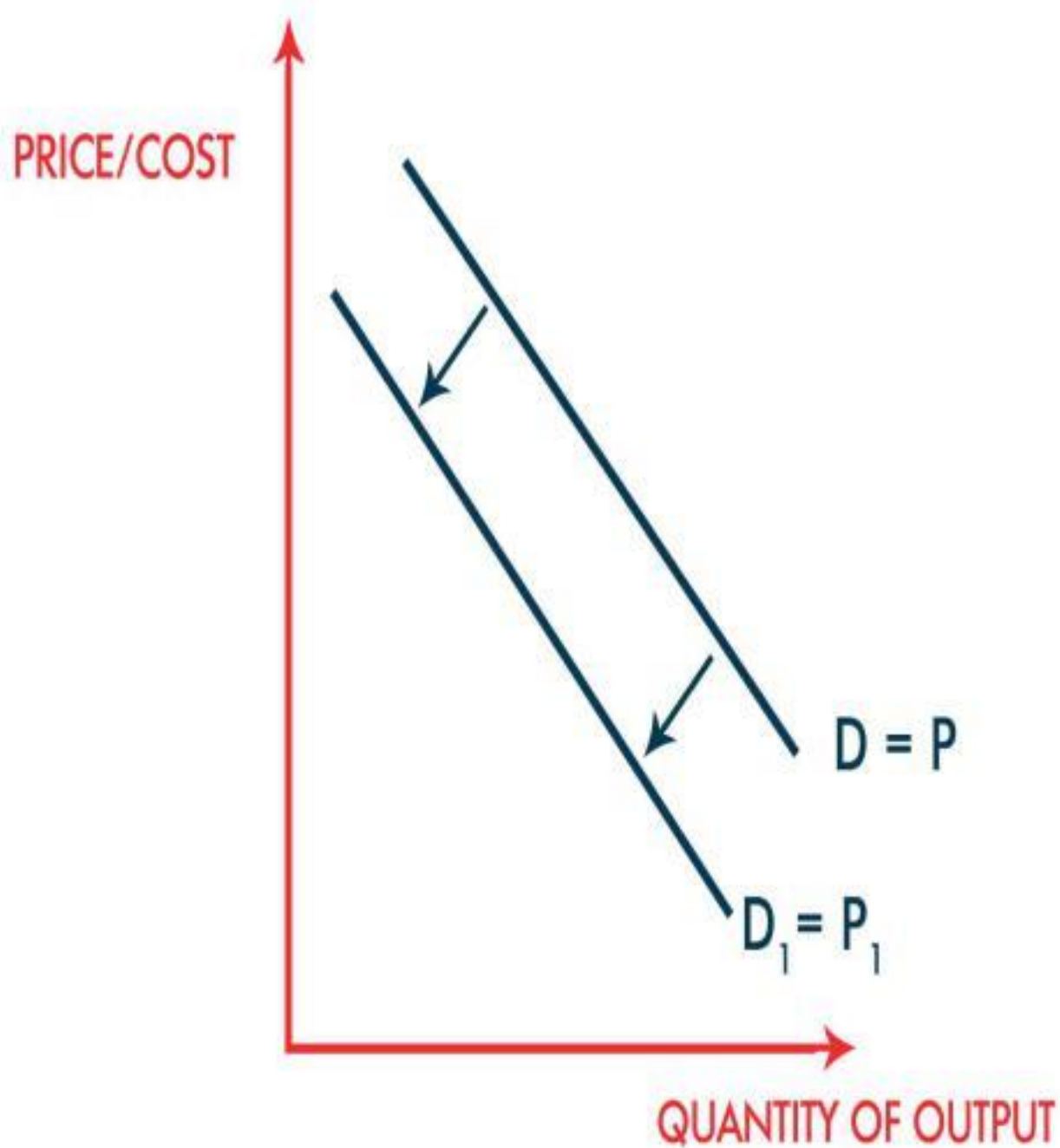
## – SR Equilibrium

- The difference between  $P_1$  and ATC shows profit per unit which in this case is Rs 15.
- The profit per unit multiplied by profit maximization quantity which is 2,000 units in this case shows total amount of Abnormal Profit made by the business.
- This is shown by the **area of the shaded region.**

# SR Equilibrium of Monopolistic Competition

- In the SR firms in Monopolistic Competition earn abnormal profit.
- However, in the LR when new firms enter the market the demand curve for each firm shifts to the left and so the abnormal profit is brought down to normal level.

