



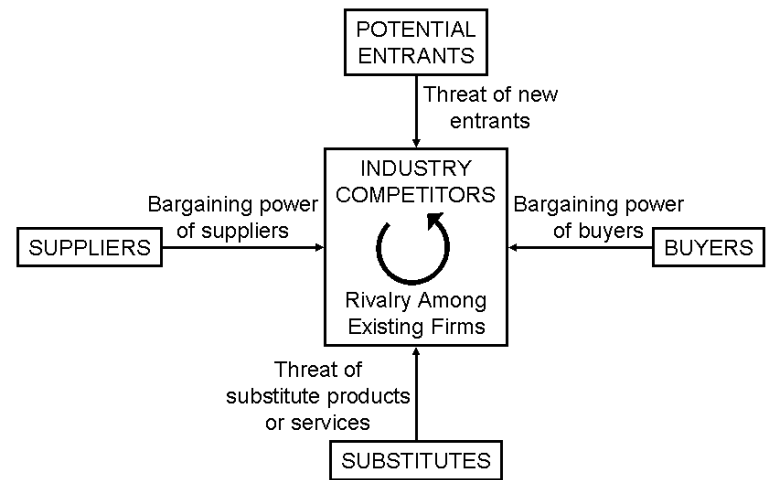
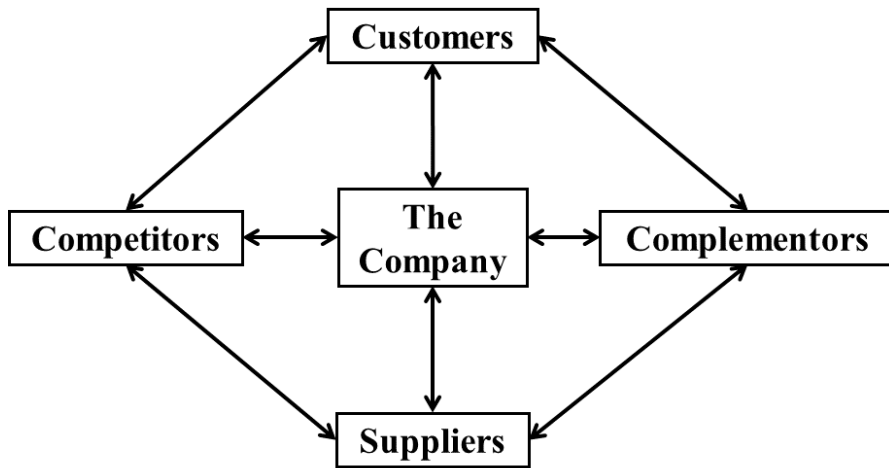
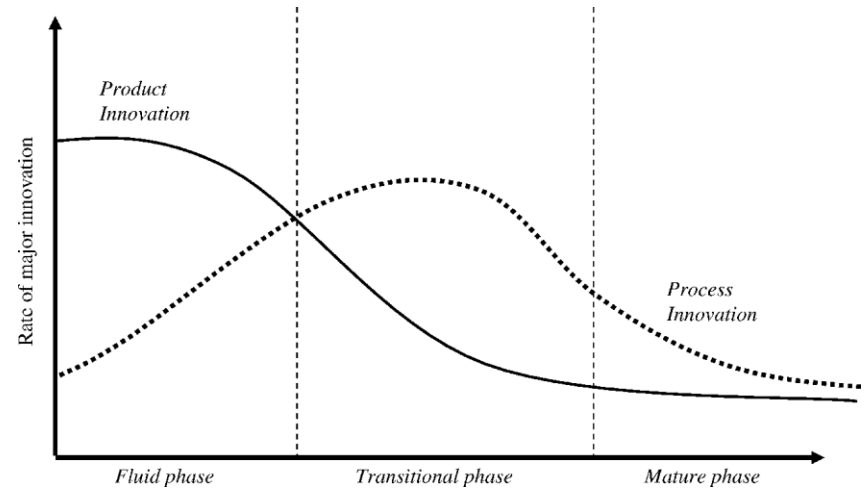
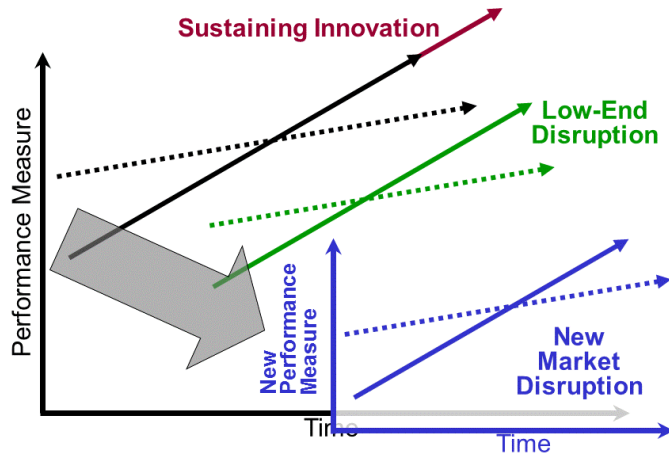
**Federal Aviation  
Administration**

