Lecture 5 Game Plan

- Qwest Bond Swap
- Chicken Game
- Sequential move games
  - … escaping from the Annoying Servant
  - … escaping from the Prisoners' Dilemma
- More on strategic moves
  - Pre-emptive moves, threats, and promises

Qwest Bond Swap

"If Judge Chin allows the offer to go ahead, institutional investors who own bonds will find themselves in a position with some resemblance to the classic 'prisoners' dilemma'... If no one tendered, then Qwest would be in the same position as before the offer, and any bondholder would be no worse off. But if a lot of holders tender, those who refuse will be worse off than they were."

- Norris, Floyd. "A Bond Swap Available Only to Big Players," *The New York Times*, 18 December 2002.

Figure for Q1,Q2 (and Q3)

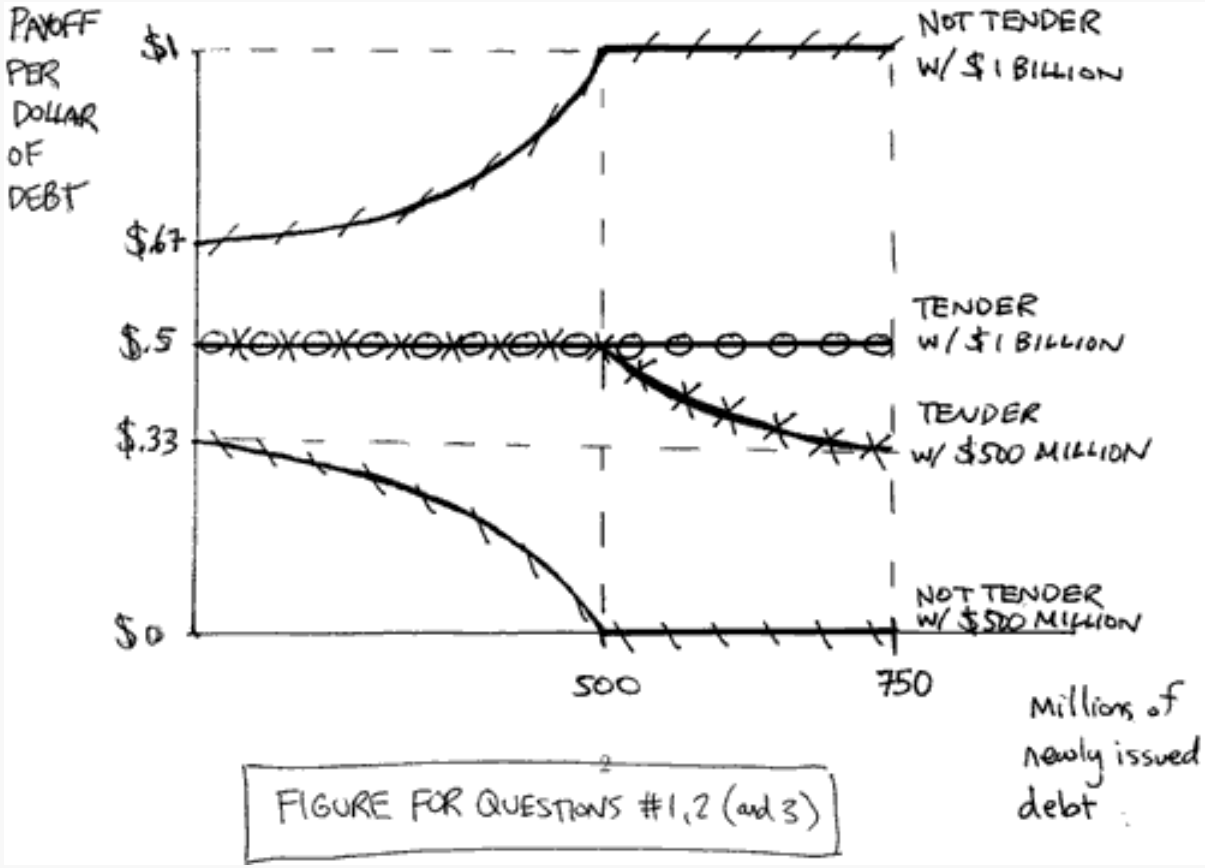


Figure for Q5

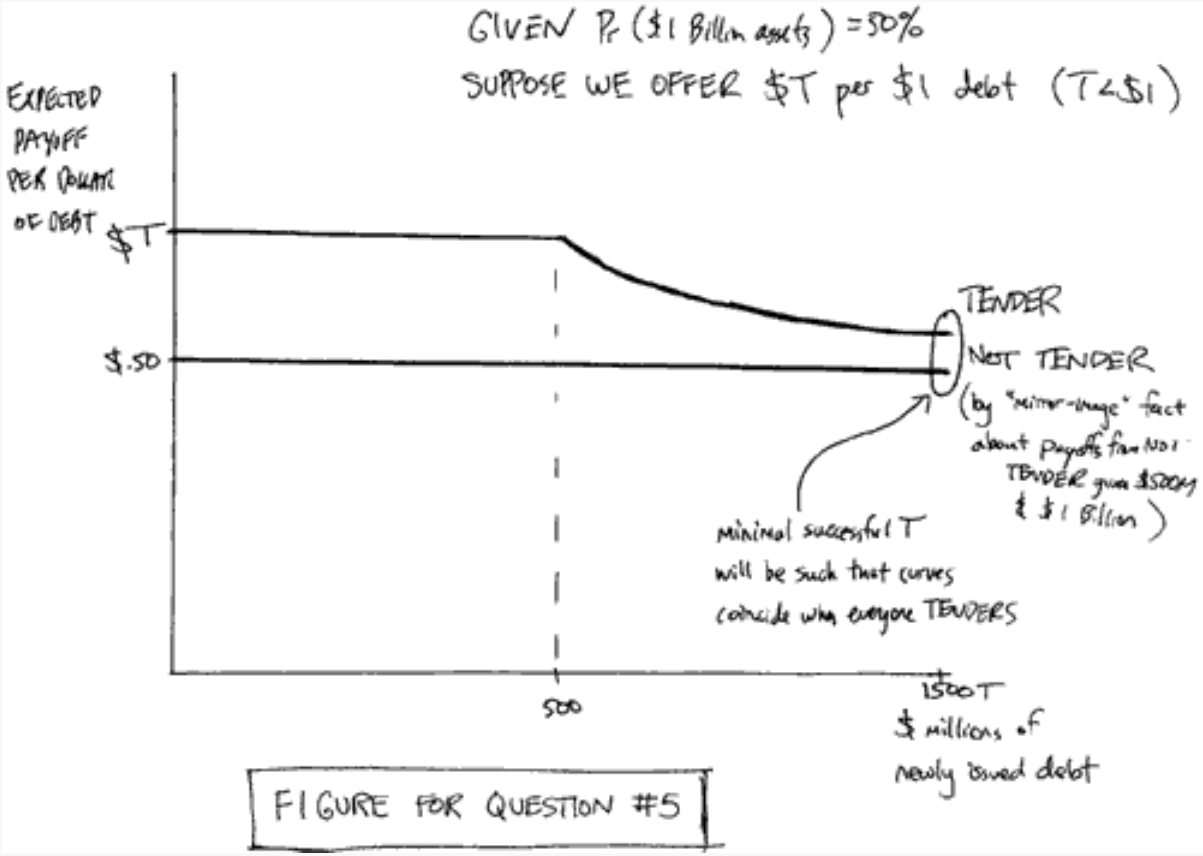


FIGURE FOR QUESTION #5

Changing the Game

“Always be wary of the superstructure of whatever situation you're in. It may just be that the whole game that you're into is something very bogus and you should get out.”

