BA 511
GAMES & POLITICS

Political Economy:

Economic Ideas Applied to Politics

Strategic Decisions All Around

Strategic Situations

- Bidding-Negotiation; Auctions; (homes, cars, yard sales, …)
- Employment: Job Market; Board-Management; Management-Labor;
- Politics/Group Dynamics
- Pricing, Ad, … Competition
- Dating, Marriage
- Families: Parent-Child, Spouses, Siblings
- Games: Poker, …

Strategic-Related Behavior

- Signaling & Filtering Information
- Altering Perceptions-Beliefs
- Promises/Threats
- Changing "Rules" (nature of game)
- Repeated IDs
- Mixing Actions
- Incentives for Cooperation
- Cooperation-Compete Dilemmas
- Free-Riding

Nature of "Games/Strategic Decisions"

- **Decisions where optimal strategies of 2 (or more) players are actively interdependent**

    - ♦ **Optimal strategy depends on choices of other participant(s) best strategy**

    - ♦ **Decisions significantly impact other decision makers and they actively respond**
        - • **Not just "playing against nature or world" with fixed prices, probabilities, behavior**
        - • **Think chess, poker, or rock-paper-scissors, not roulette**

Some Common Games …

Prisoner's Dilemma

- 2 criminals arrested for crime
  - Interrogated separately
  - Choices: Confess/Don't confess
    - Confession by one leads to low/high sentences
    - Confession by both leads to moderate sentences
    - Confession by neither leads to acquittal
- Not Confess = "cooperative", positive sum (for participants) solution
- Confess = competitive solution

Prisoner's Dilemma-like Games

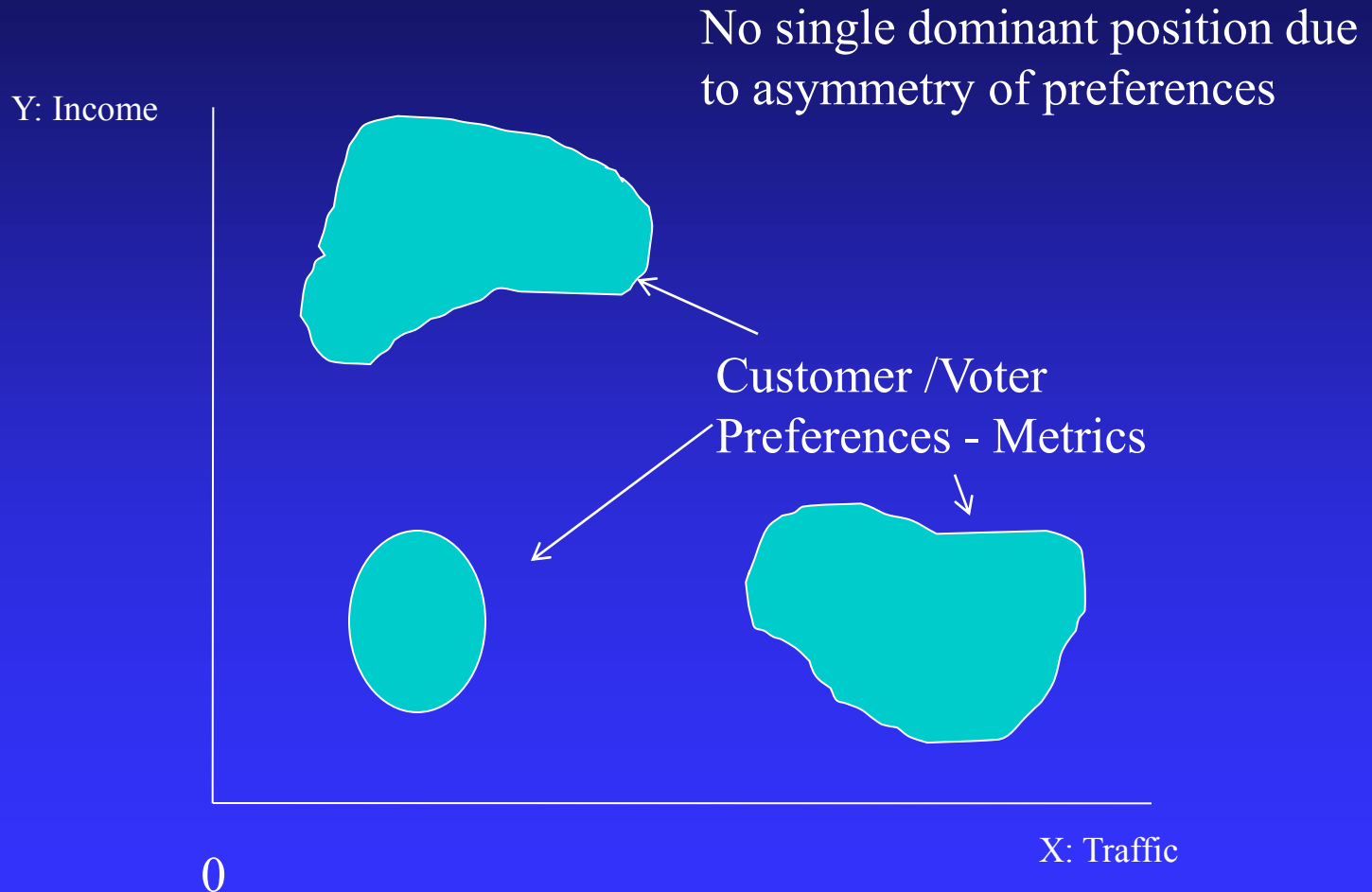- Hostage's Dilemma
  - Multi-person version of PD
- Oligopoly Games
  - (pricing, ads, entry, …)
  - Cooperation (maybe implicit) leads to higher profits than competition