# **Overview of Strategic Planning and Game Theory Industry Construct**

***Ken Davidian  
ESIL-03 Workshop in Buffalo, NY  
November 7, 2012***

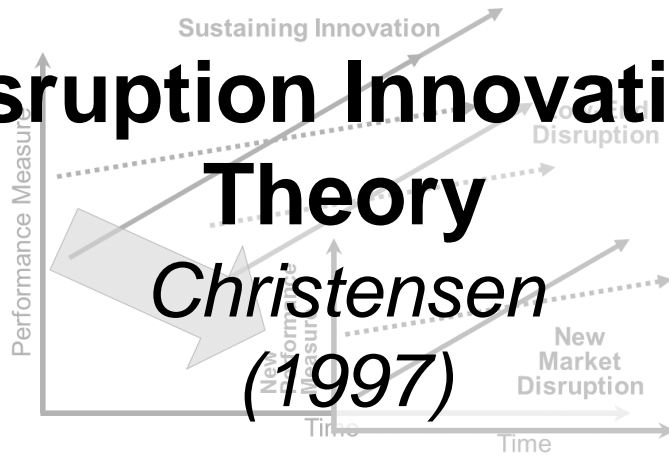


# Applied Market Models

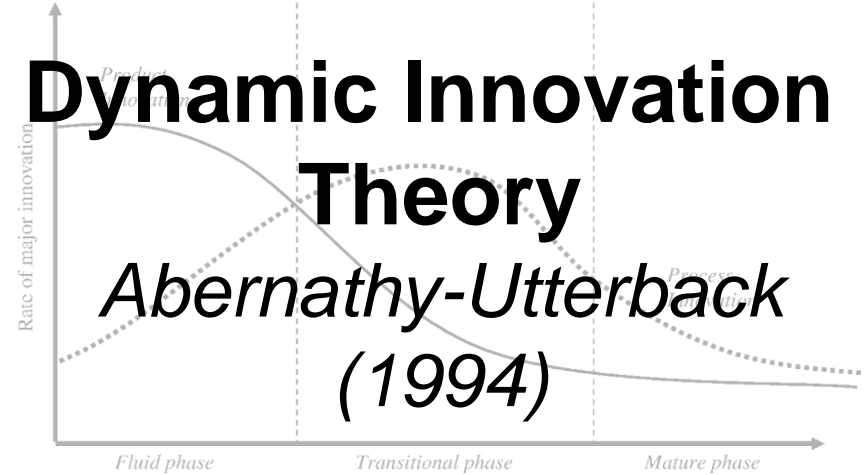


# Applied Market Models

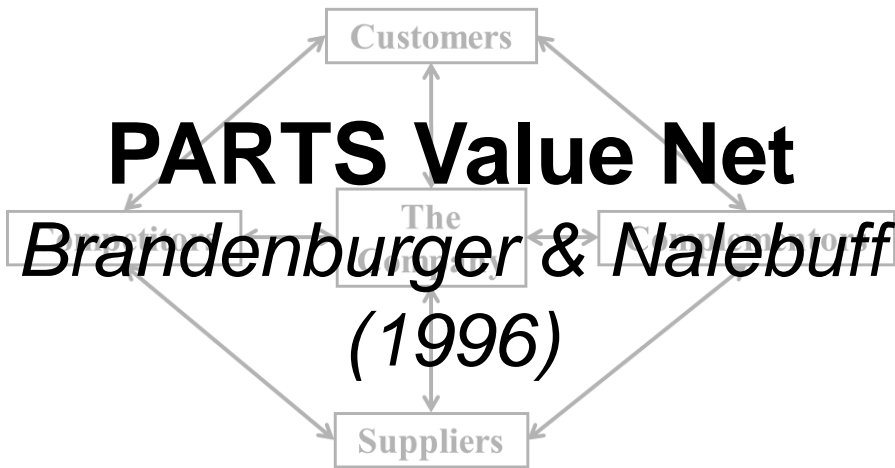
## Disruption Innovation Theory



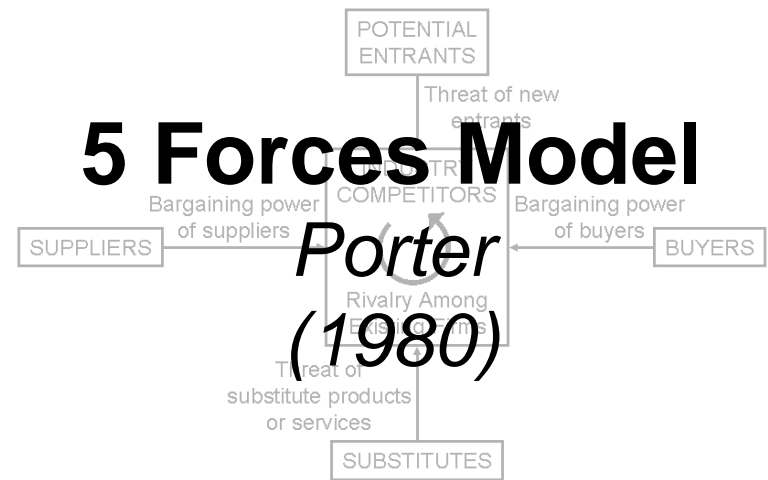
## Dynamic Innovation Theory



## PARTS Value Net



## 5 Forces Model

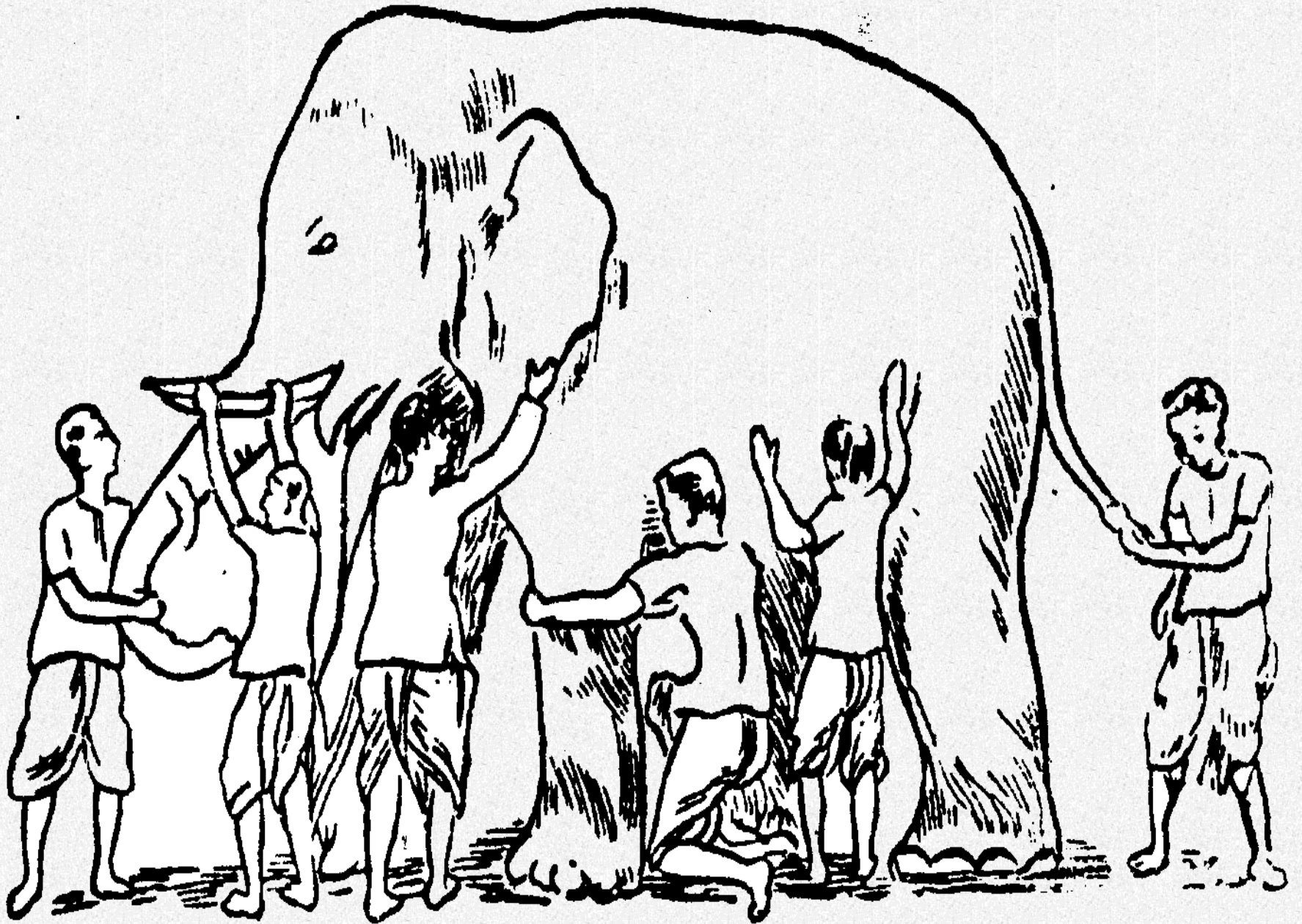


# Models Used for Market Analyses

Commercial Space Market Segments	Market Models			
	Disruption Innovation Theory [Christensen 1997]	5 Forces Model [Porter 1980]	PARTS Value Net [B&N 1996]	Dynamic Innovation Theory [A-U 1994]
Suborbital Launch Vehicles	• <b>2010</b>	• <b>2012</b>	• <b>2012</b>	
Orbital Launch Vehicles	• <b>2011</b>	• <b>2011</b>		
On-Orbit Spacecraft	• <b>2011</b>	• <b>2010</b> • <b>2011</b> • <b>2012</b>		
Nano- and Small Satellites		• <b>2010</b>		
Multi-Market	• <b>2011</b>	• <b>2011</b>		

*NOTE: All Reports Available on the Web at [bit.ly/MarketModels](http://bit.ly/MarketModels)*





COE CST Second Annual Technical Meeting (ATM2)  
October 30 – November 1, 2012



Federal Aviation  
Administration

**1. THE DESIGN SCHOOL (No dominant academic source)**

SELZNICK, Philip (1919 - 2010) 1957: Leadership in Administration • Distinctive Competence, Int. State + Ext. Expectations  
CHANDLER, Alfred D. (1918 - 2007) 1962: Strategy and Structure • Establishes link between strategy and structure.  
ANDREWS, Kenneth R. (1916 - 2005) 1965: HBS Text and Cases • Written with Edmund Learned, Christensen and Guth.

