Firm Behavior Under Monopolistic Competition, Oligopoly, and Game Theory

AP Econ – Micro II B

Mr. Griffin

MHS

Monopolistic Competition

- Characteristics of Monopolistic Competition
  - Many sellers
  - Freedom of entry and exit
  - Perfect information
  - Heterogeneous products

Monopolistic Competition

- Characteristics of Monopolistic Competition
  - First three characteristics same as those for perfect competition.
  - Fourth is an important distinction.
  - Demand curve facing the firm is negatively sloped.
  - Majority of U.S. firms are in this type of market structure.

Monopolistic Competition

- Price and Output Determination under Monopolistic Competition
  - MR = MC rule applies for setting output.
  - Long-run equilibrium: the firm's demand curve must be tangent to its average cost curve.

FOUR MARKET MODELS

Monopolistic Competition:

- **Relatively Large Number of Sellers**
- **Differentiated Products**
- **Easy Entry and Exit**

Market Structure Continuum

CHARACTERISTICS

Relatively Large Number of Sellers

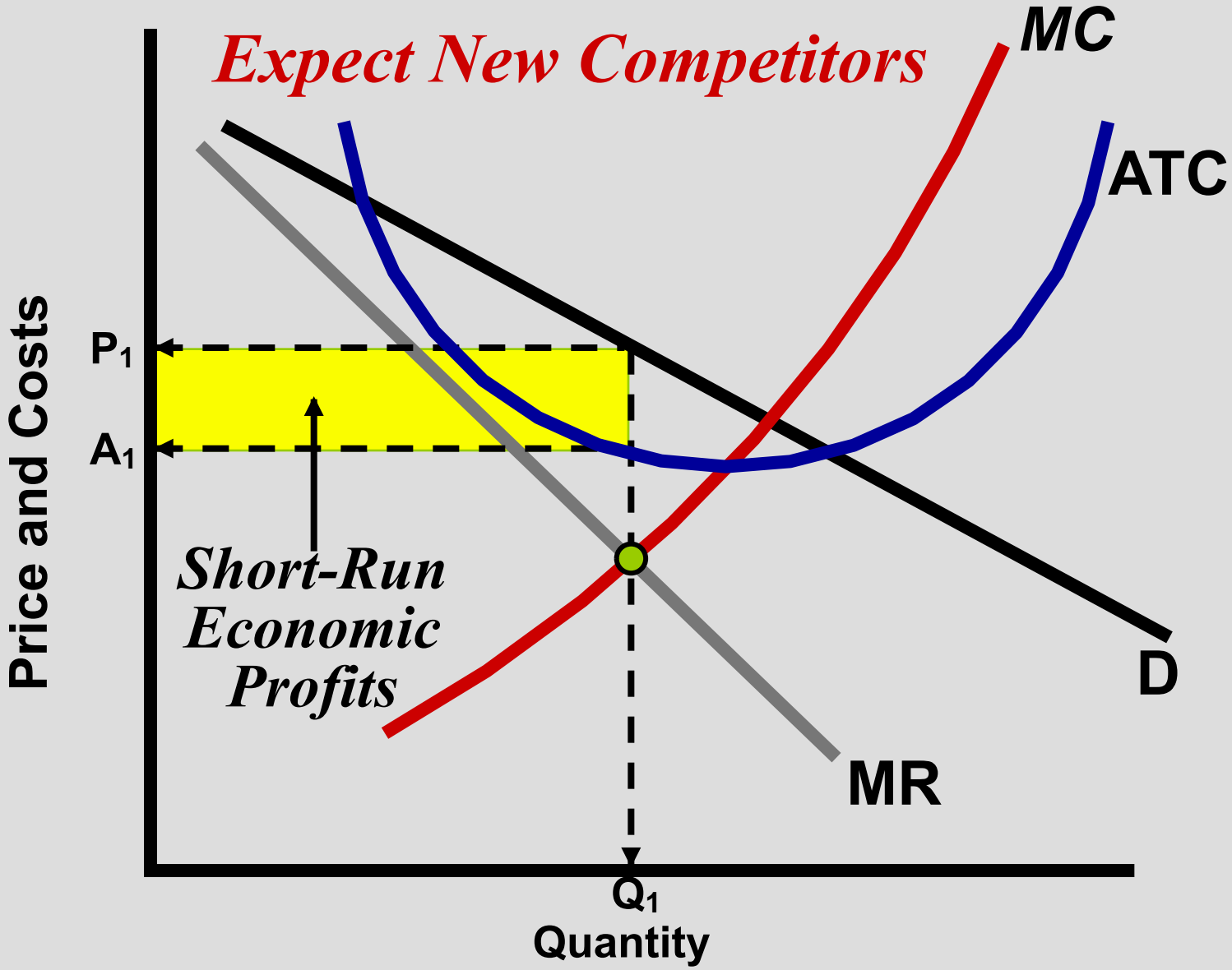
- Small Market Shares
- No Collusion
- Independent Action

CHARACTERISTICS

Differentiated Products

- Product Attributes
- Service
- Location
- Brand Names and Packaging
- Some Control Over Price
- Easy Entry and Exit
- Advertising

PRICE AND OUTPUT IN MONOPOLISTIC COMPETITION



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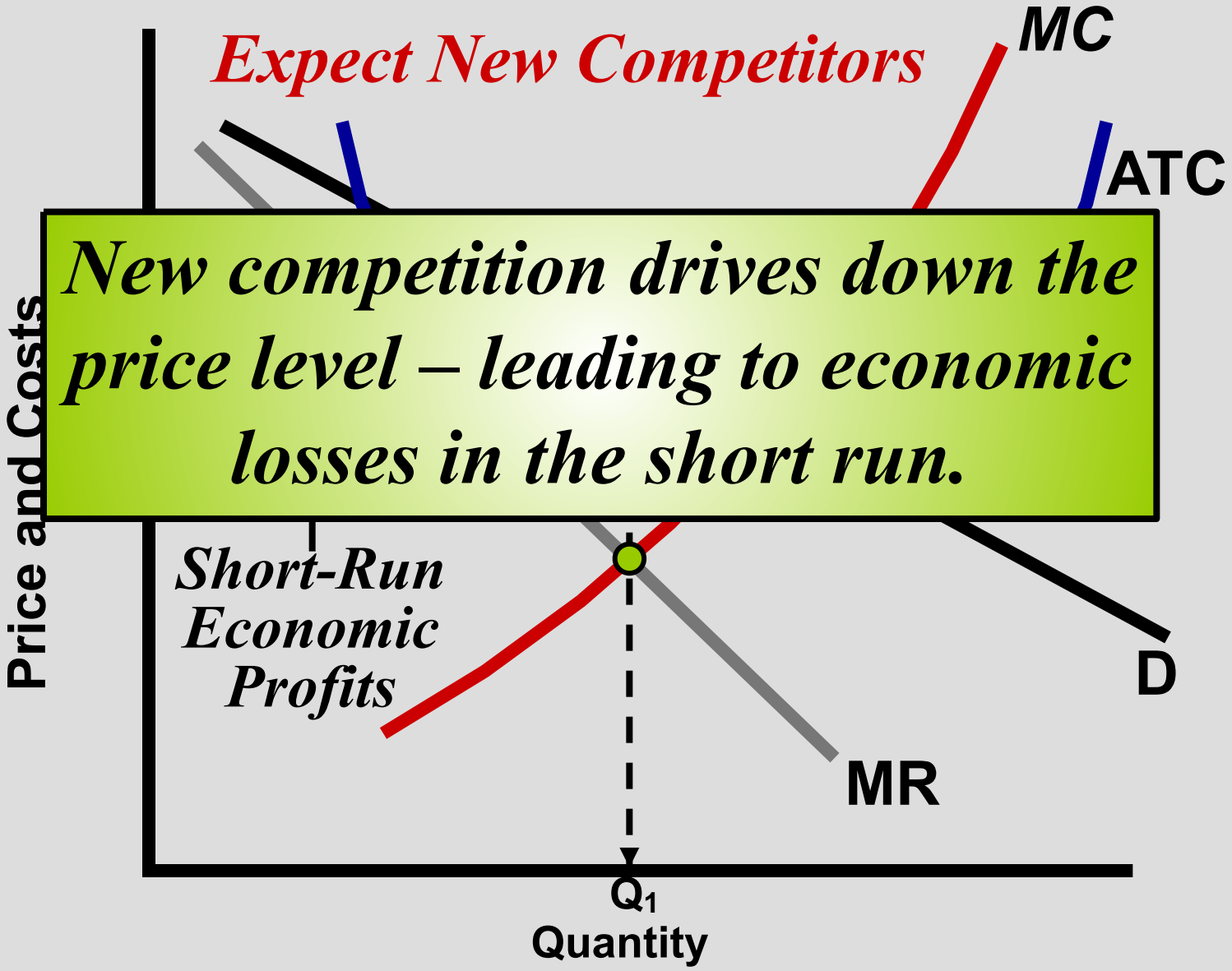

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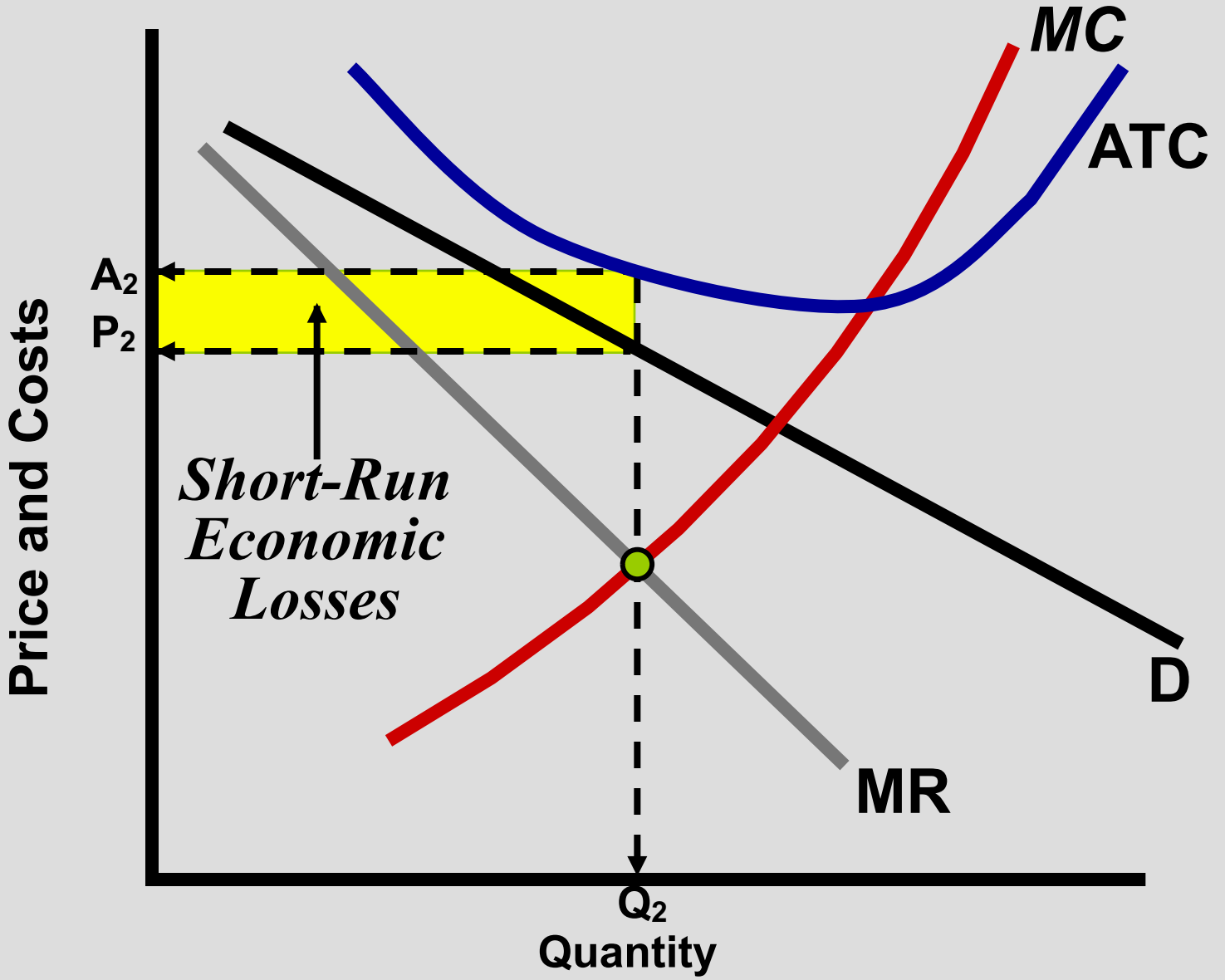