- Scott Miller, Game Theory lead guitarist,
in: Woelke, Tina. “Where Have You Gone, James Joyce? A Nation Turns Its Lolita Eyes To You.”
*Non*Stop Banter*, December 1988.

Game Theory

- *Prominent “power paisley pop” band in 80s*
  - *formed in 1981*
  - *signed by Rational Records*
- *from first album, “Blaze of Glory”...*
  - *“All I Want is Everything”*
  - *“Bad Year at UCLA”*
  - *“Sleeping Through Heaven”*

Some Prototypical Games

- Prisoner's Dilemma
- Loyal Servant
- Hunter and Hunted
- Assurance
- **Chicken**
- price war
- defensive innovation
- audits, bluffing
- driving, cooperation
- **negotiation**

On-Line Game #6

New Market Game

Negotiation Game

- Used car dealer says that the lowest possible price is $20,000
  - actual cost is $17,000
- Buyer says that the highest possible price is $18,000
  - actual value is $21,000
- Each player has two strategies:
  “Give in” or “Not”

Negotiation Game

Buyer \ Dealer	Give in	Don't
Give in	(2,2)	(1,3)
Don't	(3,1)	(0,0)

in thousands of dollars

- How would you play this game?

Mixed Strategies in the Negotiation Game

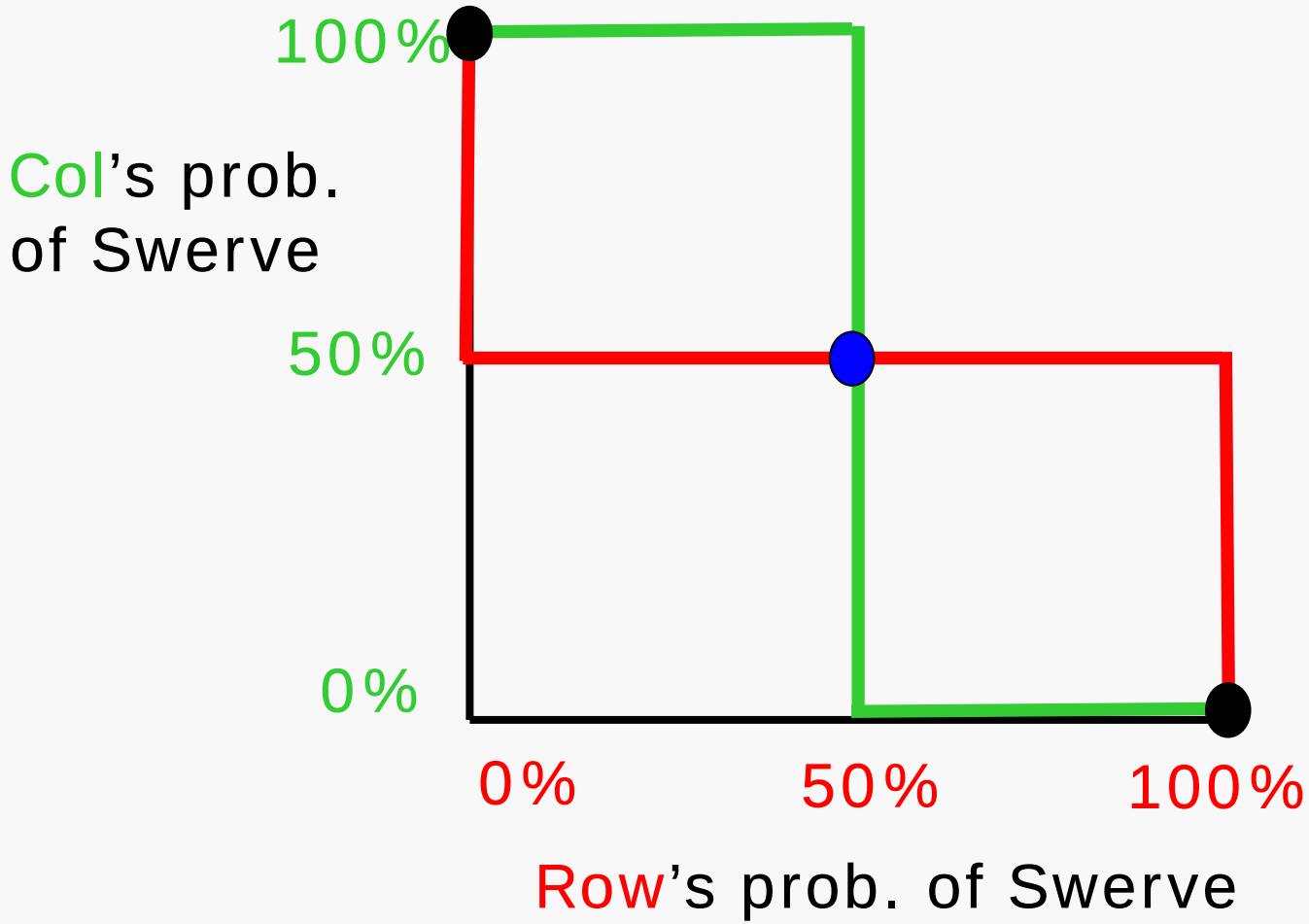
- (Give In, Don't) and (Don't, Give In) are the two *pure strategy equilibria*
- There is also a *mixed strategy equilibrium*: Prob(Give In) = 50%
  - failure to agree 25% of the time!
- Are any of these equilibria evolutionarily stable?

Chicken Game

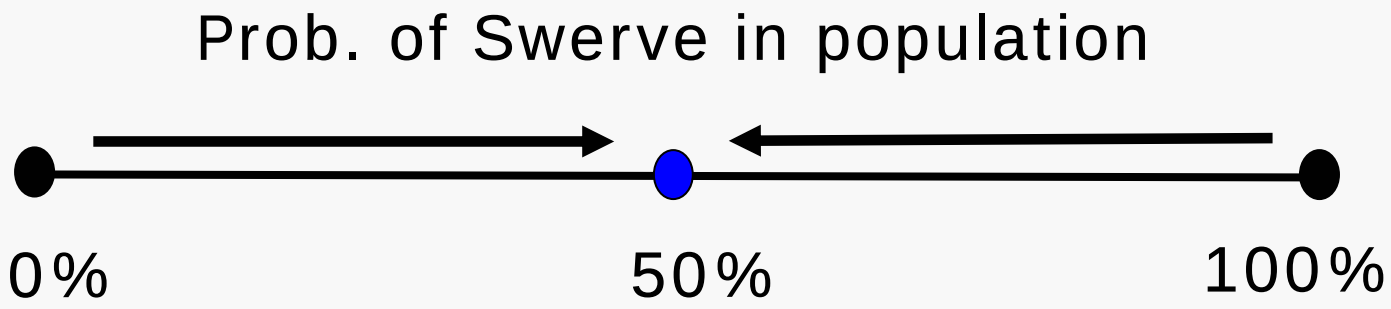
		Column Player: Swerve	Column Player: Don't
Row Player	Swerve	(2,2)	(1,3)
	Don't	(3,1)	(0,0)

