6. Basic Market Types

Key Concepts

- Four basic market types
  - Perfect competition
  - Monopoly
  - Monopolistic competition
  - Oligopoly
- Maximizing revenue and profit
  - Total revenue TR
  - Average revenue AR
  - Marginal revenue MR
  - Profit π
  - Profit maximization rule
- Short-run and long-run decisions
  - Short-run shutdown rule
  - Long-run competitive equilibrium
- Market power and deadweight loss

	Competition	Monopoly
Similarities		
Goal of firms	Maximize profits	Maximize profits
Rule for maximizing	$MR = MC$	$MR = MC$
Can earn economic profits in the short run?	Yes	Yes
Differences		
Number of firms	Many	One
Marginal revenue	$MR = P$	$MR < P$
Price	$P = MC$	$P > MC$
Produces welfare-maximizing level of output?	Yes	No
Entry in long run?	Yes	No
Can earn economic profits in long run?	No	Yes

Four Types of Markets

1. **PERFECT COMPETITION**
   - *Many* buyers and sellers that are small relative to the market
   - Homogeneous products (i.e., *identical*)
   - Free entry and exit
   - Single market price is determined by market supply and demand
   - No transaction costs
   - Firms earn zero economic profit in the long run

2. **MONOPOLISTIC COMPETITION**
   - *Many* buyers and sellers
   - Differentiated products in each firm
   - Free entry and exit
3. **OLIGOPOLY**
   - *Few* large firms
4. **MONOPOLY**
   - *One* firm
   - Unique product
   - High barriers to entry
   - Price maker