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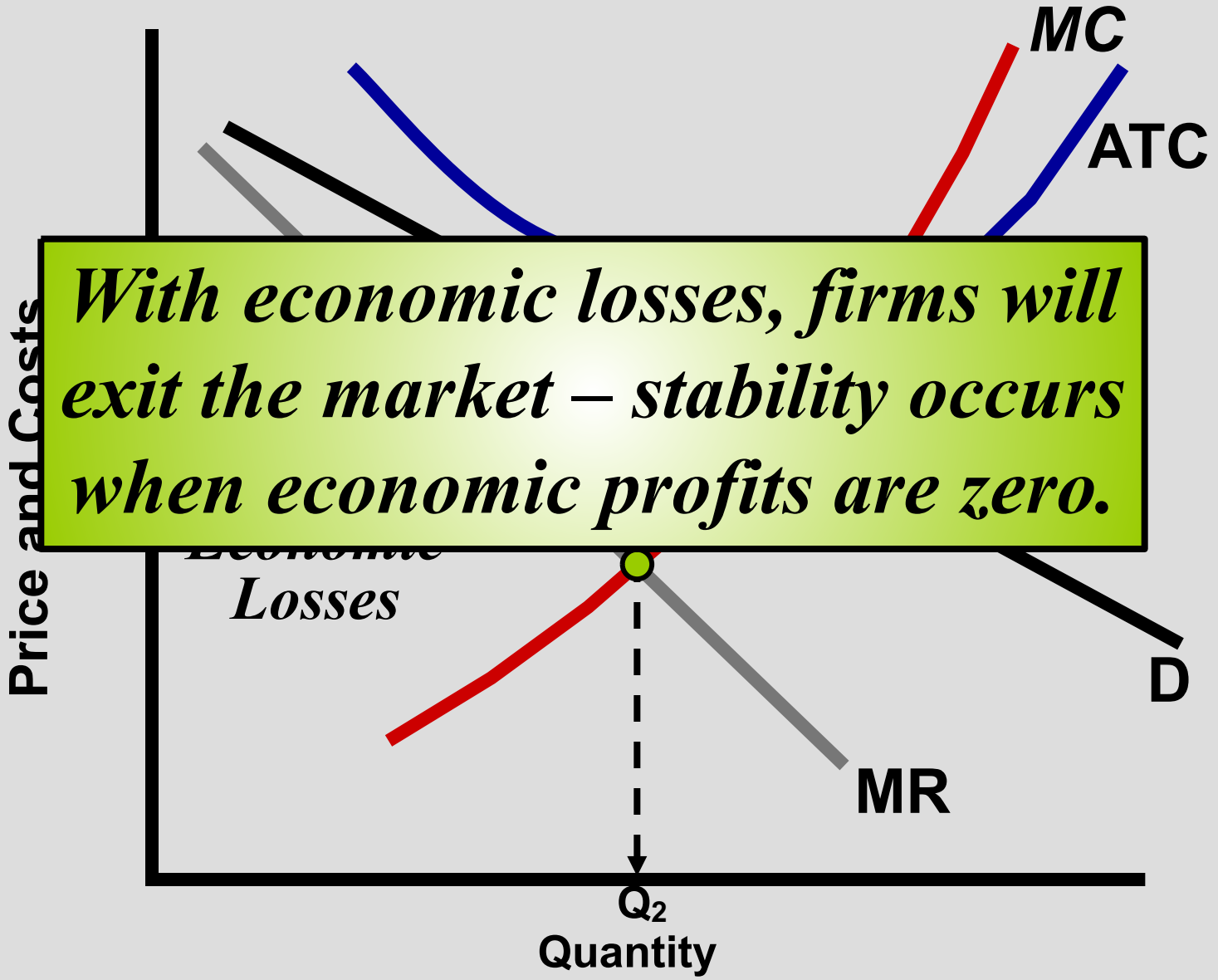

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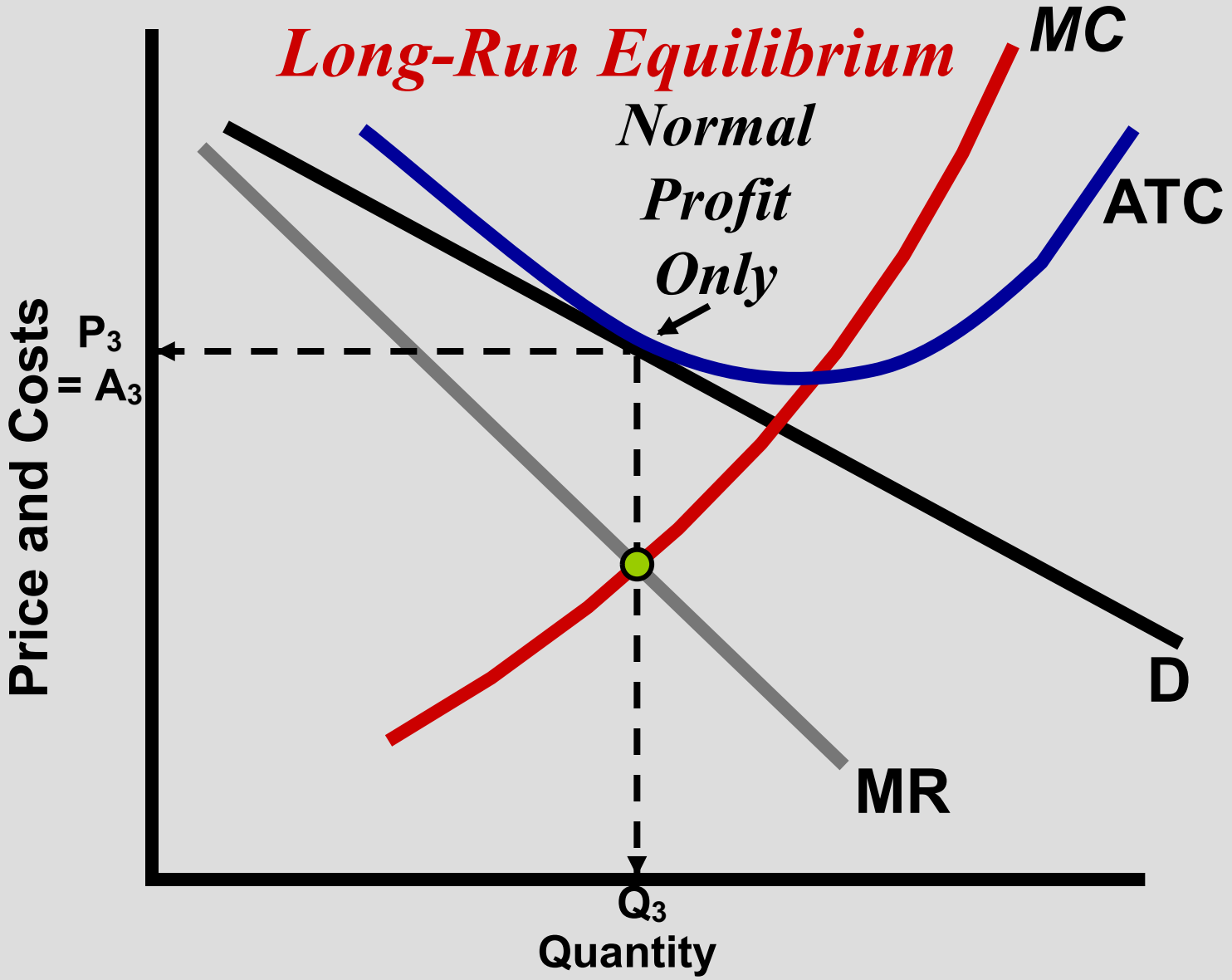


MONOPOLISTIC COMPETITION AND EFFICIENCY

- **Not Productively Efficient**

≠ Minimum ATC

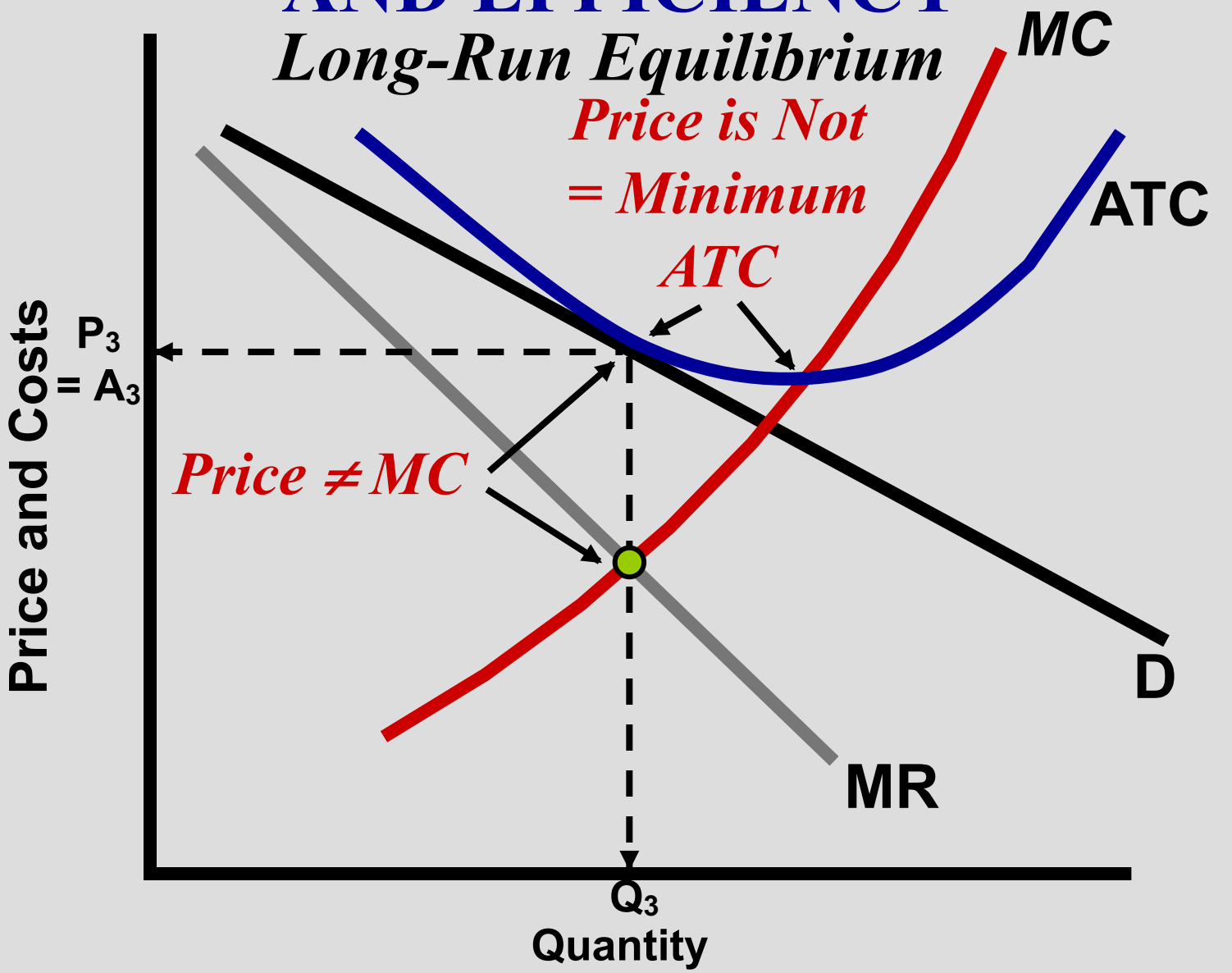
- **Not Allocatively Efficient**

Price ≠ MC

- **Excess Capacity**

Graphically…

MONOPOLISTIC COMPETITION AND EFFICIENCY



MONOPOLISTIC COMPETITION AND EFFICIENCY

Product Variety

- **Benefits of Product Variety**
- **Nonprice Competition**
- **Advertising Role**
- **Trial & Error Search for Maximum Profits**

The Excess Capacity Theorem

- Under monopolistic competition, in the long run the firm will produce an output lower than that which minimizes its unit costs.
- Hence, unit costs will be higher than necessary.

The Excess Capacity Theorem

- Achievement of minimum average costs would require fewer but larger firms.
- This inefficiency may, however, be a reasonable price to pay for providing a large range of consumer choice.

FOUR MARKET MODELS

Oligopoly:

- A Few Large Producers
- Homogeneous or Differentiated Products
- Control Over Price, But Mutual Interdependence
  - Strategic Behavior
- Entry Barriers

Market Structure Continuum

OLIGOPOLIES AND MERGERS

Mergers

Measures of Industry Concentration

- Concentration Ratio
- Localized Markets
- Interindustry Competition
- World Trade
- Import Competition

Oligopoly

- Oligopoly = market dominated by a few sellers, at least several of which are large enough relative to the total market that they can influence the market price
- Oligopoly $\Rightarrow$ more intense competition than pure competition

Oligopoly

- Why Oligopolistic Behavior is So Difficult to Analyze
  - Oligopolistic firms interact with each other in complex ways, and almost anything can and sometimes does happen under oligopoly.

Oligopoly

The Run Down:

- Ignore interdependence
- Strategic interaction
- Cartels
- Price leadership and tacit collusion
- Sales maximization
- Kinked demand curve
- Game theory

Oligopoly

- Sales Maximization: An Oligopoly Model with Interdependence Ignored
  - Firms may attempt to maximize revenue rather than profit if
    - control is separated from ownership.
    - compensation of managers is related to the size of the firm.

Oligopoly

- Sales Maximization: An Oligopoly Model with Interdependence Ignored
  - Output set where marginal revenue = 0 (rather than marginal cost)
  - Compared to a profit-maximizer
    - Higher output
    - Lower price

OLIGOPOLIES AND MERGERS

Herfindahl Index

Sum of the squared percentage market shares for all firms in the industry – Places greater weight upon the larger firms

$$(\%S_1)^2 + (\%S_2)^2 + (\%S_3)^2 + \ldots + (\%S_n)^2$$

A greater Herfindahl Index indicates a greater concentration of market power in the industry.

(Pure competition is near zero.)

THREE OLIGOPOLY MODELS

No Standard Model due to...

Diversity of Oligopolies

Complications of Interdependence

Alternative Models:

1 – Kinked Demand Curve

2 – Cartels and Collusion

3 – Price Leadership

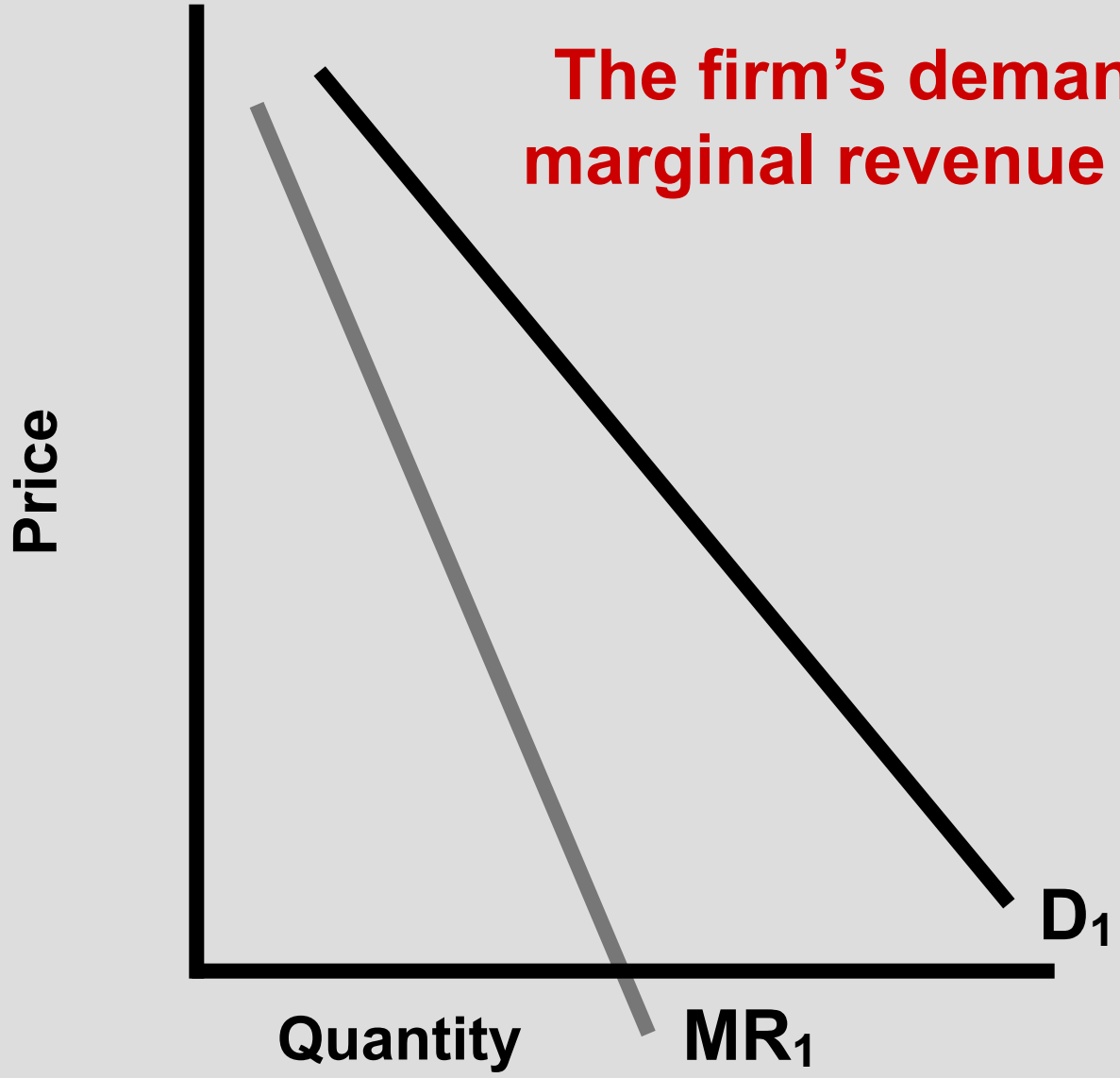
? The Kinked Demand Curve Model

- Because the managers of a firm think that other firms will match any cut they make in price, but not any increase, they may think they face an inelastic demand curve with respect to price cuts and an elastic curve with respect to price increases.

? The Kinked Demand Curve Model

- The demand curve is kinked, and the marginal revenue curve is discontinuous.
- If so, neither price nor output will change in response to moderate shifts in costs.

KINKED DEMAND THEORY:
NONCOLLUSIVE OLIGOPOLY



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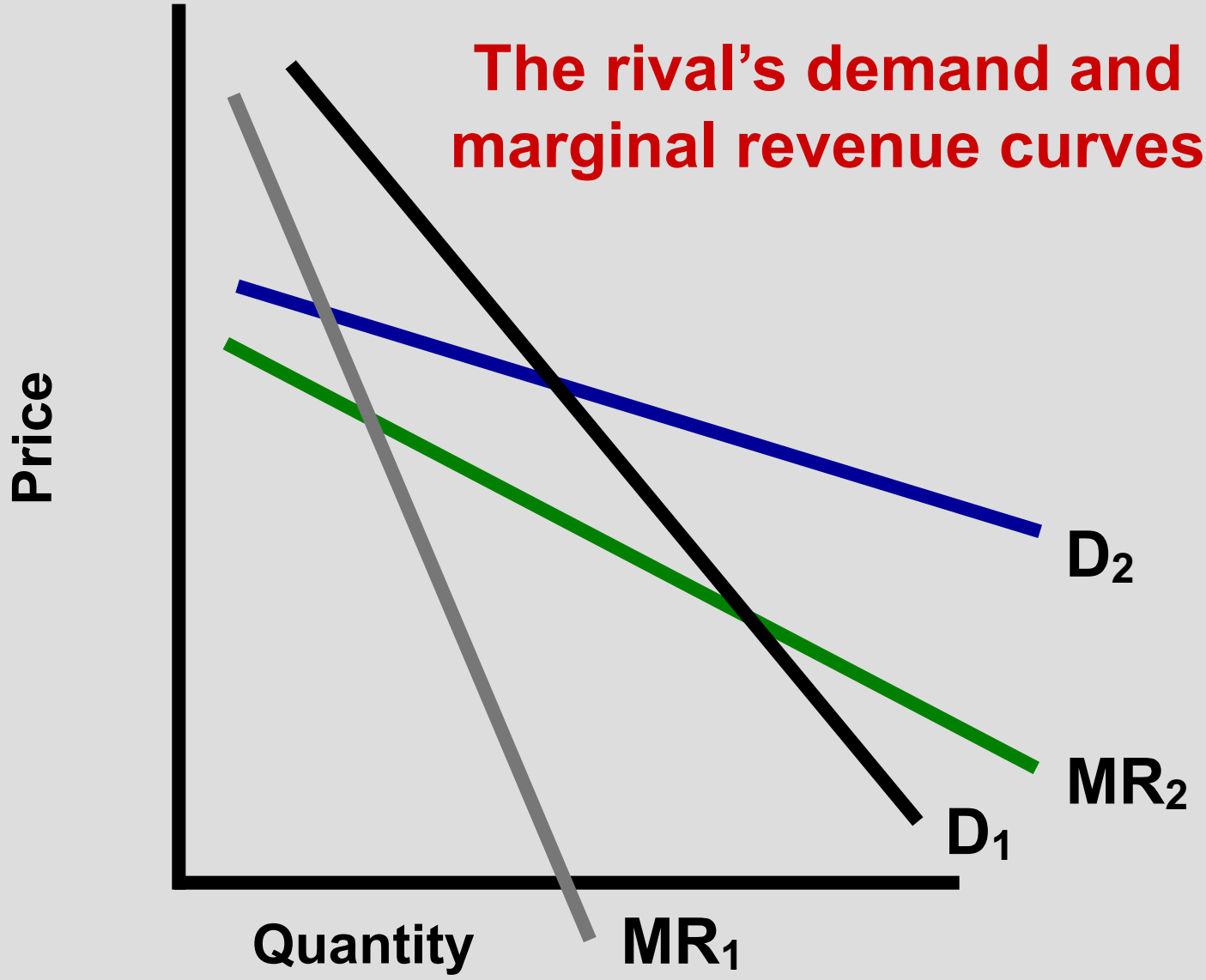

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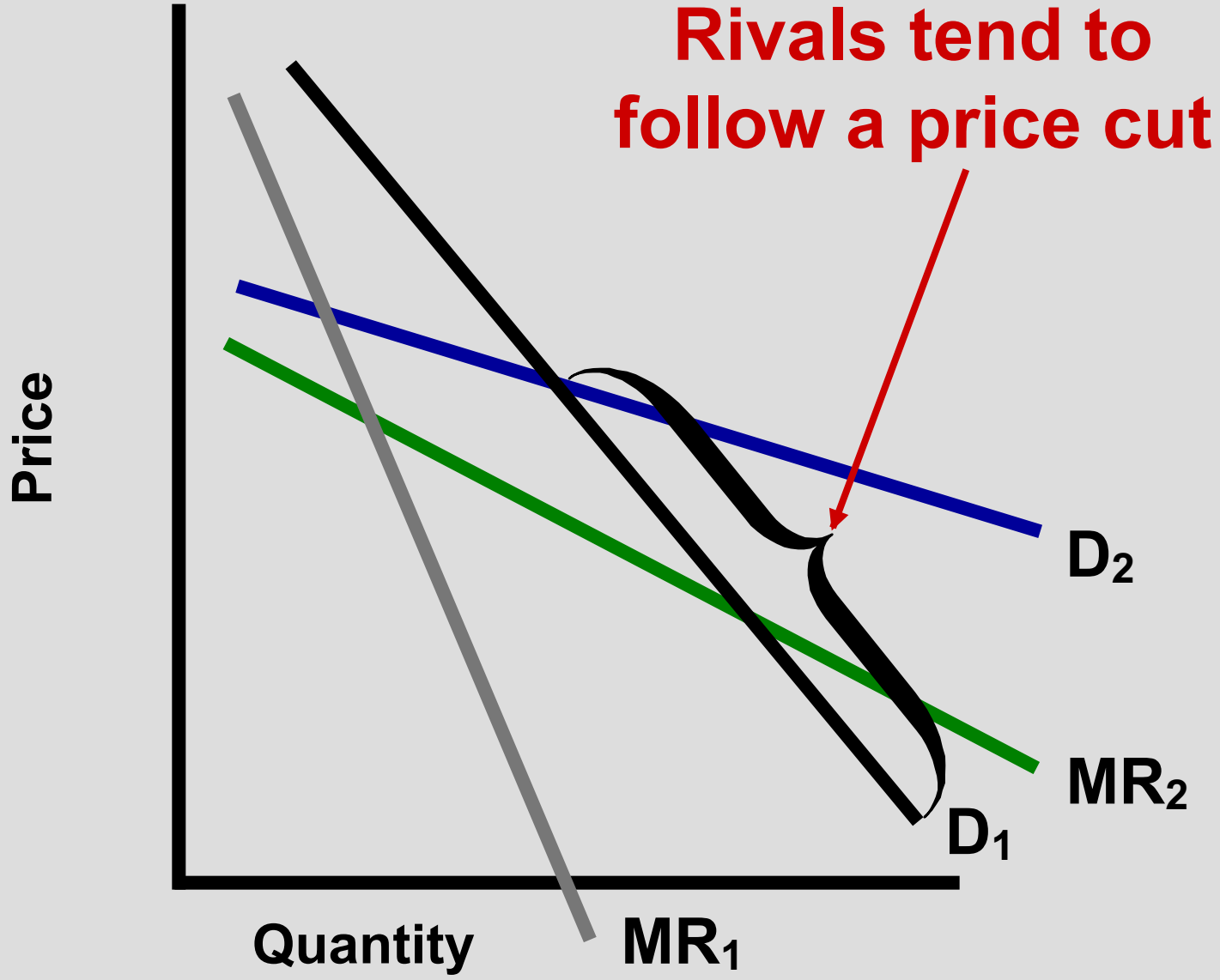

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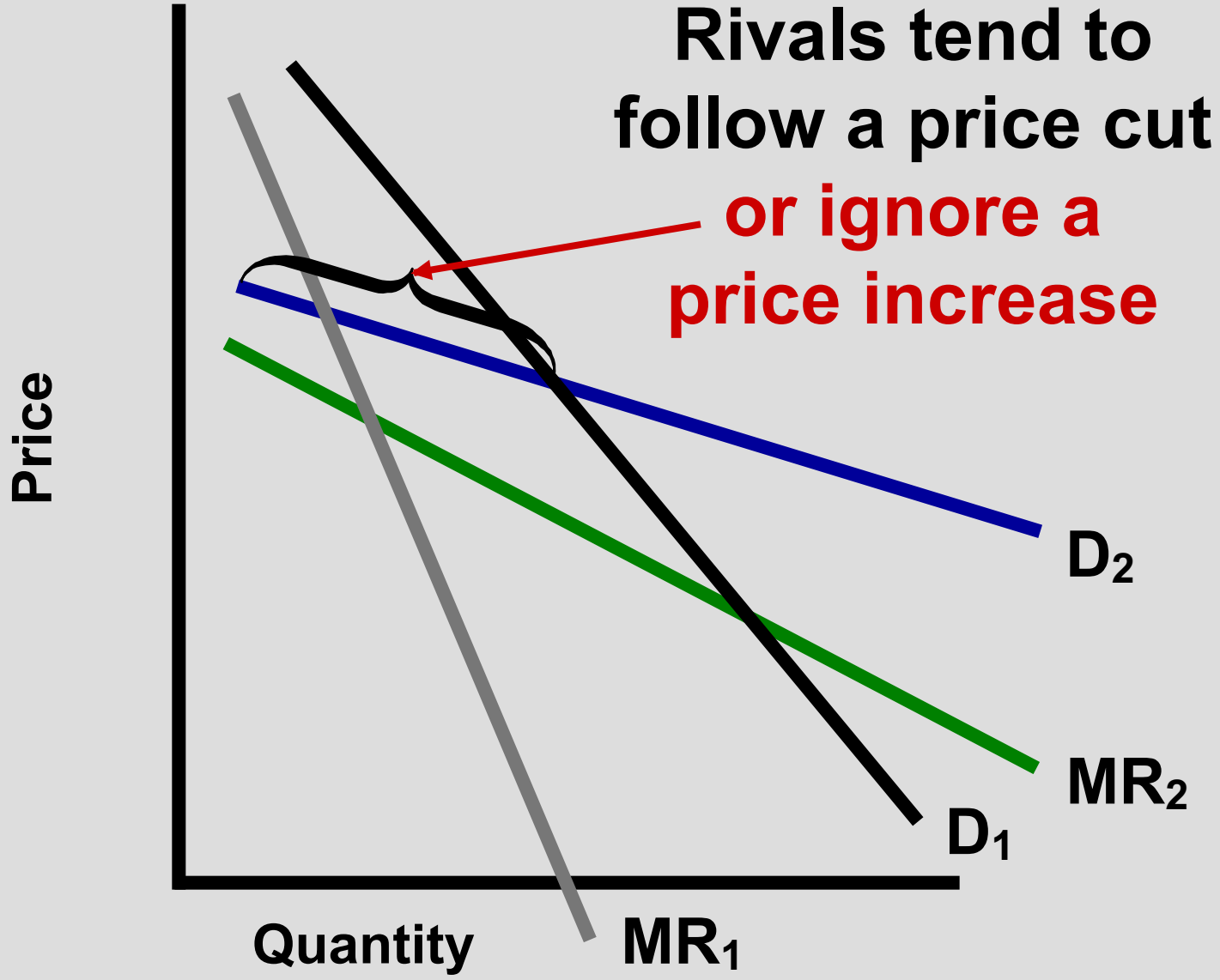

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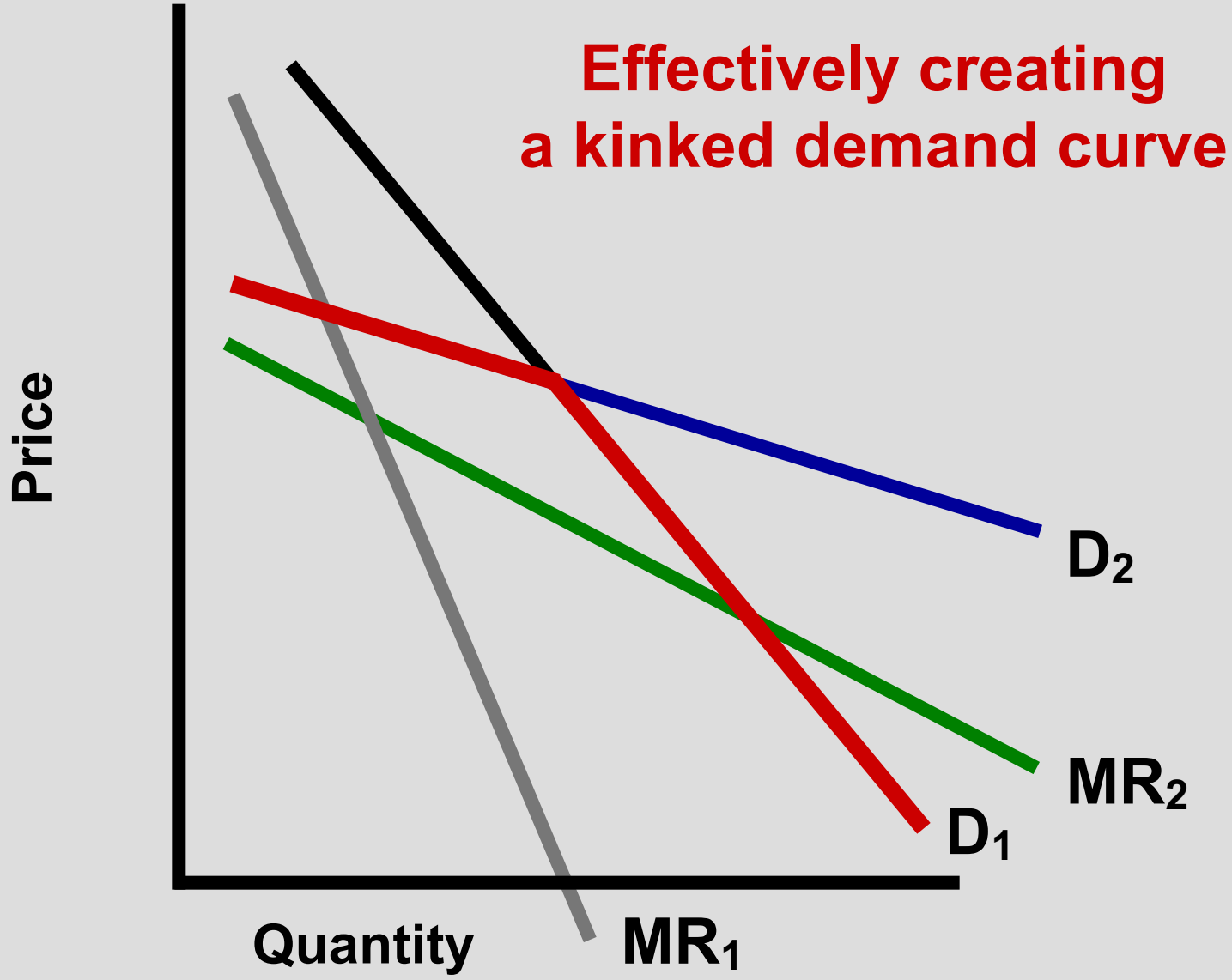

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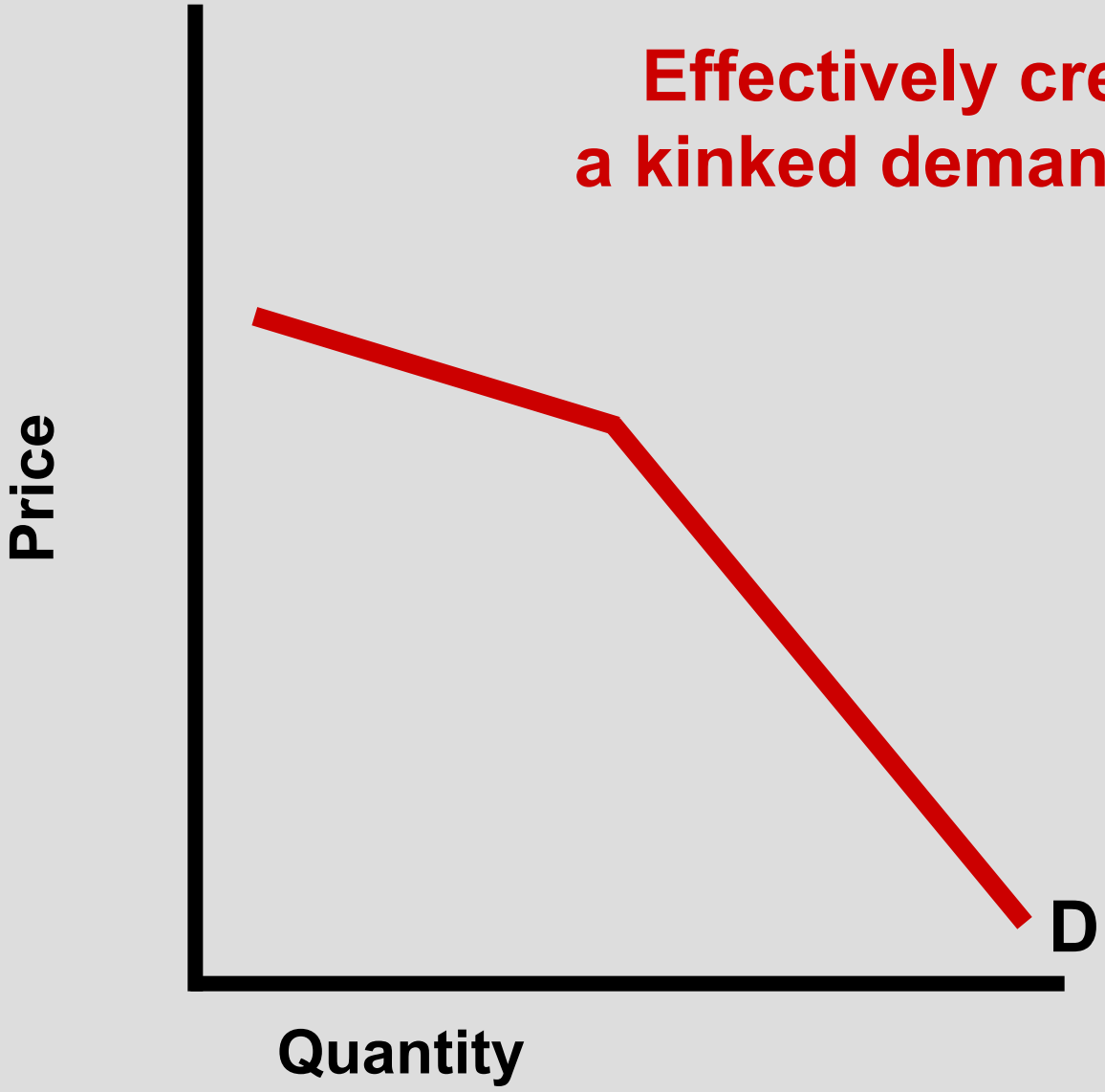

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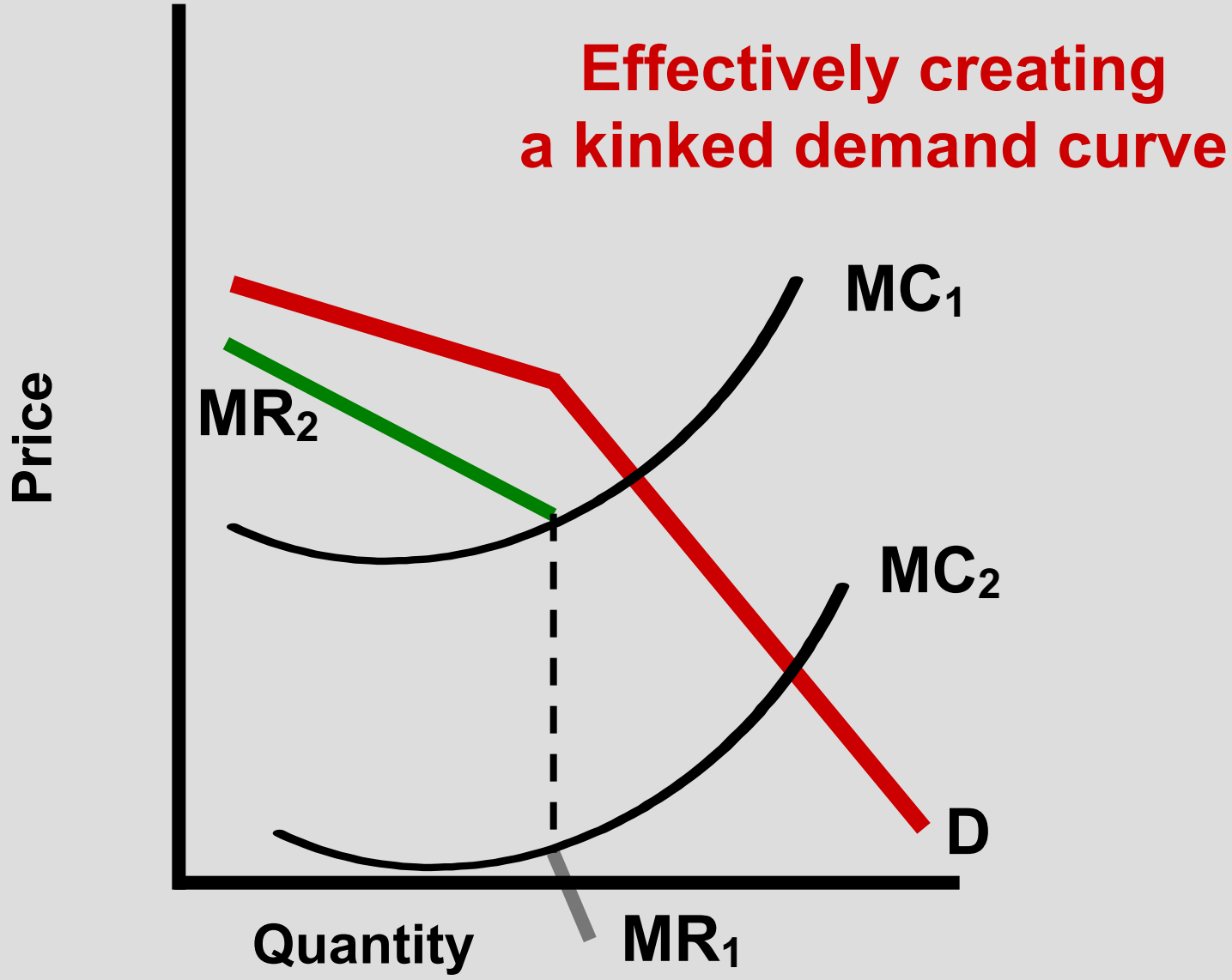

