P. 139-169: Game Theory and the Law ch. 6

Collective action, embedded games, and the limits of simple models

This chapter is about the question of how individual and social interests can diverge and the role that law can play in aligning them.

Collective action and the role of law

Almost all jobs have some kind of risk.

If one job pays 15$ an hour, and has a risk valued at 1$ an hour, a second job with the same skill requirement, but with risks of 11$ an hour, should pay a wage of 25$ an hour.

- But only known risks can be incorporated into these prices.

Embedded games

Many problems involving simultaneous decision-making are actually embedded in larger decision-making problems.

Prisoner's dilemma

		Player 2	
		Left	Right
Player 1	Up	2,2	3, 1.5
	Down	1.5, 3	2.5, 2.5

Coordination game

		Player 2	
		Left	Right
Player 1	Up	6, 1.5	0,0
	Down	0,0	1,3

This coordination game has two pure strategy Nash equilibria.

- Because of these multiple equilibria, we cannot predict the outcome of the coordination game.
- But even though a coordination game with multiple equilibria might not have a unique solution, it does have one when it is part of a larger game (embedded in a larger gamer).

Prisoner's dilemma

- The prisoner's dilemma is a paradox in decision analysis in which two individuals acting in their own self-interest pursue a course of action that does not result in the ideal outcome.
- The typical prisoner's dilemma is set up in such a way that both parties choose to protect themselves at the expense of the other participant.
- As a result of following a purely logical thought process, both participants find themselves in a worse state than if they had cooperated with each other in the decision-making process.

Personal interest seems more desirable, but it often leads to a worse result if two parties are both acting in self-interest.

- Granting security makes everyone jointly better off if the cost of obtaining a security interest is less than the total monitoring costs.

In case of a low-risk debtor, no creditor will want to monitor. And therefore no creditor will take a security interest.

The existence of secured credit may eliminate the common pool problem.
- When a secured creditor is in the picture, there are no assets for general creditors to grab.

		Creditor 2	
		Don't monitor	Monitor
Creditor 1	Don't monitor	50, 50	50, 42
	Monitor	45, 50	45, 42

Figure 6.7

Collective action and private information

When information is complete, it is possible to ensure that parties have incentives to act in a way that is in their joint interest.

It must be solved, how laws can be crafted to take account of the existence of private information.

Example:

- The government of a town with a population of 100 has to decide whether to spend $104,5 to improve landscaping in a park.
- The improvement will serve as a public good.
- Some residents value the new landscaping more than others, but how much a particular individual values it is private, nonverifiable information.
- The governments wants to spend the money on improvements, only if the residents as a group value the improvements at more than $104,5.
- It is assumed that each residents value of the improvements is either $2, $1, or $0.
    - Each residents valuation is independent to the others'.
- The easiest way to solve it would be to take a vote.
- If the project is approved, each resident will be charged $1.045 in taxes (cost of improvement divided by number of residents).
- Making a vote will not provide the government with sufficient information to make the effective decision.
    - Only those residents who value the improvements at $2 will vote in favour. Whereas those who value it at $1 or $0 will vote against it, hence the cost of $1.045 pr. Resident.
    - But by making this vote, the GOV learns how many residents value the improvements at $2.
        - To make a correct decision, the GOV also needs to know how many residents value it at $1.
            - Ideas on how to do this could be:

              1.
                - ~~If 30 people vote in favour of improvements, it's inferred that 30 people value the project at $2, making the landscape worth at least $60.~~

- Each employee receives a private signal about the level of safety associated with the 2 potential employers.
- Each employee knows that the other potential employees also receive the signal.
- The employees can observe each others actions.
- The signals are of equal strength and are independent of one another.
- If the private information suggests that Manufacturer is safer, an employee would alter the prior belief that Firm was a little safer.

