Market Power

Other Market Structures

4 General Market Structures

	# of Firms	Product Differentiation	Barriers to Entry/Exit	Market Power	LR profits
Perfect Competition	Many	None. Homogeneous product	None	No market power, price taker	None
Monopolistic Competition	Many	Differentiated, but similar products	Small	Very little	None
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Market Power and Price Searching

The distinguishing characteristic of perfect competition is that firms in that market structure are price-takers on the product market. **Price-taking** firms have **no market power**.

Firms with **market power**—the ability to influence the price of their product—are called **price-searchers**, price-seekers, or price-makers. **Monopolists**, price-searchers *par excellence*, wield **considerable market power**.

Market Power

Price-takers were such because their markets had no barriers to entry/exit and the goods being sold were homogeneous.

In order for firms to have any appreciable market power, they must

1. Be selling **differentiated** goods (according to consumers)
2. There must be **barriers to entry**, or
3. Both 1 & 2

Barrier to Entry: Legal Restrictions

Historically, a monopoly was a special grant from the crown (QE1, in particular) for one firm to have exclusive privilege to produce something. There need not be anything special about the good or the market—playing cards are an early example—just that it is **illegal to enter and compete** against the favored firm.

Legal restrictions are the most reliable way to establish and keep barriers to entry. Patents, copyrights, and trademarks are obvious examples of **legal** barriers to entry.

Barrier to Entry: Exclusive Ownership

A firm might be able to set itself up as a monopoly and exclude competitors if it **owns and markets** a good or service exclusively because of ownership of a crucial resource or technology.

This could be a physical thing like a **natural resource** (owning all the bauxite or plutonium), **knowledge or skill** that others simply do not possess (hiring all the specialized surgeons or professional athletes), or some **technology** (a trade secret or production process).

Barrier to Entry: Economies of Scale

Consider an industry with **no legal barriers** to entry and **no exclusive control** of a resource or technology. If there is one firm in this industry with **lower average costs** than its competitors, it can effectively **price them out of the market**, even though they can freely enter and exit.

This is often called a "natural monopoly."

Natural Monopoly

Natural monopolies have falling ATC over the relevant range (the quantity that satisfies market demand).

Often, this falling ATC comes about because of small VC and high FC.
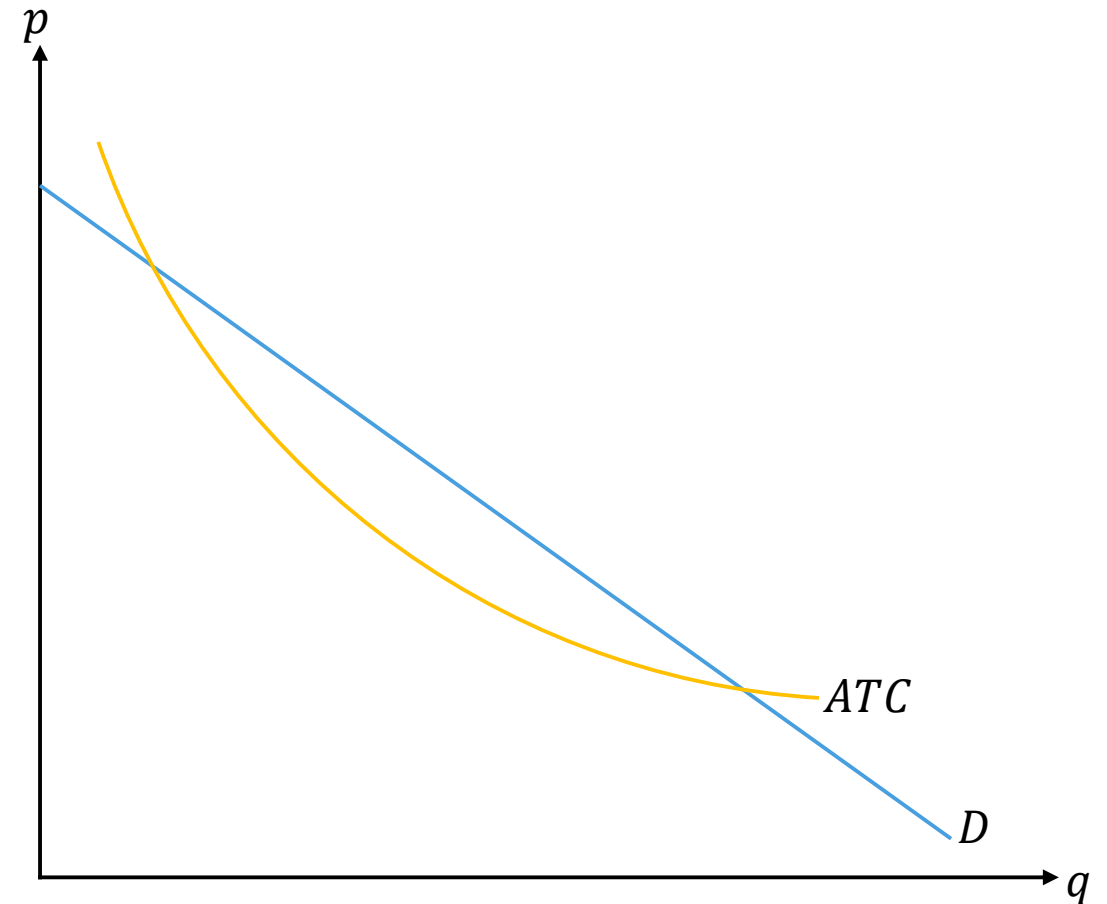
Price-Searchers

Price-taking firms face a **flat demand curve** for the product they produce/sell. They can sell whatever quantity they wish at that price, never affecting the price. They only stop selling **because of costs**.

Price-searching firms face a **downward-sloping** demand curve for their product. To sell larger quantities, they must offer lower prices, **causing marginal revenue to fall**. Meanwhile, their costs are likely rising to produce more output.

Price-Searchers' Profit Maximization

For **all** firms, profits are maximized when $MR = MC$.

For price-takers, $p = MR$, but for **price-searchers**, MR will vary with the output decisions the firm makes.

This complicates things slightly, compared to price-takers, but is simple enough when we construct a graph.