# Monopolistic Competition – LR Equilibrium

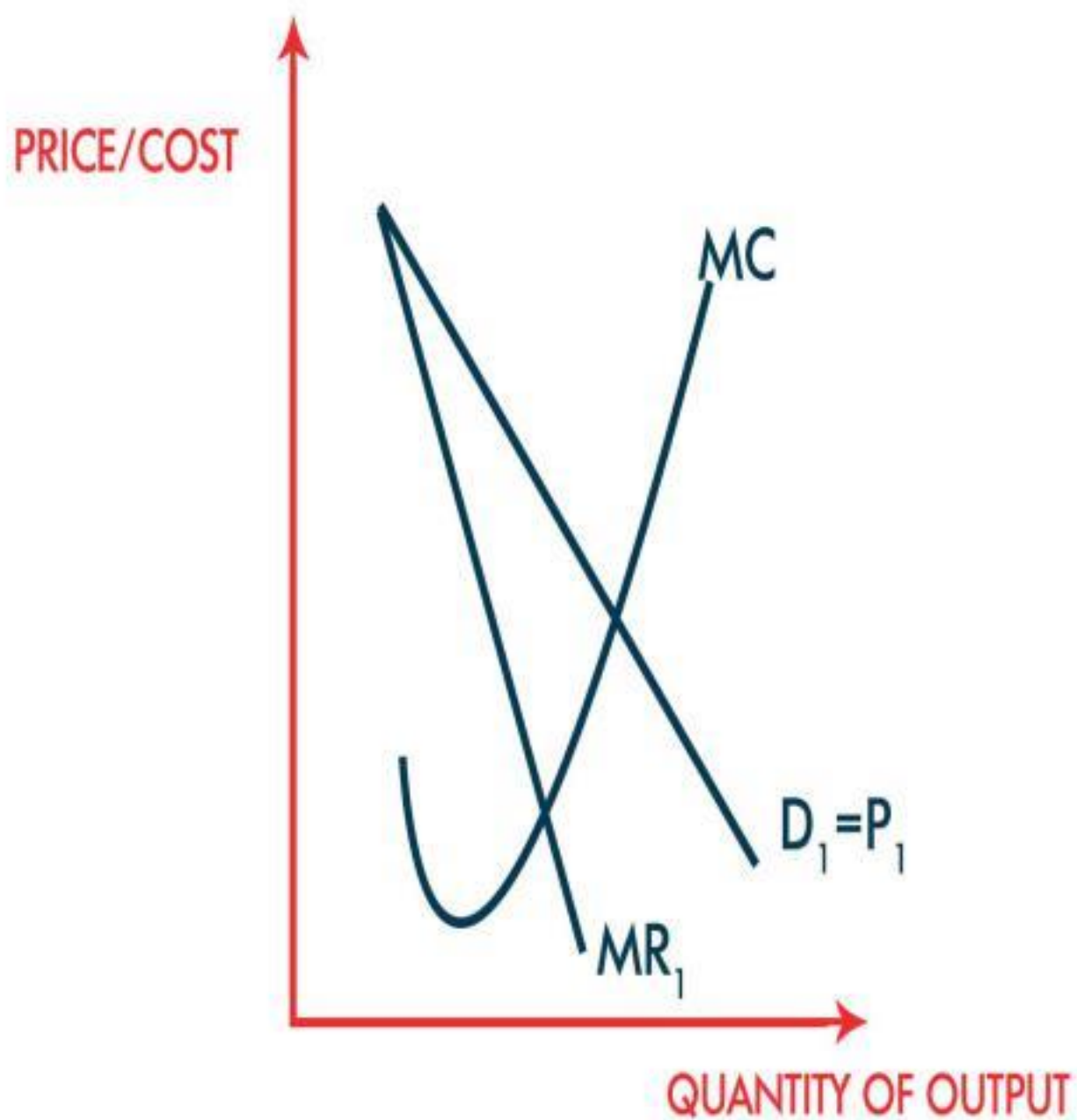




# Monopolistic Competition – LR Equilibrium

- As can be seen from the graph, in the Long Run when more firms enter the industry each firm's demand curve will shift leftwards showing a decrease in demand curve.
- Now the new demand curve is **D1** which is **lower** than Short Run demand curve which was **D**.

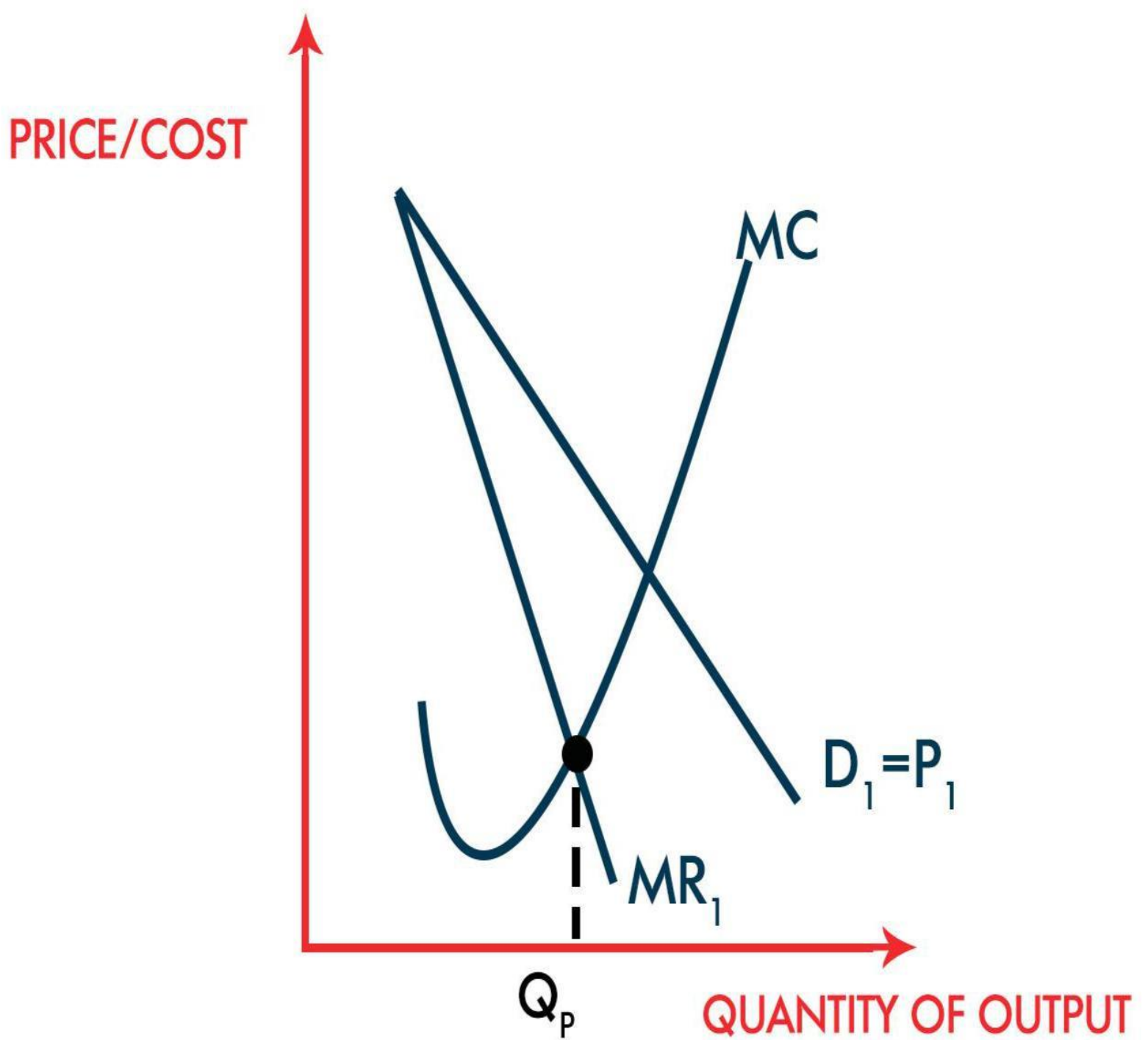
# Monopolistic Competition – LR Equilibrium



# Monopolistic Competition – LR Equilibrium

- The Marginal Revenue curve as usual will lie to the left of demand curve and Marginal Cost curve will be as usual *upward sloping*.

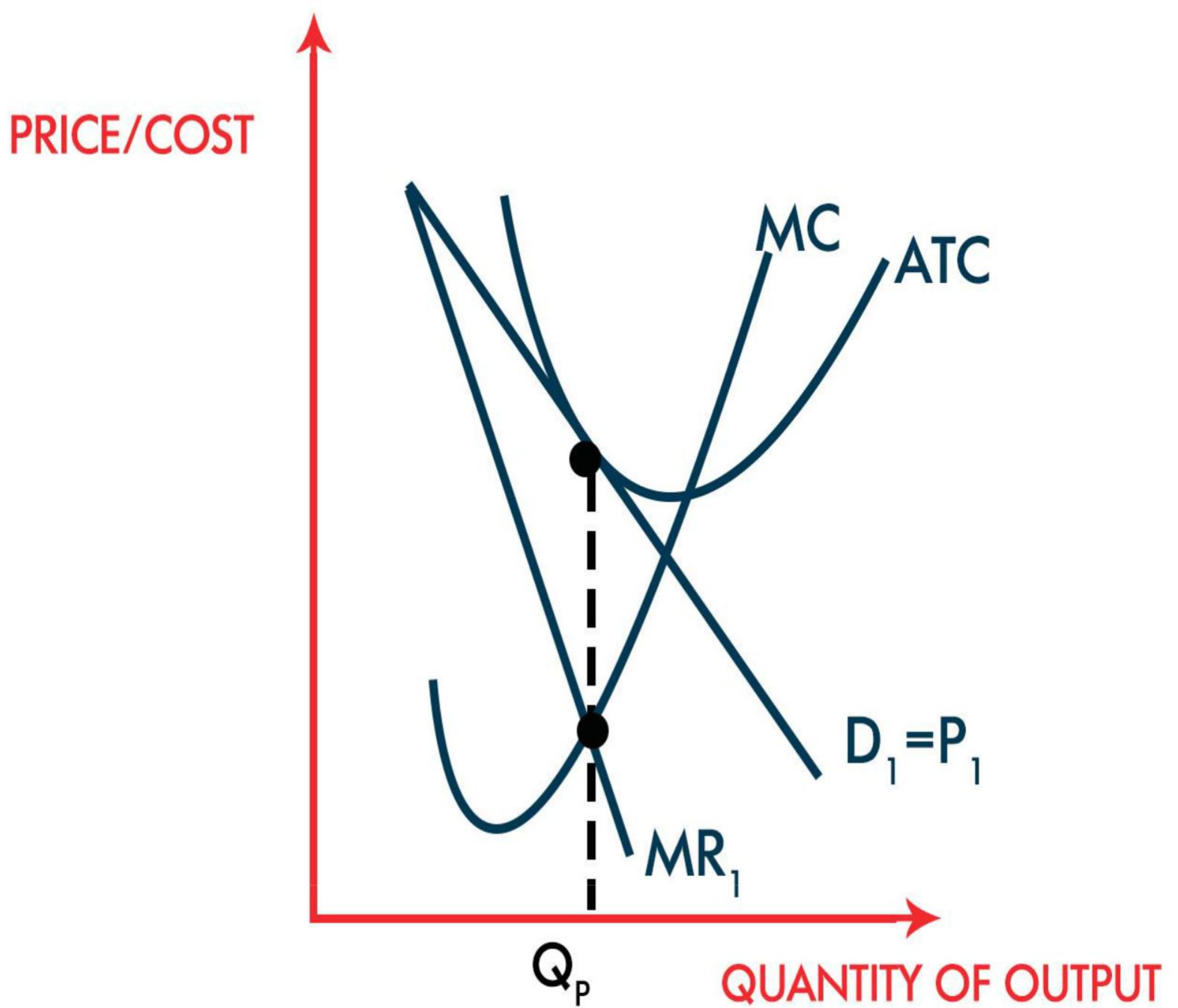
# Monopolistic Competition – LR Equilibrium