- Key features:
  - Each wants the *other* to choose Swerve
  - Both better off if both choose Swerve rather than Don't

Reaction Curves in Chicken Game

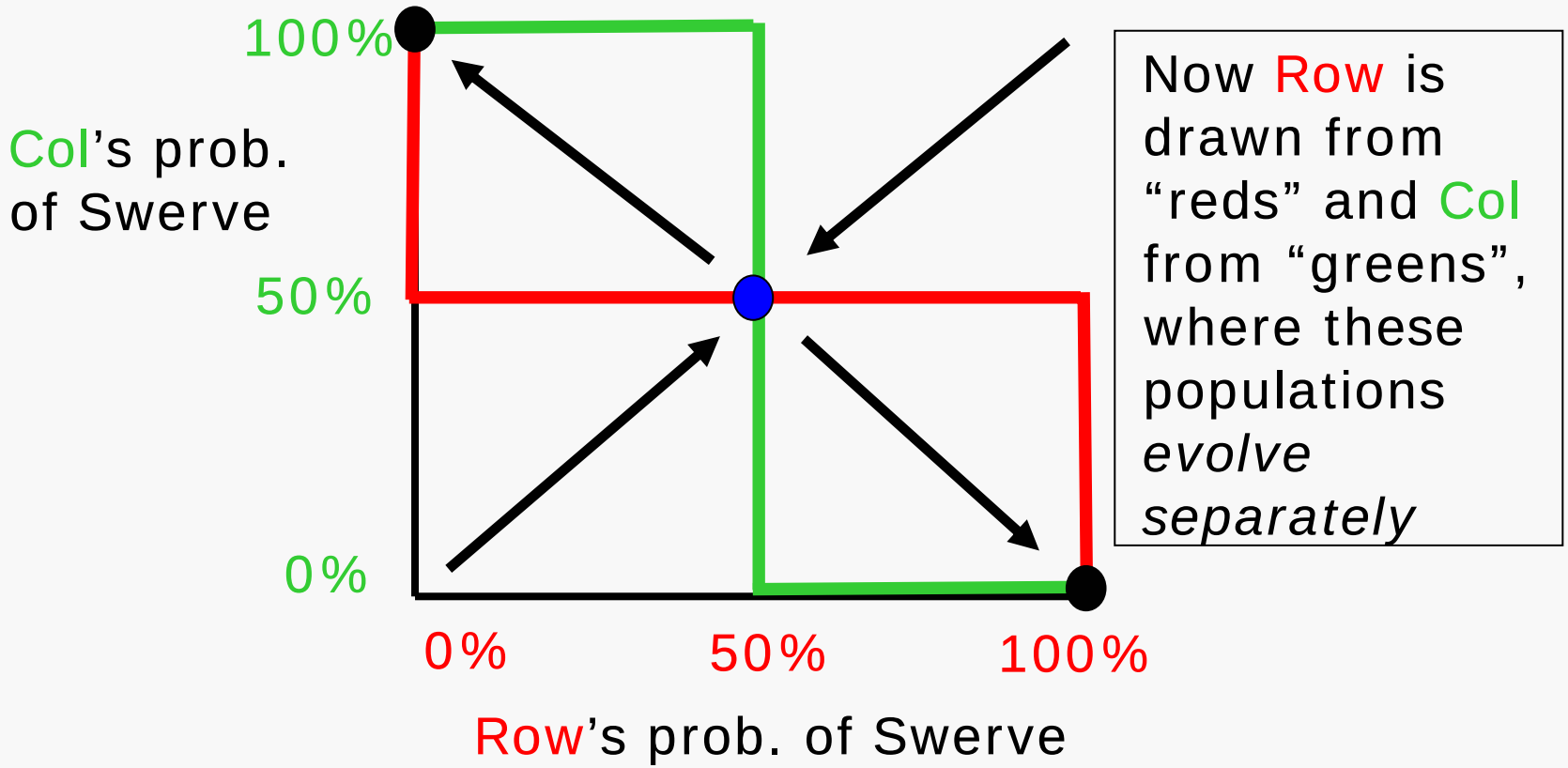


Evolution in Chicken Game with One Population



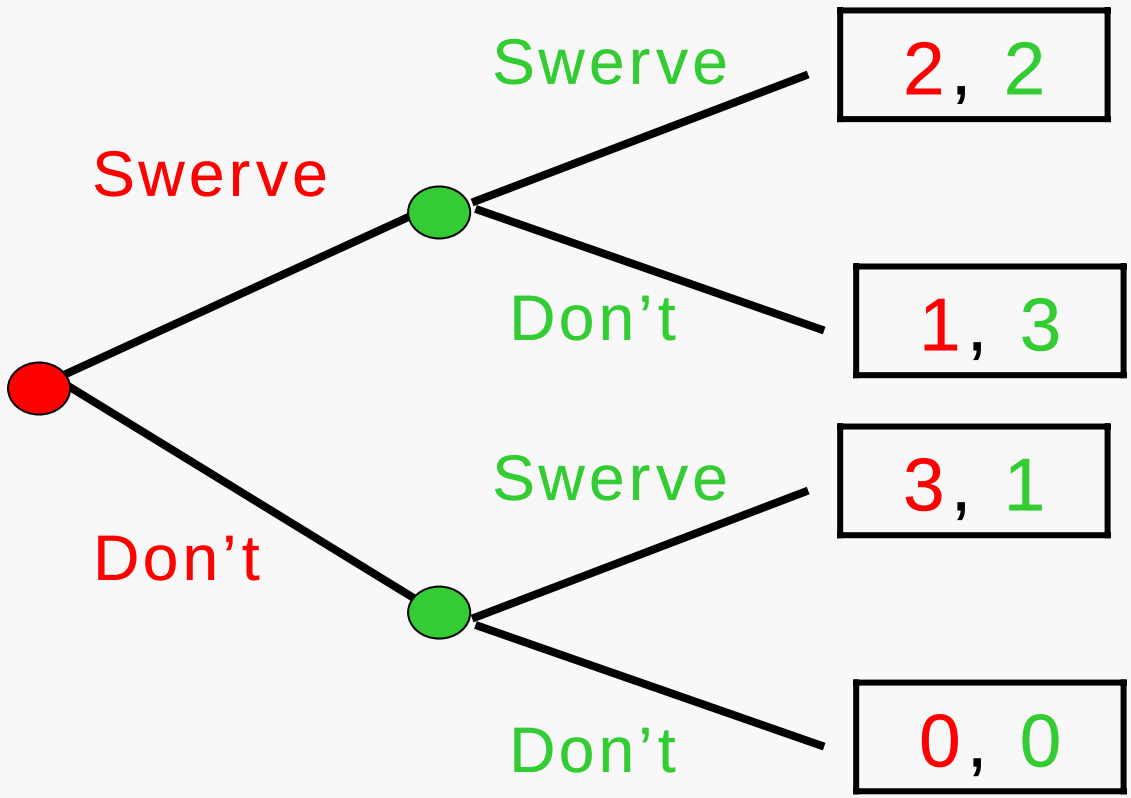
- If initial condition < 50% Swervers, then *non-Swervers* are relatively better off.
- *Only the mixed* strategy equilibrium is evolutionarily stable with one population