"Location" Games (with extensive information and single dimension)

- Where to setup shop if consumer/voters positioned uniformly (or normally) along a road, given that competitor is trying to setup shop in best location also?

    - Simple Solution: Move to the middle (median), otherwise, competitor can locate just to the "busier" side and capture everyone on that side

- Examples: Variety of retail stores; primary & general election races;

Median Location/Voter Model Breakdown (multiple dimensions)

No single dominant position due to asymmetry of preferences

Y: Income

Customer /Voter
Preferences - Metrics

X: Traffic

0

"Location" Games
(with very limited information)

- Where to setup shop if consumer/voters clustered in large 10 large cities, you will locate in 5 and a rival firm will locate in 5 but agreements that divide cities are strictly prohibited and punishable by large punitive fines?

  - ◆ Solutions: use of "focal points"

  - ◆ Stanford-Harvard MBA "Divide the Cities" Game

  - ◆ Variants: T. Schelling (Strategy of Conflict) where to meet in NYC?

Office Political Chess

- Tom Hanks directed a 12 part HBO series-- From the Earth to the Moon– dramatizing the U.S. space program from Mercury through the Apollo moon landings. One strategic segment involves the aftermath of the Apollo 1 deaths of 3 astronauts during a launch pad tests:
  - A capsule fire during a routine test.
  - The fire resulted from a spark in wiring
  - The test employed a highly pressurized, pure oxygen capsule environment about which North American (the capsule contractor) had sent repeated warnings to NASA
  - The pressurized oxygen capsule reached temperatures over 1000 degrees 15 seconds.
  - NASA planned to lay substantial blame on North American.
  - The NA engineer in charge argues for exposing NASA with the warning memos
  - His NA superior His boss says , "no,we're not and goes on to respond; we're going to just take it"
  - Can you make sense of the boss' decision?

Bargaining

- Ultimatum Game (and related) theory and experimentation
  - Split of pot if 2 parties agree on split; 1 makes offer-1 accepts or declines offer;
  - Variations: size of pot; depreciation of pot; anonymity; repetition; wealth of participants; …
    - Money matters but not all that matters
    - Typical outcomes: bigger than 99:1, less than 50:50
    - Patience is a virtue
    - Patience is the best signal of patience
    - Tradeoffs in most bargaining situations

Bargaining Tradeoffs (Home Building-Purchasing Case)

- Builder-Homeowner
  - Builder info advantage
  - Buyer Choices:
    - Flex Price w/fixed percentage
    - Fixed-Price w/negotiated changes
  - Info/Incentive Tradeoffs
    - Flex: flexibility of changes; no "hold-out problem"; wrong incentive for info problem
    - Fixed: Incentive to monitor & control expenses; "hold-out" problem on changes; incentive to cut corners

Six Essentials Questions of SDs

- Who are Key Decision makers (units)?
- What is the Timing of Decisions?
  - Sequences or simultaneous?
  - One-shot or repeated?
- What Information is Available?
  - What do decision makers know/believe?
- What Actions are Possible?
  - Aggressive/passive; high/low; fold/bluff; …
  - Cooperation or not
- Payoffs to decisions?
  - Fixed sum, positive sum, or negative sum?
  - Quantitative & qualitative
- Manipulation Possibilities?
  - Can players alter rules or beliefs of others?

- Apply to PD Game?