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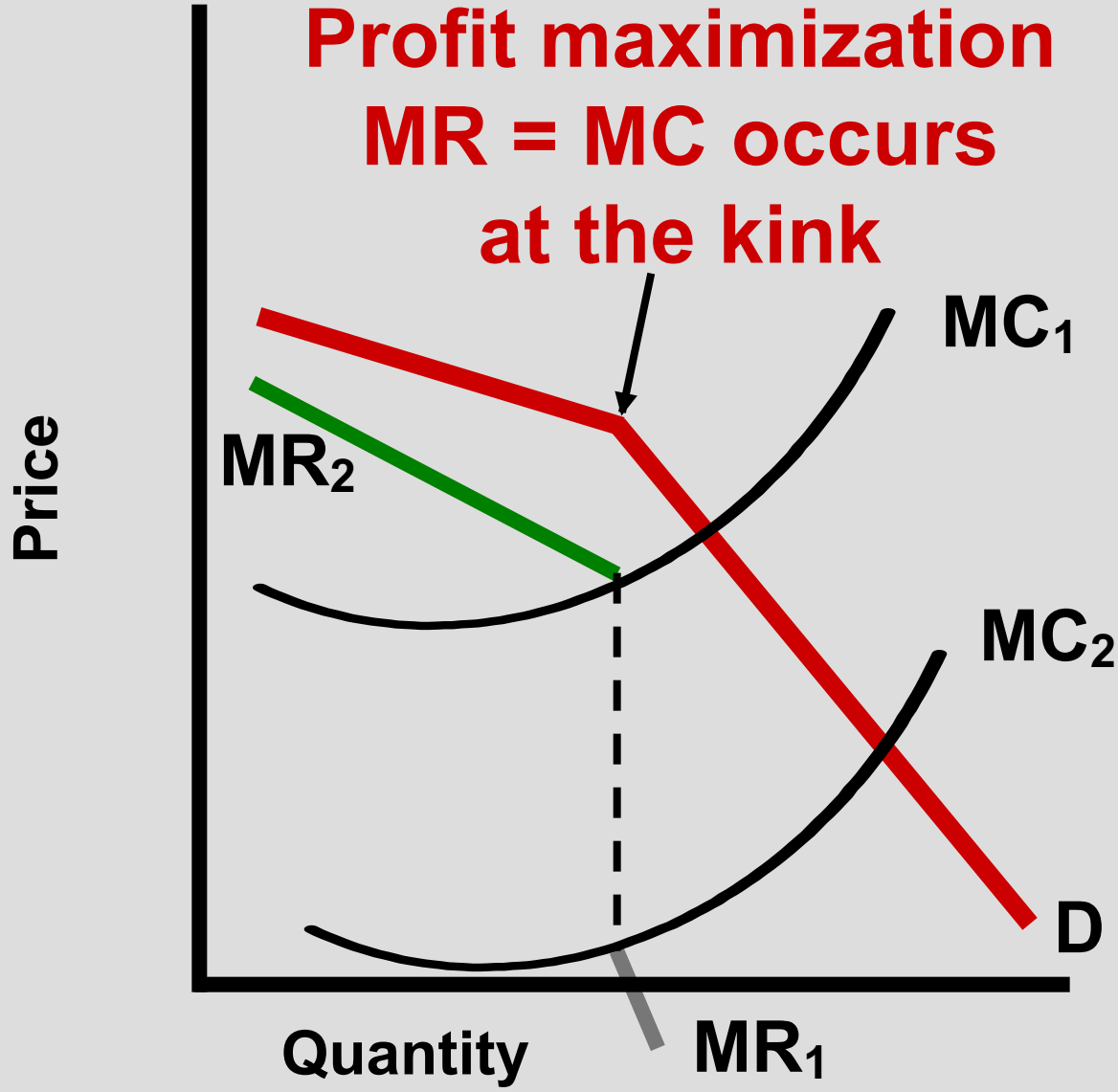
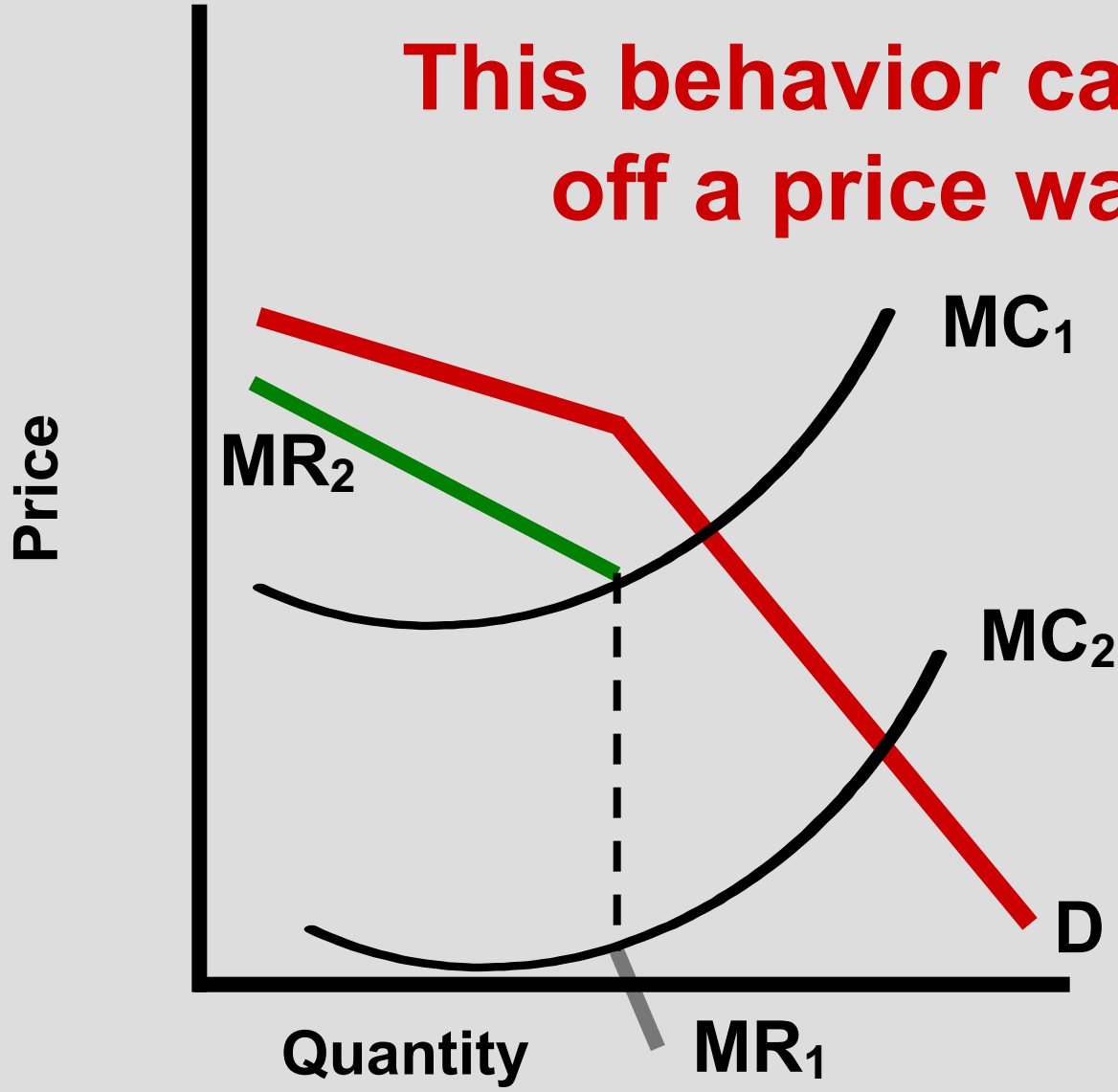


KINKED DEMAND THEORY:
NONCOLLUSIVE OLIGOPOLY

This behavior can set off a price war.



CARTELS AND OTHER COLLUSION

Oligopoly is conducive to collusion.

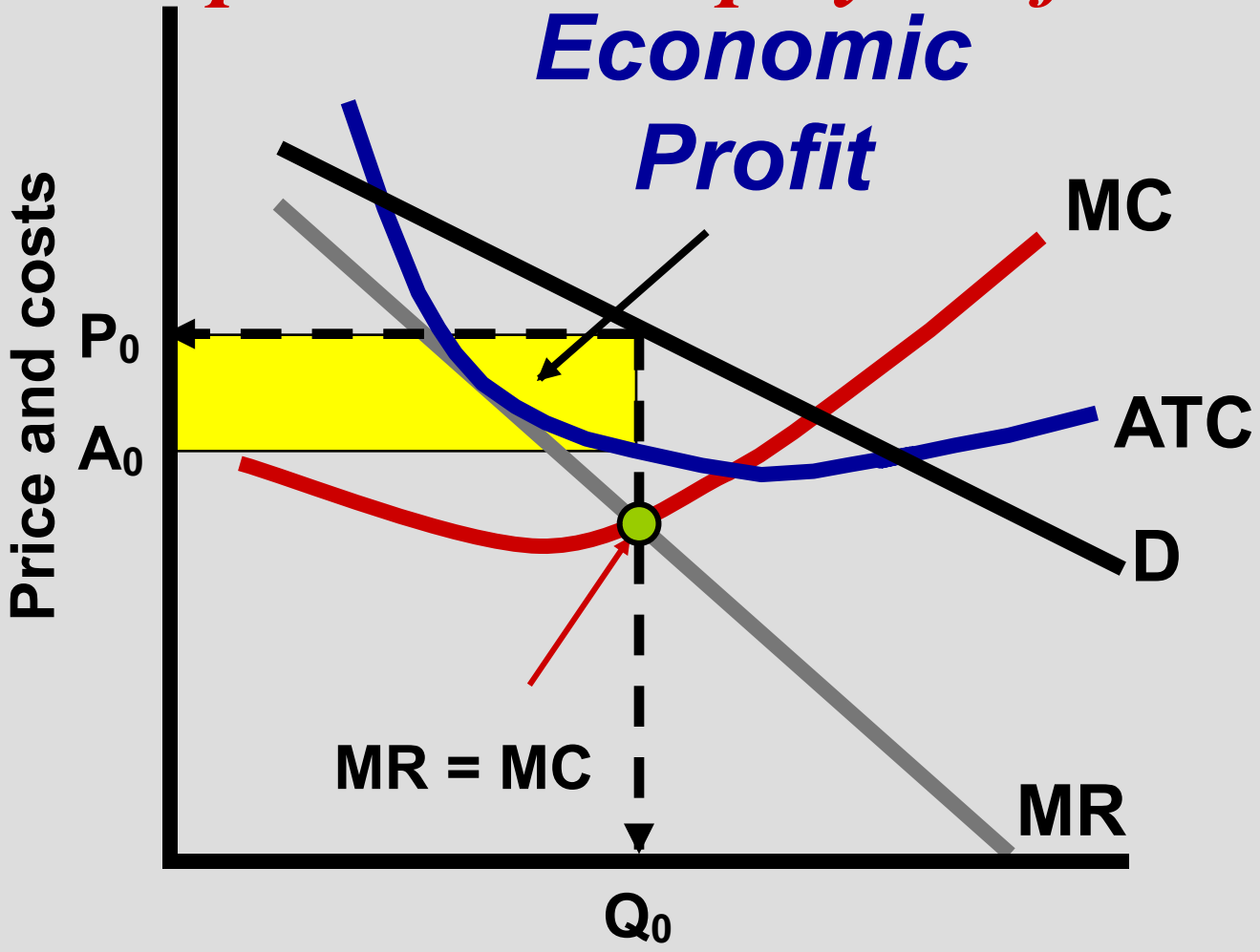
If a few firms face identical or highly similar demand and costs...

they will tend to seek joint profit maximization.

Graphically…

CARTELS AND OTHER COLLUSION

Colluding Oligopolists Will Split the Monopoly Profits



CARTELS AND OTHER COLLUSION

Overt Collusion

- Cartels Defined
- The OPEC Cartel

Covert Collusion

- Recent Examples
- U.S. Illegality
- Tacit Understandings

Obstacles to Collusion

- Demand and Cost Differences
- Number of Firms
- Cheating
- Recession
- Potential Entry
- Antitrust Law

PRICE LEADERSHIP MODEL

Leadership Tactics

- Infrequent Price Changes
- Communications
- Limit Pricing

Breakdowns in Price Leadership-Price Wars

OLIGOPOLY AND ADVERTISING

Less Easily Duplicated Adequate Resources

Positive Effects of Advertising

Potential Negative Effects of Advertising

Brand Development

OLIGOPOLY AND EFFICIENCY

Productive Efficiency

$$P = Minimum\ ATC$$

Oligopoly: No Productive Efficiency

Allocative Efficiency

$$P = MC$$

Oligopoly: No Allocative Efficiency

Qualifications

Monopolistic Competition, Oligopoly, & Public Welfare

- Behavior is so varied that it is hard to come to a simple conclusion about welfare implications.
- In many circumstances, the behavior of monopolistic competitors and oligopolists falls short of the social optimum.

Monopolistic Competition, Oligopoly, & Public Welfare

- When an oligopolistic market is perfectly contestable--if firms can enter and exit without losing the money they have invested--then the performance of the firms is likely to be socially efficient.

