Session 4.1
Solving the Predator Game

This session shows how the game of predators described last week in extensive form can be solved in a straightforward way using the strategic form. Starting with the strategic form of the game, we use the principle of iterated dominance to eliminate dominated strategies.

Recalling the Strategy Space of the Players

- The enterprise has two strategies:
  1. Propose joint venture
  2. Steal foreign expertise

- The government has two strategies:
  1. Endorse partnership
  2. Seize assets

- The corporation has five strategies:
  1. Infiltrate and commit
  2. Infiltrate and withdraw
  3. Infiltrate and commit unless government seizes
  4. Infiltrate and withdraw unless government seizes
  5. Negotiate in good faith

Matrix Representation

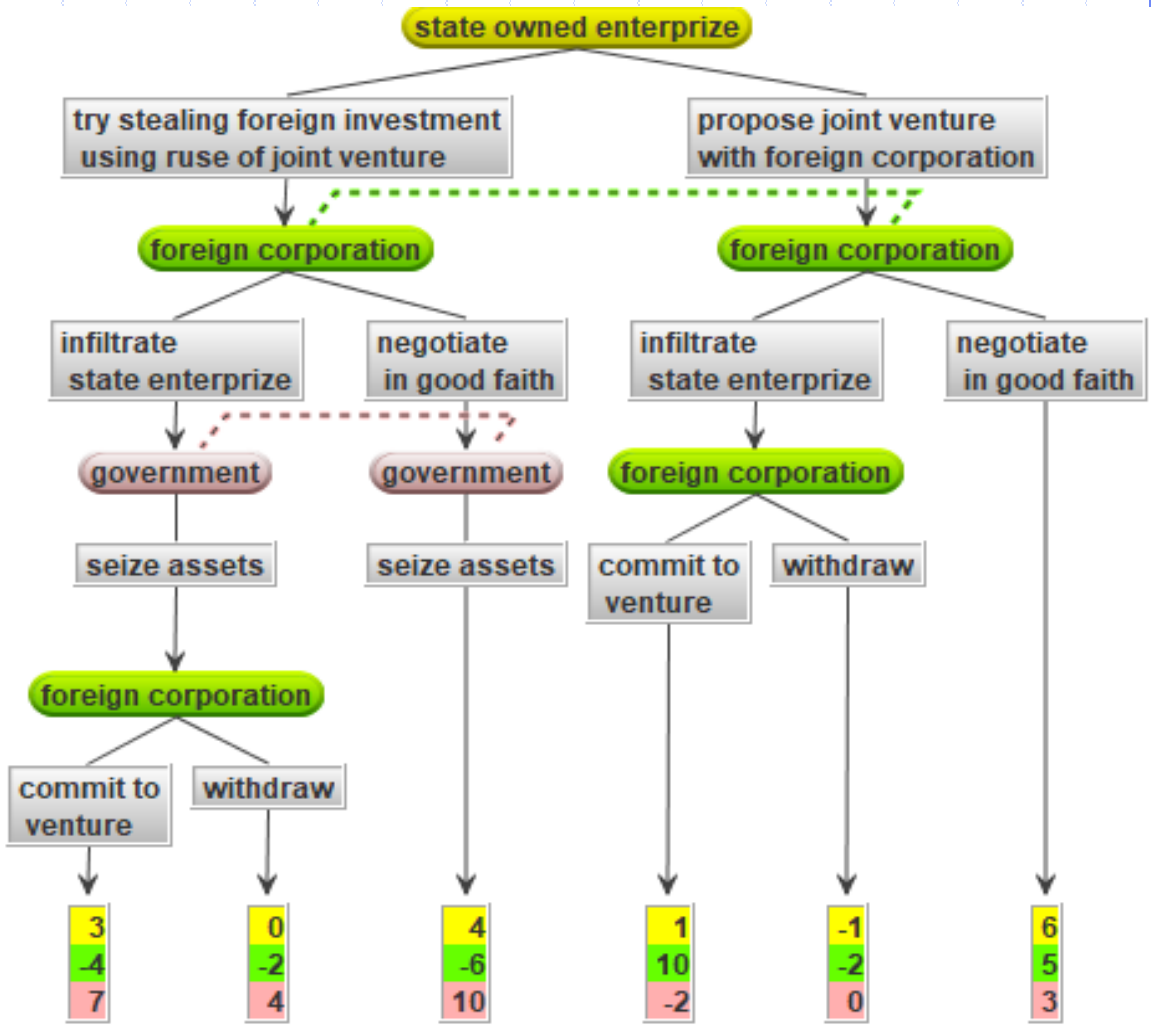
	try stealing foreign expertise using ruse of joint venture		propose joint venture with foreign corporation	
	endorse	seize	endorse	seize
infiltrate and commit	1: 2 / 3 / -2	2: 3 / 7 / -4	11: 1 / -2 / 10	12: 1 / -2 / 10
infiltrate and withdraw	3: -1 / 2 / -1	4: 0 / 4 / -2	13: -1 / 0 / -2	14: -1 / 0 / -2
infiltrate and commit unless government seizes	5: 2 / 3 / -2	6: 0 / 4 / -2	15: 1 / -2 / 10	16: 1 / -2 / 10
infiltrate and withdraw unless government seizes	7: -1 / 2 / -1	8: 3 / 7 / -4	17: -1 / 0 / -2	18: -1 / 0 / -2
negotiate in good faith	9: 9 / 5 / 1	10: 4 / 10 / -6	19: 6 / 3 / 5	20: 6 / 3 / 5