**2. THE PLANNING SCHOOL (Urban planning, systems theory)**

ANSOFF, H. Igor (1918 - 2002) 1965: Corporate Strategy  
KAHN, Herman (1922 - 1983) • The Father of Scenario Planning • 1985, Wack "Scenarios: Uncharted Waters Ahead"  
• 1985, Wack "Scenarios: Shooting the Rapids"  
SCHOEMAKER, Paul (1949 - )

**3. THE POSITIONING SCHOOL (Industrial organization economics, military history)**

• Wave 1: Early military writings by Sun Tzu and von Clausewitz  
• Wave 2: Consulting imperatives of the 1970s.  
• Wave 3: Michael Porter.  
SCHENDEL, Dan (1934 - ), HATTEN, Ken (? - )  
HENDERSON, Bruce (1915-1992) • 1968: Portfolio Matrix: Cash Cows, Stars, Pets, and ?s  
• 1963: Henderson founds Boston Consulting Group (BCG)  
PORTER, Michael (1947 - ) • 1980: Competitive Strategy  
• 1947 von Neumann and Morgenstern: Development of Game Theory • 1993, Brandenburger and Nalebuff

**4. THE ENTREPRENEURIAL SCHOOL (No dominant academic source)**

SCHUMPETER, Joseph A. (1883 - 1950) 1942: Capitalism, Socialism and Democracy • Coins "creative destruction"  
COLE, G.D.H (1889 - 1959) • 4 types of entrepreneurs: the calculating inventor, the inspirational innovator, the overoptimistic promoter, and the builder of a strong enterprise.

**5. THE COGNITIVE SCHOOL (Psychology)**

SIMON, Herbert (1916 - 2001) • 1947, Simon • 1958, March & Simon • 1974, Tversky & Kahneman • 1994, Corner, Kinicki, and Keats  
• 1962, Meyers "Meyers-Briggs" • 1985, Duhaime and 997, Bolman and Deal "Reframing Organizations"  
• 1966, Polanyi "Tacit" knowledge • 1990, Huff  
• 1972, Janis "group think" • 1993, Reger and Huff, Bogue, and Thomas

**6. THE LEARNING SCHOOL (Math chaos theory)**

• 1959, Charles Lindblom "The Science of 'Muddling Through'"  
• 1963, Cyert and March, "A Behavioural Theory of the Firm"  
• 1967, H. Edward Wrapp "Good Managers Don't Make Policy Decisions"  
• 1976, Chris Argyris • 1990, Peter Senge "The Fifth Discipline"  
• 1977, Richard Normann  
• 1980, James Brian Quinn "Strategies for Change"  
• 1983, Donald Schon

**7. THE POWER SCHOOL (Political science)**

• MICRO POWER  
• MACROPOWER  
1975, 77-78, Sarrazin: political side of planning • 1997, Bolman and Deal  
1963, Cyert and March • 1977, Pettigrew, Strategy formulation as a political process  
1978, Pfeffer and Salancik, "The External Control of Organizations" • 1978, MacMillan "Strategy Formulation: Political Concepts"  
• 1978, Majone & Wildavsky, 1978, Lipsky, 1980, Kress et al.,  
• 1978, Zald and Berger "Social Movements in Organizations"  
• 1979, Bower and Doz: Strategy formulation as a political process  
1982, Mintzberg • 1985, Macmillan and Guth  
1987, Moulton and Thomas • 1989, Mintzberg

**8. THE CULTURAL SCHOOL (Anthropology)**

• "Resource Based Perspective" 1990, Prahalad and Hamel  
• 1975, Wernerfelt • 1991, Barney  
• Late 1960s, Rhenman & Normann • 1996, Kogut and Zander, Conner and Prahalad

**9. THE ENVIRONMENTAL SCHOOL (Biology, political sociology)**

• 1977, Hannan and Freeman "The Population Ecology of Organizations"  
• 1979, Van de Ven • 1991, Oliver  
• 1976, Hage • 1984, Hannan and Freeman

**10. THE CONFIGURATION SCHOOL (History)**

CHANDLER, Alfred D. (1918 - 2007) 1962: Strategy and Structure  
• 1970, Khandwalla  
• 1976, Miller • 1985, Mintzberg and McHugh  
• 1979, Mintzberg • 1996, Miller  
• 1980, 1982, 1984, Miller and Friesen  
• 1995, Kotter  
• 1990, Beer, Eisenstat & Spector



# Game Theory History

- Game theory was proven in practical life-and-death situations before it was actually laid out on paper as a systematic theory.
  - Early days of World War II, when British naval forces playing cat and mouse with German submarines, needed to understand the game better, win it more often.
  - The classic theoretical formulation came in 1944, when mathematical genius John von Neumann and economist Oskar Morgenstern published their book “Theory of Games and Economic Behavior”.
- In 1994 three pioneers in game theory—John Nash, John Harsanyi, and Reinhard Selten—were awarded a Nobel Prize.