Evolution in Chicken Game with Two Populations

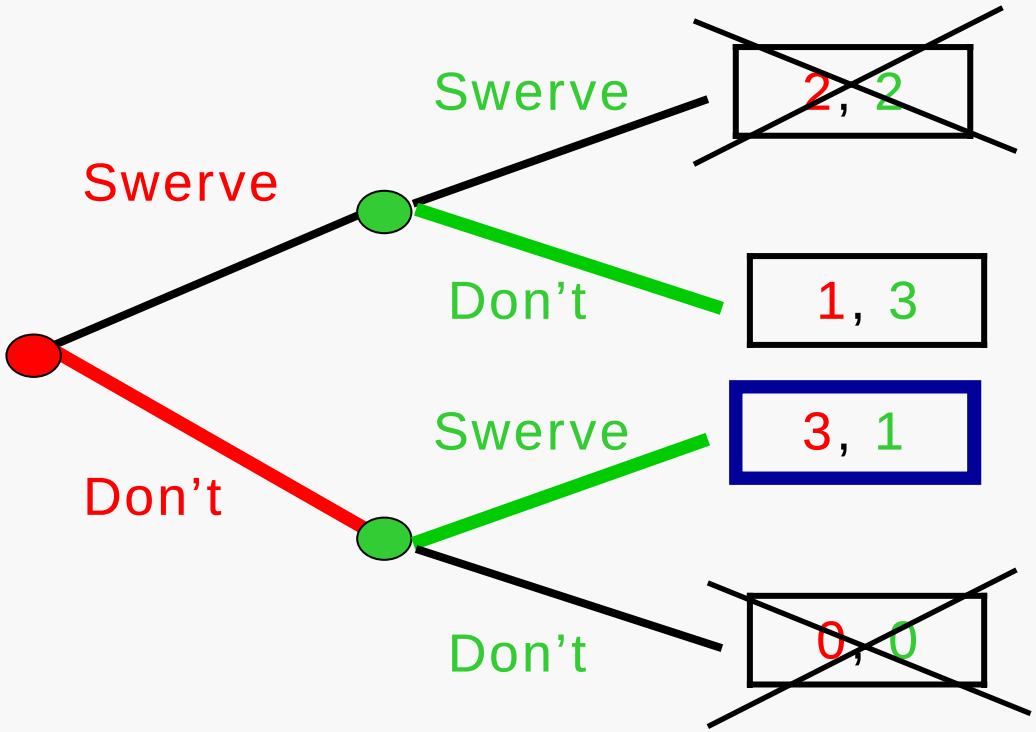


- *Only the pure* strategy equilibria are evolutionarily stable with two populations

Sequential Moves in Chicken Game



Sequential Moves in Chicken Game



- Each player prefers to be first-mover
- Being first-mover here allows you to "select your favorite equilibrium"

Sequential Games

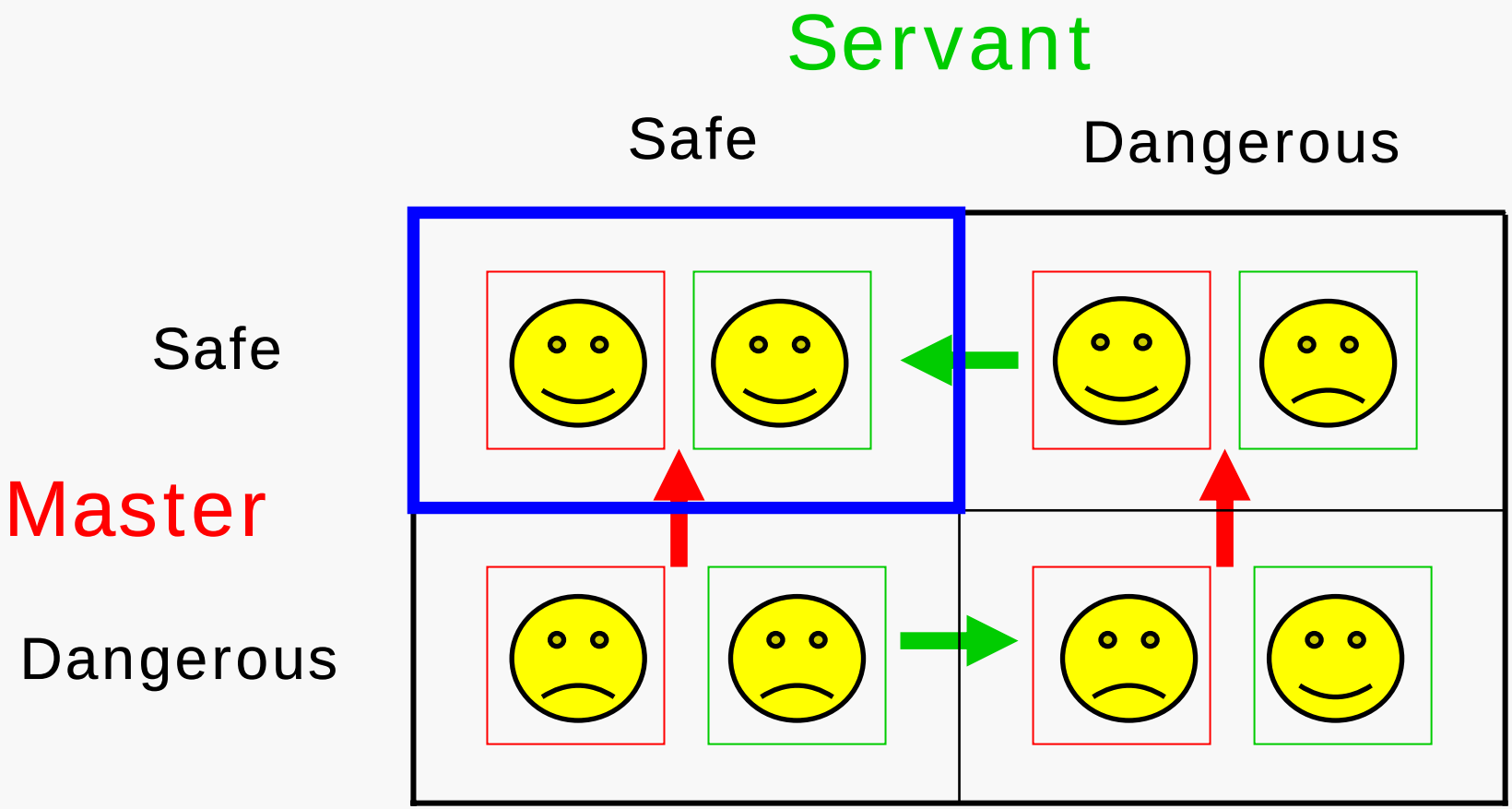
“Life must be understood backward, but it must be lived forward.”