Government will seize assets if given the opportunity

A dominant strategy for the government in this game is to seize foreign assets when presented with the opportunity to do so.

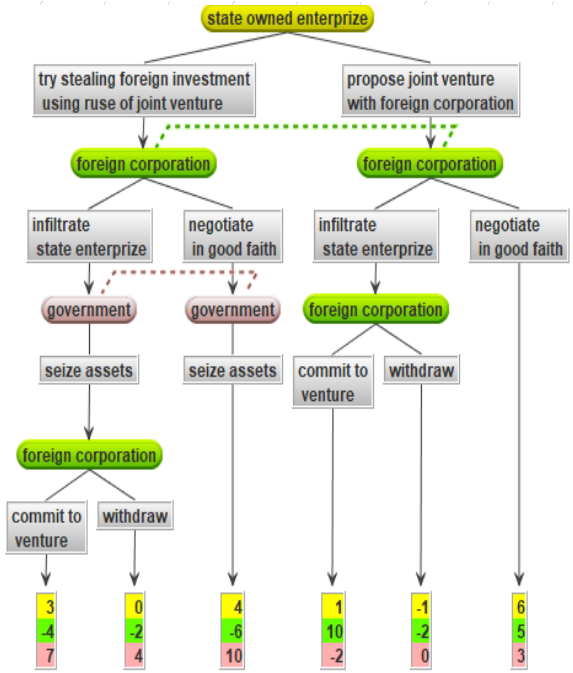
Reducing the predation game

- We now simplify the game by recognizing that the government will seize the assets if given the opportunity.
- The foreign corporation will withdraw from the venture if the government seizes its assets, but otherwise commit.



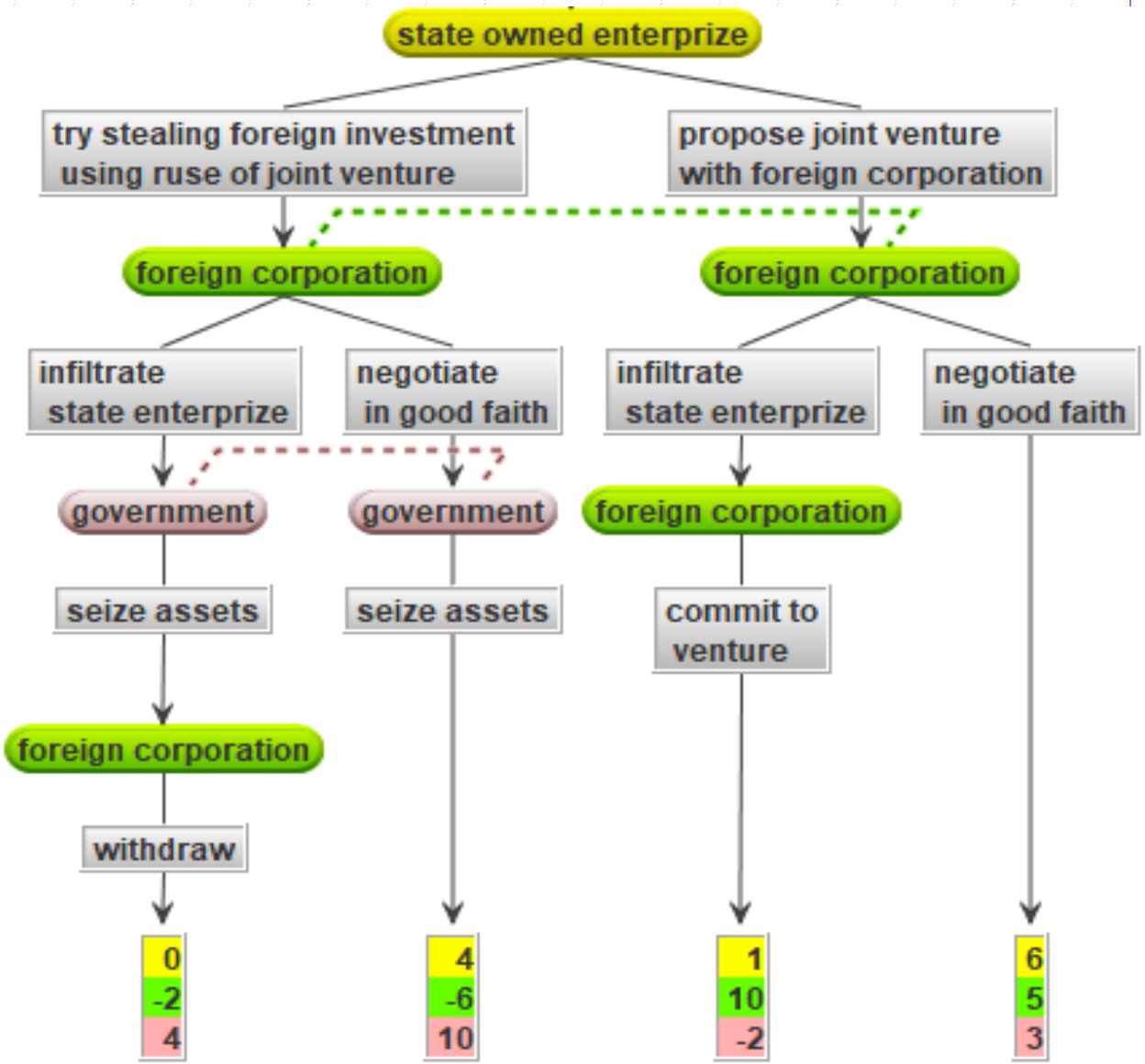
Eliminating some dominated strategies of the foreign corporation