# Monopolistic Competition – LR Equilibrium

- The Marginal Revenue curve as usual will lie to the left of demand curve and Marginal Cost curve will be as usual **upward sloping**.
- The Profit Maximization quantity is where Marginal Revenue and Marginal Cost curve intersect which is labelled as  **$Q_p$** .

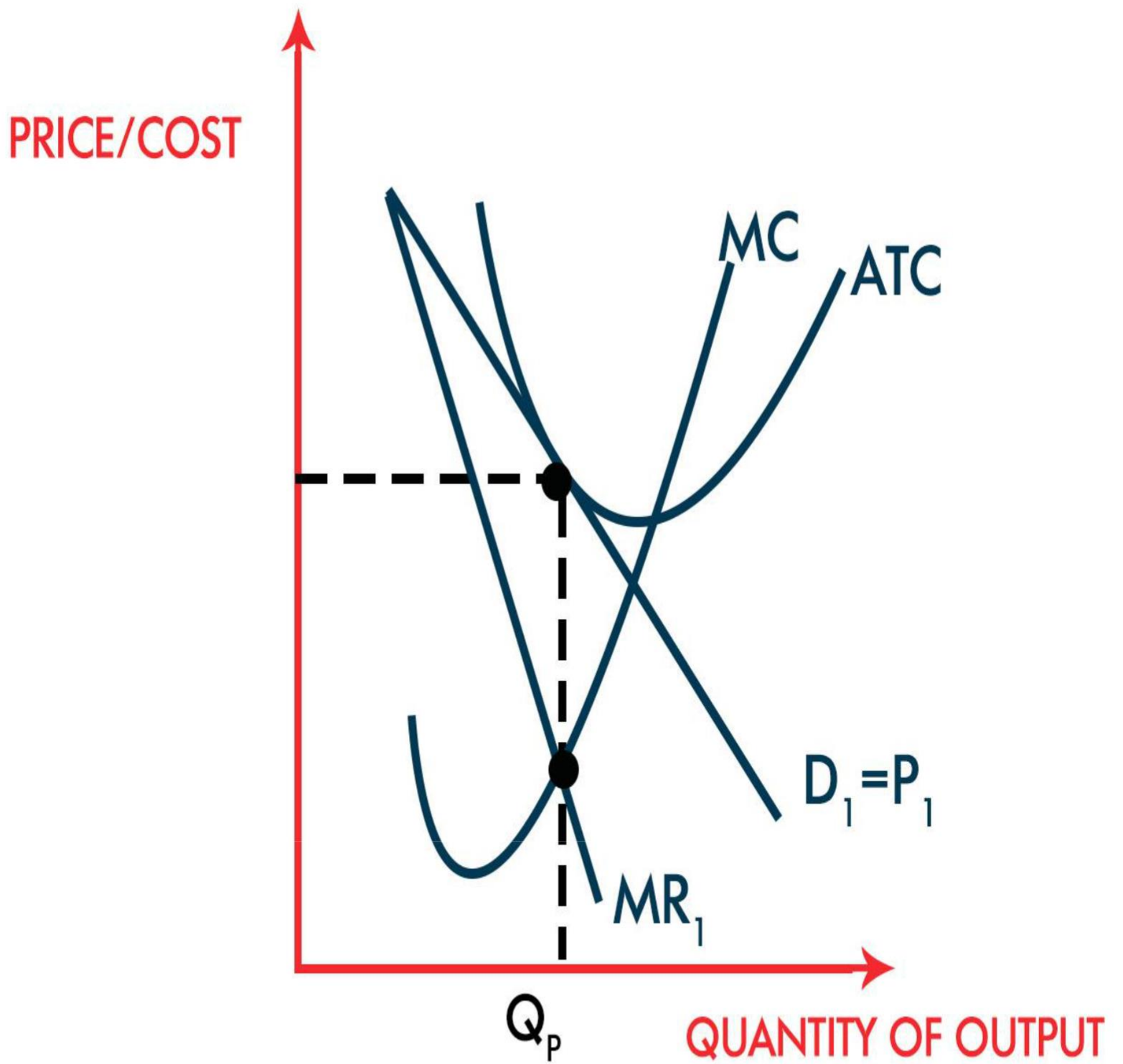
# Monopolistic Competition – LR Equilibrium



# Monopolistic Competition – LR Equilibrium

- The most important difference in the Short Run and Long Run of Monopolistic Competition is that in Long Run the ATC curve is tangent to the demand curve.
- In Short Run the **ATC curve** was at lower level than demand curve.

# Monopolistic Competition – LR Equilibrium





# Monopolistic Competition

## – LR Equilibrium

- Hence as can be seen from the graph, the Price is equal to ATC which means that firms in Monopolistic Competition in Long Run will earn **Normal Profit**.

# Oligopoly Market

- Industries where there are limited number of firms (5 to 7) and each firm is satisfying a **big proportion** of total market demand.
- Mineral extraction industries including oil refining and oil distribution firms can be classified as Oligopoly markets. Similarly telecommunication industries can also be classified as Oligopoly markets.

# Game Theory

- A technique used to analyze real world problems / situations using **quantitative analysis**.
- It is commonly used in Economics and Political Science.

# Prisoners Dilemma

- A popular example of game theory that explains how due to lack of trust between parties involved in any situation they will opt for **less desirable outcomes**.
- In this game, prisoners opt to confess to police about their crime and so are subject to greater number of years in jail whereas ideally they should not have confessed which could have saved them extra years in jail.

# Game Theory and Oligopoly

- Firms in Oligopoly markets are faced with similar circumstances as prisoners in the case of Prisoners Dilemma situation.
- Firms can either increase the price or reduce the price.
- If both firms collectively increase the price of their products then both firms will earn higher profits.