OLIGOPOLIES AND MERGERS

Mutual Interdependence

Game-Theory Model

Collusive Tendencies

- **Collusion**

Incentive to Cheat

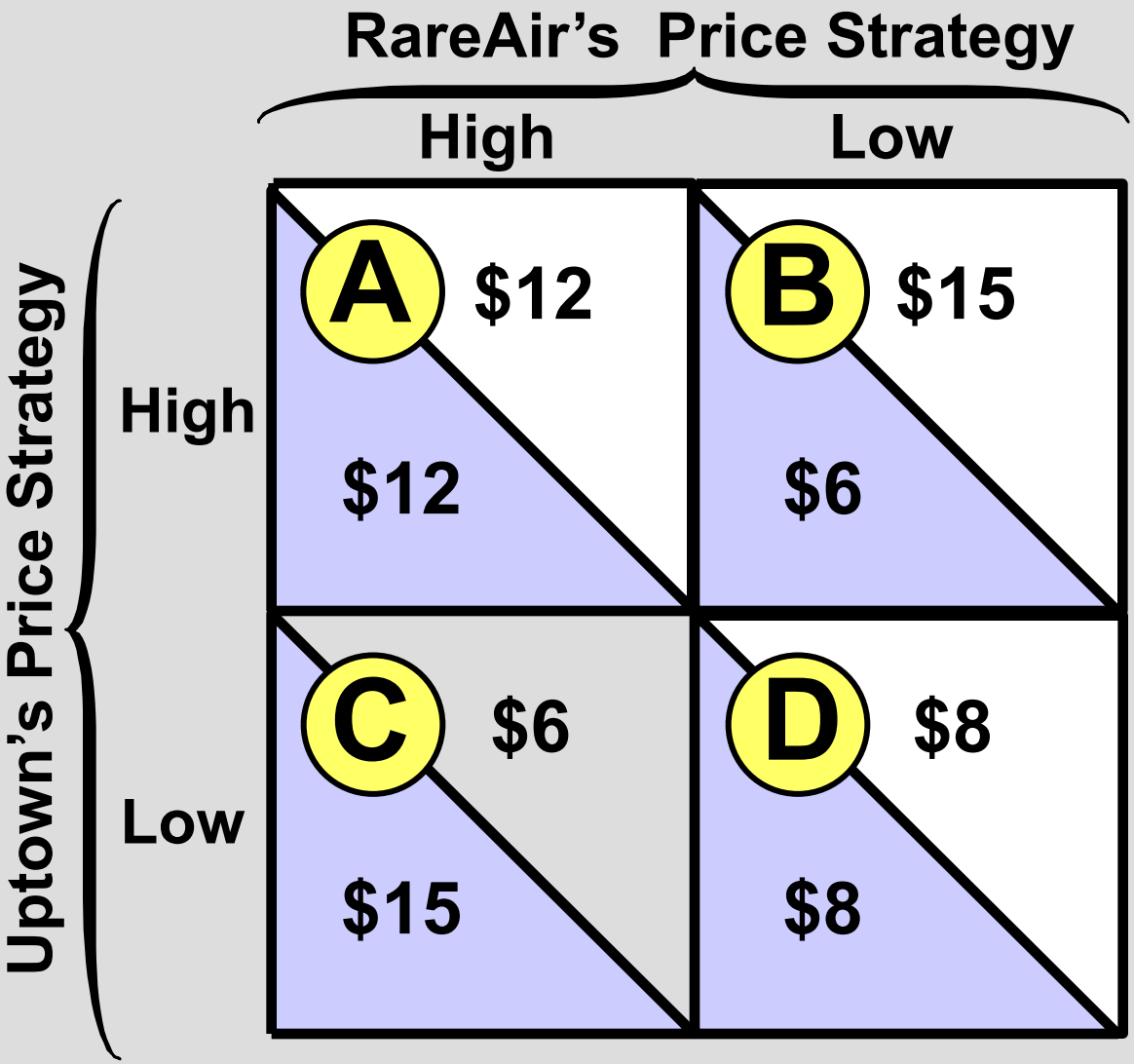
Introduction to Game Theory…

Oligopoly

- The Game-Theory Approach
  - Each oligopolist is seen as a competing player in a game of strategy.
  - Managers act as though their opponents will adopt the most profitable countermove to any move they make.

OLIGOPOLY BEHAVIOR

A Game-Theory Overview



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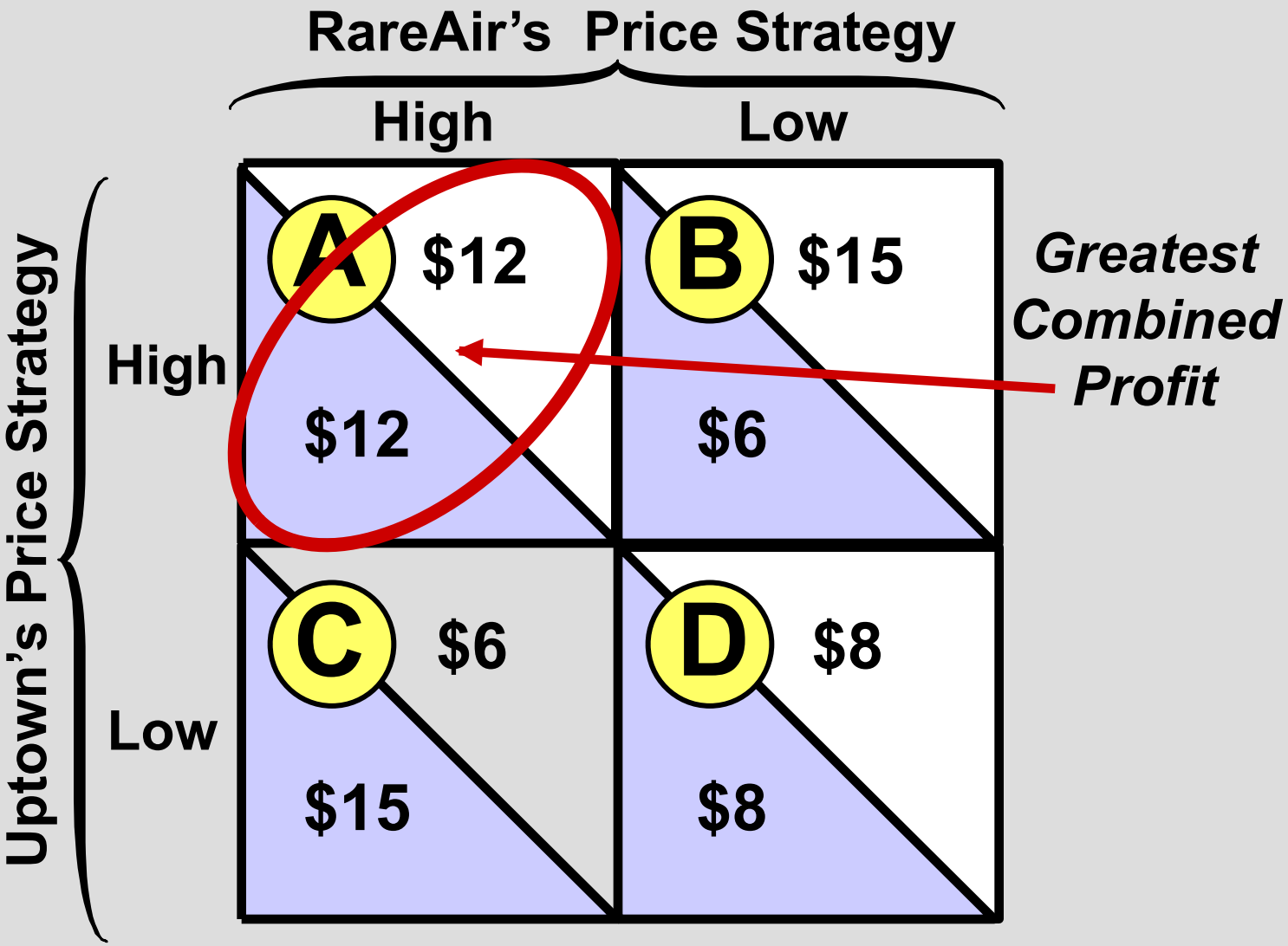

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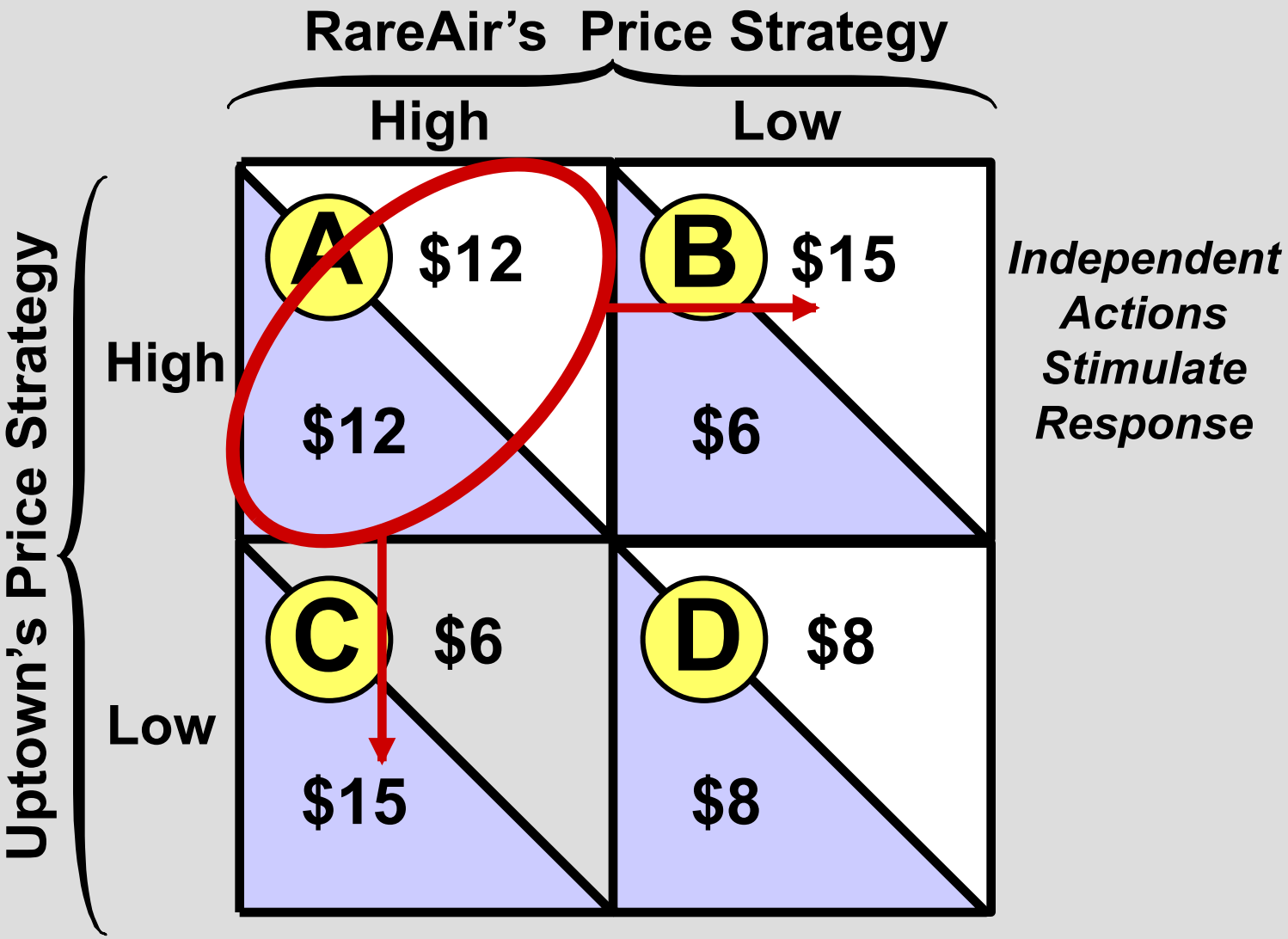

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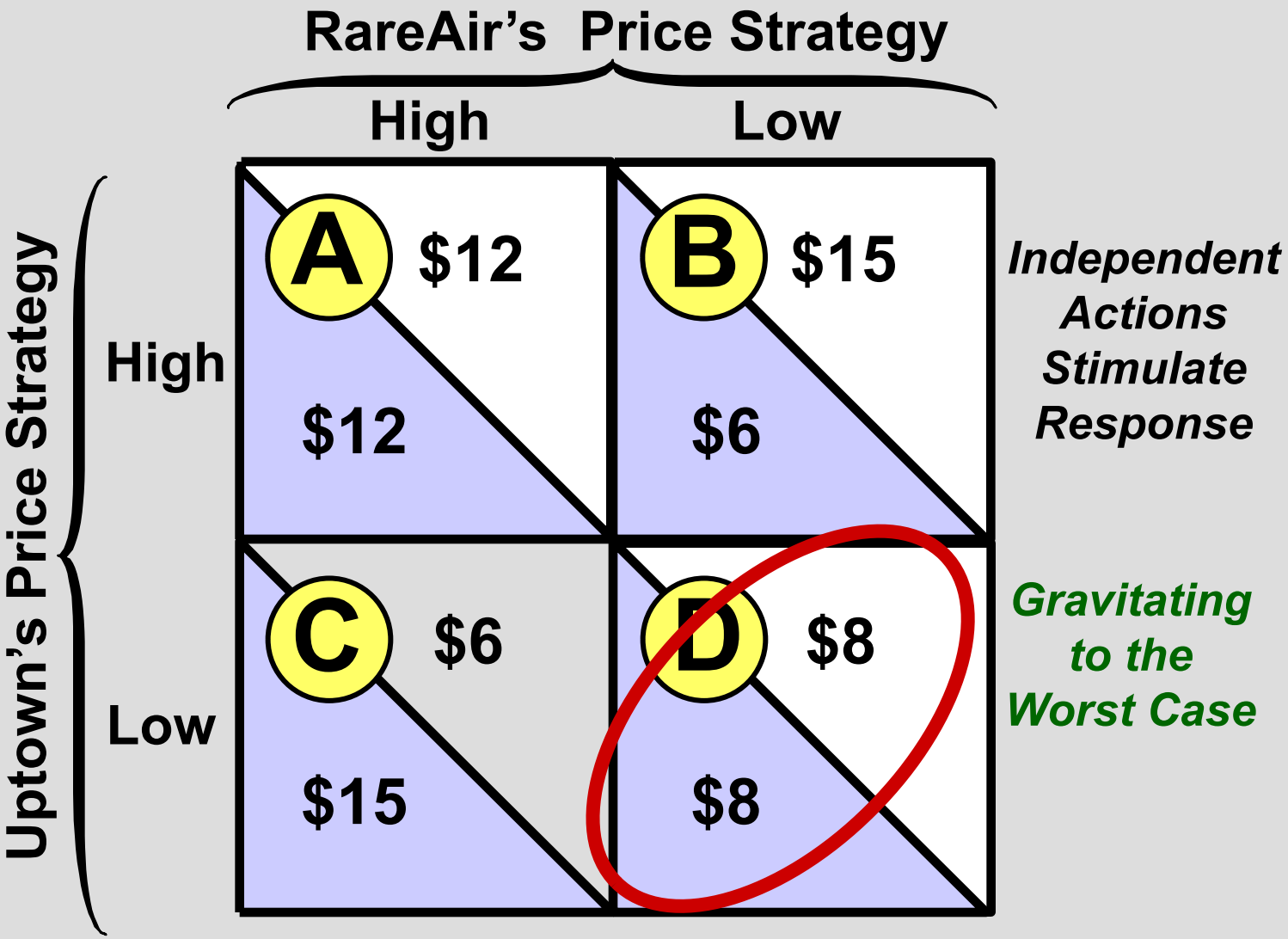