Price-Searchers' Marginal Revenue

LeaCo's marginal revenue is more complicated than for price-takers. If LeaCo wants to sell the third unit, they lower the price *on all other units* by $2. They gain $5 for selling the 3rd unit, but lose $2 on the 1st and 2nd units.
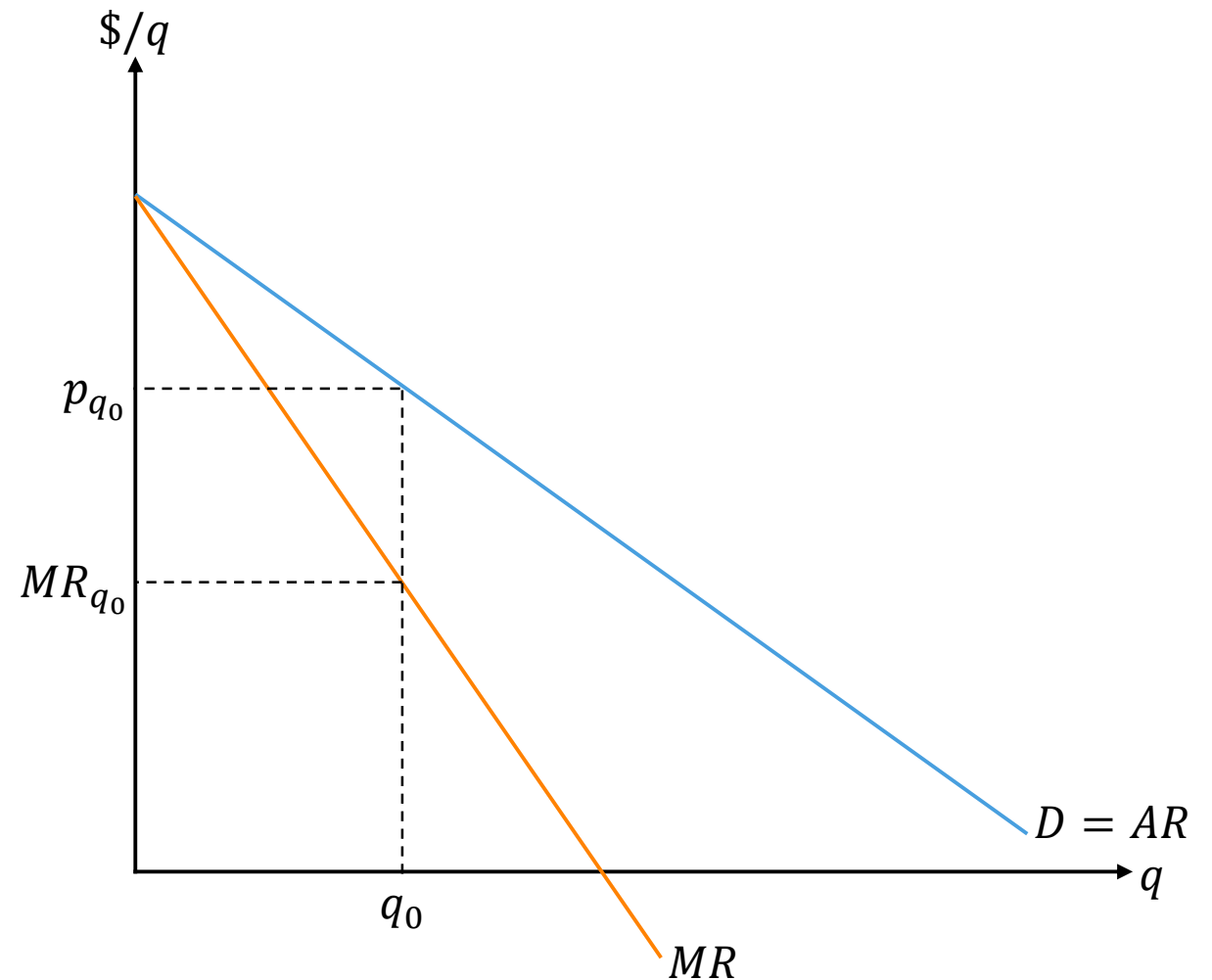
$$MR = (\$5 * 1) - (\$2 * 2) = \$1$$
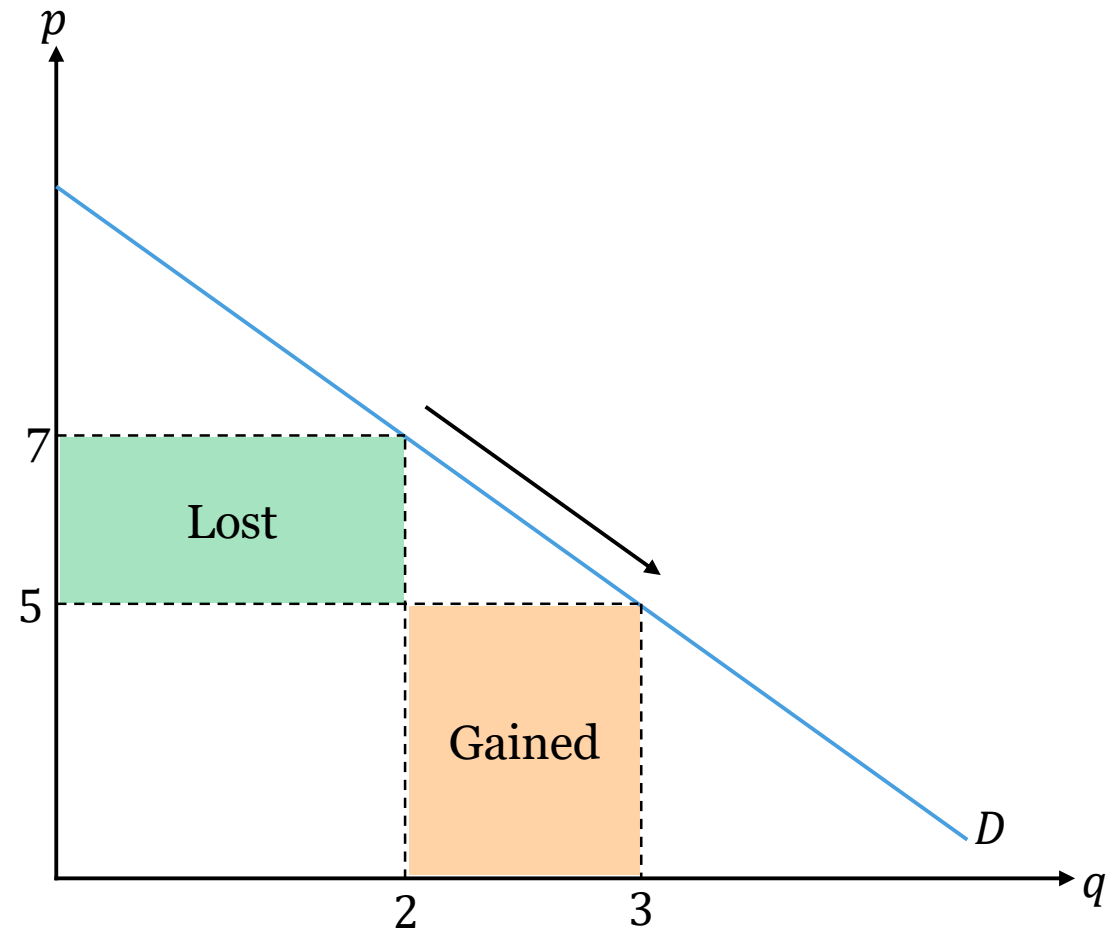
Price-Searchers' Marginal Revenue