# Game Theory and Oligopoly

- However because in absence of collusion / cartel the firms do not trust other firms and so try to **undercut** the price for their products to **attract more customers** but since all firms end up reducing the price of their products, the firms' profits fall drastically.

# Game Theory & Oligopoly

- If firms have signed a cartel agreement in which firms explicitly agree to fix their prices all firm will collectively increase their prices and so their profits will increase.

# What is Collusion?

- Collusion is **agreement among participating firms** that they will collectively increase price and / or reduce their output to earn higher profits.
- This agreement can either be in the written form which is known as Explicit Collusion or Cartel or unwritten agreement which is known as Implicit Collusion or Price Leadership.



# Types of Collusion

- Firms in any industry can collude in following manner:

## 1. Cartel / Explicit Agreement:

through formal written agreement firms agree to collectively set prices and control their output.

## 2. Price Leadership / Implicit

**Agreement:** this generally takes the form of price leadership when dominant firm sets prices and other firms follow.

# Types of Collusion

- The objective of any collusive behavior is to control market prices to enjoy higher profits.
- Implicit collusion unlike cartels is safer to operate for it is harder for regulatory bodies to detect such illegal competition practices. However firms can more easily cheat upon each other in absence of cartel arrangements.

# Characteristics of Oligopoly Market

1. Demand curve faced by Oligopoly firms is known as Kinked Demand Curve, as shown in the next slide.
2. There is element of price rigidity in Oligopoly markets due to interdependence of firms in terms of their decision making.
3. The entry barriers are high. The most significant entry barrier in the case of Oligopoly is **high investment requirement.**

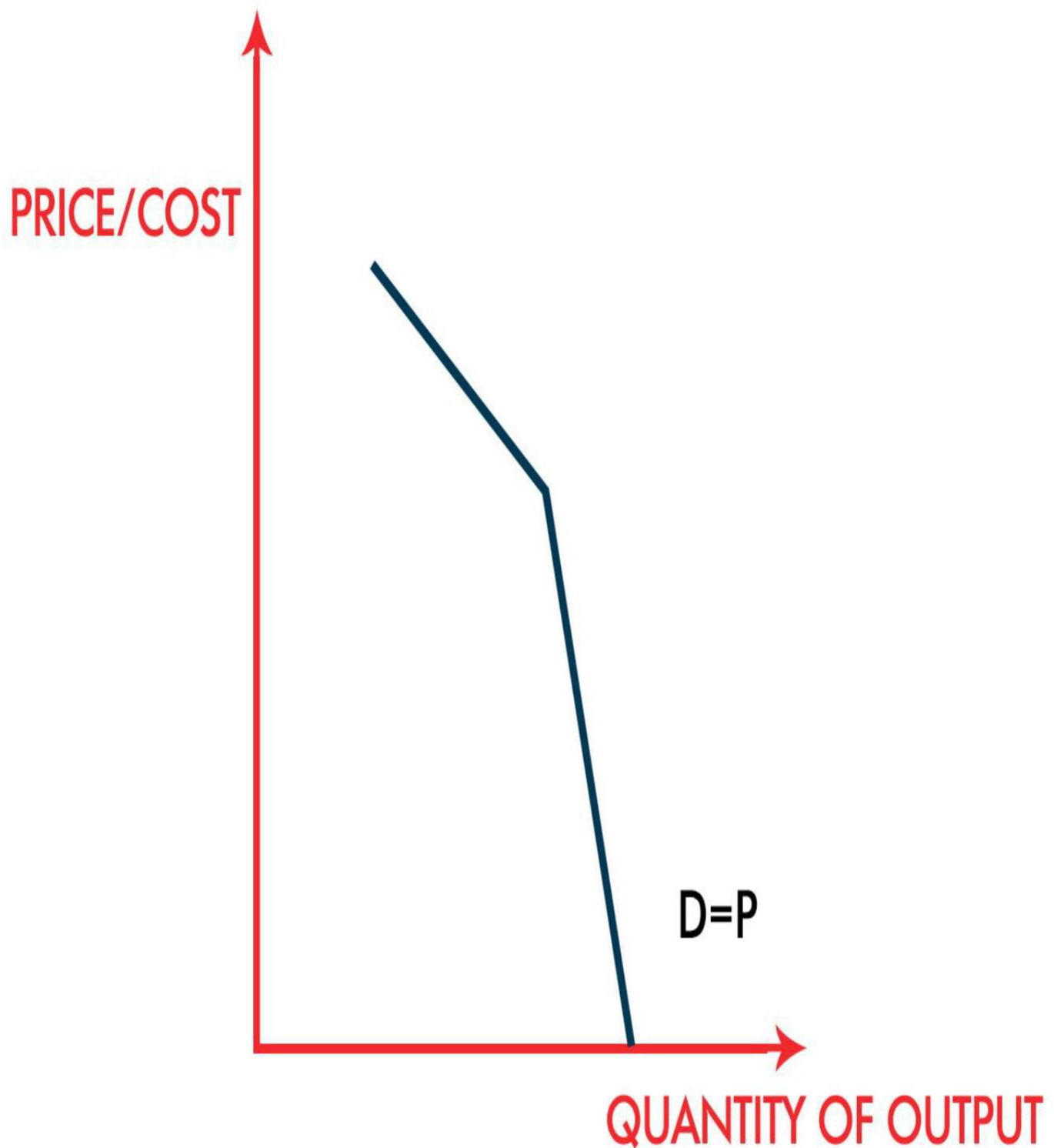
# Characteristics of Oligopoly Market

3. Few firms and homogenous nature of products **incentivize** firms to **collude** to benefit from their market manipulation powers. Collusion is when firms illegally act as single producer to benefit from monopolistic powers.

# Characteristics of Oligopoly Market

4. Collusion give firms in Oligopoly markets monopolistic powers which are used to significantly increase entry barriers like Predatory Pricing, lobbying against government actions to resist any of government decisions against these firms etc.

# Kinked Demand Curve



# Kinked Demand Curve & Price Rigidity

- The price of the product is rigid around the bend of demand curve. Every firm operating in oligopoly market faces two options of either to increase the price or to decrease the price.
- Price increase comes with the threat that competitors will not follow and therefore the company can lose its customers to its competitors. Hence firms are generally reluctant to increase prices.

