1 Property Rights and the Rule of Law

• When we analyzed market outcomes, we took for granted the presence of the rule of law
  – The presence of the rule of law means that laws are generally enforced in the economy
  – Within the general body of law in a given country (that would protect human rights, for example), we are especially concerned with the enforcement of property rights or the rights to ownership
  – These are especially important for the well functioning of markets: their functioning may be severely impaired in the absence of the rule of law

• The rule of law also has consequences for the behavior of governments:
  – Governments have a legal monopoly on coercion
  – Without the rule of law, governments can use this monopoly in intrusive and harmful ways
1.1 Benefits of the Rule of Law

- The principles of the rule of law specify rights of ownership of possessions and property, as well as basic human rights
  - These include the right to be free of coerced subservience to others, the right not to be kidnapped and enslaved or raped, and the right to life itself
  - Under anarchy without the rule of law, the strong can prevail over the weak and neither possessions nor life itself are safe

- The rule of law includes requisites for a civil society such as provisions for the enforcement of contracts or the resolution of disputes
  - A bankruptcy code protects rights of debtors and creditors
  - And so on...

- The rule of law is not the same as the rule of government
  - When there is no rule of law, there can be (an arbitrary) rule of government
  - Without the protection of the rule of law, an arbitrary rule of people who control the government can subvert the “law”
  - The “law” then becomes a means of appropriation and repression rather than a means of ensuring basic individual rights
Private Property Rights and Markets

- The rule of law certifies (or confirms) and protects private property rights
  - A nomadic hunter-gatherer population roaming where land is plentiful would not require property rights to land (but the rule of law would still be required to protect other basic rights)
  - When competition for natural resources becomes intense – by animals in the wild or from other groups searching for food for livestock – property rights to grazing land become valuable
  - Similarly, property rights are valuable when crops are planted or houses are built, or when other types of output require effort and can be physically appropriated by others

- Certified and protected property rights allow the different types of markets to exist and function correctly
  - In product and asset markets, the rule of law ensures that sellers exercise their right to sell and that buyers gain ownership once transactions are completed
  - In labor markets, people know they have the right to the value of their contribution to output
  - Asset markets mobilize resources for investment and allow for risk diversification
  - Without the rule of law, there is no assurance that returns to an investment will belong to the investors and thus the incentive to undertake risk is greatly diminished
Without the rule of law, property is not well defined and exchange of assets is not possible

Further, assets cannot be used as collateral for other transactions (such as loans)

Similarly, ownership of, say, a company, cannot be shared among different people through the issuance of stock

- The benefits of the market that we studied before are based on the prevalence of rule of law

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**Property Rights and the Avoidance of Anarchy**

- If the absence of markets, people could still be self-sufficient and not trade
  - However, without the rule of law, there is anarchy
  - Under anarchy, the right of natural possession is not protected and people’s possessions become contestable by force
  - Appropriation, extortion and theft are means of acquiring the property of others
  - Without the rule of law, a person can only have as much property as s/he can successfully secure
• The activities of appropriation, extortion, theft and defense use resources and time in socially wasteful ways
  – These resources could be used productively to add to society’s output rather than in attempts to appropriate and defend possessions that already exist
  – When the rule of law protects private property, people can use their time and effort in productive ways

• It is important to notice that enforcing the rule of law also uses resources
  – However, the government – or alternatively a centralized entity – might be more efficient in its provision than individual agents seeking private defense without coordination

Efficiency and Social Justice

• The rule of law allows a society to obtain the benefits of efficiency in two ways:
  1. The rule of law allows markets to exist (or to function better)
     Without markets, the rule of law is still beneficial:
  2. It provides incentives to the productive use of resources rather than to appropriative activities (and, consequently, to defensive ones)

• The rule of law is also the basis for social justice:
  – It protects the natural right of possession and also people’s lives
Anarchy and the Prisoner’s Dilemma

• A situation known as “the prisoner’s dilemma” provides a way of describing the social loss from appropriation when the rule of law does not protect property rights

• We consider two identical people under anarchy (without the rule of law)
  – We view these two people as representing society as a whole (and results apply to larger populations)

• The benefits/payoffs to each player depend on the actions of the other
  – Each person has to decide whether to use time and resources productively or whether to steal from the other player