Because price-searchers lose some revenue on selling **some units at lower prices**, their marginal revenue will always* be less than the price, which is the revenue of the marginal unit.

*Price discrimination can change this, as we will soon see.

Price-Searchers' Profit Maximization

1. Find where $MC = MR$, which provides q^*

2. To find p^*, go from q^* up to the demand curve

3. When you hit D, trace to the left to find the p^*
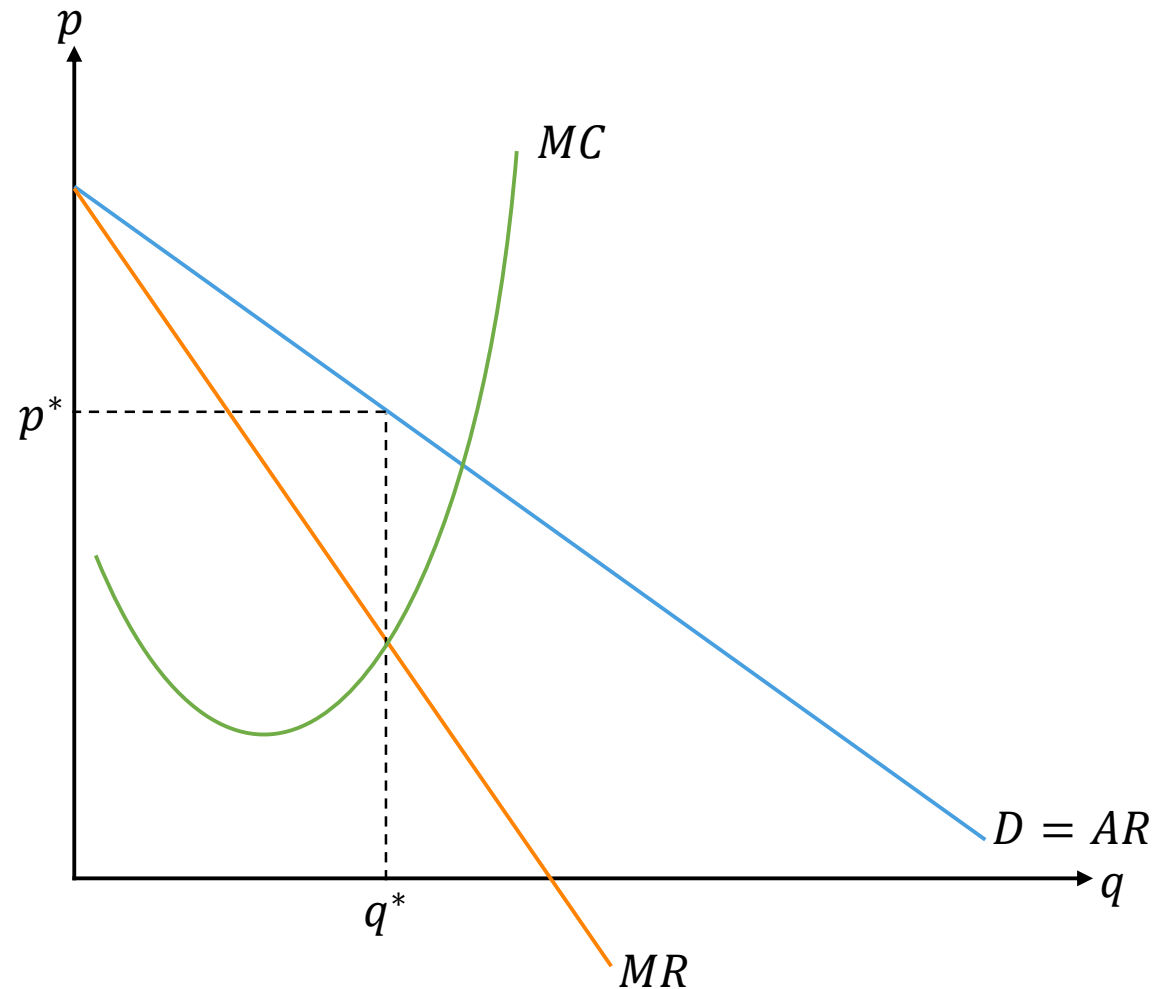
Price-Searchers' Profits/Losses