# Kinked Demand Curve & Price Rigidity

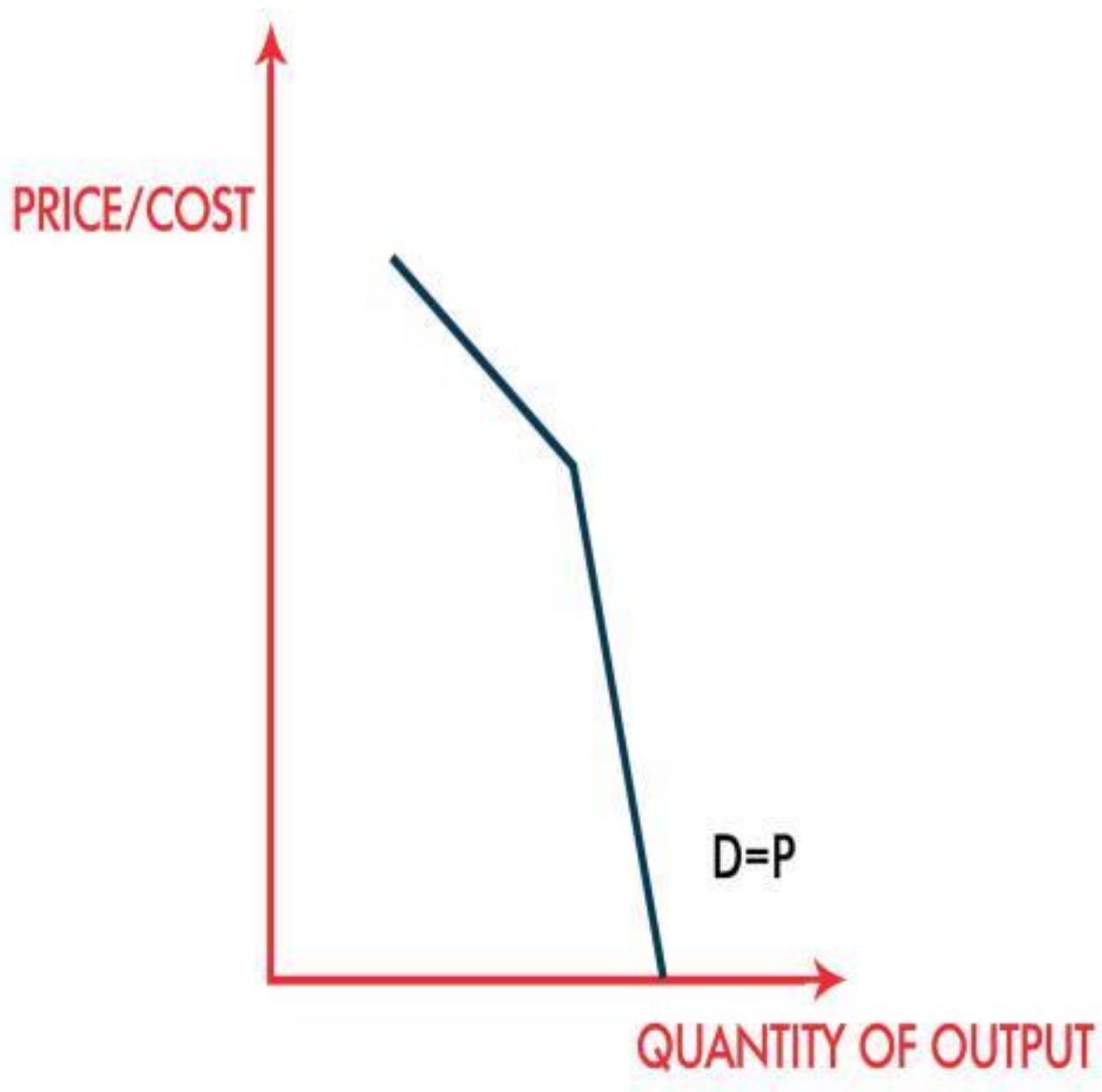
- On the other hand, price decrease means that competitors will also reduce the price of their products to **stay competitive** and as the result this is risk of price war. Hence firms are also reluctant to reduce prices.



# Price Rigidity & Collusion

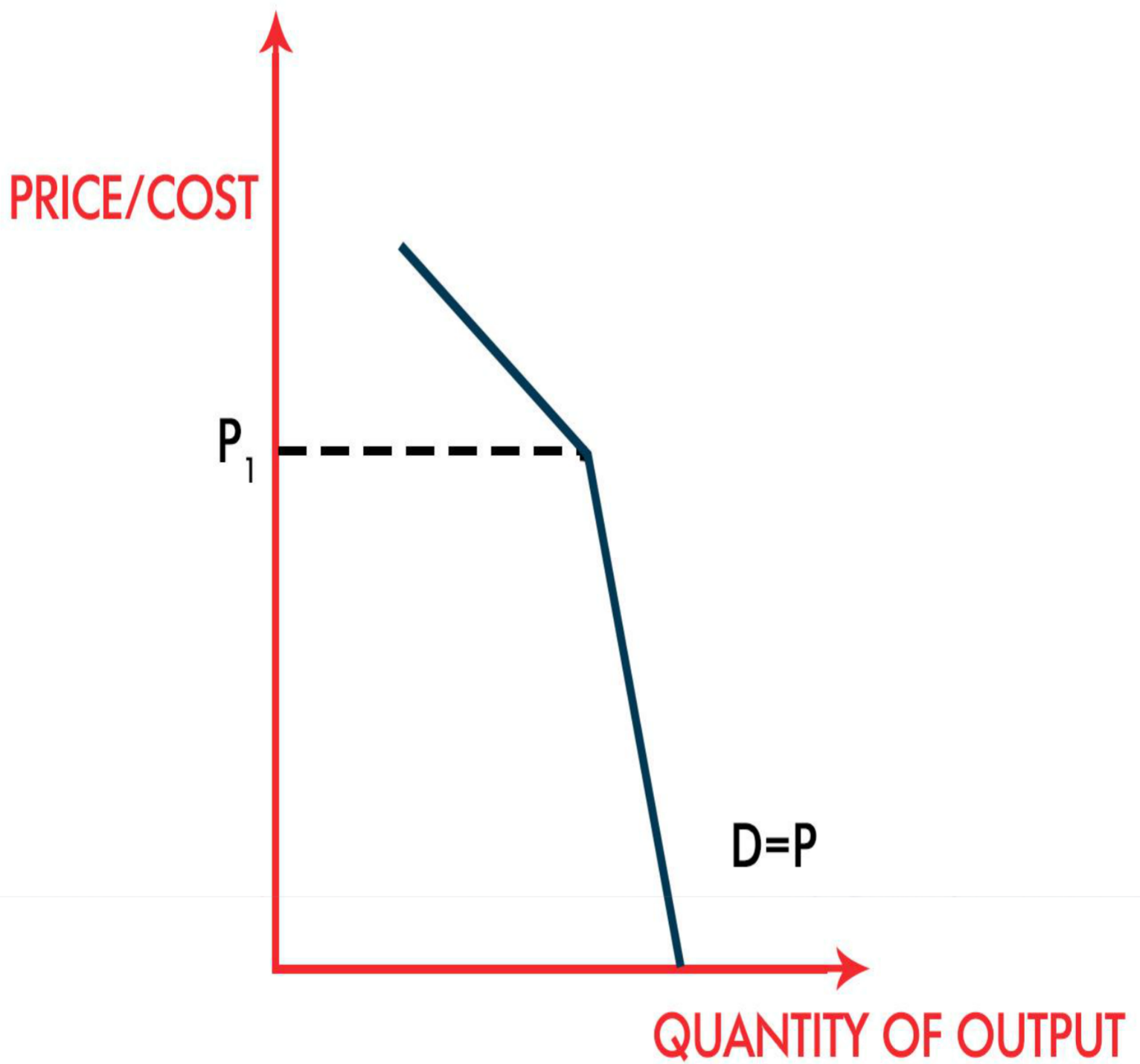
- Firms in oligopoly markets deal with price rigidity through collusion.
- Collusion allows firms to operate as **single producer** which allows them to earn higher profits.

# Oligopoly in SR & LR



As can be seen from the graph, firms in Oligopoly markets have Kinked Demand Curve.