• In the absence of the rule of law, private ownership is not certified by the judicial system
  – Thus, it could be argued that “stealing” is not strictly illegal
  – Nonetheless, there is a conception of natural rights of possession, especially associated with things that were produced with effort
  – For example, if people cleared a field and planted a crop – and the field did not belong to other people – then it would be natural for those who worked on the field to claim possession of the crop
  – This is so since the crop would not have existed without their work
  – Theft in anarchy could then be defined as taking from other people what would belong to them by the natural right of possession
The payoffs from the interaction of the two people are described in table 1.1, reproduced below

Table 1.1. **The Prisoner’s Dilemma Without the Rule of Law**

<table>
<thead>
<tr>
<th>Person 2 only produces</th>
<th>Person 2 uses resources to steal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person 1 only produces</td>
<td>3, 3</td>
</tr>
<tr>
<td>Person 1 uses resources to steal</td>
<td>4, 1</td>
</tr>
</tbody>
</table>

- Table 1.1 shows the four possible outcomes of the two person’s decisions
- Each person can choose to either be exclusively productive or to use some resources to steal

- No resources are used on defense; it could be that it is not efficient to do so (say because one would have to use more than one unit of output to defend one unit of output)
  - Defense could be incorporated without loss of generality
  - As a consequence of the lack of defense, stealing always yields a benefit

- The first entry of each cell indicates the benefit (or payoff) to person 1 from the combination of actions that corresponds to that cell, denoted $B_1$
  - The second entry represents the benefit for player 2, $B_2$
  - These numbers also reflect rankings: higher payoffs indicate more preferred personal outcomes
  - Since the two people represent society, the sum of their individual benefits is the total benefit to society: $W = B_1 + B_2$
  - An outcome is efficient when the sum of the benefits to the two people is maximized
When both persons use their resources productively, each gets personal benefits of 3

- When both use resources to steal, they each get 2
- The outcomes (3, 3) and (2, 2), on the diagonal of the payoff matrix, are symmetrical:
  - Both people are identical and, when both do the same action, they have the same payoff
  - Off the diagonal, players are taking different actions
  - Payoffs are asymmetrical there
  - In these two cases, the person who steals has a payoff of 4 and the person who produces exclusively has a payoff of 1

The highest payoff of 4 is obtained by the robber when s/he steals and the other player does not

- The lowest is attained by the person who does not steal when the other player does
- The person who steals gets one unit of output from the other player
- Stealing causes an aggregate loss of output of unity: the player who does not steal loses two units of output but the player stealing only gains one
- This happens because those who steal use resources in order to do so and possibly also because output gets destroyed in the process
- Stealing does not simply lead to a redistribution of output, it causes output to be lost
• An outcome is efficient when the total benefit $W$ is maximized
  
  – The outcome when both players use all their resources productively and no resources are wasted stealing achieves this goal
  
  – Total benefit $W$ is $3 + 3 = 6$ in this case, which is the largest possible total benefit

• The next best outcome is $(4, 1)$ or $(1, 4)$, when only one player steals
  
  – Total benefit for society is $1 + 4 = 5$
  
  – The worst outcome is $(2, 2)$, with total benefit of 4

• The question we consider next is whether or not the independent voluntary decisions of players achieve the efficient outcome of the game

The Equilibrium Outcome

• Table 1.1. describes a game in which people strategically interact with each other, with the outcome for one person depending on his own action but also on the other player’s action
  
  – The game is described by the set of players, their action space and payoffs
  
  – The action space contains two actions, {only produce, use resources to steal}
  
  – Both players have full information about the actions available to both players as well as to the resulting benefits
  
  – That is, both players know their own action space and their opponent’s as well as the associated payoff matrix
  
  – They know everything about the game’s “rules” and payoffs, know that the other players know it also, know that that they know that they know, ...
• A strategy is a choice of probabilities over the action space
  
  – In a pure-strategy equilibrium, a strategy is a single action: that is, the probability profile assigns probability 1 to one action
  
  – We will use the terms “strategy,” “decision,” and “action” to mean the same thing in a pure-strategy equilibrium
  
• Players choose an action/strategy from the set of possible actions at their disposal
  
  – Each person independently decides on their strategy based on self-interest
  
  – There is no cooperation or coordination in decision-making

• We will use the concept of Nash Equilibrium – after John Nash – as our equilibrium concept
  