4. Find the value of ATC at q^* and trace across to the price axis.

5. Compare revenues and costs to find profits.

6. Remember: price-searchers can earn losses, too!
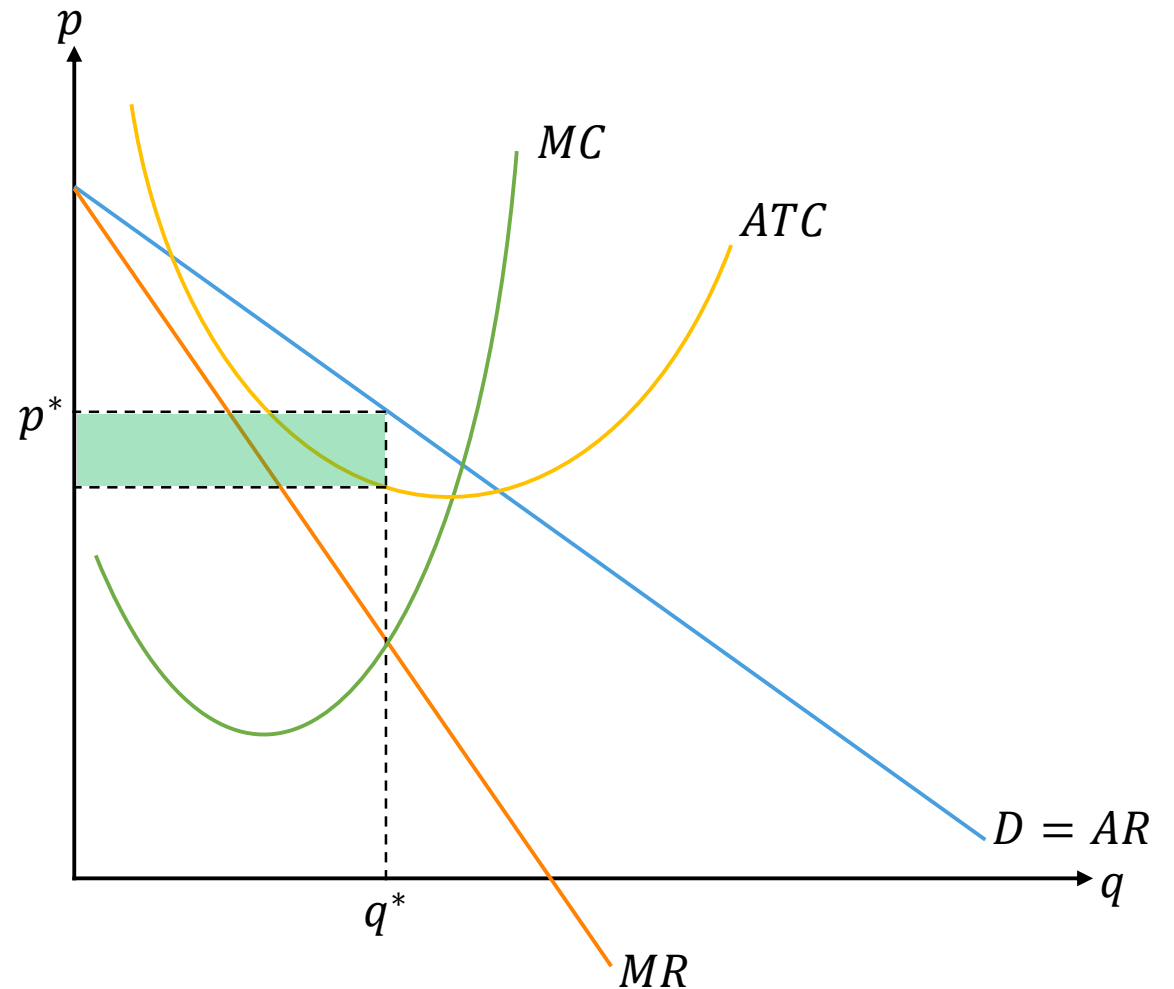
Comparing Efficiency

Assume that the monopolist has the same flat (i.e. constant) marginal cost curve as competitive industry would.

Monopolization reduces output and raises price.

$A: CS \rightarrow CS$
$B: CS \rightarrow PS$
$C: CS \rightarrow Nothing\ (DWL)$
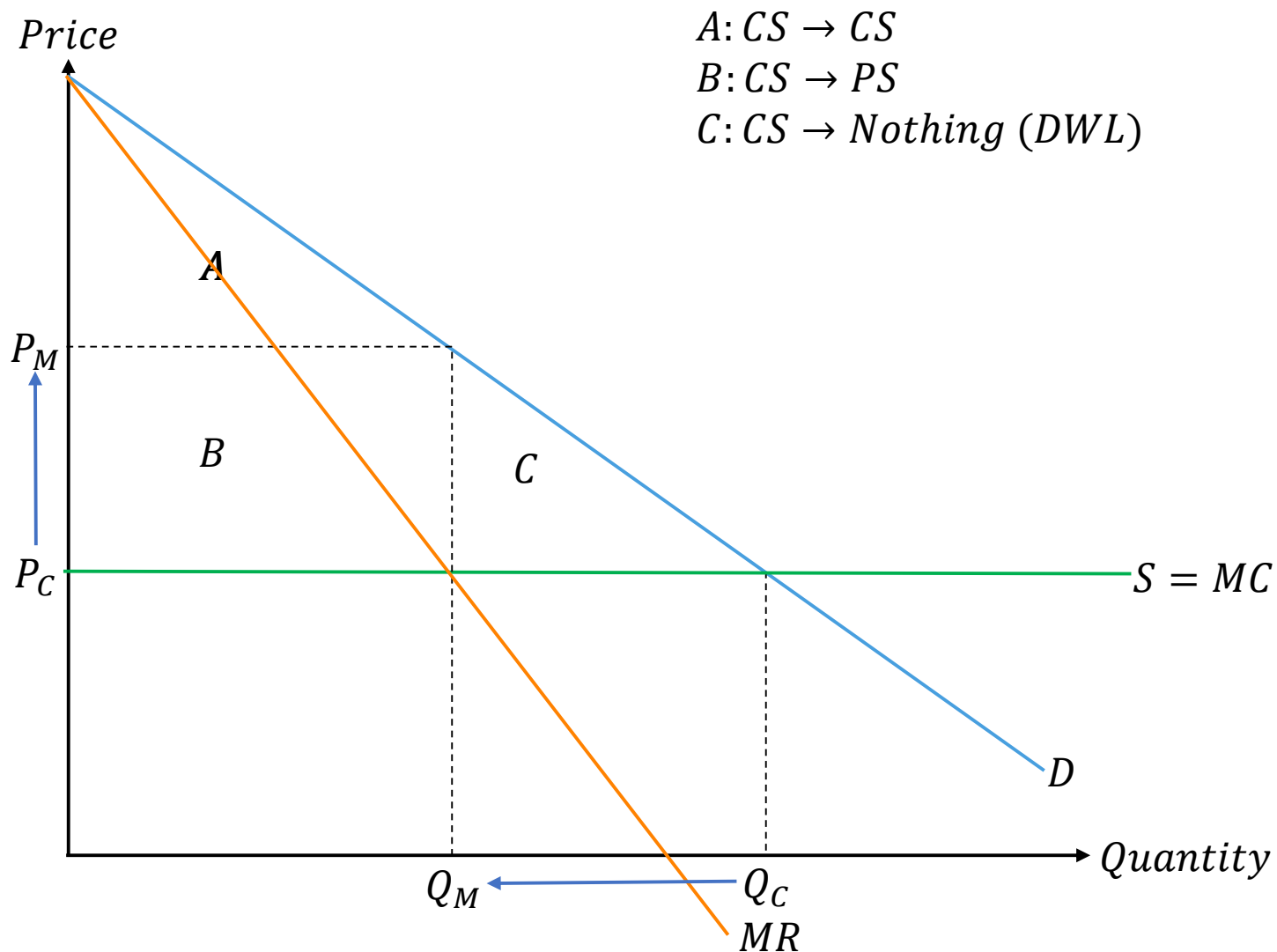
Comparing Efficiency