Perfect Competition

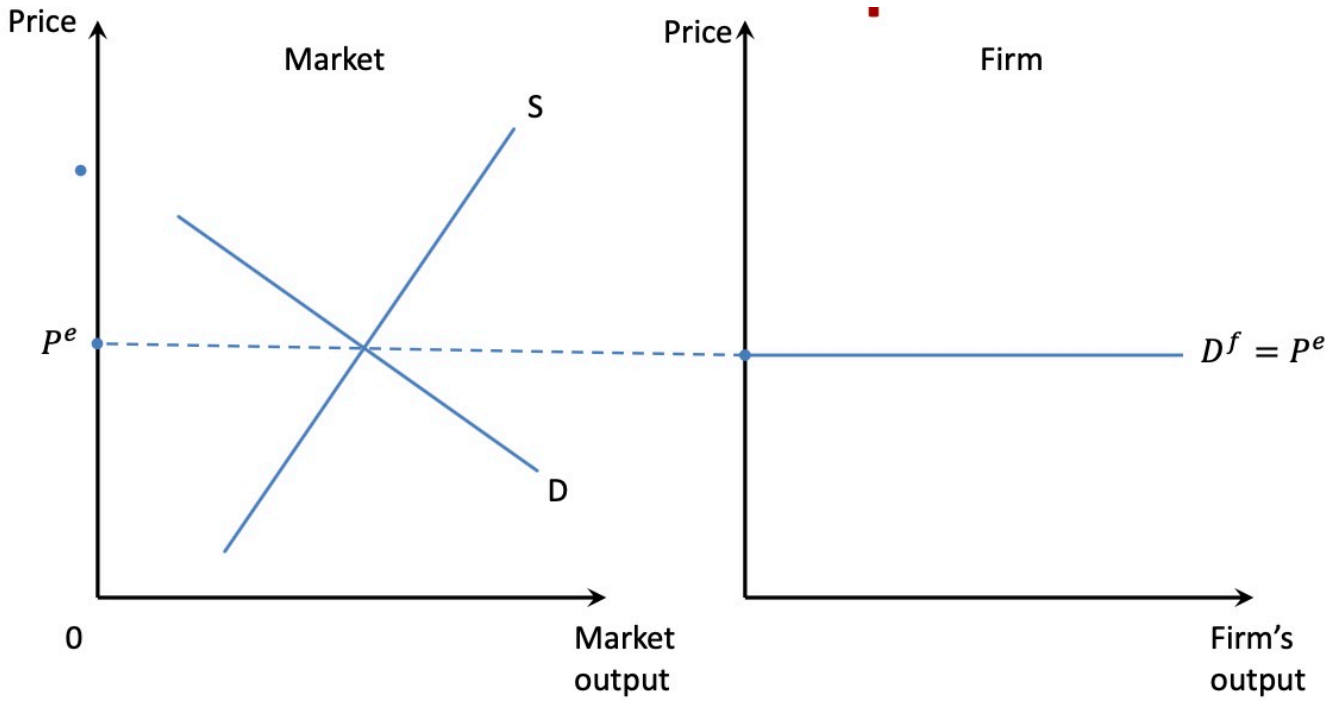
Market supply and demand

Under perfect competition, the market supply and demand determine the equilibrium price P^e
$\implies$ the **demand curve of a single firm** D^f is **horizontal at** P^e.
$\implies$ the demand D^f is **perfectly elastic** ($E_{Q,P} = \infty$).

Competitive Firm's Demand Curve

The demand curve of a single firm in a perfectly competitive market is **horizontal at the market price** P^e.
This price is the competitive firm's **marginal revenue** MR.

$$\boxed{D^f : P = P^e = MR}$$



Revenue of a Competitive Firm

- **Total revenue** $TR = P \times Q$
- **Average revenue** $AR = \frac{TR}{Q} = P$
- **Marginal revenue** $MR = \frac{dTR}{dQ} = P$

∑ Profits

$$\boxed{\pi = TR - TC} = PQ - TC = (P - ATC)Q$$

To find the Q that maximizes profit π, we **think at the margin**. If $MR > MC$, increase Q. If $MR < MC$, decrease Q.

Profit Maximization

A firm maximizes profit by producing the quantity Q such that

$$\boxed{\pi(Q) \text{ maximized at } MR = MC}$$

So, to maximize profits, a perfectly competitive firm produces the output at which price equals marginal cost **in the range over which marginal cost is rising**.

Competitive Output Rule

$$\boxed{P = MC(Q)}$$

So **MC** represents the firm's **supply curve**.

Short-Run Operating Losses

Should a business shut down in the short run?

Remember that

$$\pi = (P^e - ATC(Q))Q$$

so if $P^e < ATC(Q)$, the firm incurs a loss.

- If the firm shuts down, its **loss equals its fixed costs** FC:

$$\pi_{st\ dwn} = (P^e - (AFC + AVC(Q))Q = -FC$$

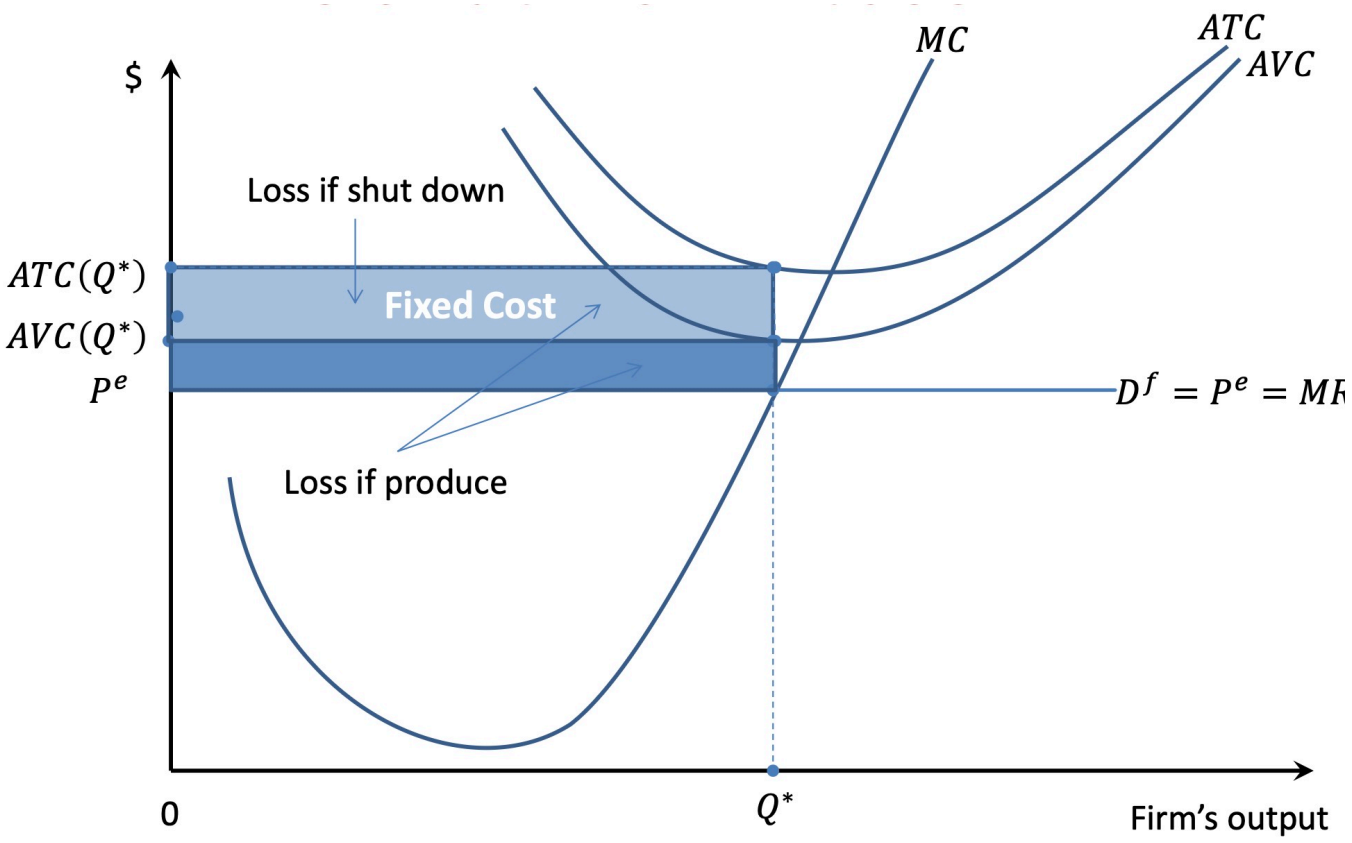
- If the firm produces, its loss equals its **fixed cost + variable cost - TR**:

$$\pi_{rdce} = (P^e - (AFC + AVC(Q))Q$$

Short-Run Shutdown Rule

A firm should **shut down in the short run** if the price is less than the average variable cost at the profit-maximizing quantity Q:

$$\boxed{\text{Shut down} \iff P < AVC(Q)}$$



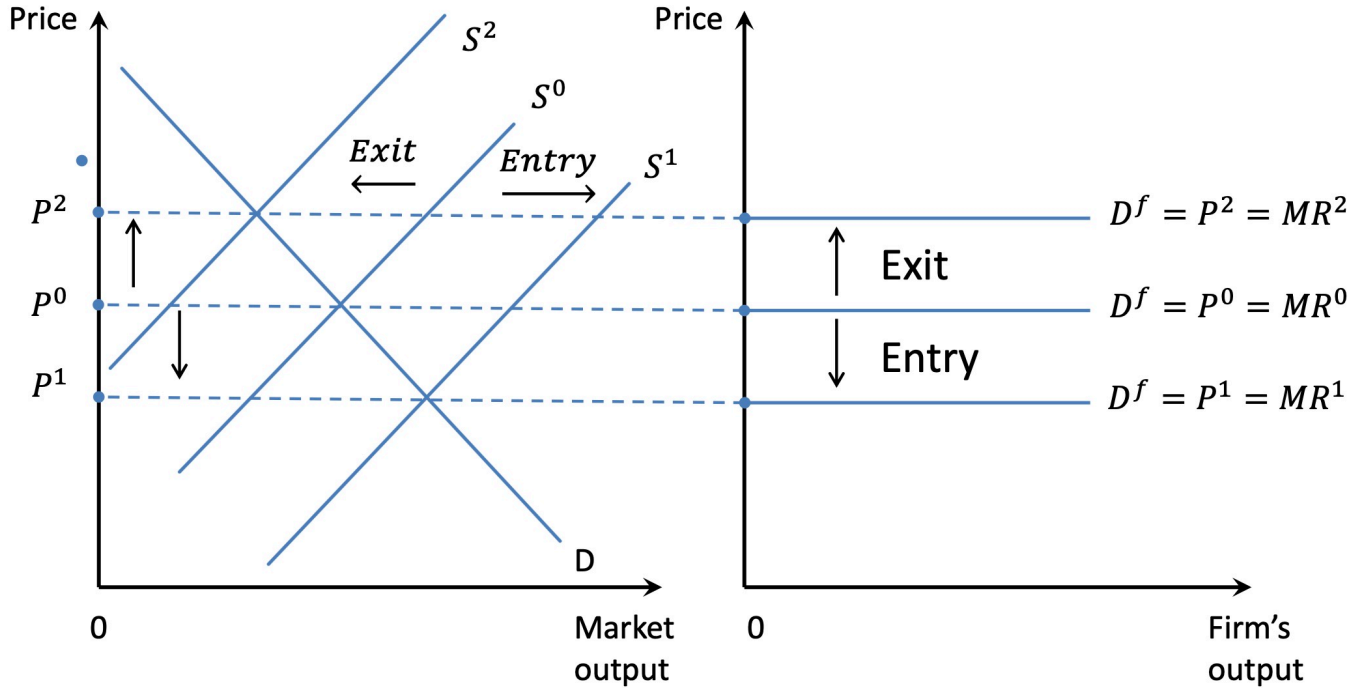
Long-Run Decisions

In the long run, the market will experience **entry and exit of firms**.

- Short-run profits: $\boxed{P^e > ATC(Q)}$
  - $\rightarrow$ new firms will enter the market
  - $\rightarrow$ market supply increases (sum of all firms' supply curves)
  - $\rightarrow$ market price P^e falls
  - $\rightarrow$ profits decrease
  - $\rightarrow$ entry continues until **profits are zero**
- Short-run losses: $\boxed{P^e < ATC(Q)}$
  - $\rightarrow$ some firms will exit the market
  - $\rightarrow$ market supply decreases (sum of all firms' supply curves)
  - $\rightarrow$ market price P^e rises
  - $\rightarrow$ losses decrease
  - $\rightarrow$ exit continues until **profits are zero**

So, in the long run, a perfectly competitive firm earns **zero economic profit**:

$$\boxed{P^e = ATC(Q)}$$



The long-run **competitive equilibrium** occurs when firms enter and exit the market until economic profits are zero. Then, Q is the output that **minimizes average total cost (ATC)**.

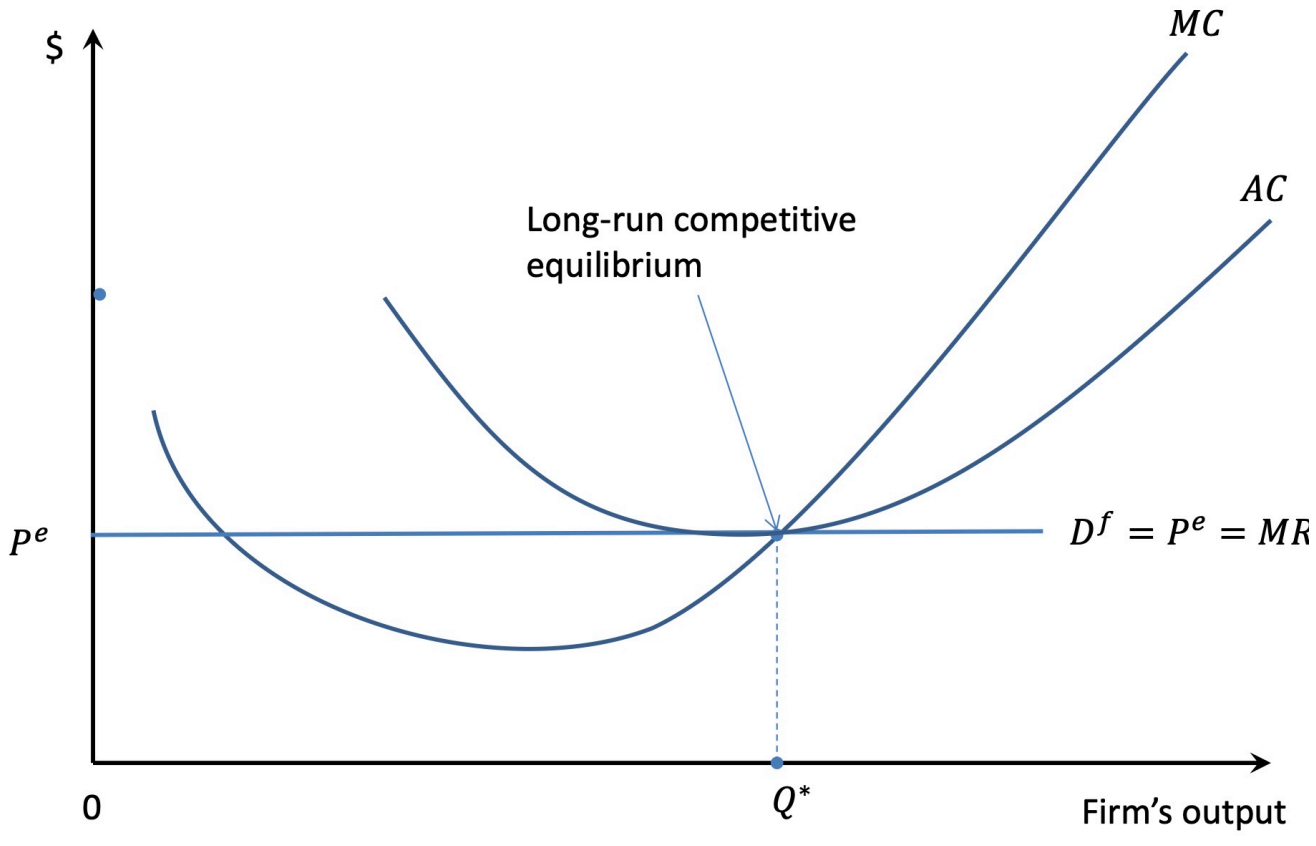
Long-Run Competitive Equilibrium

In the long-run competitive equilibrium, the price **equals the minimum of average total cost**:

$$\boxed{P = MC \quad \text{and} \quad P^e = \min ATC(Q)}$$

with

$$\boxed{Q = \text{argmin } ATC(Q)}$$



Monopolistic Competition

Monopoly

A **monopoly** is a market structure in which a **single firm serves an entire market** for a good that has **no close substitutes**.

Market Power

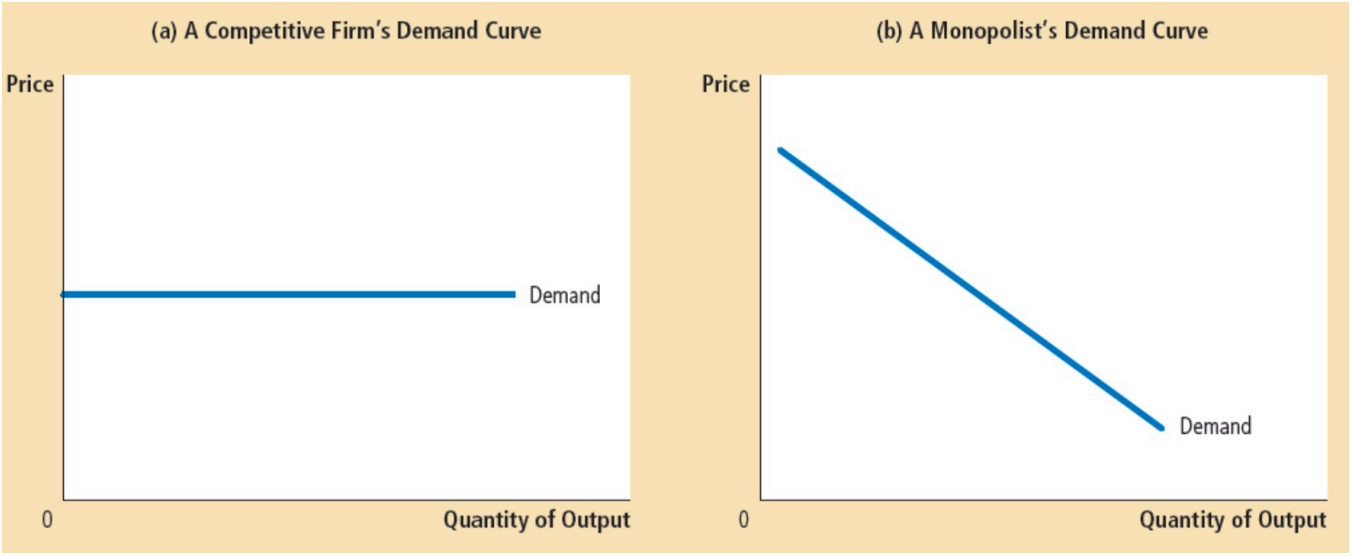
Sole seller of a good in a market gives that firm **great market power**, but n**ot unlimited** market power.