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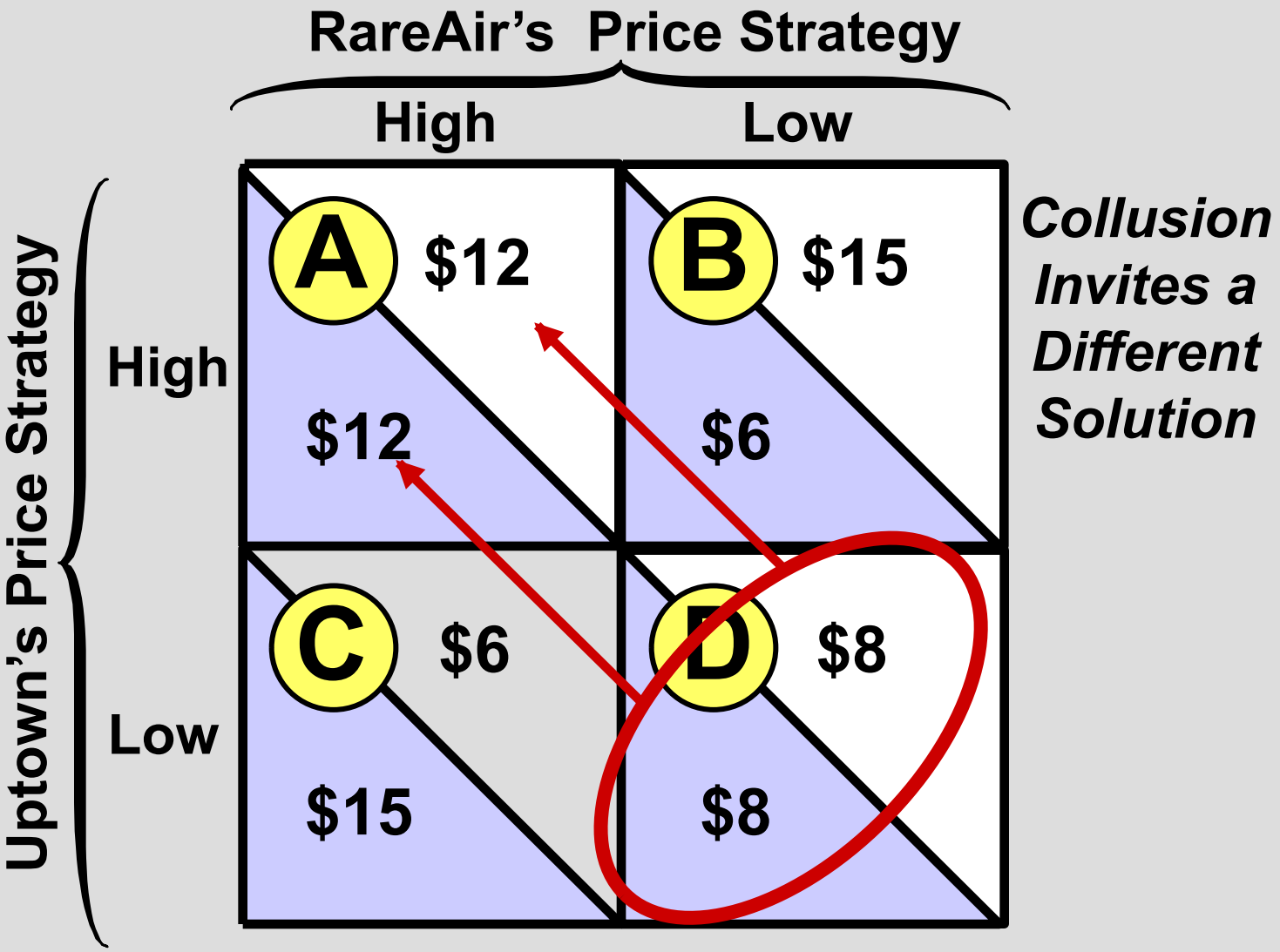

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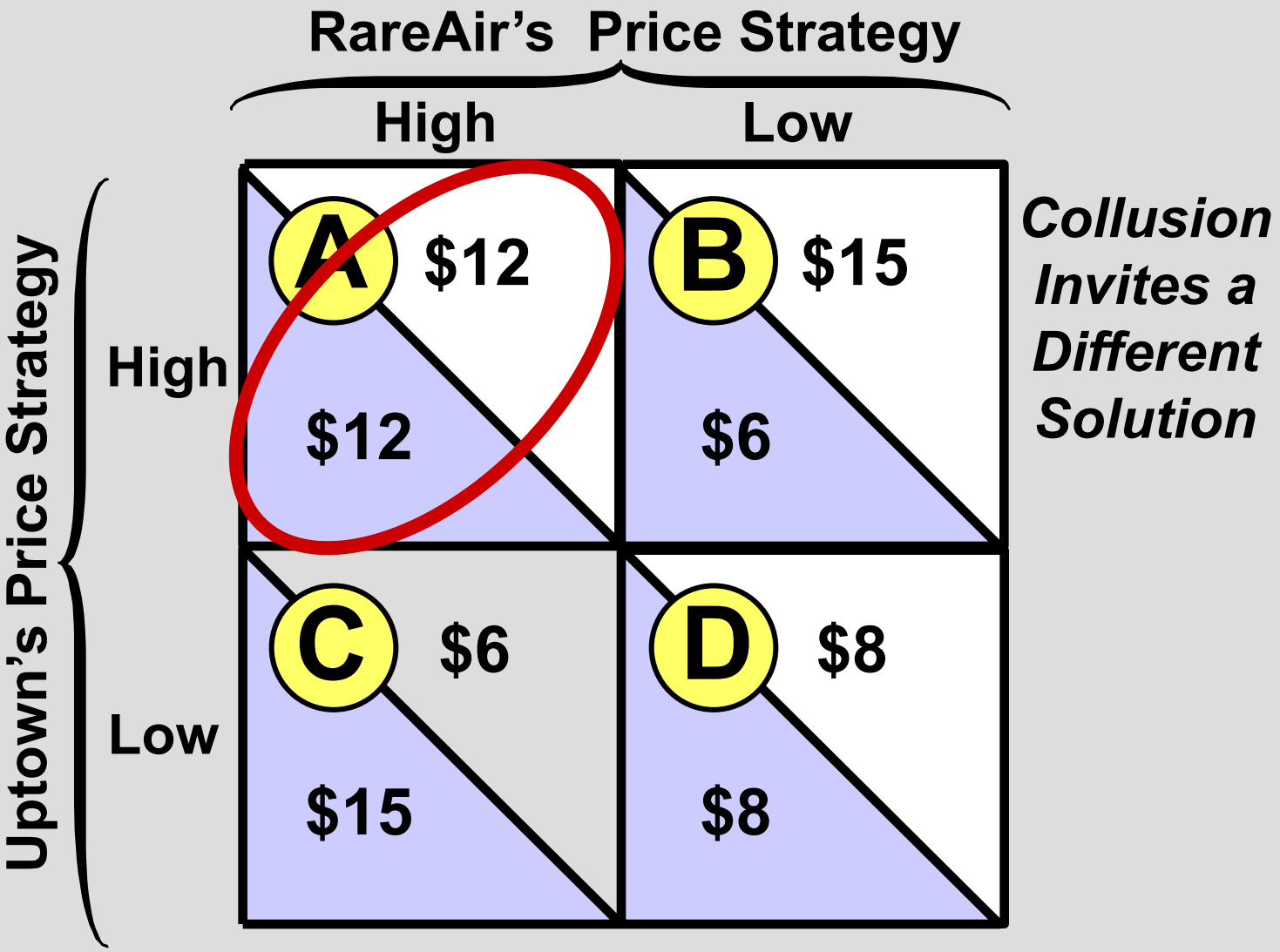

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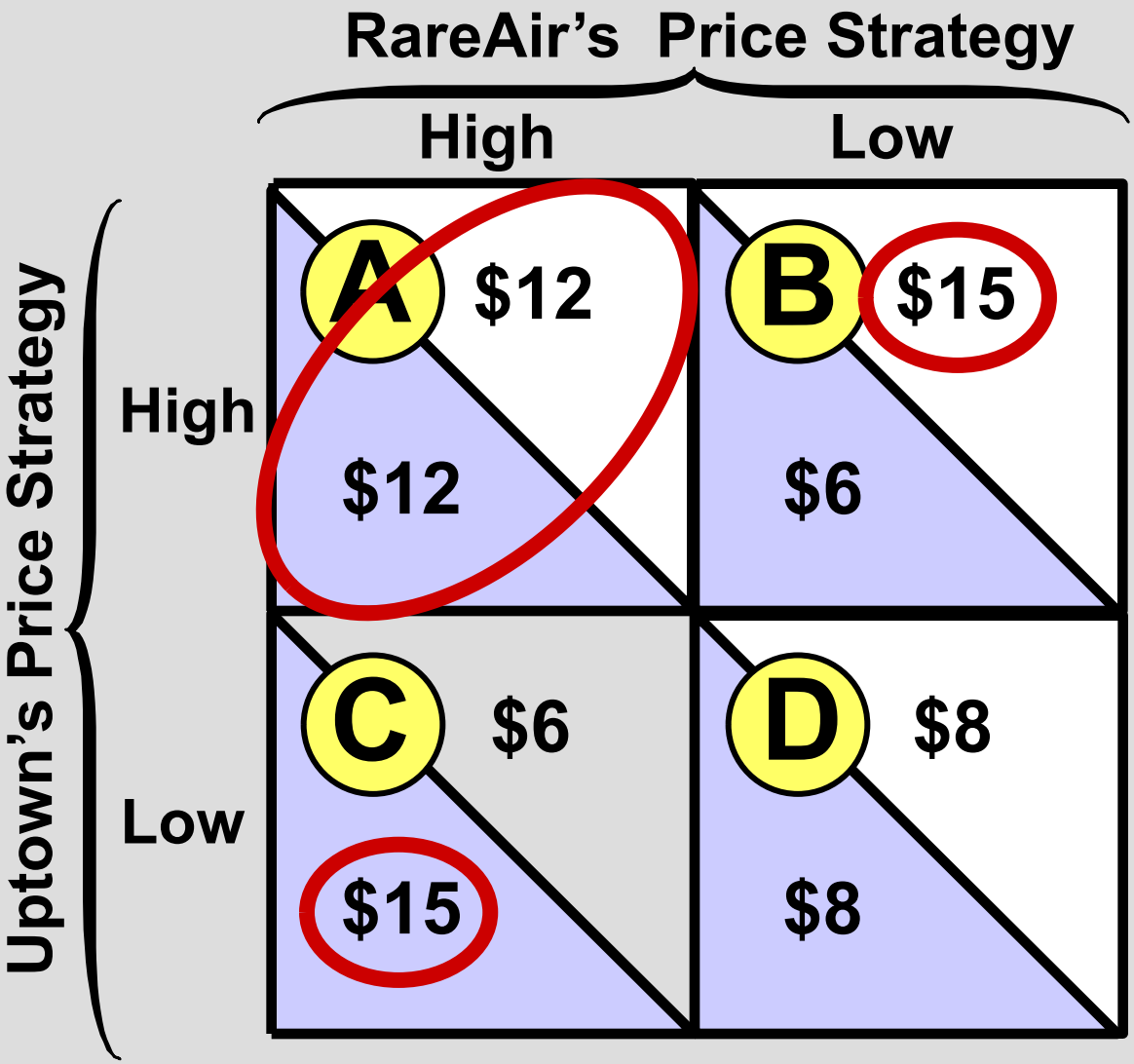


Collusion Invites a Different Solution

But, the incentive to cheat is very real

Oligopoly

- The Game-Theory Approach
  - Games with dominant strategies
    - Dominant strategy = one that gives the bigger payoff to the firm that selects it, no matter which of the two strategies the competitor selects
    - “Prisoners’ Dilemma”

Oligopoly

- The Game-Theory Approach
  - Games with dominant strategies
    - A market with a duopoly serves the public interest better than a monopoly because of the competition created between the duopolists.
    - It is damaging to the public to allow rival firms to collude on what prices to charge for their products and what quantity of product to supply.

