GAME THEORETIC RIVALRY:
BEST PRACTICE TACTICS
CHAPTER 14

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Best Practice Tactics
Chapter 14

- Greater attention in business is being given to *tactics and strategy* to achieve competitive advantage.
- This chapter predicts rival firm behavior as if they were games.
  - Sometimes being the *first-mover* offers advantages.
  - Sometimes *credible threats* affect opponents' behavior.
  - In oligopolistic industries, the interdependence among firms is most keenly felt.

Business Strategy Games

- When an oligopolistic rival alters its product or pricing, our firm must react or adapt.
- Best would be *proactive behavior* that could anticipate actions.
- A **sequential game** is one in which there is an explicit order of play.
  - A sequential example is when one firm has announced a price cut, your decision to respond or not is sequential.
- A **simultaneous game** occurs when all players must chose their actions at the same time.

Game Tree

An Illustration of a Sequential Game

- A game tree is like a **decision tree**. It is a schematic diagram of decision nodes.
- Solutions to games parallels board games like chess.
- One way to solve a decision problem is to use **end-game reasoning**, where we start with the final decision and use **backward induction** to find the best starting decision on the game tree.

Two Accountant Firms Bid
Illustrated as a Sequential Game Tree

- Alpha & Daughters (A) is the incumbent auditor at $200 per hour.
- Omega & Sons (Ω) could bid the same or less (say $50 increment reductions) to unseat the incumbent in year 1.

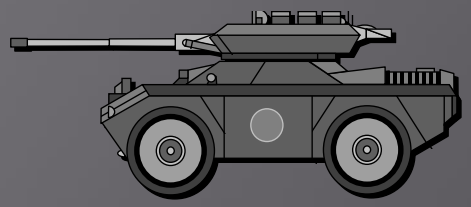
Subgames in Game Trees

- Since game trees have several branches, we can examine the concept of equilibrium in each part of the tree, called a **subgame**
  - example: If Alpha always matches any cut by Omega (*tit for tat* style), this would be a "branch" or a subgame.
- When all players make their best reply responses then the game is in a Nash Equilibrium.
- Looking to the **end-game**, it may be that both offering $150/hour is an equilibrium
- If keep cutting prices, this ends in losses.
  - Optometrists, accountants, insurance, and other homogeneous suppliers of services seem to recognize this.
  - Avoid price wars through recognition of its outcome

Business Rivalry as a Sequential Game

- The **first** to introduce a product, lower price, *etc.*, often achieves recognition and an advantage, called a **first-mover advantage**.
- When games last several periods, the actions by firms in one period can be punished or rewarded in future period.
  - If a new firm enters a market, the threat is that the incumbent firm may drop prices down to levels that are unprofitable.

First Mover Games



- Andrew Carnegie: *The first person gets the oyster, the second person gets the shell.*
- Some markets are too small for multiple firms.
- Game with Military and Civilian markets for "water-land vehicles" (DUCKS)

A \ B	civilian	military
civilian	-10, -10	30, 15
military	15, 30	-10, - 10

In a simultaneous game, both would want the civilian market. But in a sequential game, the first to get the civilian market preempts it. The other firm takes the military market.

A "credible threat"

- A **credible threat** is an action that is perceived as a possible penalty in a noncooperative game.
  - Its existence sometimes induces cooperative behavior.
- A **credible commitment** is a mechanism for establishing trust
  - such as a reward for good behavior in a noncooperative game.

Mechanisms for credible threats and commitments

- **contractual side payments**, but these may violate antitrust laws.
- use of **nonredeployable assets** such as reputation.
- entering **alliance relationships** which would fall apart if any party violated their commitments.
- using a "**hostage mechanism**" that is irreversible and irrevocable can deter breaking commitments.
  - Examples are "double your money back guarantees," and "most favored nation" clauses.

Hostage Mechanisms in Oligopoly

- Circuit City's offer: *If you find a lower advertised price, you'll get that money back*
  - Double the Difference Price Guarantee as a credible commitment
- This makes Circuit City cut prices whenever local TV stores cuts prices
  - Local stores realize that they won't undercut Circuit City
  - Customers realize it is unlikely to find lower prices
  - If potential entrants (Best Buys, Silo, Freddy's, *etc.*) think they can get a foothold in area, they know that Circuit City's pricing is a credible commitment.