- Soren Kierkegaard

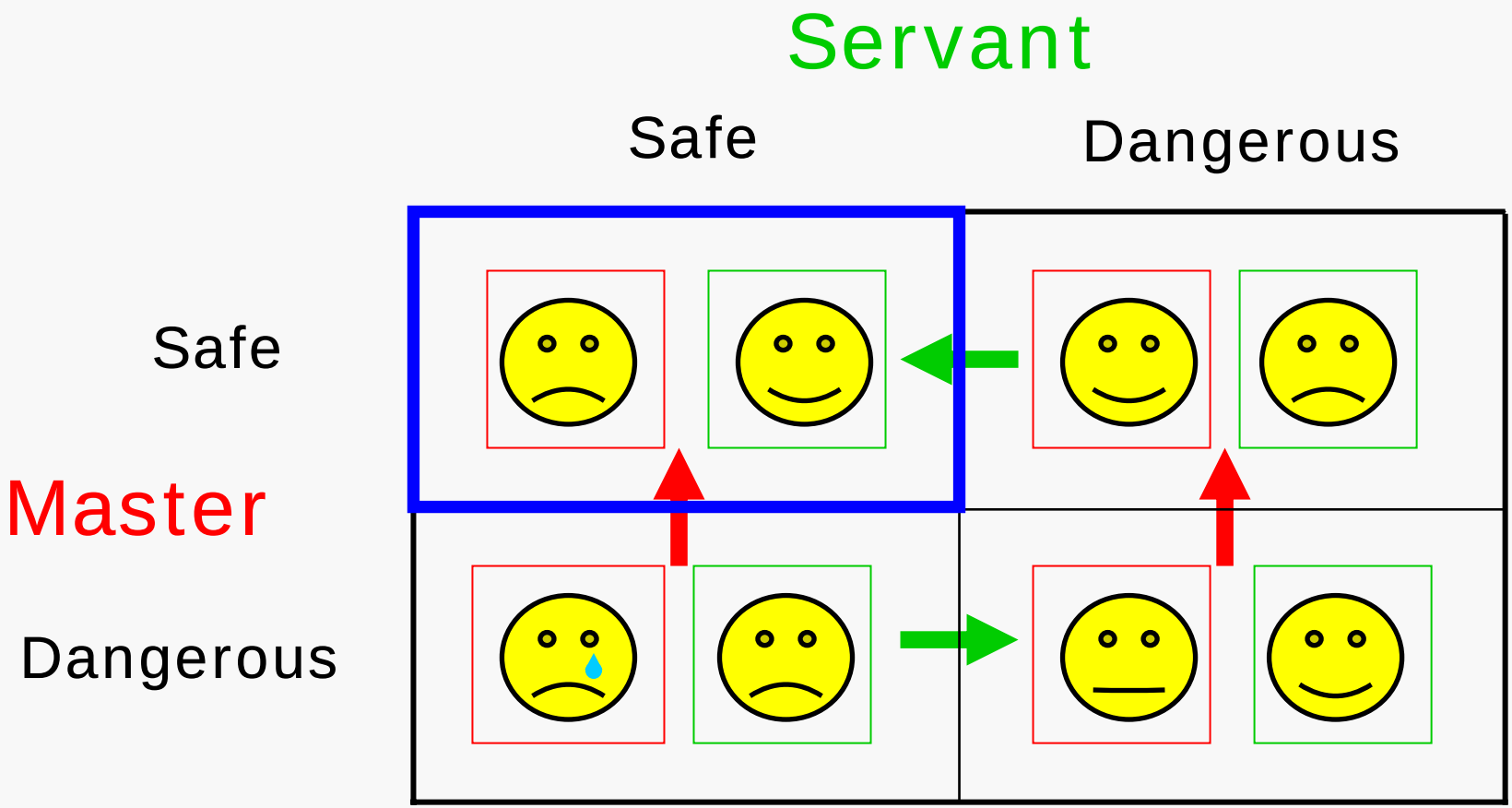
Lazy Husband Game

- Husband and wife both work long hours but can’t afford a housekeeper
- Wife happy to do housework if Husband also does, but not if Husband shirks
- Husband has dominant strategy to shirk
- Both prefer that both do housework than that both shirk

