

Repeated Games



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- Often, you compete period after period with your opponent
- Each period is then a different game
- You are playing repeated games

Repeated Games

- Return to our basic problem

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$$MC = 5$$

Repeated Games

- Return to our basic problem
- $$Q = 100 - 2p$$
- $$MC = 5$$
- Assume two firms, who must announce a price at the start of each period.
 - Winner-take all market.

Repeated Games

- The monopoly solution is
- $$p = \$27.50, \pi = \$1012.50, Q = 45$$
- With a cartel, each firm makes \$506 each period.
 - Suppose one firm cheats, announces a price of \$26.50. It sells $Q = 47$

$$\pi = (47)(\$21.50) = \$1010$$

The Basic Strategy

A firm can honor the cartel strategy or cheat. If it undercuts, it may all unravel.

		Firm 2's choices	
		Follow cartel strategy	Undercut by a dollar
Firm 1's choices	Follow cartel strategy	$\pi_2 = 506$	$\pi_2 = 1010$
	Undercut by a dollar	$\pi_1 = 506$	$\pi_1 = 0$
		$\pi_2 = 0$	$\pi_2 = 505$
		$\pi_1 = 1010$	$\pi_1 = 505$

A Strategy to Stop Cheaters

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- Firm 1 can then eschew cheating and earn its share of cartel profits.
- Firm 1 can cheat for one period, earn a huge profit and nothing thereafter.

The Payoff

Of course, this assumes a credible threat.

Period	Cheat	Don't Cheat
1	\$1010	\$506
2	\$0	\$506
3	\$0	\$506

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- This basic strategy unlined MAD during the Cold War.
- But is it credible here? Won't the hard line firm find it in its self interest to reach an accommodation?
- After all, it is earning zero profits for itself as well.

The Tit-for-Tat Strategy

What Firm 1 Did Last Period?	Firm 2's Strategy this Period
Followed the Cooperative Strategy	Follow the Cooperative Strategy
Followed the Non-cooperative Strategy	Follow the Non-cooperative Strategy

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Variants appear to be the optimal way to deal with non-cooperative behavior.

The Tit-for-Tat Strategy

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This is a credible strategy.

End

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