# Game Theory Application

- Focuses directly on finding the right strategies and making the right decisions.
- Particularly effective when there are many interdependent factors and no decision can be made in isolation from a host of other decisions.
- Can suggest options that otherwise might never have been considered.
- Game theory began as a branch of applied mathematics.
  - Could be called the “Science of Strategy”.



# The Concept of Co-opetition

- The goal is to do well for yourself.
  - Sometimes that comes at the expense of others, sometimes not.
- A more nuanced business mindset.
  - Cooperation when it comes to creating the pie.
  - Competition when it comes to dividing it up.
- Cooperation can be in your own self-interest.

# Thinking About Complements

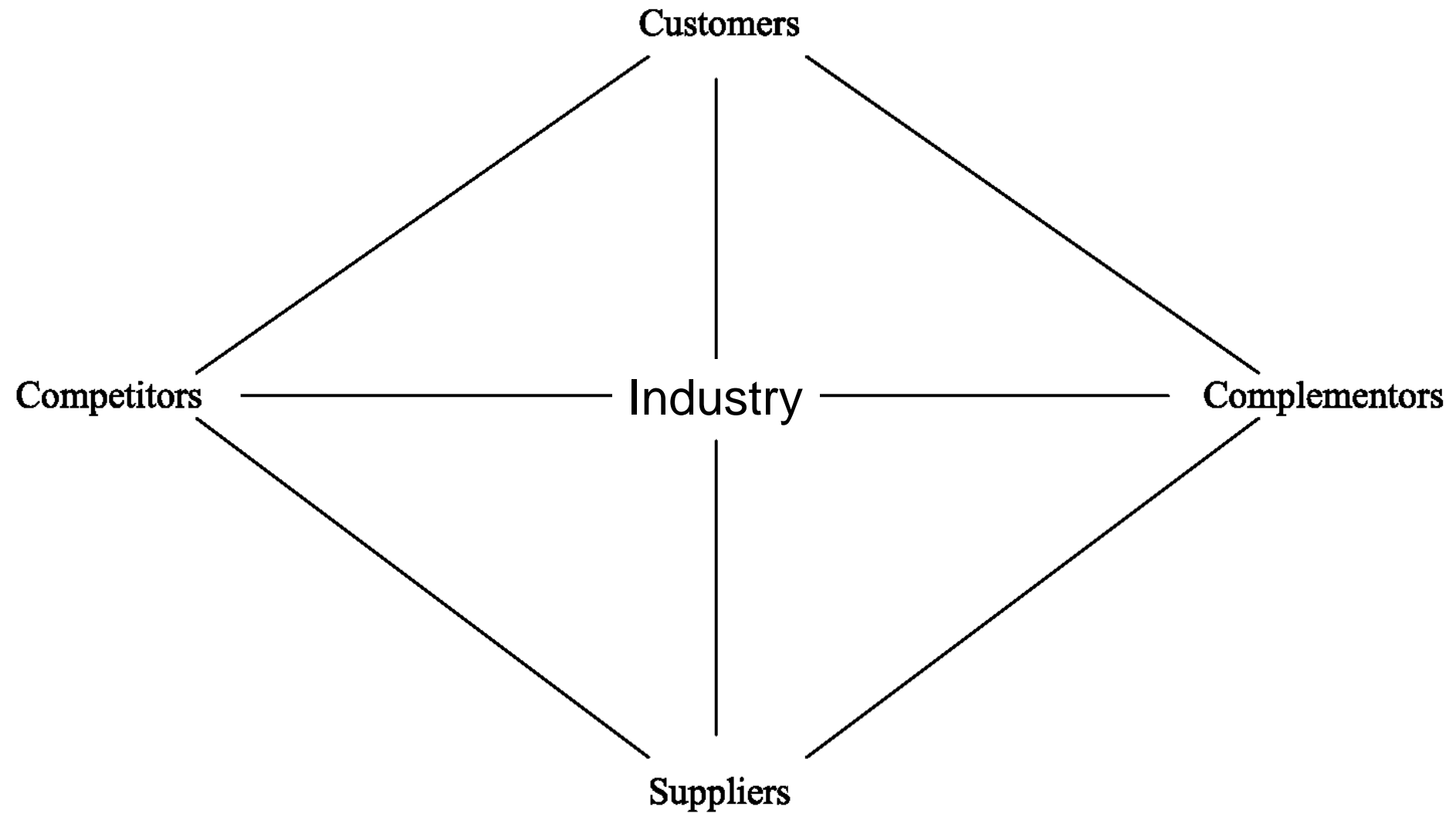
- A complement to one product or service is any other product or service that makes the first one more attractive.
  - Complements are always reciprocal.
- Everything has to happen all together, or nothing might happen at all.
- Think about how to expand the pie by developing new complements or making existing complements more affordable.

# Co-opetition Industry Construct



- Game Theory = Mathematics of Strategic Management
- PARTS
  - Players (Value Net)
  - Added Value
  - Rules
  - Tactics (to create/manage perceptions)
  - Scope

# PLAYERS: The Value Net



# Complementors

- **DEMAND SIDE:** A player is your complementor if customers value your product more when they have the other player's product than when they have your product alone.
- **SUPPLY SIDE:** A player is your complementor if it's more attractive for a supplier to provide resources to you when it's also supplying the other player than when it's supplying you alone.

# Competitors

- **DEMAND SIDE:** A player is your competitor if customers value your product less when they have the other player's product than when they have your product alone.
- **SUPPLY SIDE:** A player is your competitor if it's less attractive for a supplier to provide resources to you when it's also supplying the other player than when it's supplying you alone.

# Multiple Perspectives

- There are also your customers' customers, your suppliers' suppliers, your competitors' competitors, your complementors' complementors, and the list goes on.
- Draw a separate Value Net from each perspective: your customers', your suppliers', your competitors', and your complementors', and, perhaps, from perspectives even further removed.
- It's the norm for the same player to occupy multiple roles in the Value Net. That makes the game a lot more complicated.

# Making Markets By Bunching

- In some cases, the bunching effect helps create a bigger market for suppliers as well as for customers.
  - By locating close together, antique stores, though competitors in dividing up the market, become complementors in creating the market in the first place.
- Bunching together creates complementarities that develop the market, even if there's sometimes more competition in dividing it up.



# A Player You Can't Avoid

- The ultimate example of a player occupying more than one position in the Value Net is government, both federal and state.
- Depending on the aspect of government you're looking at, it can appear in the role of customer, supplier, competitor, or complementor.
- It also has an important behind-the-scenes role.
- The government serves as a complementor to every business activity by providing basic infrastructure and civil order.

# Friend or Foe?

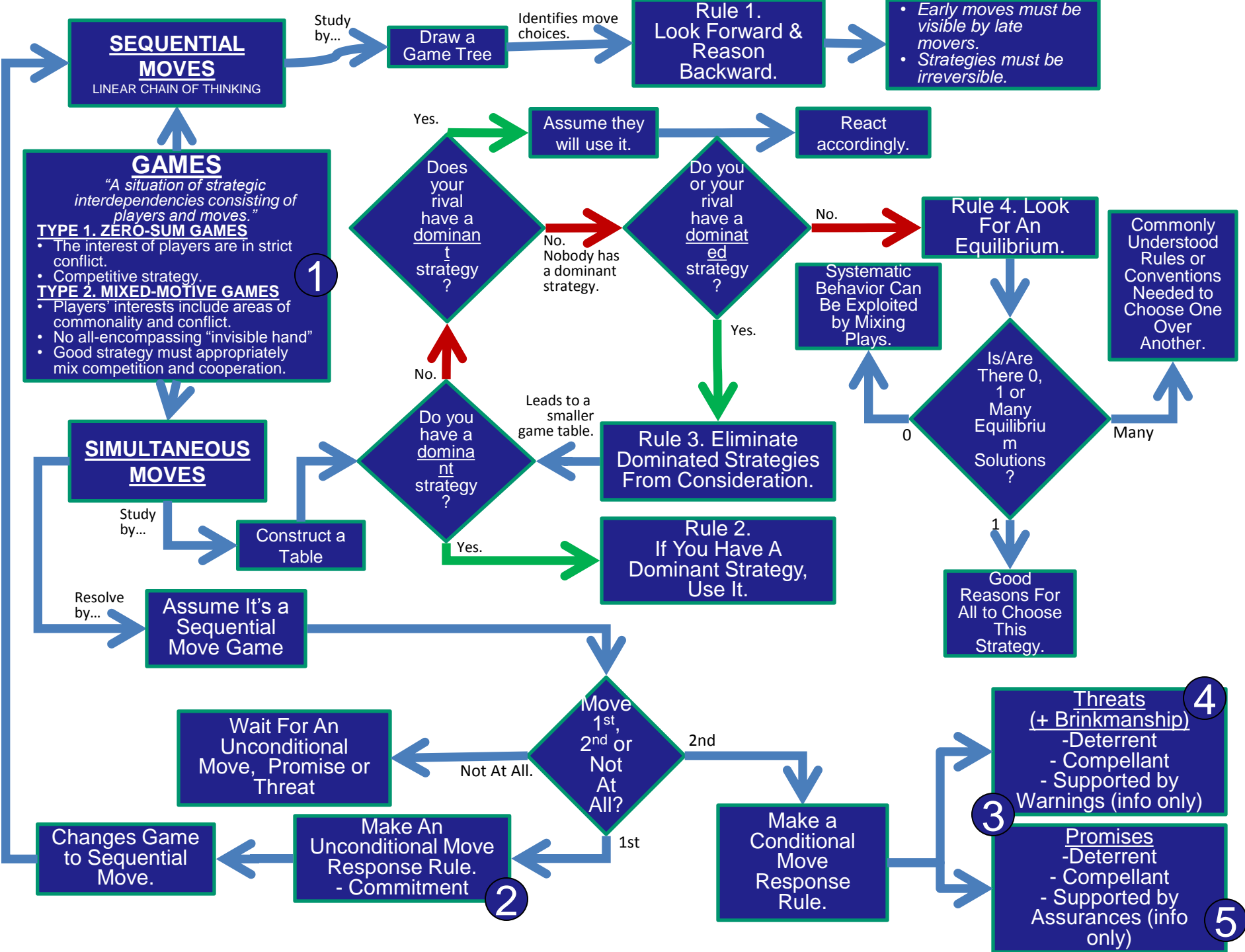
- Whether it be customer, supplier, complementor, or competitor, no one can be cast purely as friend or foe. There is a duality in every relationship—the simultaneous elements of win-win and win-lose.
  - The idea that it's always war with competitors is overly simplistic.
  - Often, the win-lose approach leads to a Pyrrhic victory.
  - What matters is whether you, not others, win.
  - Sometimes the best way is to let others do well.
- Work with competitors to develop common complements.
  - Sometimes it's best to let competitors succeed. A prosperous competitor is often less dangerous than a desperate one.
- Do not simply act nice, hoping that others will reciprocate.
  - Often a lose-win recipe.

# ADDED VALUE

- Added value measures what each player brings to the game.
- YOUR ADDED VALUE =  
(The size of the pie when you are in the game) -  
(The size of the pie when you are out of the game)
- It's hard to get more from a game than your added value.
- There are some common errors that people make when they try to assess their added values.
  - The first error is to look at only half of the equation.
  - A second error is to confuse your individual added value with the larger added value of a group of people in the same position as you.
- What Is Your Added Value? Looking back is futile...

# RULES

- Some negotiations are free-form, others have rules.
- Like added value, rules are an important source of power in games.
- The general principle is that to every action there is a reaction.
  - In games, the reaction need not be equal or opposite. Reactions aren't programmed.
- Look Forward, Reason Backward
  - You look forward into the game and then reason backward to figure out which initial move will lead you where you want to end up.
  - This principle applies to any game with a specified sequence of possible moves and countermoves.



# TACTICS (Perceptions)

- Different people view the world differently. The way people perceive the game influences the moves they make. Perceptions are particularly important in negotiations.
- The right strategy takes account of your perception of the other partner's perception of the pie.
- In a case where you don't feel confident in your assessment of your partner's valuation, try to go second: there's no downside and a potential upside.

# SCOPE

- A game without boundaries is too complex to analyze.
- In practice, people draw boundaries in their minds to help them analyze the world... a fiction that there are many separate games.
- Industry boundaries are largely artificial.
- Analyzing individual games in isolation is treacherous.
- Every game is linked to other games: a game in one place affects games elsewhere, and a game today influences games tomorrow.

# Rationality & Irrationality

- A person is rational if he does the best he can, given how he perceives the game (including his perceptions of perceptions) and how he evaluates the various possible outcomes of the game.
- The fact that other people view the world differently does not make them irrational.
- More important is remembering to look at a game from multiple perspectives—your own and that of every other player



# Allocentrism

- *When I am getting ready to reason with a man I spend one-third of my time thinking about myself and what I am going to say, and two-thirds thinking about him and what he is going to say. — Abraham Lincoln*
- Many people view games egocentrically; they focus on their own position.
- The insight of game theory is the importance of focusing on others—namely, allocentrism.
- The skill lies in putting the two vantage points together: in understanding both the egocentric and the allocentric perspectives.
- Added Value: Put yourself in the shoes of other players to assess how valuable you are to them.
- Rules: Put yourself in the shoes of other players to anticipate reactions to your actions.
- Perceptions: Put yourself in the shoes of other players to understand how they see the game.