Strategic Moves: Manipulating the Game

- **Changing information or beliefs**
  - Think Poker/Dr. Strangelove
    - Threats, promises, credibility
    - Poker examples (info sending & receiving)
- **Changing available strategies**
  - Cortez's burning of ships
- **Changing available payoffs or beliefs about them**
  - My daughter & "salami tactics"
  - Retail stores use of agents
- **Changing order of moves**
  - Agenda control

Countering Strategic Moves:

- Information-Extraction countermeasures
  - Signal-Jamming, e.g. vagueness in at poker table
- Threat/promise countermeasures
  - Going to the extreme ("brinksmanship")
  - Going really small ("salami slices")
- Option/payoff-limiting countermeasures
  - Expand Options, e.g., Let me talk to the GM
  - Increasing likelihood (Hawken research)
- Order counter-measures
  - Amendments, coalitions,

First or Second Mover Advantage?

- First Mover Advantage if manipulation of possible through changing game or beliefs of rival
  - ◆ – Princess Bride
- Second Mover Advantage if information becomes available by rival's move
  - ◆ Sailing; NCAA Football Overtime;
- What about Poker?
  - ◆ Tradeoff: manipulation v. info gathering

Insight on Solutions

- "Nash Equilibrium": outcome where opponent doing best possible
  - Sequential
    - "Rollback": Look ahead to last period and work back
  - Simultaneous
    - Iterative: step-by-step analysis of best choice given a decision by other
  - Repeated Simultaneous
    - Rollback + Iterative

Solutions to Simultaneous Game (PD Example)

- Payoffs = (Coke profits , Pepsi profits)

- Decisions: Price Low or Price High

		Pepsi Decision	
		Low	High
Coke	Low	10,10	1,20
Decision	High	20,1	3,3

Solutions to Simultaneous

- First Iteration: Coke considers best choice if Pepsi sets low price (column 1)

Best choice for Coke,
if Pepsi Sets Low Price

Pepsi

Low

		Low	
Coke	Low	10,10	
	High	20,1	

Solutions to Simultaneous

- Second Iteration: Coke considers best choice if Pepsi sets high price;

- Low is dominant strategy for Coke; Low better than high in both iterations

Best outcome for Coke,
If Pepsi Sets High Price

Pepsi

High

Coke			High
	Low		1 20
	High		3,3

Solving Sequential Games

"Life must be understood backward, but ... it must be lived forward." - Soren Kierkegaard

(Consider Chess as Example)

- Diagram a game tree – simplify if needed
- Start with the last move in the game
- Determine the best course(s) of action for the player with the last move
- Trim the tree -- Eliminate the dominated strategies
- Repeat the procedure at the prior decision node(s) with the trimmed tree

# An Example: Market Entry

- Game Essentials:
  - Players: Current firm (F) with large market share faces a potential entrant (E)
  - Timing: Potential entrant moves first
  - Moves: Potential entrant (enter-stay out) Current firm (accept passively-fight)
  - Information: full information
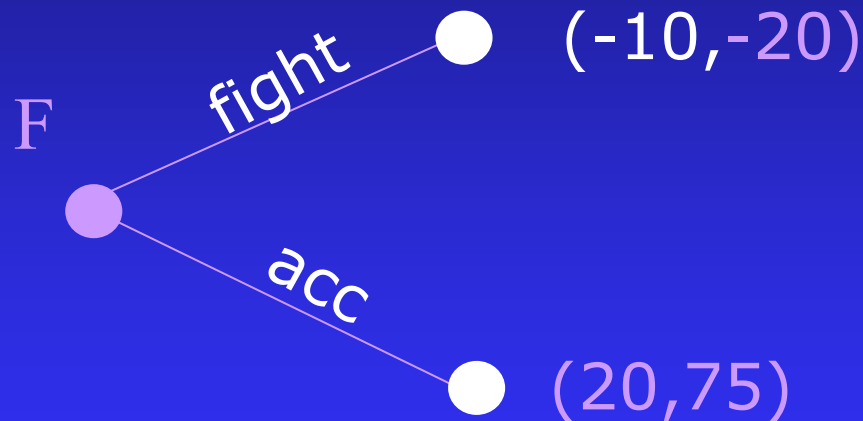 - Payoffs: (see game tree)
  - Rules: Fixed (to simplify game for now)

Scenario in Game Tree

Payoffs = (E, F) expressed as profits (mil $)