  – In a Nash equilibrium, no player can gain by changing his or her decision given the decisions that others have made

• Our game has a unique Nash equilibrium with payoffs (2, 2)
  
  – In equilibrium, both players choose to use resources to steal
  
  – When at (2, 2), both players cannot improve upon their payoff by choosing a different action given what the other player is doing
  
  – A change of mind of either player to “only produce,” given that the other player is “using resources to steal,” would reduce their payoff from 2 to 1
• The efficient outcome (3, 3) where neither player is using resources to steal is not a Nash equilibrium
  – Given that the other person is not stealing, each player could improve their payoff from 3 to 4 by using resources to steal
  – Thus, the outcome (only produce, only produce) is not a Nash-equilibrium

Dominant Strategies
• In the game under consideration, each player has a dominant strategy (or decision)
  – A dominant strategy exists when the best course of action for a player is independent of what the other players are doing
  – That is, it is best to play the dominant strategy regardless of the other players’ action
• Here, the dominant strategy is to steal, which we can confirm by examining the matrix of payoffs
  – Let us consider the choice of action of person 1
  – If person 2 decides not to use resources to steal and thus plays “produce only,” person 1 has a payoff of 3 by choosing the same action and one of 4 by choosing to “use resources to steal”
  – It is of course better to “use resources to steal”
• If player 2 plays “use resources to steal,” player 1 will get payoff of 1 by playing “produce only” and a payoff of 2 by choosing to “use resources to steal”
  – Again, it is better to “use resources to steal”

• Therefore, no matter what player 2 does, the best course of action for player 1 is to play “use resources to steal”
  – Since player 2 is identical, the best decision for player 1 is also the best decision for player 2
  – Both players thus have the same dominant strategy “use resources to steal”

Promises and Credibility
• Suppose that the two people agree to move to the best social outcome simply by promising not to steal from one another
  – A promise is only credible if people gain from following through with their promises
  – However, we have seen that each individual would have an incentive to deviate from “produce only” and play “use resources to steal” instead
  – Put differently, the outcome (produce only, produce only) is not a Nash-equilibrium
  – Since keeping a promise is not in the best interest of either player and since there is no rule of law to enforce promises, neither player will believe the other’s promise
  – With promises not credible, the unique equilibrium of the game remains the Nash-equilibrium where decisions are made independently and noncooperatively
The Inefficiency of Independent Self-Interested Decisions

- Since both players have a dominant strategy of “use resources to steal”, this is what they do
  - Society finds itself at the worst possible outcome where total benefit is the smallest, $2 + 2 = 4$
  - Further, the Nash-equilibrium outcome, (use resources to steal, use resources to steal) is clearly Pareto inefficient:
  - Both players would be strictly better off if they chose to “produce only”
  - It is clearly in the best interest of these two people to find a way to move toward the more efficient outcome where neither steals

- In a competitive market equilibrium, efficiency is achieved through independent and self-interested decisions
  - In the circumstances of the prisoner’s dilemma, people are also making independent and self-interested decisions
  - The outcome, however, is the inefficient Nash-equilibrium

- We conclude that, in anarchy and without the rule of law, the invisible hand is no longer effective in guiding self-interested decisions to efficient outcomes
Repeated Interactions in Small and Large Populations

- We have examined a single encounter between the two players
  - Would they choose to cooperate if they met each other in repeated interactions?
  - The advantage from achieving the higher payoff of 3 (instead of 2) would be magnified from repeated play
  - If they could develop a reputation for cooperating, so that the other player would believe they are cooperating, then both could decide not to steal and the outcome would be \((3, 3)\)
  - The prisoner’s dilemma could be solved if the two people could trust the other to honor the promise of not stealing

- We will later come back to a case of repeated interactions
  - For now, it is important to notice that, as long as the number of interactions is finite and known with certainty (for example, there will be 10 repetitions of the single stage game), no cooperation is possible

- To see this, consider the two players at stage 10
  - Since there will be no future repetition of the game, there is no value to cooperation then
  - They both play their single-stage dominant strategy “use resources to steal”
  - Take a step back and examine what happens at stage 9
  - Since there is no value in cooperating in stage 10, there is also “no future” in stage 9 worth cooperating for
  - Both players again play the dominant strategy
  - And so on until stage 1
• If interactions are finite and their number known in advance, both players will always play the single-stage dominant strategy
  