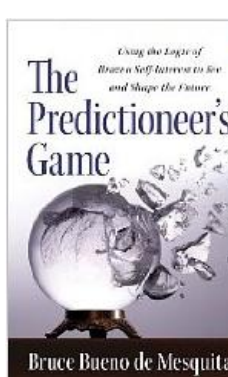
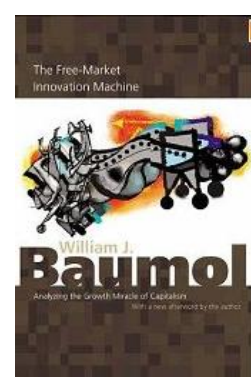
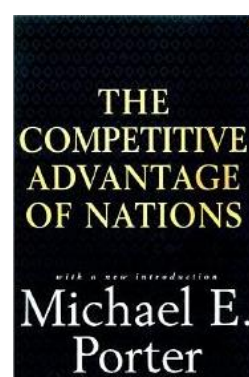
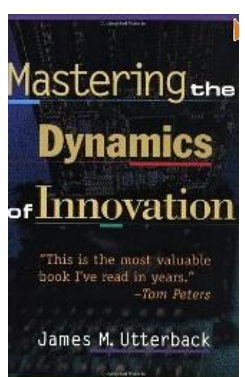
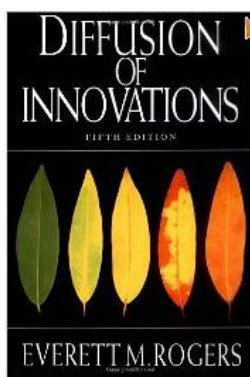
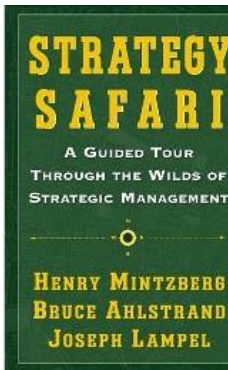
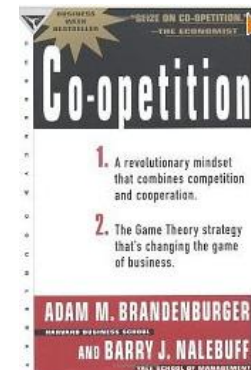
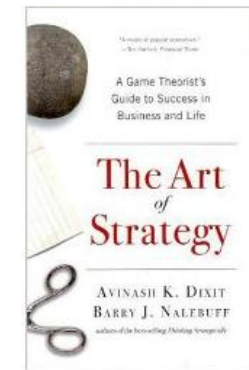
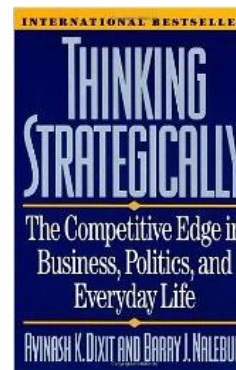
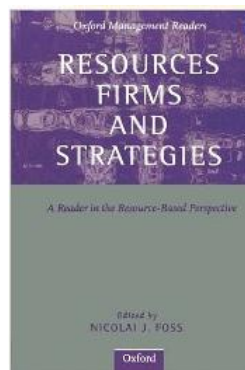
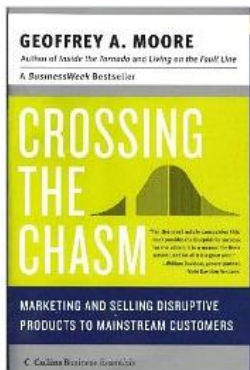
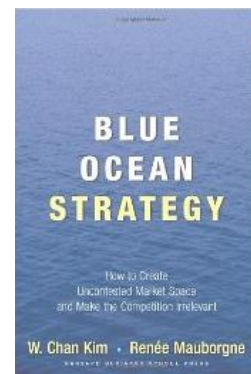
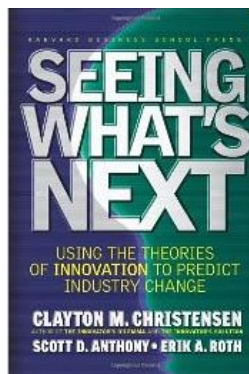
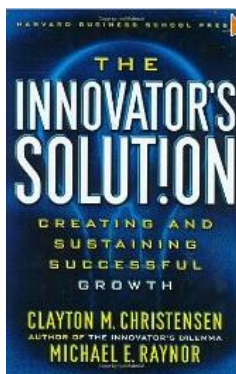
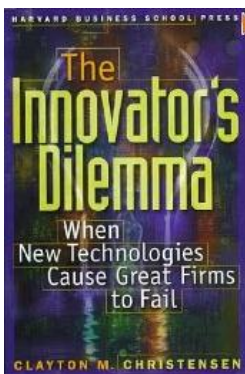
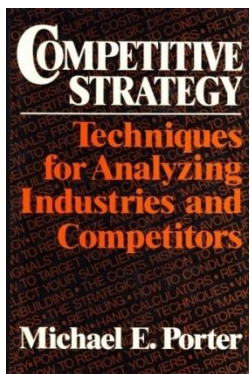
# Conclusions

- The concepts of game theory are simple, but deceptively so.
- The trick is to apply the concepts creatively to a wide variety of real-world situations.
- All this is BEFORE the strategic element comes into play...

# BACKUP SLIDES



# Strategic Planning Texts/Popularizations



# Game Theory Introduction

- How much can you hope to get in a game?
  - What you get depends on your power in the game as well as on the power of others who have competing claims on the pie.
  - Power—yours and others’—is determined by the structure of the game. Game theory shows how to quantify this power.
- There has been a growing recognition that game theory is a crucial tool for understanding the modern business world.

1. **Strategic Moves** contain 2 elements: planned course of action, the science (the “what”) & the art (the “how”).
2. **A commitment** is an unconditional strategic move.
3. **Threats and promises** are more complex conditional moves; they require you to fix in advance a response rule. A threat is a response rule that punishes others who fail to act as you would like them to. A promise is an offer to reward other players who act as you would like them to.
4. **Brinkmanship: The deliberate creation of risk.** Taking your opponent to the brink of disaster, and compelling him to pull back. Deliberately creating and manipulating the risk of a mutually bad outcome in order to induce the other party to compromise. The key to understanding brinkmanship is to realize that the brink is not a sharp precipice, but a slippery slope, getting gradually steeper. This makes brinkmanship a strategic move, a special kind of threat.
5. **8 Steps to Credibility:** Contracts, Reputation, Cutting Off Communication, Burning Bridges Behind You, Leaving the Outcome Beyond Your Control or to Chance, Moving in Steps, Teamwork, Mandated Negotiating Agents.