- If the foreign corporation infiltrates, in its final moves it should:
  - commit if the government does not seize (since 10 > -2)
  - withdraw if the government seizes assets (because -2 < -4)
- This advice corresponds to eliminating three strategies:
  - #1 . . . Infiltrate and commit
  - #2 . . . Infiltrate and withdraw
  - #4 . . . Infiltrate and withdraw unless government seizes.
- These three strategies are dominated by strategy #3, which yields higher payoffs regardless of what the state owned enterprise does.



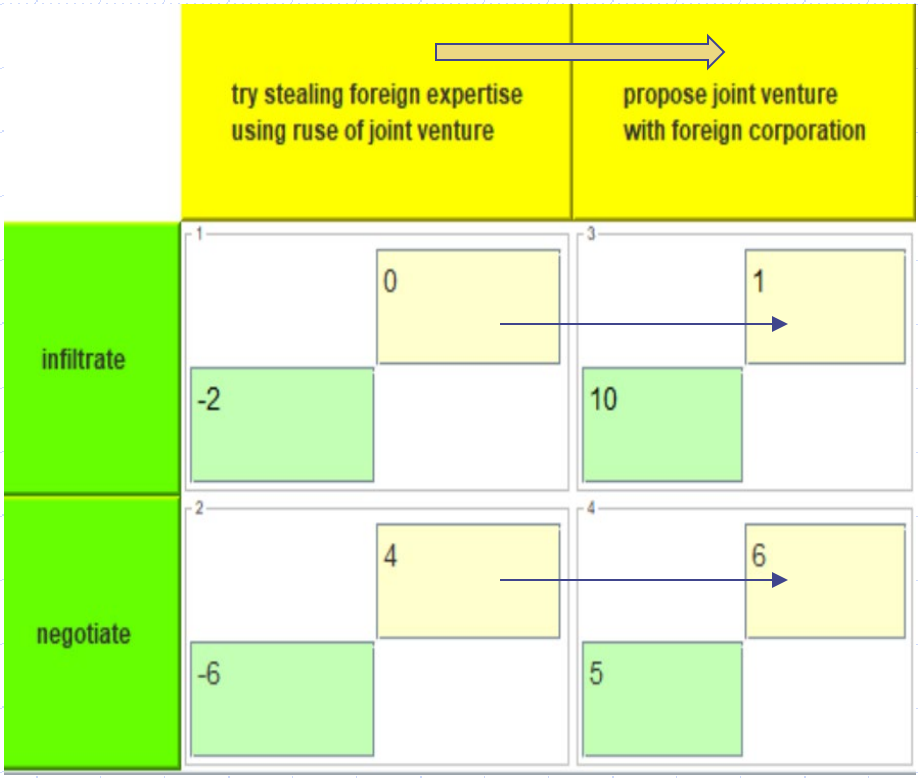
Further reducing the predator game

- Folding back the final decisions of the foreign investor yields a simultaneous move game.



The reduced game

- We have now:
  - solved for the government
  - eliminated three dominated strategies for the foreign investor
  - leaving a 2 player game, where each player has 2 strategies
  - which corresponds to a 2 player simultaneous move game, where both players make one of two moves.
- The state owned enterprise has a dominant strategy to propose a joint venture.
- The foreign corporation has a dominant strategy to infiltrate.



The reduced strategic form upon anticipating the government's choice

- There is a faster way of reaching this solution.
- We first reduce the strategic form by conditioning on the government's dominant strategy.
- There is a unique dominant strategy for green in this reduced game, the middle one.
- Thus yellow should move right.