Monopolist's Demand Curve

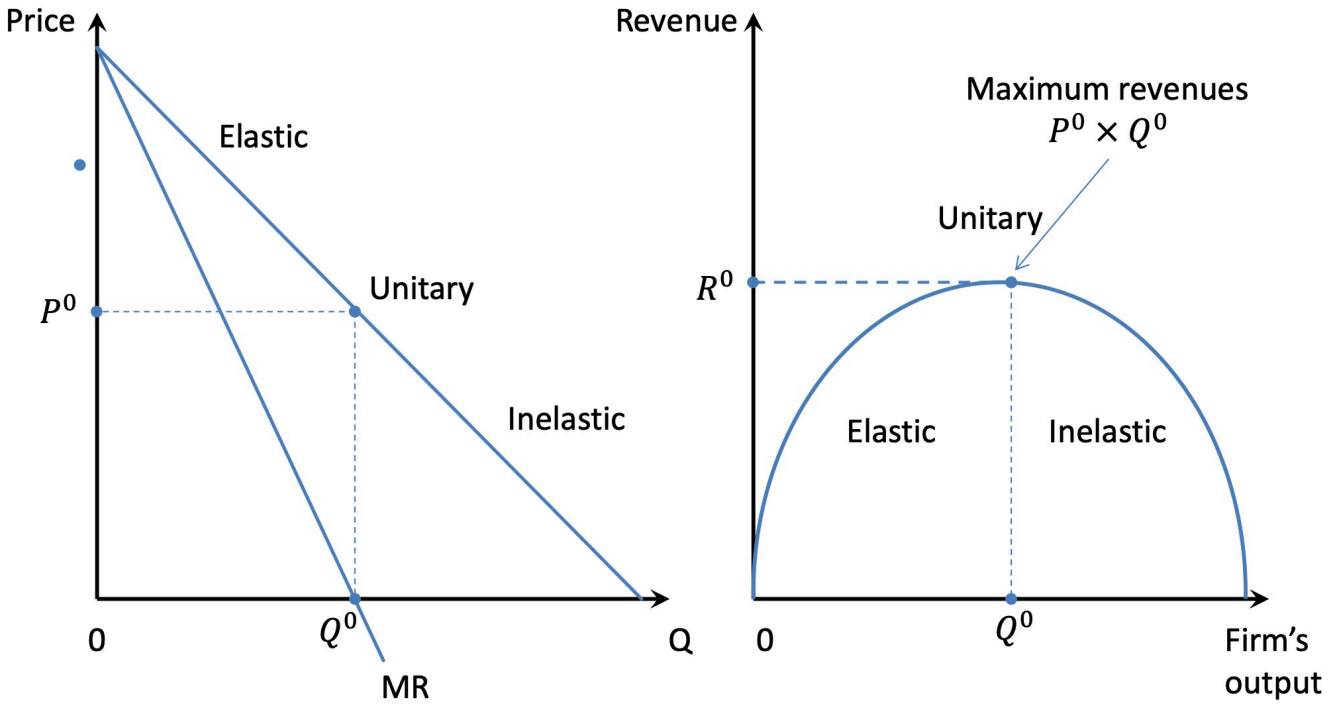
The **demand curve of a monopolist is the market demand curve**, which is **downward sloping**.

$$D^f = D^M$$

So the **monopolist is constrained by the market demand curve**.



Marginal Revenue of a Monopolist



∑ Marginal Revenue of a Monopolist

$$\boxed{MR = P\left(\frac{1 + E_{Q,P}}{E_{Q,P}}\right)}$$

Where $E_{Q,P}$ is the price elasticity of demand.