E

out

(0, 100)
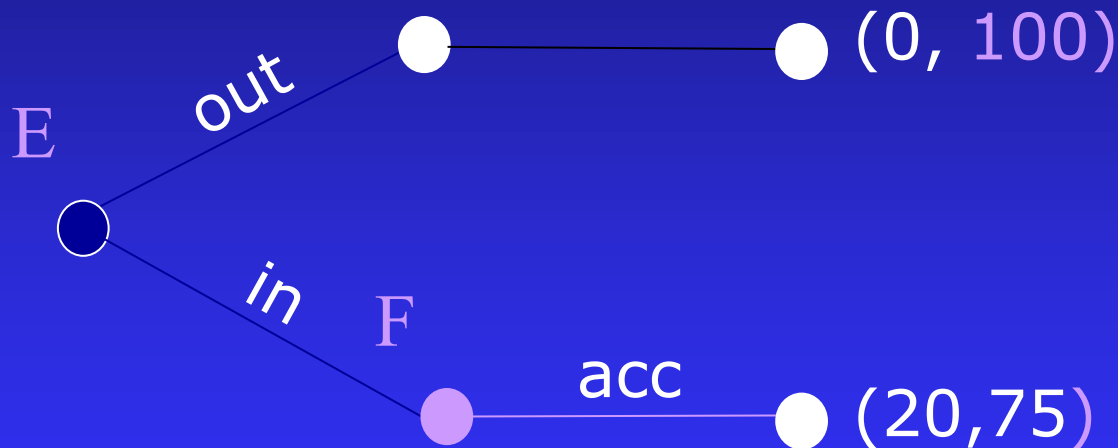
in

F

fight

(-10,-20)

acc

(20,75)
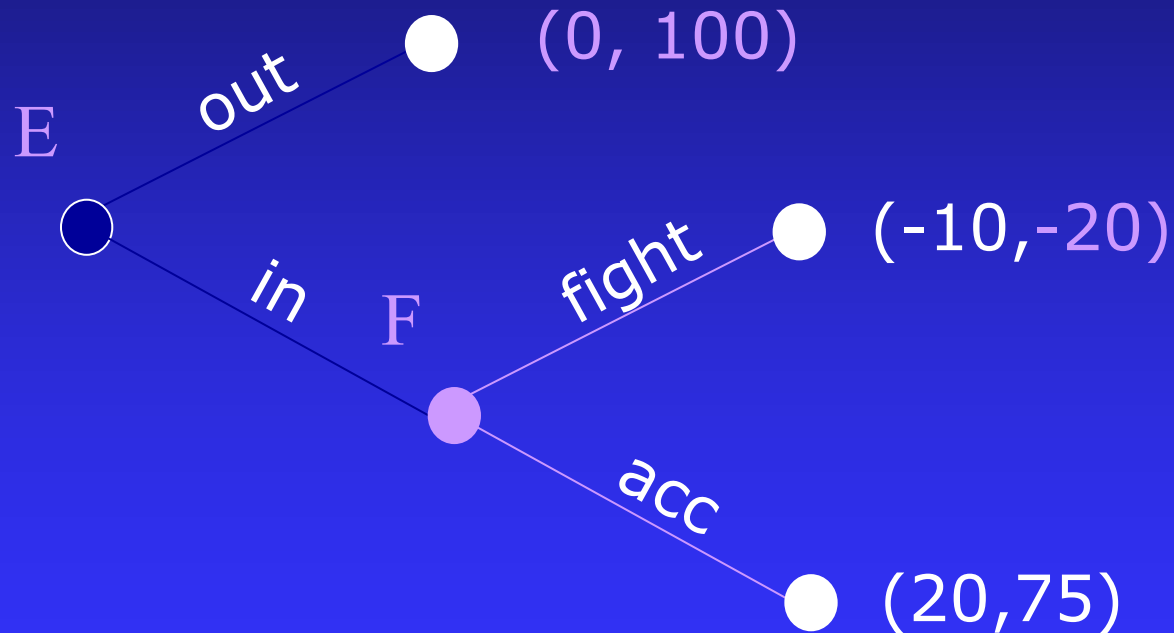
Looking Forward…

- Entrant makes the first move:
  - ♦ Must consider how F will respond
- If enter:

$$F$$

fight → (-10,-20)

acc → (20,75)

- Current Firm better off if accepts; so trim "fight" branch from tree

… And Reasoning Back

- Now consider entrant's move with tree trimmed

E

out

(0, 100)

in

F

acc

(20,75)

- Solution = (In, Accept Passively)

Political Economy (including office politics)

- Problem of Aggregating Fairness & Policy Mechanisms

  - Arrow Theorem (+ Sen): No aggregating mechanism (voting; market) can satisfy 5 basic conditions:
    - no dictator;
    - all preferences/options matter;
    - consistency of alternative options;
    - consistency from individual to aggregate preferences;

  - To arrive at decisions, must violate one or more of these principles to some degree; which is most acceptable?

Political Economy (including office politics)

- ## Rules (policies) v. Discretion

  - ♦ Coach K: "people set rules to keep from making decisions"
  - ♦ How widespread/systematic is the problem

Political Economy: Optimal Voting Rules

MB of additional
Parties to agreement

MC of additional
Parties to agreement

0%   M*   100%

Percent in Agreement