Size Barriers

- Sometimes entrants must leap to a large scale if they wish to enter a market
  - incumbent firms may accommodate the entrant, allowing a niche.
  - incumbent firms may take entry deterring actions, such as cutting their prices at any threat of

Excess Capacity, Scale of Entry, and Entry Deterrence

- Building excess capacity can deter entry. Potential entrants know that the price can be driven down to near zero if they entered, and the incumbent firm began a price war.
- The building of extra capacity is an action in a sequential game, often with the intent of forestalling entry. This is called a **precommitment game.**

Sorting Rules

- Brand loyalty to incumbents
- Efficient rationing
- Random rationing
- Inverse intensity rationing

Theory of Contestable Markets

- The theory of contestable markets holds that, with no barriers to entry, even a **monopolist** must be aware that charging higher prices will encourage entry.
- Hence, a contestable market will tend to have zero economic profits and competitive prices.
- Potential entry, rather than number of firms matters most

Simultaneous Games

- A **sealed bid auction** is a simultaneous game.
- A **dominant strategy** is the best decision, no matter what anyone else does. It is an action (strategy) that is better in each "state of the world."
- When no Nash equilibrium exists, it is useful to hide one's strategy by randomly changing strategies. This is a **mixed** Nash equilibrium strategy.

Nash Equilibrium

- When all players make their best reply responses (so changing their choices cannot improve their position) then the game is in a Nash Equilibrium.
- Since game trees have several branches, we can examine the concept of equilibrium in each part of the tree, called a **subgame**.

Escape From Prisoner's Dilemma: Repeated Games

- If the games are repeated, there is greater expectation that firms will achieve the cooperative solution.
- Each firm "shows" by its behavior each period that it wants to cooperate.
- Firms that expand production "show" that they do not want to cooperate.

Examples of Repeated Game Strategies

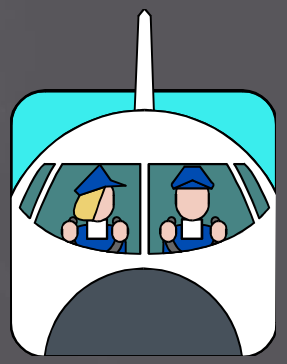
- a **grim trigger strategy** which has an infinitely long punishment.
- alternatively, the punishment can last for a period.
- For multi-period games, there usually is some period of punishment that can induce cooperation.

Trembling-hand trigger

- For non-infinite lived games, if you are one period before the end, the best strategy is to act noncooperatively.
  - Yet this logic works for two periods before the end, and tends to unravel a cooperative, multi-period game.
- Some game theorists have wondered if the slight defections could go unpunished, called a **trembling hand trigger strategy**.
- If the rival acts noncooperatively once, perhaps you can forgive. But fool me twice, and then watch out!

Capacity Planning and Pricing Against a Low-Cost Competitor Appendix 14A

- **Piedmont Airlines** and **People Express** present a case study of the reaction to entry of a low-cost firm.
- Deregulation in 1979 permitted new entry
- **People Express** was the first to enter the highly competitive airline industry.
- Choice of 30-seat or 120-seat planes.



Airline Strategy

- People Express tried a strategy of a uniform low-price in the mid-Atlantic states in 1981.
- They cut costs by adding seats and eliminating all 'frills.' Low cost flying would compete with driving.
- People Express could enter with large or small scale planes
- Should they use **large scale** or **small scale**, measured number of seats per planes?
- Their decision would be based on what People Express thought would be the reaction of rival firms, particularly Piedmont Airline.

Choices as a Decision Tree

- Piedmont Airline could make would be either *match* the low price of People Express, or to *accommodate* them, keeping only the customers who like the 'frills' of full service.
- This strategy game can be written as a decision tree.
- The best final outcome (or subgame) being if People Express entered at large scale and Piedmont accommodated.

Large Scale Entry Deterrence of a Low-Cost Competitor

- As **Piedmont** was faced with more routes likely to compete with People Express, their decision tree became more complex.
- **People Express** entered with large scale (120 seat planes). Piedmont matched their low price. But Piedmont, as the incumbent firm, tended to get most of the travelers to select Piedmont.
- **People Express** did not see that with too many seats on a route, more of the passengers would take their rival.
- A price war ensued, and ultimately People Express lost too much money to continue operations.