For $P > 0$,

- If demand is elastic ($E_{Q,P} < -1$), then $MR > 0$
- If demand is inelastic ($-1 < E_{Q,P} < 0$), then $MR < 0$
- If demand is unitary elastic ($E_{Q,P} = -1$), then $MR = 0$

Profit Maximization

Monopolist's Profit Maximization

A profit-maximizing monopolist produces output Q^M such that

$$\boxed{MR(Q^M) = MC(Q^M)}$$

Pricing rule

Monopolist's Pricing Rule

Given the optimal output Q^M, the monopolist **sets the price according to the demand curve**:

$$\boxed{P^M = P(Q^M)}$$

Absence of Supply Curve

A monopolist's market power implies that

$$\boxed{P > MR}$$

Furthermore, $MR = MC$ at the profit-maximizing output. Because this implies that

$$\boxed{P > MC}$$

there is **no supply curve for a monopolist**, because there is no one-to-one relationship between price and quantity supplied.

Same applies for markets served by a firms with market power (e.g., monopolistic competition, oligopoly).

Rule

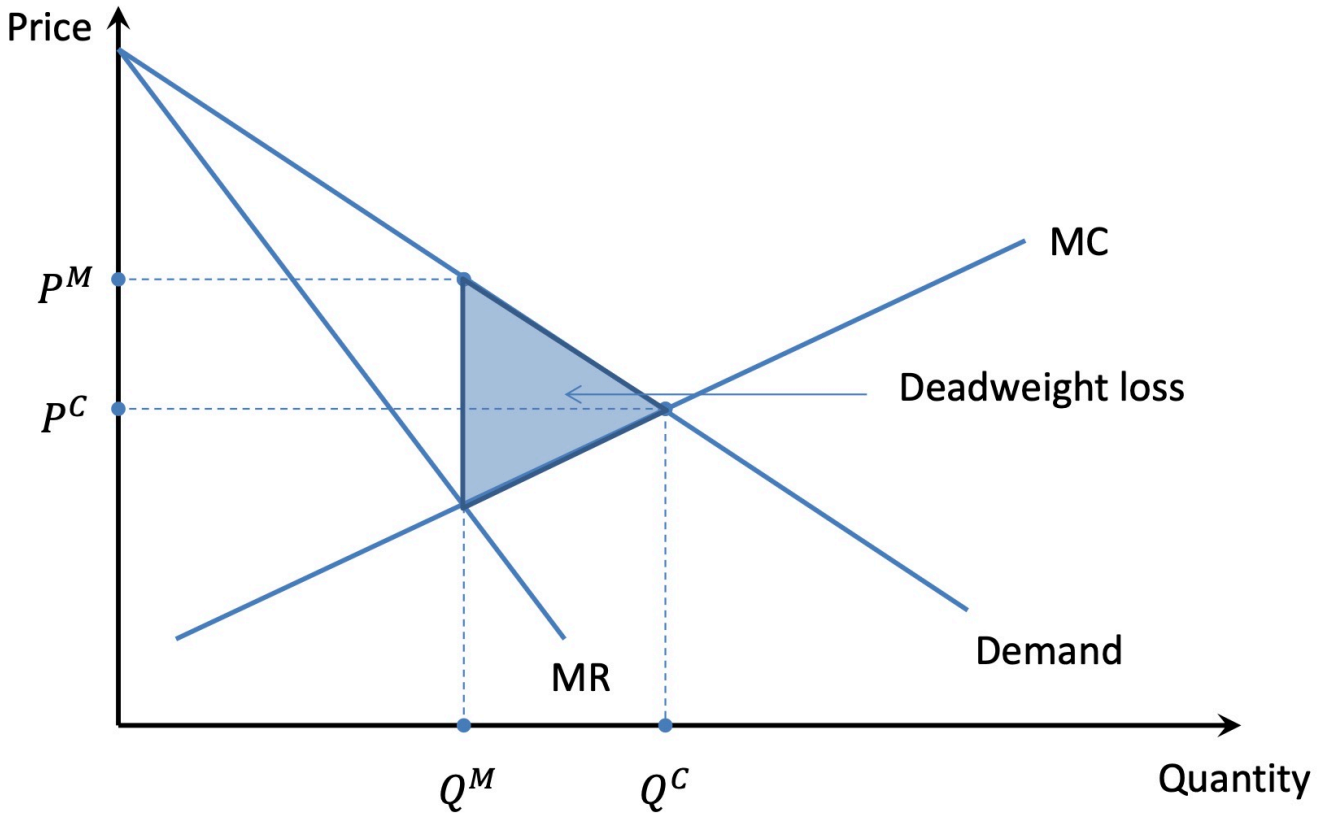
A firm with market power has **no supply curve**

- monopoly
- monopolistic competition
- oligopoly

Deadweight Loss

Deadweight Loss (DWL)

The **deadweight loss** is the **total surplus lost by society because the monopolist produces less than the socially optimal output**.