- Now consider: 99 employees receive a signal that says that Manufacturer is safer than Firm - and the remaining one employee receives a signal that says that Firm is safer.
- What will their decision be?
    - We suppose that the single receiver (employee) (player 1) chooses first.
        - That person will choose Firm.
    - Now what will player 2's (the rest of the employees) decision be?
        - The signal saying that Manufacturer was strong enough to convince them to choose Manufacturer over Firm.
        - But player 1's choice has altered player 2's information.
    - Player 2 knows that player 1 would have chosen Manufacturer if player 1 had received a private signal favouring Manufacturer.
    - Instead player 1's choice means that player 1 received a private signal favouring Firm.
    - Player 2 infers player 1's information from player 1's choice.
    - Player 2 therefore has 2 signals in hand:
        1. Player 2's original signal favouring Manufacturer
        2. Player 1's signal favouring Firm.
            1. These two signals cancel each other out. And player 2 is left with his prior belief (before receiving any signals) that Firm is safer.
    - Player 2 therefore goes to Firm.
- Enter player 3.
    - Player 3 will know that players 1 and 2 have chosen Firm.
    - Player 3 also knows in what order the players have chosen - but does not know about the signals player 1 and 2 received.
    - This is consistent with 2 possibilities:
        0. Both players received a signal favouring Firm.
        1. Player 1 received a signal favouring Firm and player 2 received a Signal favouring manufacturer.
    - Player 3 can infer only that player 1 received a signal favouring Firm.
        - It can infer nothing about what player 2 learned.
    - Given this, the signal sent to player 2 is ignored and the one sent to player 1 is again sufficient to cancel out the signal sent to player 3.
    - Player 3 will also ignore the private signal favouring Manufacturer and will select Firm, as will any subsequent player.

The strategy space in this model is limited.

In this herd behavior model, those who make the first decisions ignore the effects if their decision on those who choose later.

- This result arises because the players act in sequence and subsequent players ignore the private information they receive.

- Garland must offer an amount that is at least as large as the value that the Peevyhouses attach to having the land restored.
    - If they offered anything less, the Peevyhouses would reject it.
    - If they offered more than $800.000, Garland has the wrong set of incentives.

If the value of the exit option is sufficiently low, the exit option itself does not affect the play of the game.

The Rubinstein Bargaining model sheds light on a crucial question:
- To what extent does an exit option affect the dynamics of bargaining itself?
    - If the value is known to both the counterpart and to the court, there is nothing to be gained from having a specific performance award.
    - If the value is known to the counterpart only (and not the court), there is at least a possibility that bargaining between the parties will lead to their settling on an amount that is in fact equal to the subjective value that the main part places on the deal.
    - When the value is private information, there is a possibility that bargaining will regularly break down and that the land will be restored even when it is in no one's interest.

Bargaining and Corporate Reorganizations

We can use the Rubinstein bargaining model with exit options to understand how different bankruptcy rules affect the rights of the parties.

An example

A Firm that is a good candidate for a successful reorganization made an effort to expand its operations and borrowed heavily fromCreditor in the process.
- However, Creditor took a security interest in all the assets of Firm = has priority to claim.

The effort to expand became a disaster. Even though the heart of Firm was basically sound, the amount it owed Creditor alone could exceed the value of Firm.
- Now Firm was worth more if it is kept intact as a going concern, but only if Managercontinues to run it.
- Firm is worth much less without Manager (and his knowhow etc.)

Bankruptcy law creates a bargaining environment in which Creditor and Manager negotiate with each other.
- At the time of the loan, Creditor and Manager can anticipate the bargaining environment in which they will find themselves in the even that Firm needs to be reorganized.
    - If Creditor can predict that is is likely to receive a small share in the even of a reorganization, it will demand a correspondingly high interest rate at the time of the initial loan.
        - And Firm will be more likely to default if it must pay a higher rate of interest to Creditor.

If there are social costs associated with default, giving a smaller share of Firm to Creditor in the even of a reorganization may cause welfare losses.

When a bankruptcy petition is filed, an automatic stay goes into effect.
- Such stay prevents any creditor from exercising rights against the debtor on default.
- While such stay is in effect, the creditors and the old equity-holders try to agree upon a plan of reorganization.
- Creditor has no right to any of the assets if Firm has value as a going concern.

Regarding the Rubinstein Bargaining Model: