Ch. 15 Learning Targets

- The meaning of **oligopoly**, and why it occurs
- Why **oligopolists** have an incentive to act in ways that reduce their combined profit, and why they can benefit from **collusion**
- How our understanding of oligopoly can be enhanced by using **game theory**, especially the concept of the **prisoners' dilemma**
- How repeated interactions among oligopolists can help them achieve **tacit collusion**
- How oligopoly works in practice, under the legal constraints of **antitrust policy**

Oligopoly

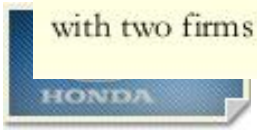
- Numb
- Simila
- Ease o
- Contr
- Non-p
- Exam

Herfindahl Index

- It is a measure of the size of firms in relationship to the industry and an indicator of the amount of competition among them.
- Named after economists Orris C. Herfindahl and Albert O. Hirschman, it is an economic concept but widely applied in competition law and antitrust.
- It is defined as the sum of the squares of the market shares of each individual firm: ie the average market share, weighted by market share.
- As such, it can range from 0 to 10,000 moving from a very large amount of very small firms to a single monopolistic producer.
- Decreases in the Herfindahl index generally indicate a loss of market power and an increase in competition, whereas increases imply the opposite.

$$H = \sum_{i=1}^{n} s_i^2$$

where s_i is the market share of firm i in the market, and n is the number of firms. Thus, in a market with two firms that each have 50 percent market share, the Herfindahl index equals $0.50^2 + 0.50^2 = 0.5$



Mercedes-Benz

Understanding Oligopoly

- Some of the key issues in oligopoly can be understood by looking at the simplest case, a ***duopoly*** (2 firms)
- ↑ production = ↓ price
- So each firm would, like a monopolist, realize that profits would be higher if it limited its production.

Ways Oligopolies keep prices artificially high:

1. Price leadership: dominant firm set price, smaller firms follow
2. Collusion: secret agreements between firms (production levels and pricing)
3. Cartels: organized collusion, illegal in US OPEC (Government **anti-trust** efforts?)

Understanding Oligopoly

- However, each firm has an incentive to cheat:
  - Produce more than colluded quantity and make more money
  - If discovered, other party tends to follow breaking of rules

- **non-cooperative behavior:** When firms ignore the effects of their actions on each others' profits.

The Prisoners' Dilemma

- When the decisions of two or more firms significantly affect each others' profits, they are in a situation of **interdependence**.

- The study of behavior in situations of interdependence is known as **game theory**.

- The reward received by a player in a game—such as the profit earned by an oligopolist—is that player's **payoff**.

- A **payoff matrix** shows how the payoff to each of the participants in a two player game depends on the actions of both. Such a matrix helps us analyze interdependence.

Game Theory

Guy

Gal	Split	Steal
Split	$50,000 / $50,000	$100,000 / $0
Steal	$0 / $100,000	$0 / $0

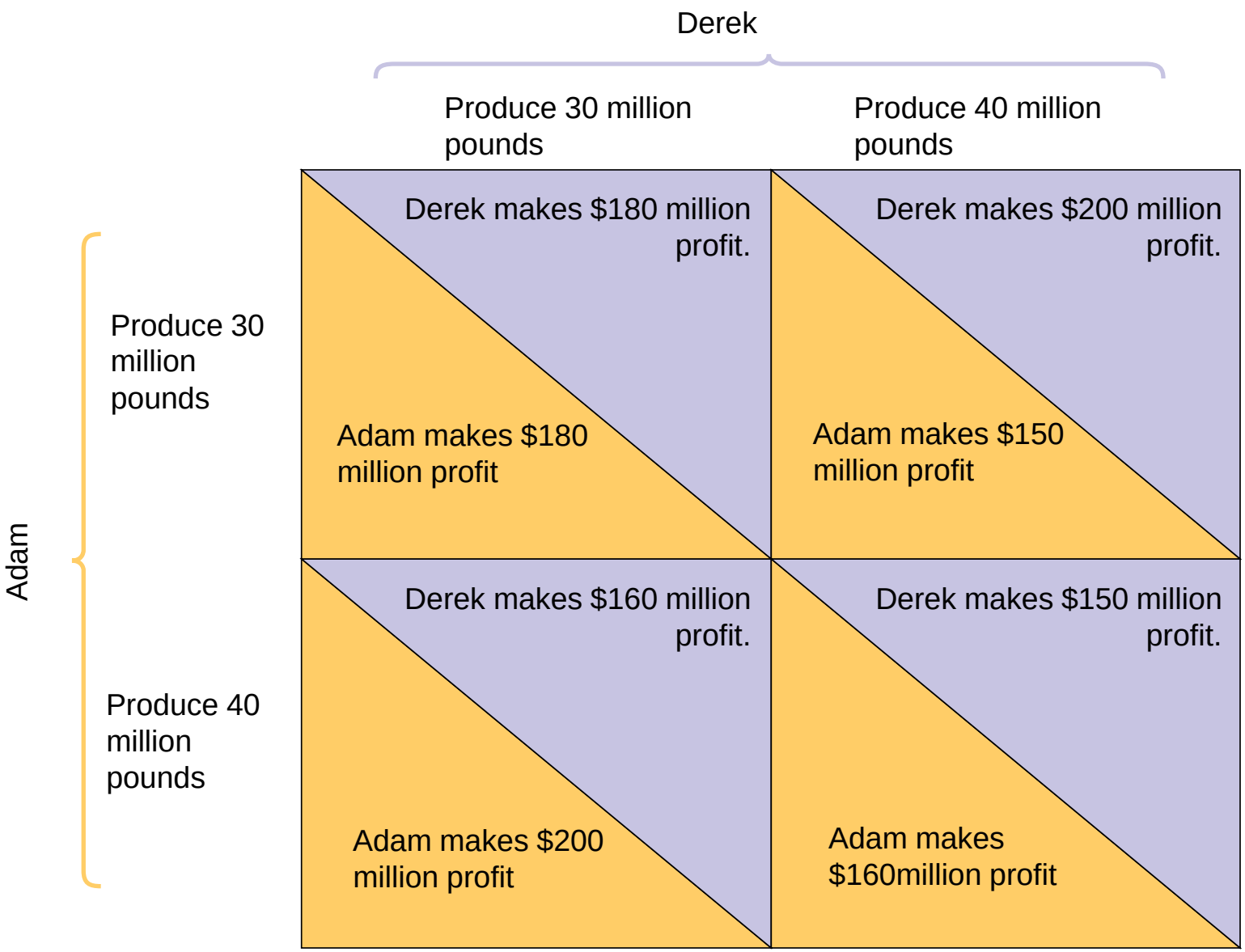
Game Theory

Big Guy

Frustrated Guy

	Split	Steal
Split	$7,000 / $7,000	$14,000 / $0
Steal	$0 / $14,000	$0 / $0

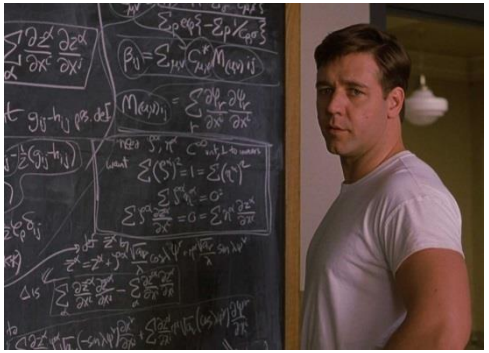
A Payoff Matrix



Dominant strategy & Nash Equilibrium

- **dominant strategy-**a player's best action regardless of the action taken by the other player (not all situations have this)

- A **Nash equilibrium**, AKA **non-cooperative equilibrium**:
  - stable state
  - **NO** participant can gain by a change of strategy as long as all the other participants **remain unchanged** (no diagonal moves!!!!!)
  - Intersecting dominant strategies



If you are **Jim** & don't know John's strategy will you confess or deny?

Very stable, not optimal

Jim

	Confess	Deny
Confess	3 years / 3 years	10 years / 1 year
Deny	1 year / 10 years	2 years / 2 years

John

Dominant strategy? Confess

Is there a Nash Equilibrium?

Optimal, not stable

Overcoming the Prisoners' Dilemma

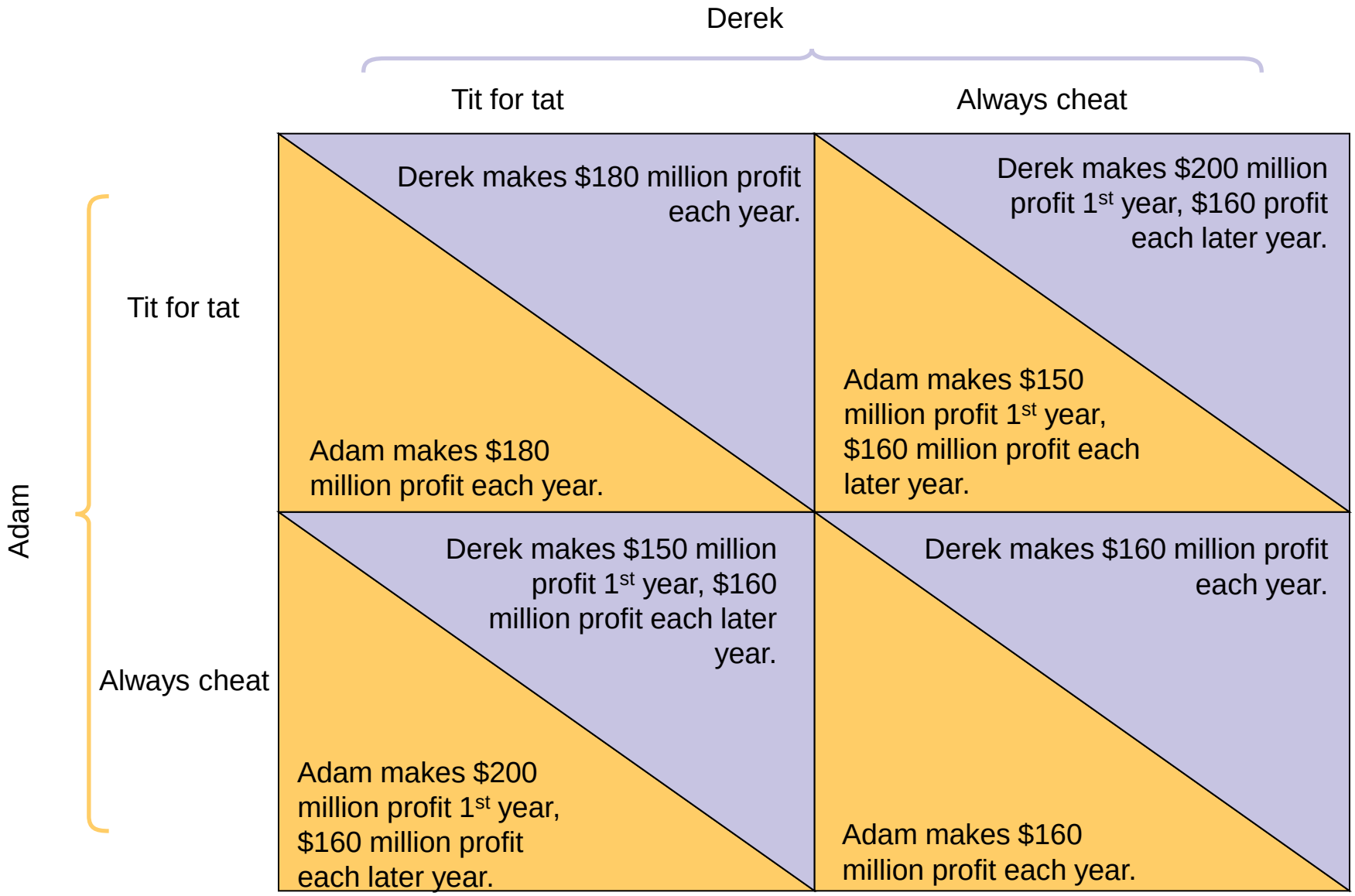
Repeated Interaction and Tacit (Implied & Unstated) Collusion

- Players who don't take their interdependence into account arrive at a *Nash*, or *non-cooperative*, *equilibrium*. But if a game is played repeatedly, players may engage in *strategic behavior*, sacrificing short-run profit to influence future behavior. In repeated prisoners' dilemma games, *tit for tat* is often a good strategy, leading to successful *tacit collusion.*

- *Tit for tat* involves playing cooperatively at first, then doing whatever the other player did in the previous period.

- When firms limit production and raise prices in a way that raises each others' profits, even though they have not made any formal agreement, they are engaged in **tacit collusion.**

How Repeated Interaction Can Support Collusion



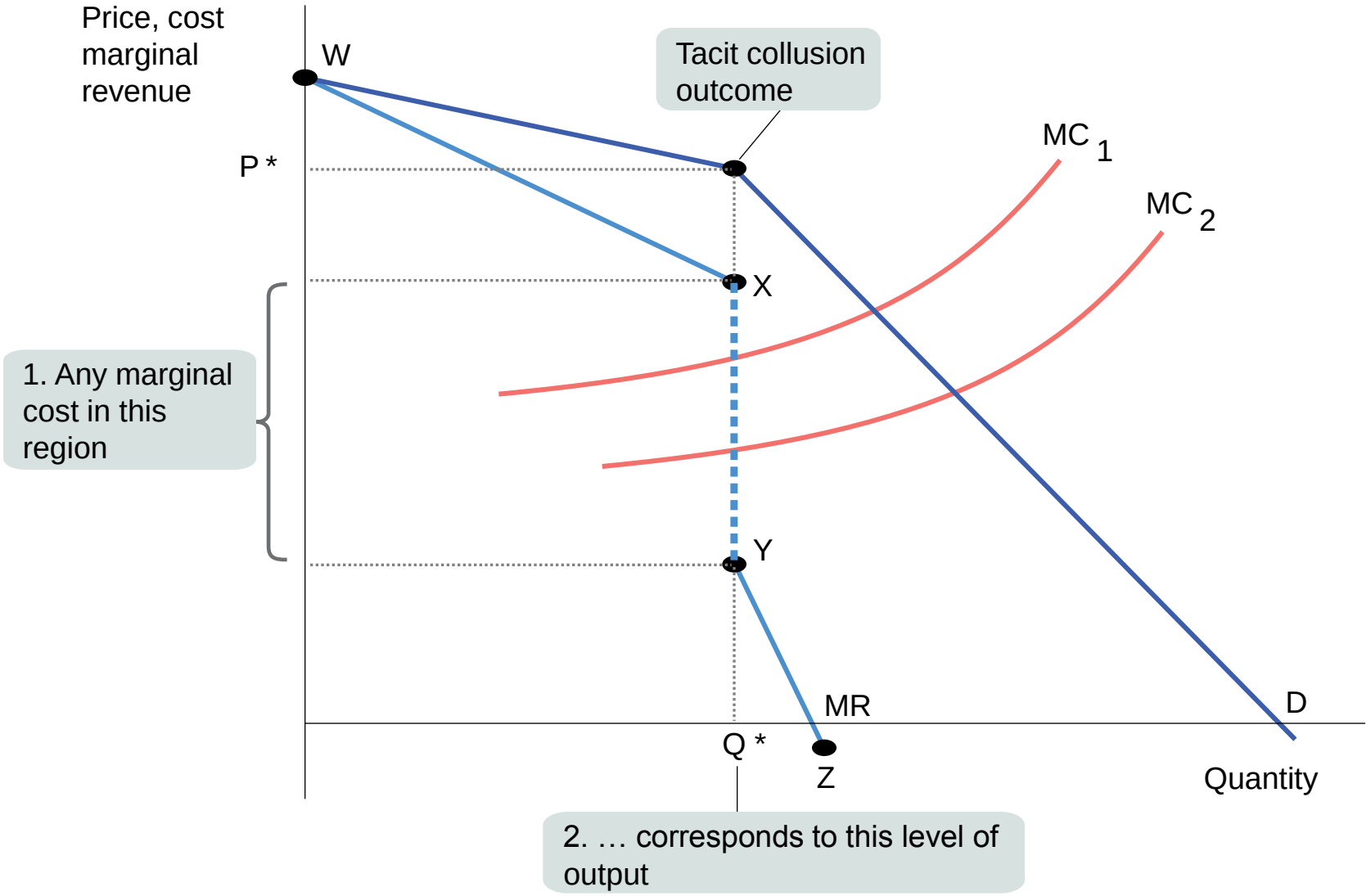
Payoff Matrix for Health Care

FAMILY	DOCTOR: $$$ care		DOCTOR: inexpensive care	
$$$ care	relieves guilt	**looks good**	relieves guilt	**looks uncaring, possible license action**
inexpensive care	looks bad, **feels bad GUILT**	**looks good**	looks bad **feels bad GUILT**	**looks uncaring, patient dies early license action**

The Kinked Demand Curve

- An oligopolist who believes
  - she will lose a substantial number of sales if she reduces output and increases her price, (moves up the demand curve)
  - but will gain only a few additional sales if she increases output and lowers her price (moves down the demand curve)
  - flat above the kink and very steep below the kink.

The Kinked Demand Curve



Oligopoly in Practice

- Oligopolies operate under legal restrictions in the form of *antitrust policy.* **Antitrust policies** are efforts undertaken by the government to prevent oligopolistic industries from becoming or behaving like monopolies. But many succeed in achieving tacit collusion.

- Tacit collusion is limited by a number of factors, including:
  - large numbers of firms
  - complex products and pricing scheme
  - bargaining power of buyers
  - conflicts of interest among firms

Product Differentiation

- To limit competition, oligopolists often engage in **product differentiation** which is an attempt by a firm to convince buyers that its product is different from the products of other firms in the industry.
- Firms that have a tacit understanding not to compete on price often engage in intense **non-price competition**, using advertising and other means to try to increase their sales.

Price Leadership

- In **price leadership**, one firm sets its price first, and other firms then follow.

- When collusion breaks down, there is a **price war**.

- Study Guide: Pages 479-480 #’s 16-20