Monopolistic Competition

A key difference between monopolistically *competitive* and *perfectly* competitive markets is that each firm produces a **slightly differentiated product**.

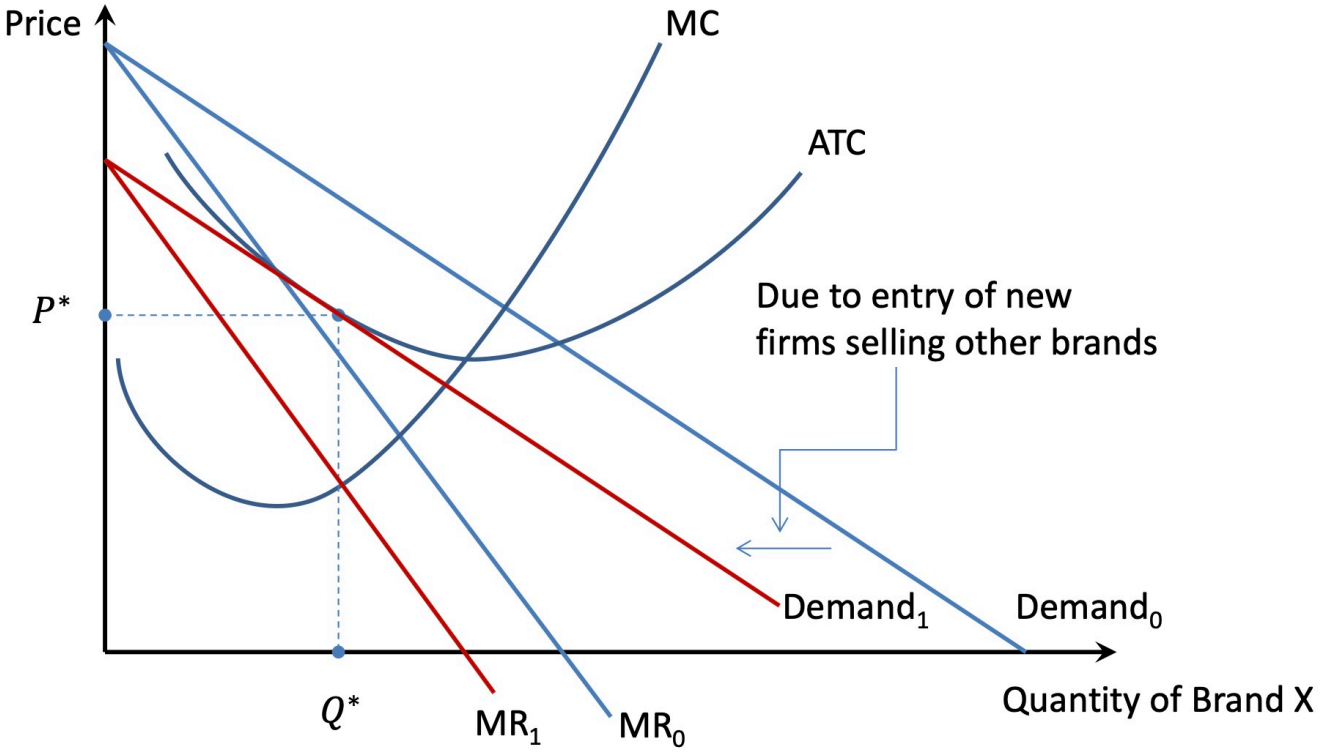
- Products are close, but not perfect, substitutes
- Firm's demand curve is **downward sloping** under monopolistic competition

Monopolistically Competitive Firm's output Rule

A profit-maximizing monopolistically competitive firm produces the output Q such that

1. $\boxed{P > MC}$ (because $MR = MC$ and $P > MR$)
2. $\boxed{P = ATC}$ in the long run

- because of free entry and exit
- but beware that $\boxed{P = ATC > \min ATC}$ because of excess capacity


Price
MC
ATC
P^*
Due to entry of new
firms selling other brands
$Demand_1$
$Demand_0$
Q^*
MR_1
MR_0
Quantity of Brand X