Oligopoly

- The Game-Theory Approach
  - Games without dominant strategies
    - Maximun = a strategy in which one seeks the maximum of the minimum payoffs to the available strategies.

Oligopoly

- The Game-Theory Approach
  - Other strategies: Nash Equilibrium
    - Nash equilibrium = both players adopt moves such that each player's move is its most profitable response to the other's move.
    - Often, no such mutually accommodating solution is possible.

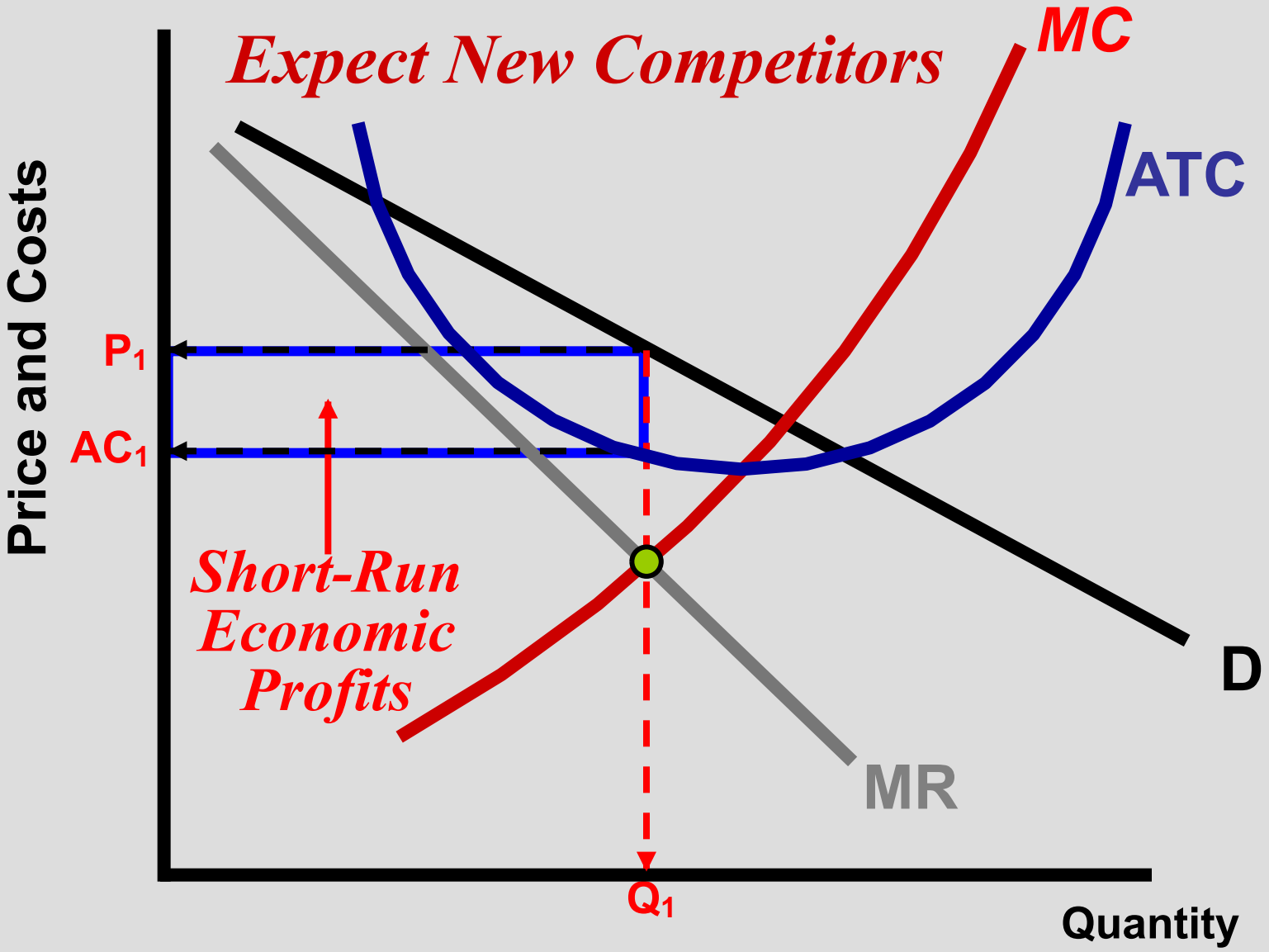
Oligopoly

- The Game-Theory Approach
  - Zero-sum games
    - Zero-sum game = if one player gains, the other must lose such

Oligopoly

- The Game-Theory Approach
  - Repeated games
    - Most markets feature repeat buyers.
    - Repeated games give players the opportunity to learn something about each other's behavior patterns and, perhaps, to arrive at mutually beneficial arrangements.
    - Threats and credibility
      - Induce rivals to change their behavior
      - Threat must be credible

PRICE AND OUTPUT IN MONOPOLISTIC COMPETITION



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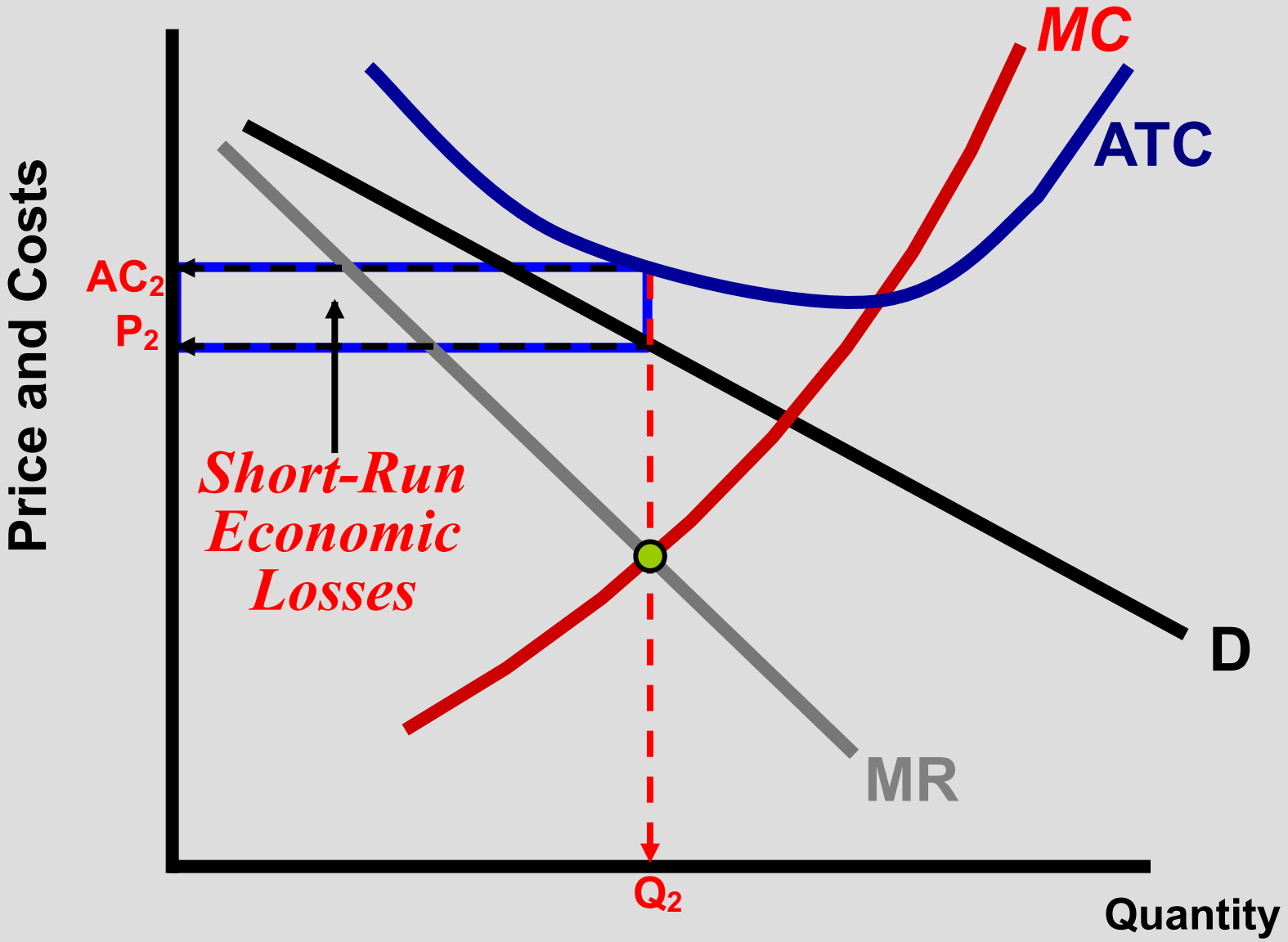

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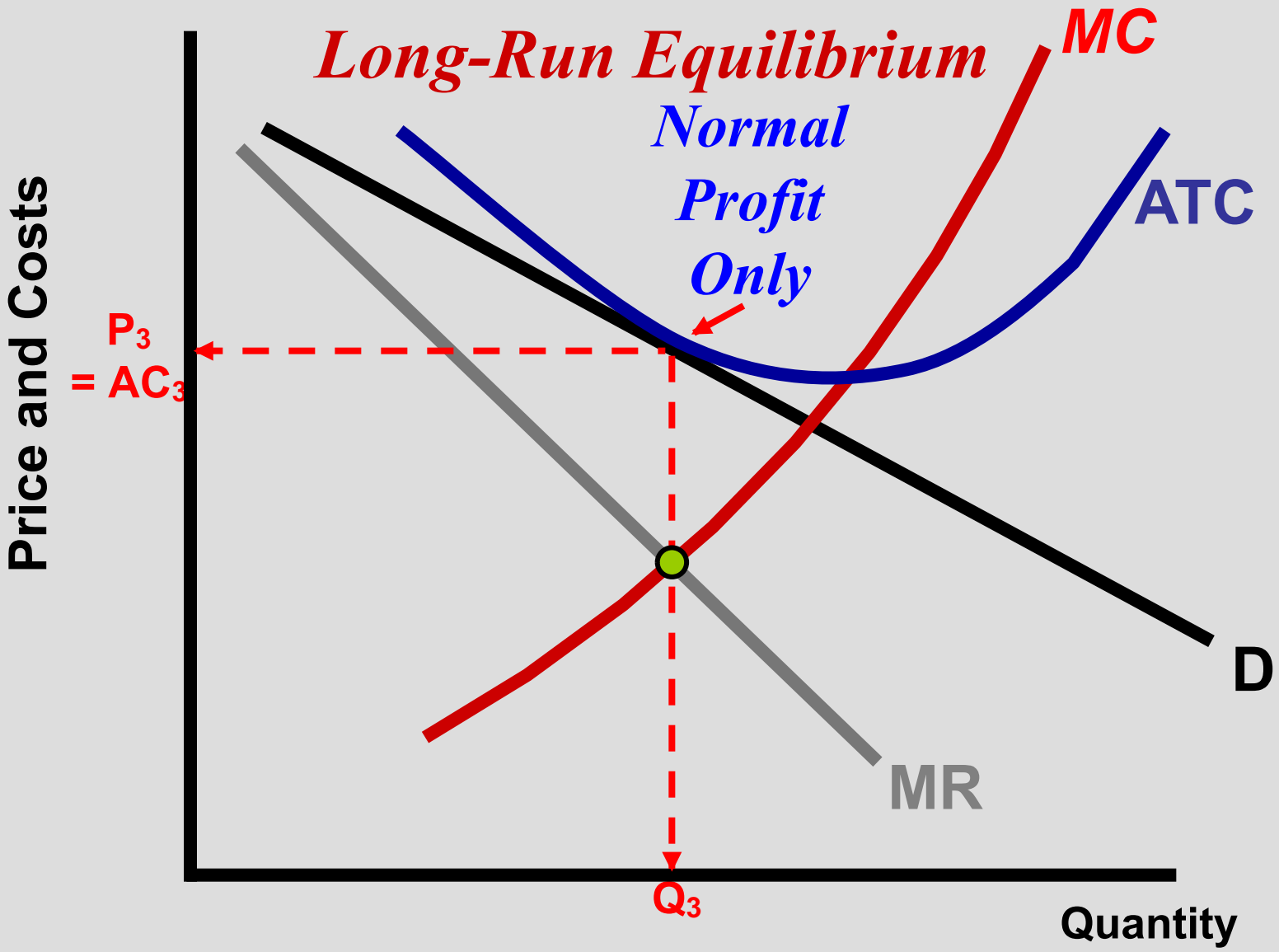

Using Game Theory

- **Game theory can be used to describe a game when:**
  - **There are rules which govern *actions*;**
  - **There are two or more *players*;**
  - **There are choices of action where *strategy* matters;**
  - **The game has one or more *outcomes;***
  - **The outcome depends on the strategies chosen by all players, i.e., there is *strategic interaction.***

Advertising Game

		COMPANY Y	
		Don't Adv.	Advertise
COMPANY X	Don't Adv.	10,10	2,15
	Advertise	15,2	7,7

- ***Dominant strategies*: Strategy 1 dominates Strategy 2 if every payoff from 2 is dominated by the respective payoff from 1.**

Nash equilibrium: **a set of strategies, one for each player, such that no player has an incentive (in terms of improving his own payoff) to deviate from his strategy, i.e., each player can do no better given what the opposing player(s) does.**