For simplicity, assume that the monopolist has the same marginal cost curve (as firm) as competitive industry would (as an industry).

Monopolization reduces output and raises price.

$A: CS \rightarrow CS$
$B: CS \rightarrow PS$
$C: CS \rightarrow Nothing\ (DWL)$
$D: PS \rightarrow Nothing\ (DWL)$
$E: PS \rightarrow PS$
$B - D: Gain\ to\ Monopolist$
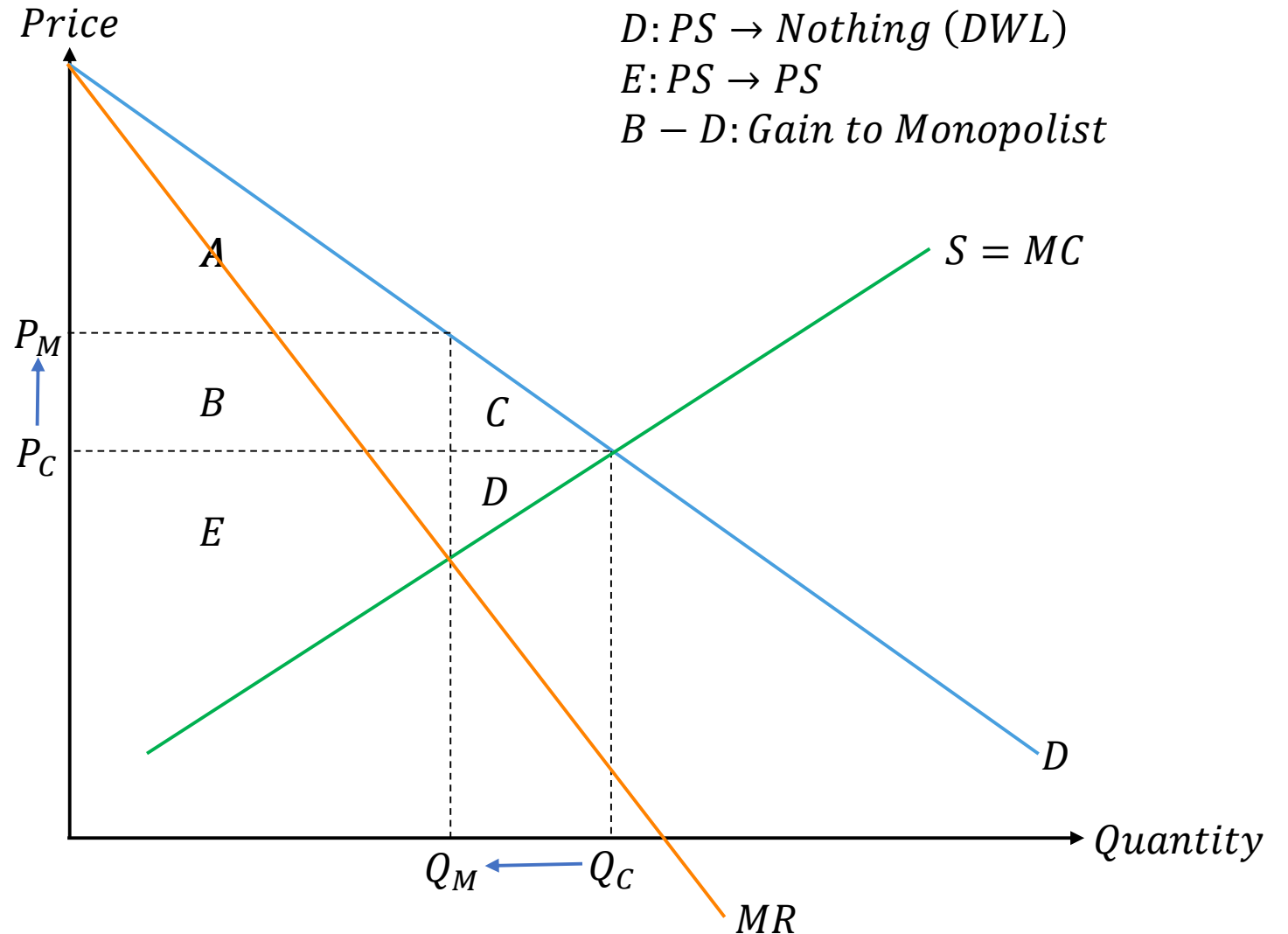
Monopoly

A monopoly is a certain type of price-searcher where an industry is made up of—or overwhelmingly dominated by—a **singe firm**.

In order to accomplish this, this one firm must have found a way to meaningfully exclude competitors from offering rival goods/services at attractive prices. This could be because there simply are **no close substitutes** for the good or service. More generally, though, monopoly position arises from **barriers to entry**.

Monopoly Inefficiencies

Deadweight Loss (DWL) is the reduction in output that destroys producer and/or consumer surplus (areas C and D).

Rent-seeking is the spending of productive resources to establish monopoly in order to secure a transfer of wealth (area B, but some share of E)

X-Inefficiency are counter-factual, hard-to-measure sources of inefficiency because firms are not disciplined by competition.

Price Discrimination

Price discrimination is the practice of charging different prices to different people for the same good/service. This price difference **cannot** be the result of a cost saving to the firm.