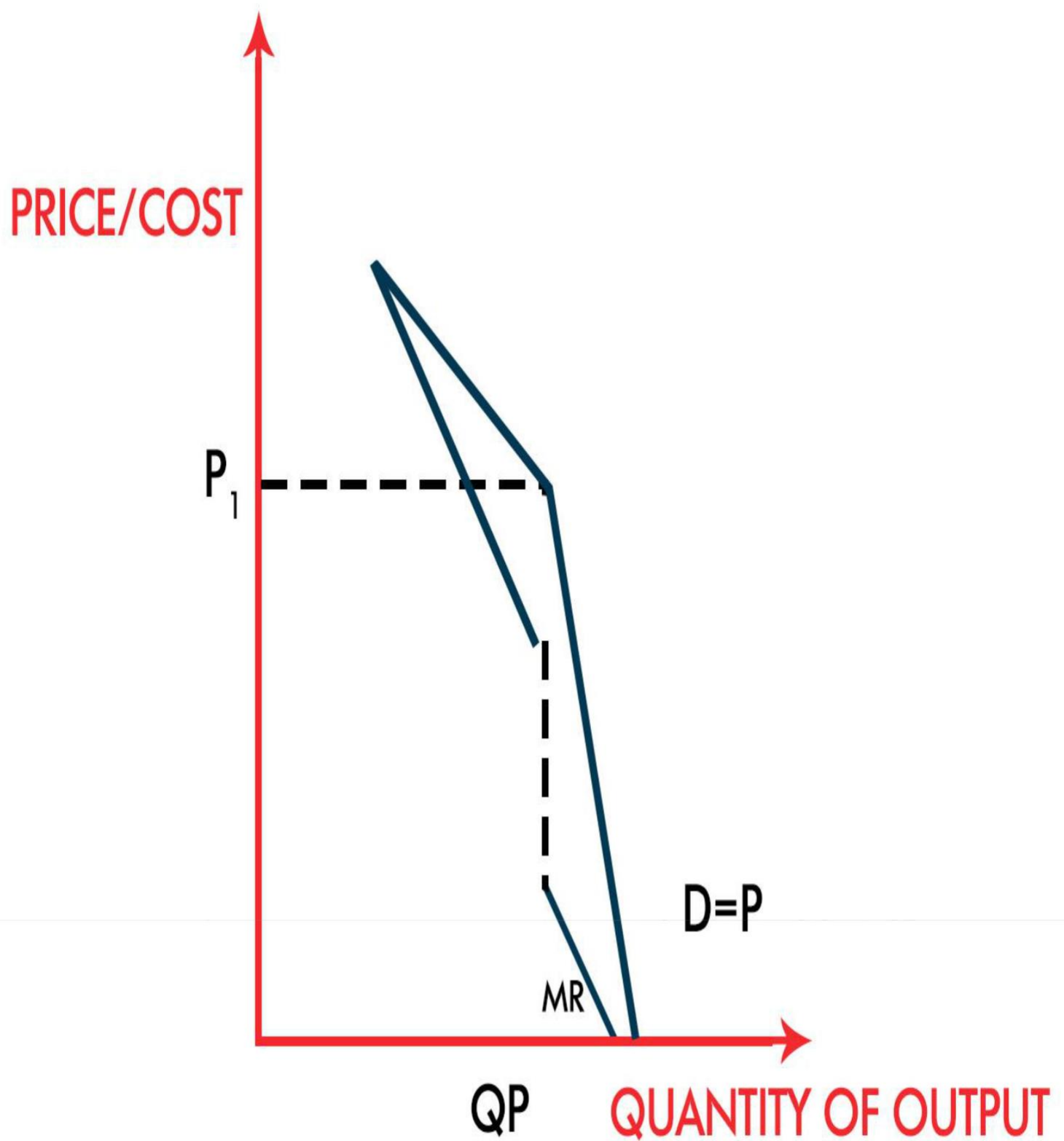
# Oligopoly in SR & LR



# Oligopoly in SR & LR

- As mentioned earlier, the price is rigid at Price level of  $P_1$ .
- This is because increasing and decreasing price from this level can be harmful for the company and therefore each firm will let the price stay at this level unless firms in the market collude with each other after which all firms can collectively increase price.

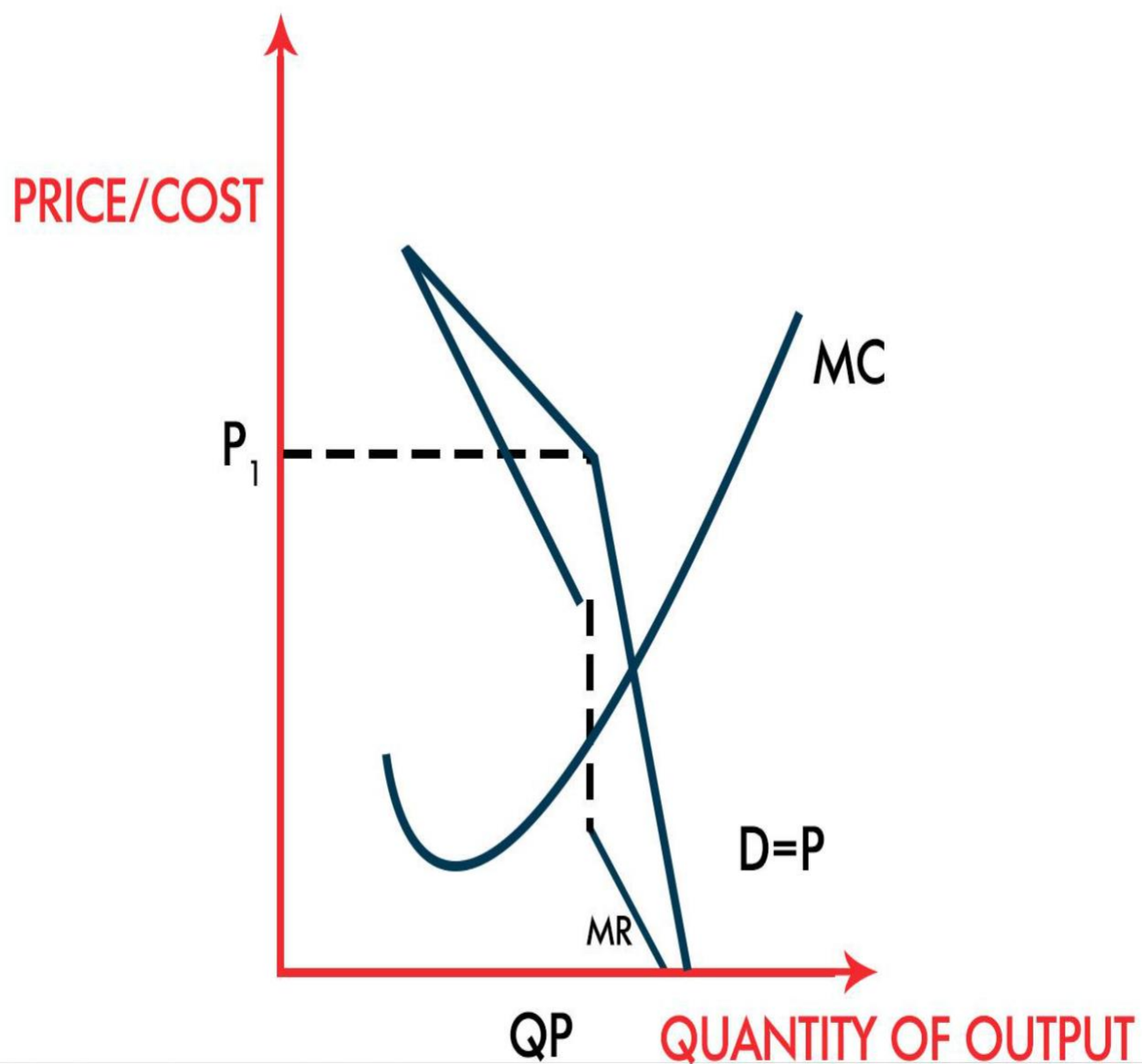
# Oligopoly in SR & LR



# Oligopoly in SR & LR

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- This is because increasing and decreasing price from this level can be harmful for the company and therefore each firm will let the price stay at this level unless firms in the market collude with each other after which all firms can collectively increase price.
- The Marginal Revenue is also unique shape in Oligopoly market as you can see from the graph.