  – However, if the number of interactions is uncertain (there will be another repetition with some probability $\beta \in (0, 1)$, for example) or if it is expected to go on forever, then cooperation could be achieved
  
  – For players to choose “produce only,” however, some conditions must be met
    
    – It must be the case that the probability of continuation is large
    
    – They must also value the future enough (so they are willing to forego the current gain from deviating in order to achieve the benefits from cooperation over time)

• Cooperation is less likely to succeed in large populations, however
  
  – If two people know each other, personal reputation for cooperation is valuable when they play the game
  
  – In large populations where people do not know each other, reputation has no value since players do not know the reputation of their opponent
  
  – There is no point in cooperating then

• Lab experiments with the prisoner’s dilemma show, however, that people often cooperate even under finite repetitions of the game
  
  – In cooperating, people attribute empathy to the other player, rather than strict rationality
  
  – They find it “natural” to cooperate, perhaps responding to an instinct like the one that made people share food in the hunter-gatherer environments
• Sometimes people cooperate in order to behave expressively (they are making a statement about themselves)
  
  – They obtain utility from the confirmation of their identity as pleasant and cooperative individuals
  
  – Here – as in the case where cooperation is natural – however, the payoffs are no longer those of the prisoner’s dilemma

The Personal Benefit from External Enforcement

• We have seen that, under anarchy, cooperation is generally not possible
  
  – The efficient outcome could be attained by imposing the rule of law
  
  – Imposing the rule of law requires external enforcement to ensure people do not steal (since we saw it was to their advantage to do so)
  
  – The enforcement of the rule of law is usually provided in a centralized manner: one central authority provides protection from crimes against property
  
  – It is generally provided by the government (though it need not be the case, a private company could do so as well) as governments have a monopoly on coercion
• By using the legal right of coercion to apply the rule of law, governments can ensure that the efficient outcome will prevail:
  – All resources will be used productively except, of course, for the costs of imposing the rule of law

• If these costs are lower than the efficiency loss from not imposing the rule of law, we seemingly have a paradox:
  – Society would be better off under coercion and, indeed, people would prefer to be coerced
  – They would prefer that some of their actions were effectively deterred
    – though they could choose themselves not to execute those actions

• The government could introduce a legal penalty for stealing, for example
  – Table 1.2 shows the new payoffs of the game once deterrence through the rule of law is taken into account

  **Table 1.2. A Penalty for Stealing**

<table>
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</tr>
<tr>
<td>2, 1</td>
<td></td>
<td>0, 0</td>
</tr>
</tbody>
</table>

• A penalty of 2 is set as punishment for theft
• The penalty is subtracted from a player’s payoff whenever s/he has made a decision to steal
  – The penalty changes the dominant strategy of the game which is now not to steal (“produce only”) – verify
  – Since both players are symmetrical, this is again true for both
  – Thus, under punishment, the equilibrium of the game becomes the efficient outcome for society (“produce only”, “produce only”)

• Note that no punishment is ever necessary since both players choose not to steal
  – The rule of law does not punish in this case but instead rationally deters
  – People choose not to steal in the knowledge that, if they did, they would incur a penalty

• Incentives are changed and deterrence provided only if the threat of punishment is credible
  – Credibility requires an effective ability to carry out punishment if required
  – Therefore, the means to carry out punishment must exist (for example, if punishment is a jail sentence, the jail must exist)
  – Consequently, resources must be expended to make the threat of punishment credible
  – Credible punishment is therefore not free: public spending on the police force, courts, jails, and so on must be carried out
• Rather than having the government protect property rights, individuals could take up protective measures on their own
  
  – That is, people could use resources for defending their property
  
  – However, centralized action by the government is usually more efficient
  
  – The government takes into account the effects of defense on every individual in the economy, whereas individuals only care about the safety of their property
  
  – In making their property more secure, individuals do not take into account the deterrent effect they have on predatory activities: they generally spend less on safety than the efficient amount
  
  – By acting in a centralized fashion, the government takes into account the impact of deterrence on the incentives to steal

• Another reason to prefer public provision of property protection is that private defensive activities depend on individual ability to pay for defense
  
  – It violates the principle of the rule of law that everyone should be equal before the law
  
  – Thus the protection of property rights through private defense is more similar to anarchy than to the rule of law