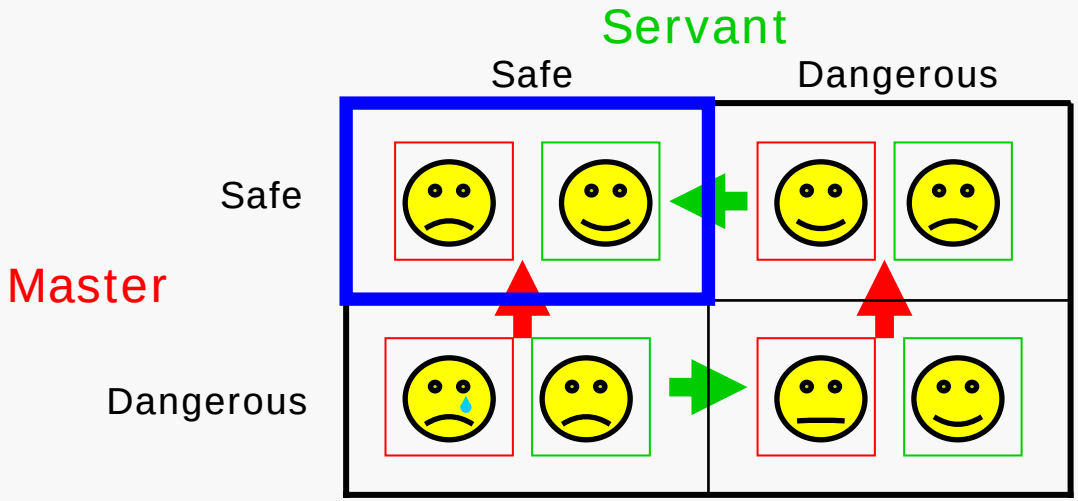
Loyal Servant Game



Special Case: Annoying Servant Game

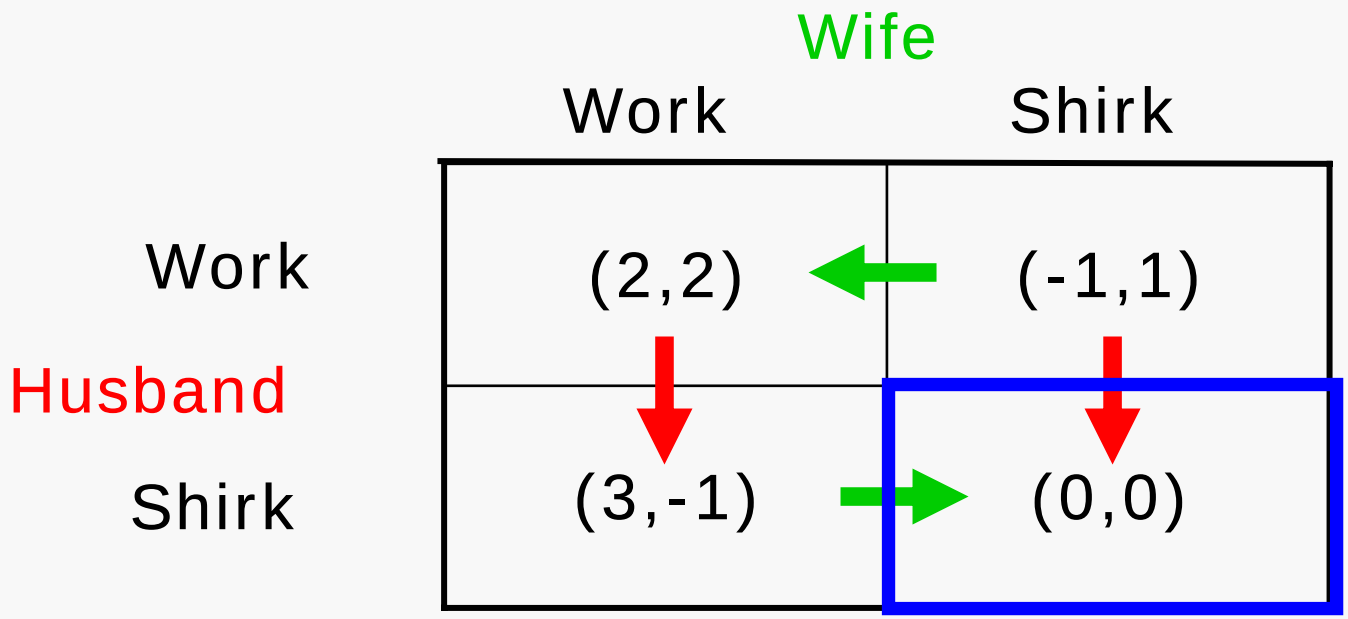


“Story” behind Annoying Servant Game



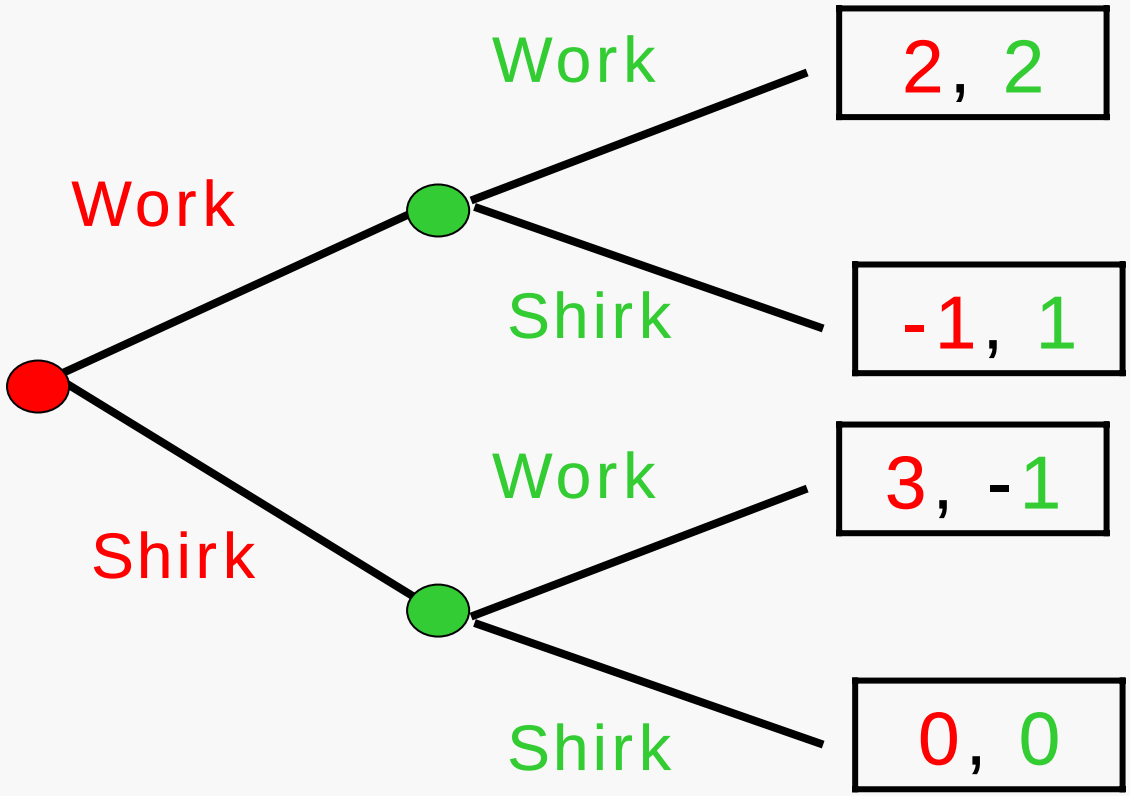
- Servant wants to be with Master
- Servant is annoying → Master likes (S,D) most
- Dangerous route not passable alone → Master prefers (S,S) over (D,S)
- Servant might “accidentally” fall off the cliff → Master prefers (D,D) over (S,S)

Lazy Husband Game

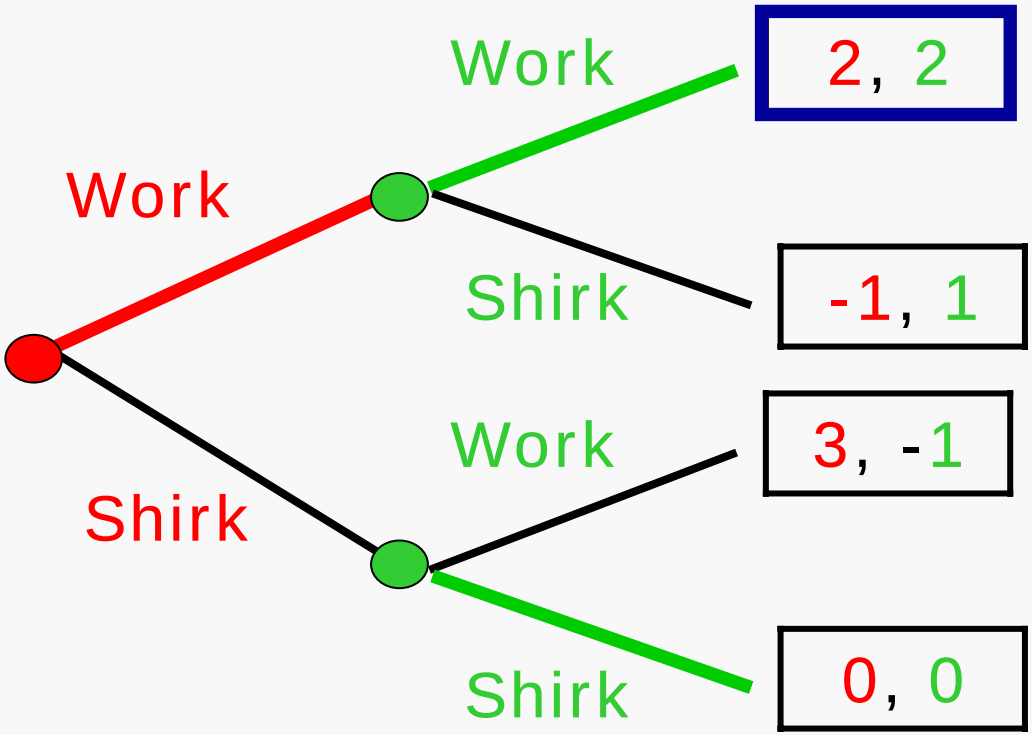


- What should Husband do?

Lazy Husband Game



Not Dominant Anymore …



- Husband commits *not* to Shirk

Strategic Moves

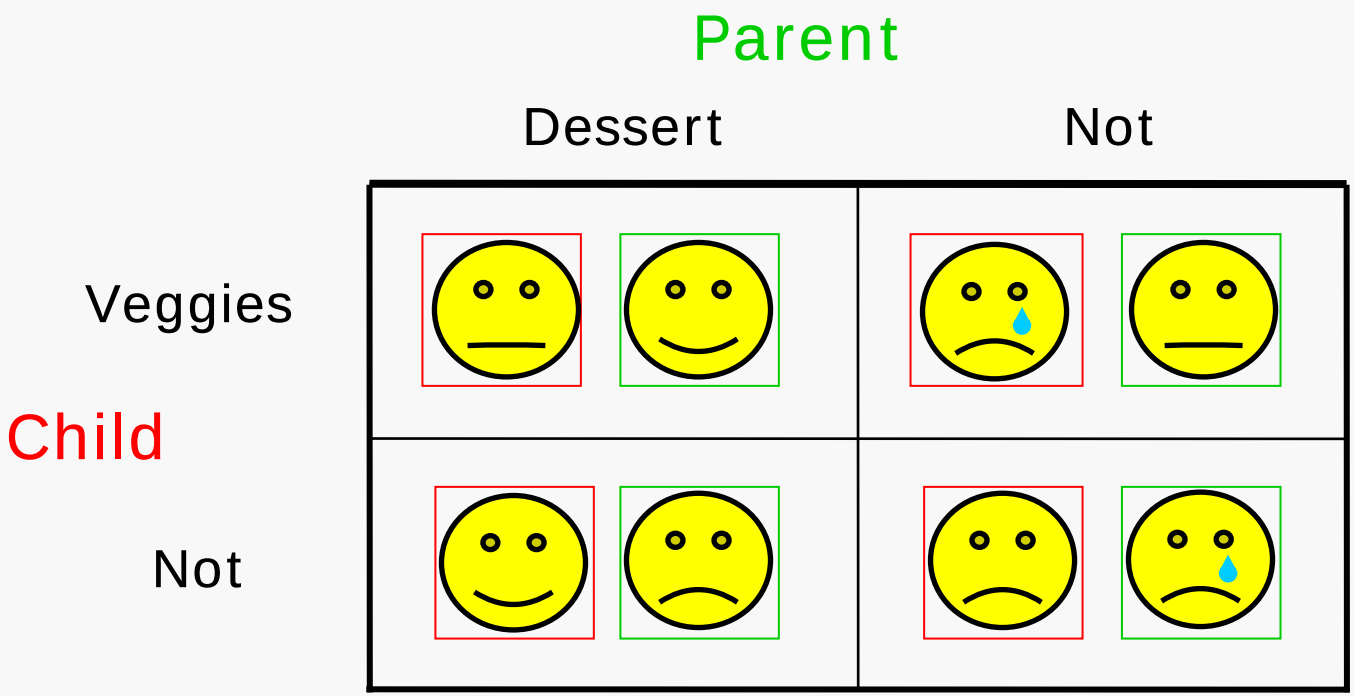
"The Power to Constrain an Adversary Depends Upon the Power to Bind Oneself."

- Thomas Schelling

“What’s For Dinner?”

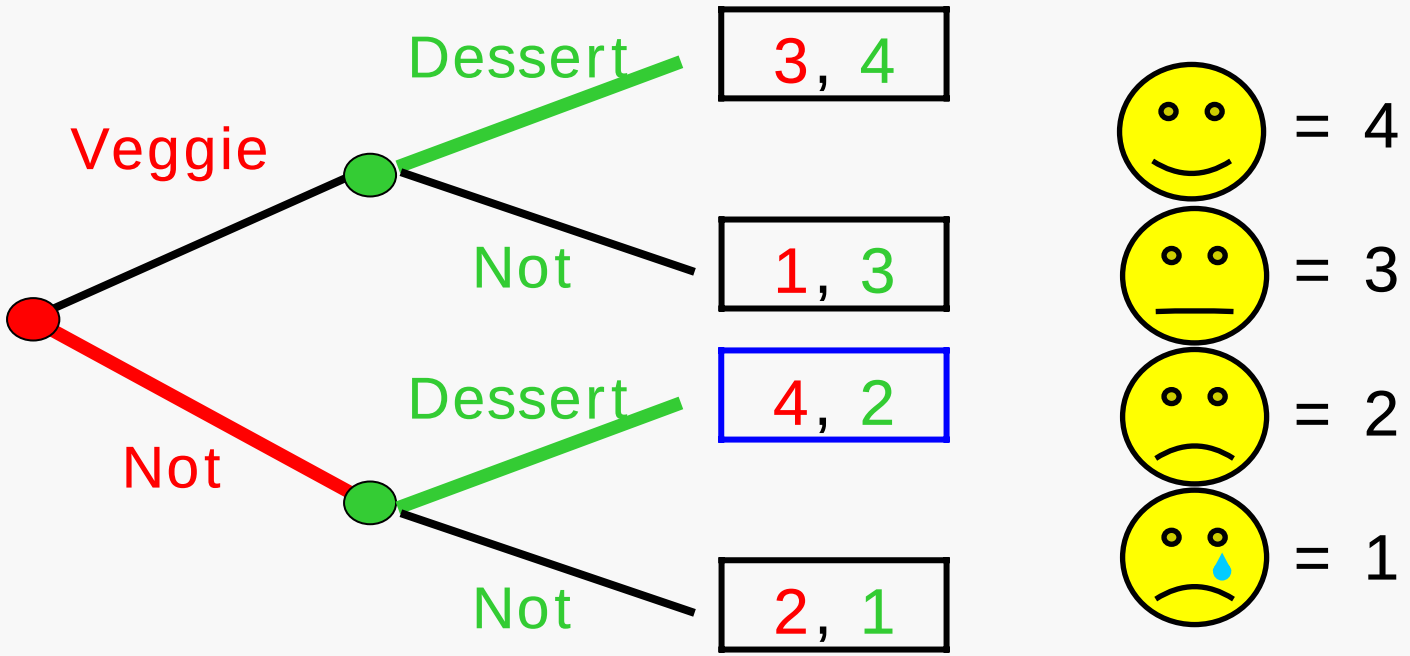
- Child decides whether to eat veggies
  - wants to not eat veggies
  - wants very much to eat dessert
- Parent decides if dessert will be served
  - wants Child to be happy
  - wants very much for Child to eat veggies

Payoffs in Dinner Game



- In simultaneous move version, both have dominant strategies: No Veggies and Dessert

Dinner w/ Sequential Moves



- No Veggies & Dessert is unique subgame-perfect equilibrium when Child moves first

Strategic Moves at Dinner

- Does moving first help Parent?
- What should Parent do?