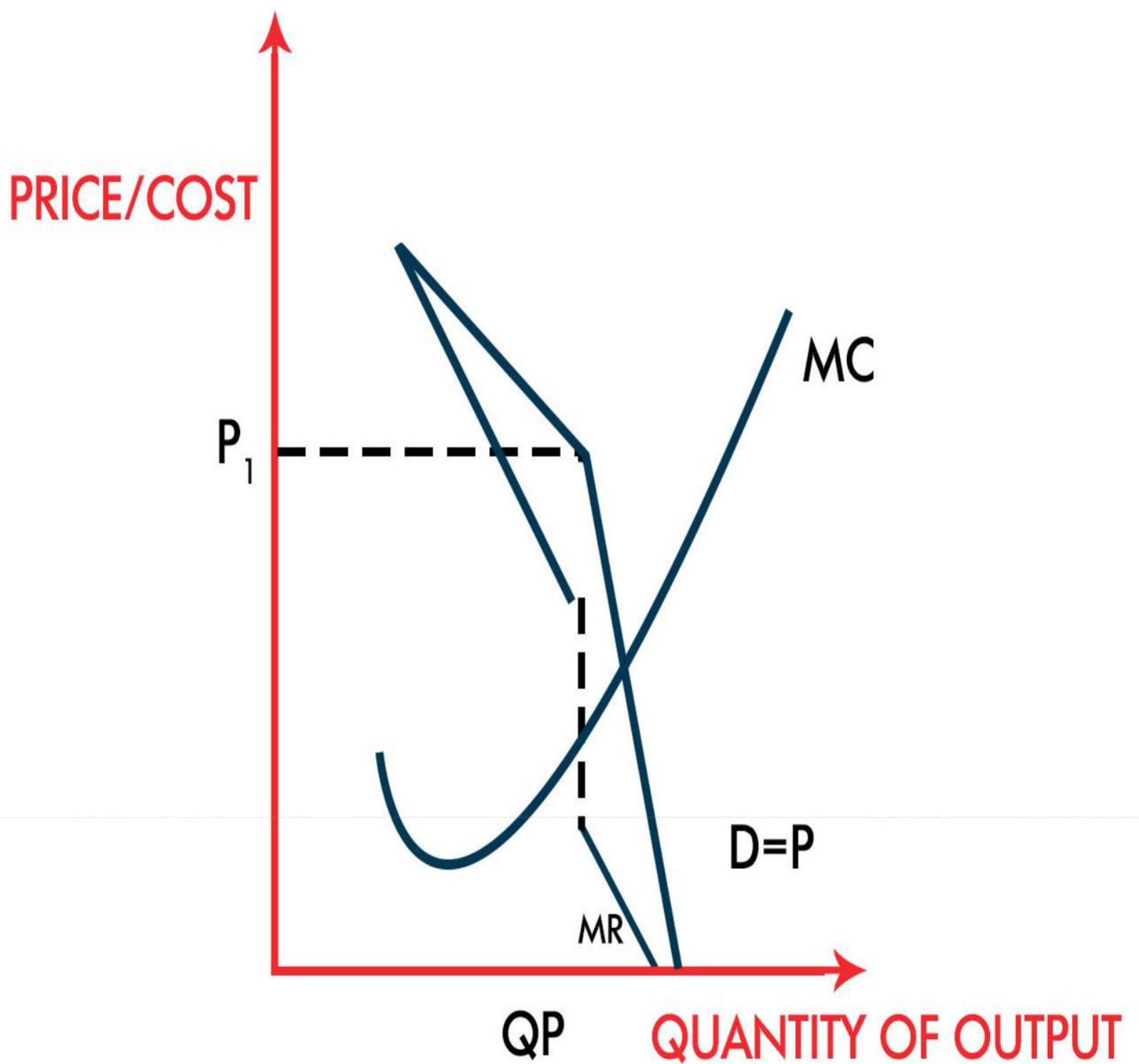
# Oligopoly in SR & LR



The Marginal Cost graph is the same shape as it is for any other business.

The profit maximization quantity is also the same in oligopoly as any other firm which is equal to  $MR = MC$ .