In order to price discriminate, a firm must

1. Be a price-searcher or price-maker

2. Be able to separate consumers into groups—generally according to price elasticity of demand

3. Be able to prevent resale of the good or service
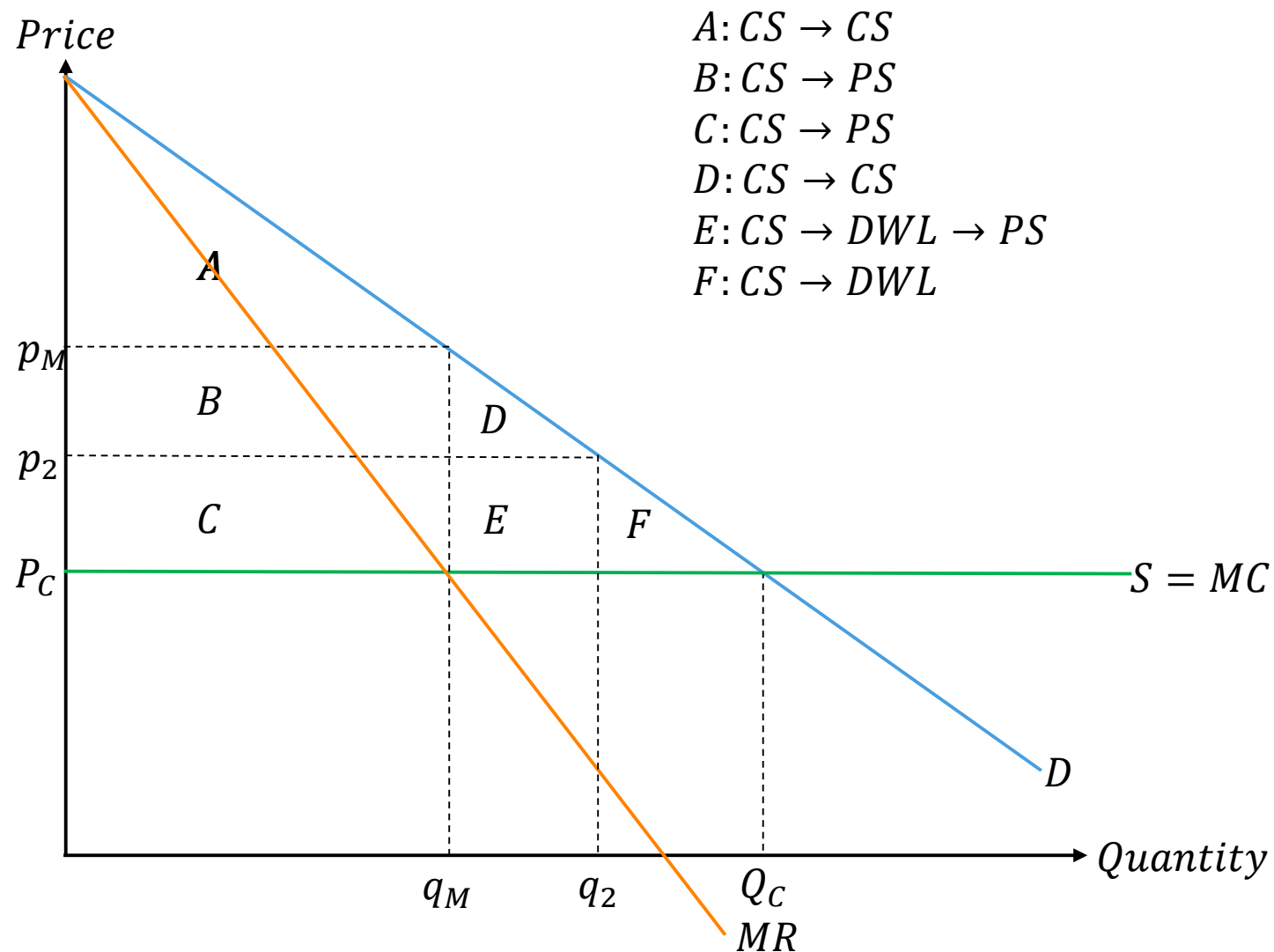
Price Discrimination

Price discrimination is quite common, and it is far from bad or pernicious. You are probably the beneficiary of several forms of price discrimination right now!

Price discrimination does two things—not always at the same time:

1. Convert consumer surplus into producer surplus
2. Reduces deadweight loss

Price Discrimination

Price discrimination might also be used to convert some deadweight loss ($D + E + F$) into producer surplus (E) and consumer surplus (D), by charging a lower price, p_2, on the quantity between q_M and q_2, and a higher price, p_M on goods up to q_M.

$A: CS \rightarrow CS$
$B: CS \rightarrow PS$
$C: CS \rightarrow PS$
$D: CS \rightarrow CS$
$E: CS \rightarrow DWL \rightarrow PS$
$F: CS \rightarrow DWL$

Price Discrimination: By Degrees

Price discrimination commonly takes the form of **market segmentation**, which requires **breaking the demand curve** into two or more segments along some **identifiable difference** regarding consumers' **price elasticity**.

College students, parents of young children, and senior citizens have predictably higher price elasticity of demand for many goods and services, and so could be charged lower prices than the rest of the consumers on the demand curve.

Price Discrimination

"Perfect" price discrimination requires charging **each consumer a price** corresponding to that consumer's **marginal willingness to pay**.

Perfection is quite rare, but many goods are sold in a highly "customized" way: automobiles, airline tickets, college tuition (especially at smaller, private colleges).

Price Discrimination

Perfect price discrimination **completely eliminates consumer surplus *and* the deadweight loss** of price-searching. It is, therefore, efficient, even if it means all consumer surplus has been captured by the price-searcher.

Price discrimination is often **more efficient than uniform-pricing**, but remember all of the things that must be present in order for price-searchers to discriminate!

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Monopolistic Competition

There are **two distinguishing characteristics** of monopolistic competition. The first is that firms have **some market power due to product differentiation**. The second is that **long-run profits will be competed away** as firms can **easily enter and exit** from this market.

Easy entry and exit imply that there are **no legal barriers** to entry and **no prohibitively high fixed costs**. Differentiation, according to consumers' subjective evaluations, provides some market power.

Profits in Monopolistic Competition

As a price-searcher, these firms face a downward-sloping demand curve and will produce output where $MR = MC$.

Profits are found by the vertical distance between the price (p_0) and the total cost of production (TC_0) for that amount of output (q_0).
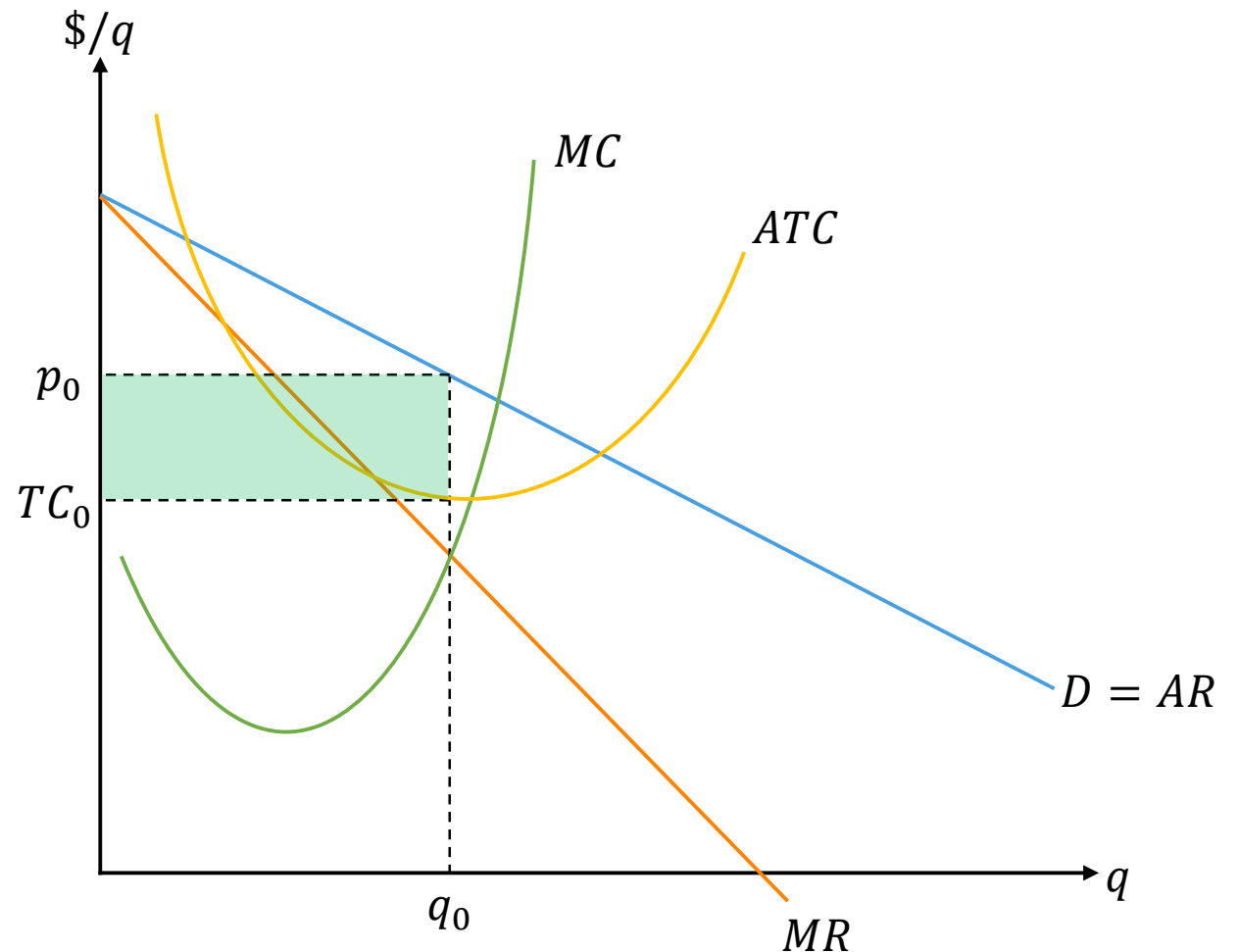
Competing away Profits/Losses

Just like in **perfect competition**, small barriers to entry and exit means that firms will **enter (exit)** the industry when they are earning **profits (losses)**.

As firms enter, there are two effects:

1. Demand curves **shift to the left** (and might become more elastic) as each firm faces stiffer competition for customers
2. Costs are bid up as more firms **compete for inputs**

Profits in Monopolistic Competition

As firms enter, the demand curve shifts to the left and becomes flatter. Marginal revenue responds accordingly. Marginal cost and average total cost increase.

At the new price and quantity, profits are 0.
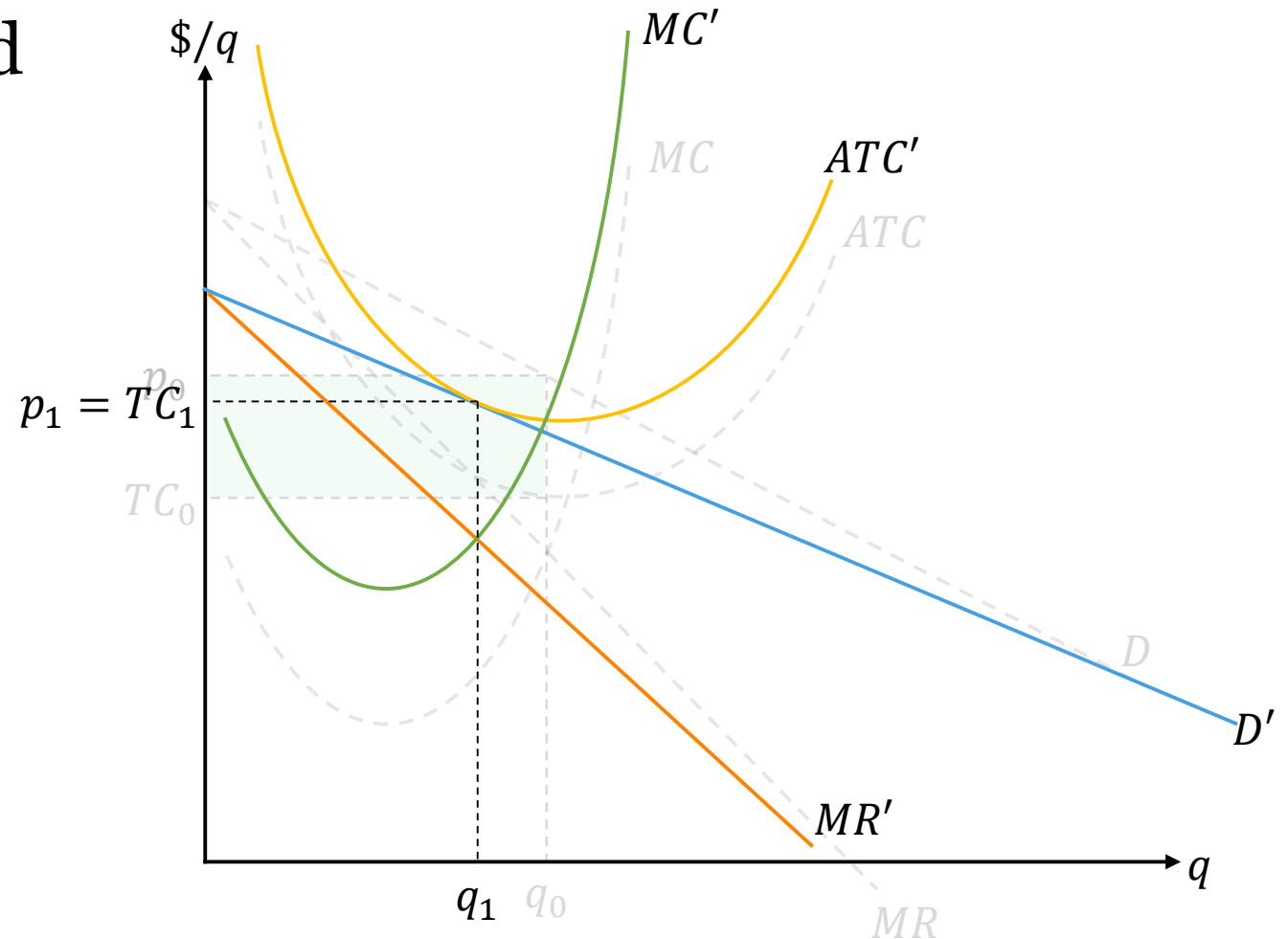
Efficiency Analysis

Perfect Competition

- Allocation efficiency $(p = MC)$

- Production efficiency $(p = \min ATC)$

- Zero economic profit

- No Deadweight Loss

Monopolistic Competition

- Allocation inefficiency $(p > MC)$

- Production efficiency $(p = \min ATC)$

- Zero economic profit

- Deadweight loss

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Oligopoly

Oligopoly simply means "few sellers," and oligopolies are truly varied. They share some things in common, however.

1. Price-searchers
2. Interdependence of pricing/quantity decisions, as well as product differentiation
3. Barriers to entry (either legal or prohibitive cost)

Cartels: Monopoly by Committee

Cartels act **collusively** to maximize profits, which they then would share. They act like a **monopoly for the point of profit maximization** on the industry, then split up those monopoly profits.

Very few cartels are successful in practice, and the most successful, **OPEC**, has been facing declining influence and internal squabbling.

Cartels

The principle problem facing cartels is **forcing individual firms/producers to act in accord with the plan**.

Each member of the cartel, knowing the others are acting to reduce output and raise price (like monopolists do) has an incentive **to sell more than the agreed amount**, making larger revenues—and profits—because of **the higher price**.

This practice is called "chiseling."

Preventing Chiseling

1. Keep the number of co-conspirators low.
2. Sell uniform product. Differentiated product breaks down the cartel model of unified profit maximization.
3. Keep up barriers to entry from outsiders or substitute goods.
4. Try to keep costs similar.
5. Convince the government to provide oversight of the cartel itself. They will enforce against chiseling or non-cooperative behavior.

Product prices ultimately provide little information about market structure

When prices **rise**, many consumers assume it's because of **price gouging** and **greedy businesses**.

When prices **fall**, many consumers assume it's due to **predatory pricing** or **anti-competitive behavior by big firms**.

When the price is **constant**, many consumers assume it's due to **collusion to keep the price steady**.

Game Theory

3 types of analysis in microeconomics:

1. Optimization – individuals make choices taking everything else as given; nothing they do affects the broader world, they are just making the best choices for themselves (chapter 8, firms in 9, and monopolies in 10)

2. Equilibrium – the movement of countless individuals to make up tectonic changes in outcomes (chapters 3, 4, 5, industries in 9, monopolistic competition in 10)

3. Game Theory – what each person does matters (like optimization), but it does not wholly determine the outcome, which is a joint product of everyone's choices (like equilibrium)

Elements of a Game

1. Players – Who is playing?
2. Actions – What can they do?
3. Information and Sequence – Who goes when? When and how to players learn what the others have done?
4. Payoffs – What is the overlap of different actions worth to each player?

Strategies

A "strategy" is a complete plan of actions for how to play the game prior to the beginning of the game.

Strategies are not all created equal; some strategies are all-but guaranteed to hurt your chances of doing well in the game.

Some strategies are better than all others. These are dominant strategies. Other strategies are never better; these are dominated.

Best Response Strategies

A dominant strategy is always a best-response, since it does better for the player than all other strategies could.

In the absence of dominant strategies, players look for best-response strategies. A player is playing such a strategy if the player can't do any better playing a different strategy, given what other player(s) is(are) doing.

It's conditional. If you do X, I'll do A. If you do Y, I'll do B.

Nash Equilibrium

An equilibrium in a game is a set of strategies—one for each player. A Nash equilibrium is a set of strategies, one for each player, in which each player is playing a best-response strategy.

So if each player is playing a best-response strategy to all of the other players, the collection of those strategies defines an equilibrium. Let's do an example.

Finding Nash Equilibrium

Player 1 can choose Up or Down.

Player 2 can choose Left or Right.

We find best-response strategies with a simple algorithm.

We will work through this together.

The Prisoner's Dilemma

This game is formally described as a symmetric, dominance-solvable, inefficient Nash equilibrium.

Prisoner's dilemmas are very common in [social] science, from economics to law to ecology!

Solving Repeated Games

What happens if people play Prisoner's Dilemma games over and over and over and over and over? "It depends."

If the game is played finitely, i.e. a set number of times, cooperation unravels, through backward induction.

If the game is played infinitely, i.e. an indefinite number of times, cooperation is possible.

Robert Axelrod and *The Evolution of Cooperation*

If two or more people are playing an infinitely repeated prisoner's dilemma, cooperation can evolve through a number of strategies:

1. Grim trigger – one and done
2. "Trembling Hand" trigger – once bitten, twice shy
3. Tit-for-tat – trading defection to secure cooperation
4. Variations on tit-for-tat