“You don’t get dessert *unless* you eat veggies”

- Parent can improve outcome by committing to a *response rule*
- “Threat” = response rule that punishes others if they do not cooperate with you, in a way that goes *against* your own incentives
- “Promise” = response rule that rewards others if they do cooperate, in a way that goes *against* your own incentives

“You don’t get dessert *unless* you eat veggies”

- This is a “threat” in our game
  - Parent will act against incentive to give Dessert if Child doesn’t eat veggies
- Would be a “promise” if Parent would normally not give Dessert *even if* Child ate veggies

Threats and Promises

- A school bully says to me: “I will beat you up if you come to school”
  - This is a fact, not a “threat”!!
  - Saying this will not change whether I decide to go to school
- To be effective, promised or threatened actions must go *against* one’s own incentives

Students' Dilemma

- Two students in a class. Professor announces an unusual "final exam":

1. *"If neither of you shows up to class tomorrow, you both get A's.*
2. *"If both of you show up, you both get B's.*
3. *"If one of you shows up, that person gets an A plus TAship for next year, while the other person gets an F."*
    - *both students would like the TAship*

- How can the students escape this Prisoners' Dilemma?

Escaping the Prisoners' Dilemma

"I won't confess if you don't but I will confess if you do"

- Is this a promise or a threat?
- If credible, what is its effect?

Warnings and Assurances

- Just stating what you will do without commitment is called a “warning” or “assurance”
- Warnings and assurances are effective for coordinating behavior when there are multiple Nash equilibria
  - To be effective, warnings or assurances must be *consistent with* one’s own incentives

Talk is Cheap

"Continental Airlines said yesterday that it would raise airfares on about two-thirds of its routes … to take effect September 5."

- Reuters. "Continental Raising Fares," *The New York Times,* 29 August 1992.

"Continental Airlines has dropped its plan to raise domestic airfares by 5%."

- Carroll, Doug. "Airlines Delay Fare Increases," *USA Today*, 4 September 1992.

Slide courtesy of Mike Shor, Vanderbilt University.

Talk is Cheap …

Boeing Co. “announced it was building a plane with 600 to 800 seats, the biggest and most expensive airliner ever. Some in the industry suggest Boeing’s move is a bluff to preempt Airbus from going ahead with a similar plane.”

- Rothman, Andrea, and Dori Jones. “Boeing Launches a Stealth Attach on Airbus,” *Business Week*, 18 January 1993.

Slide courtesy of Mike Shor, Vanderbilt University.

… And Getting Cheaper

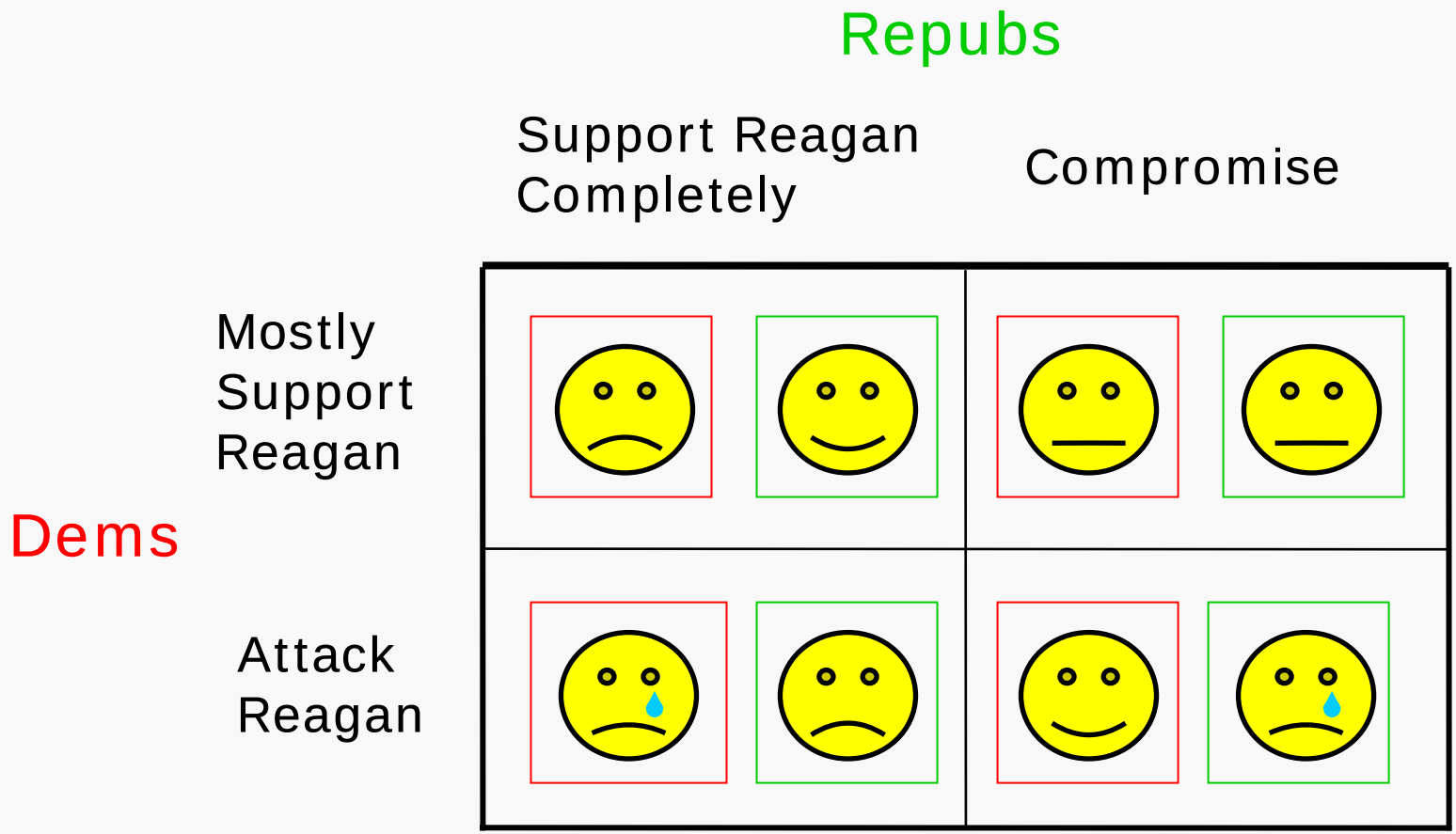
Airbus announces commercial launch of the A3XX, the largest civil aircraft ever.

"Boeing … has said that there is no market for such a large plane and has decided to modernize its trustworthy 747 family of planes rather than build its own megaseater."

- Seward, Deborah. "Airbus Announces Launch of A3XX Superjumbo Jet." *Associated Press,* 23 June 2000.

Slide courtesy of Mike Shor, Vanderbilt University.

Reagan Tax Plan



Senate vs. House

- Senate Dems hoped for compromise by not attacking Reagan … but Repubs didn’t yield
- Can House Dems do anything to get a better outcome?

In-Class Game Next Time

- Please prepare for “Dynamic Pricing Game” to be played next class
  - See handout