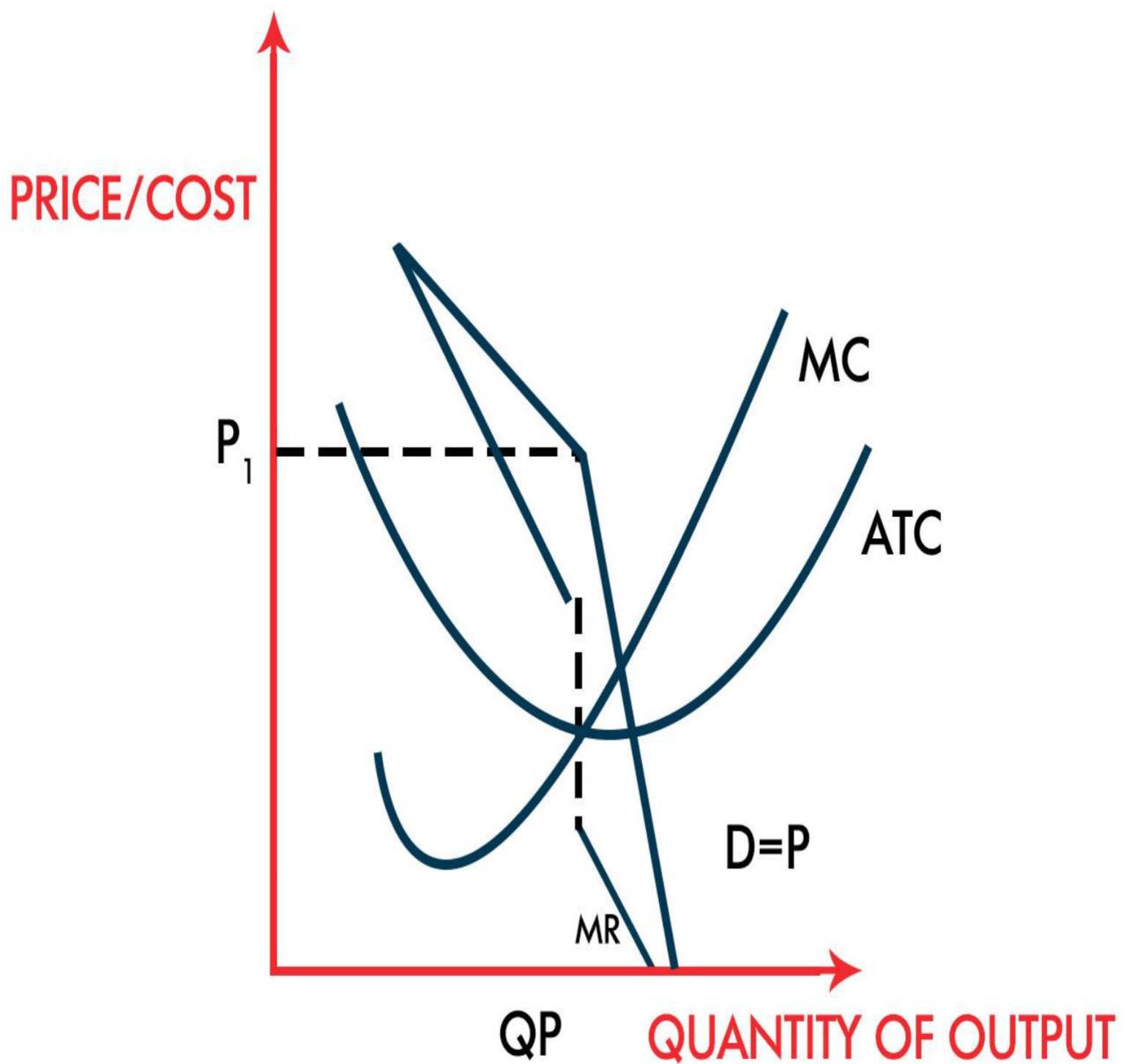
# Oligopoly in SR & LR



The ATC curve in Oligopoly market is also the same U shaped graph.

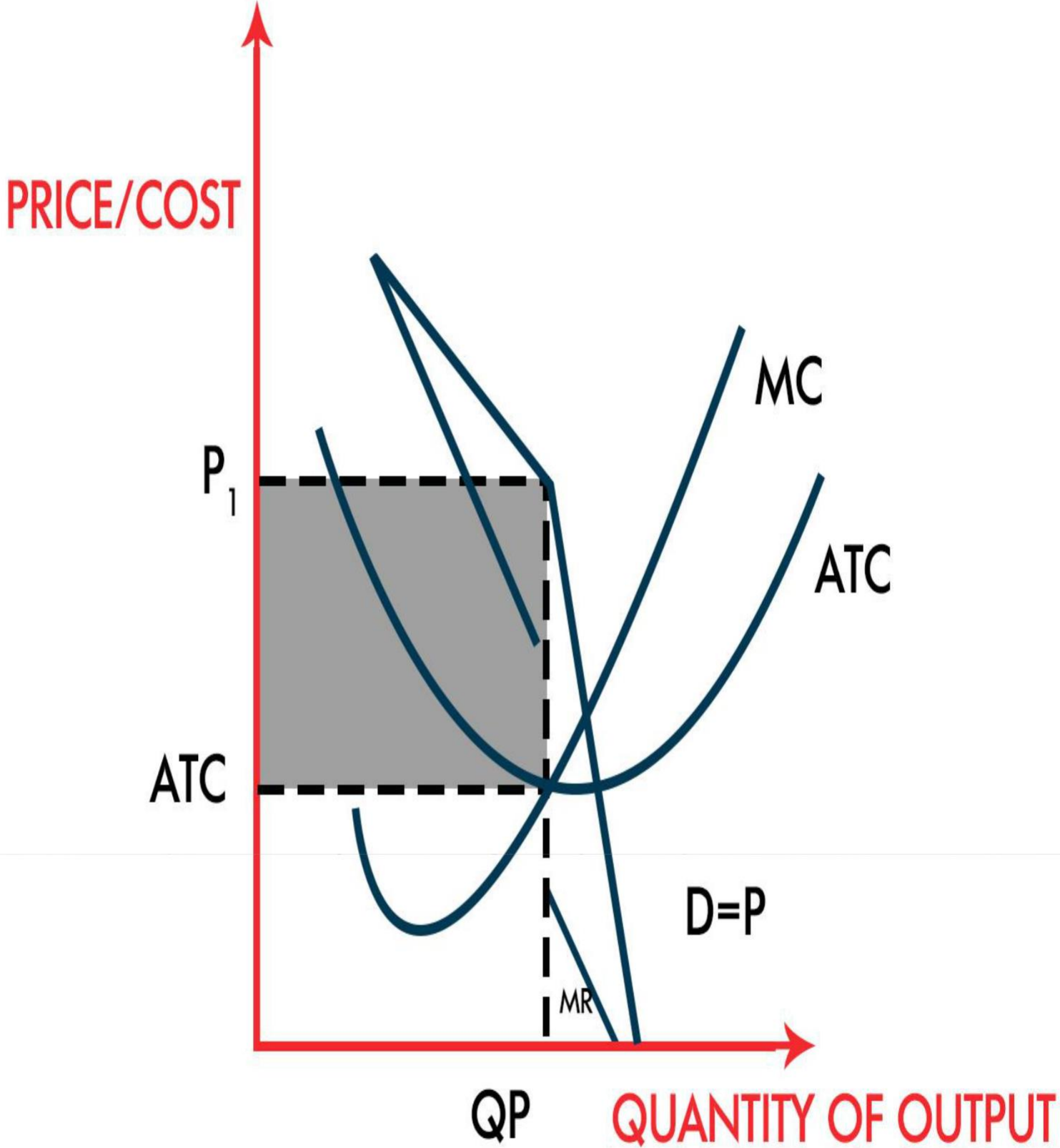


# Oligopoly in SR & LR



The difference between  $P_1$  and  $ATC$  is the **profit per unit**.

# Oligopoly in SR & LR



# Oligopoly in SR & LR

- The shaded region represents the **abnormal profit** made by Oligopoly firm.
- Since the entry barriers are high in Oligopoly markets therefore the firms in the industry will continue to earn abnormal profits both in **SR** and **LR**.
- Since no new firms entry the Oligopoly market in the long run the SR and LR equilibrium in Oligopoly markets stay the same.

# Game Theory

- Game Theory refers to use of mathematical models to **predict** behavior of game participants concerning their various interactions of cooperation and conflict.

# Game Theory

- The information needed to mathematically model any interaction requires following information:
- The game players
- The information and options available to each player
- The payoffs for different options for each player

# Prisoners' Dilemma

- The famous Game Theory model known as Prisoners' Dilemma is assumed hypothetical situation in which there are two accused criminals whose guilty has not been established.
- Police will try its best to make criminals confess their crime or else there will be **no evidence** to convict them.
- The game's payoff matrix has been shown on following slide.

# Game Matrix

	Omer Confesses	Omer stays Silent
Ali Confesses	Each player has to serve 5 years of imprisonment	Omer has to serve 10 years of imprisonment  Ali has to serve 1 year of imprisonment
Ali stays Silent	Omer has to serve 1 year  Ali has to serve 10 years	Each player has to serve 2 years of imprisonment

# Prisoners' Dilemma

- As can be seen from the game matrix, each player is expected to benefit from staying silent but since there is threat of being in worse position by staying silent when other person confesses therefore each player will have incentive to confess regardless of their partners' strategy.
- When both players opt to confess then they will be in **worse position** as compared to situation when would not have admitted their crime.



# Prisoners' Dilemma

- Firms' decisions operating in Oligopoly markets can be depicted using Game Theory models.

MEGALecture

# Should Oligopolistic firms increase their prices?

	Firm B raise its prices	Firm B does not raise its prices
Firm A raises its prices	A's Profit 7 Million B's Profit 7 Million	A's Profit 3 Million B's Profit 10 Million
Firm A does not increase its price	A's Profit 10 Million B's Profit 3 Million	A's Profit 5 Million B's Profit 5 Million