The Origins of the Modern State
Max Weber: The state “is a human community that (successfully) claims the monopoly of the legitimate use of physical force within a given territory.”
A state is an entity that uses coercion and the threat of force to rule in a given territory.
A **nation** is a group of people who share some sort of common identity like a language, a religion, an ethnicity, or a shared history.

A **nation-state** is a state in which a single nation predominates and the legal, social, demographic, and geographic boundaries of the state are connected in important ways to that nation.
A failed state is a state-like entity that cannot coerce and is unable to successfully control the inhabitants in a given territory.
In reality, there is a continuum of ‘stateness’ or state effectiveness.

Samuel Huntington: “the most important political distinction among countries concerns not their form of government but their degree of government.”
Contractarian View of the State

Early modern political thinkers engaged in thought experiments to think about the role of the state.

What would life be like without a state?
The state of nature is the term used to describe situations in which there is no state.
Hobbes: The state of nature is a “war of everyone against every man” in which life is “solitary, poor, nasty, brutish, and short.”
Individuals in the state of nature face a dilemma.

• Everyone would be better off if they could all agree not to take advantage of each other.

• But if an act of violence or theft were to happen, it would be better to be the attacker than the victim.
Claim: Without a “common power to keep them all in awe,” the people will choose to steal and kill.
Social contract theorists argue that there is something structural about the state of nature that makes it difficult for citizens to behave themselves.
Game theory can shed light on the structural aspects of the state of nature that might lead to problems.

- A stylized interaction between two individuals who can steal or refrain from stealing.
What is Hobbes really saying here? In this stylized interaction, both individuals have essentially two actions that they can take: they can choose to "steal" or they can choose to "refrain" from stealing. If an individual refrains from stealing, then he is essentially choosing to earn a living by doing something productive rather than by stealing. What should the individuals do? The choice facing each individual is complicated because one individual's choice of what to do depends on what he thinks the other individual will do. As we saw in the last chapter, game theory is an extremely useful tool for analyzing these types of strategic situations. We can think of this interaction between two people in the state of nature as a game. In the previous chapter, we used an extensive form game to examine how individuals respond to negative changes in their environment. In this chapter, we are going to use a normal, or strategic, form game to examine how individuals might behave in the state of nature. Recall that an extensive form game employs a game tree that allows us to see what happens when the players take turns to make decisions; that is, there is a specific sequence of play as illustrated by the branches and choice nodes in the game tree. In contrast, a normal, or strategic, form game employs a payoff table or payoff matrix that allows us to see what happens when the players make decisions at the same time; that is, decisions are made simultaneously in normal form games rather than sequentially.

Figure 4.1 illustrates the "empty" payoff table of the normal form game that captures our stylized interaction between two individuals, whom we'll call A and B, in the Hobbesian state.

10. To the extent that steal presupposes the concept of property, this choice in the state of nature is slightly inaccurate. This is because Hobbes explicitly denies that the concept of property can exist in the state of nature. A more accurate term, then, might be dispossess.

A payoff table represents the strategies and payoffs available to players in a strategic or normal form game.
A preference ordering indicates how a player ranks the possible outcomes of a game.

**Individual A**

- (Steal; Refrain) > (Refrain; Refrain) > (Steal; Steal) > (Refrain; Steal)

**Individual B**

- (Refrain; Steal) > (Refrain; Refrain) > (Steal; Steal) > (Steal; Refrain)
Numbers – ordinal payoffs – can be assigned to represent the preference orderings.

- Given four possible outcomes, one could use 4, 3, 2, and 1.

**Ordinal payoffs** allow us to know how a player ranks the possible outcomes.
Individual A

- (Steal; Refrain) > (Refrain; Refrain) > (Steal; Steal) > (Refrain; Steal)

  4  3  2  1

Individual B

- (Refrain; Steal) > (Refrain; Refrain) > (Steal; Steal) > (Steal; Refrain)

  4  3  2  1
We can now add these payoffs to the normal form game shown in Figure 4.1. The new game is shown in Figure 4.2. Player A's (the row player's) payoffs are shown first in each cell; player B's (the column player's) payoffs are shown second. A comma separates the payoffs for the players in each cell. Thus, player A receives a payoff of 1 if he refrains and player B steals; player B receives a payoff of 4 in this situation. Player A receives a payoff of 4 if he steals and player B refrains; player B receives a payoff of 1 in this situation. Each player receives a payoff of 3 if they both refrain, and they each receive a payoff of 2 if they both steal.

Solving the State of Nature Game

Now that we know the players, the choices available to them, and how they value each possible outcome, we are ready to solve the State of Nature Game.12 In the previous chapter, we saw that political scientists solve extensive form games, like the Exit, Voice, and Loyalty Game, for something called a subgame perfect equilibrium (SPE). When it comes to strategic, or normal, form games like the State of Nature Game, though, political scientists solve them for something called a Nash equilibrium (NE). A Nash equilibrium is a combination of strategies, one for each player, such that each player in the game would not want to

---

12. We refer to this game as a State of Nature Game because of the topic under discussion. As we note later in the chapter (pp. 122–125), however, games with this same payoff structure are more familiarly known as Prisoner's Dilemma games. Prisoner's Dilemma games are used widely in political science to examine a whole host of phenomena, ranging from arms races and democratic transitions to resource exploitation and international cooperation. They are also commonly used in other disciplines such as biology, economics, and sociology.
What would a rational decision maker do?
What would a rational decision maker do?

A strategy specifies the choices that are made by a player at every point in a game where that player has a choice to make.

A Nash equilibrium is a combination of strategies, one for each player, such that each player in the game does not want to unilaterally change her strategy given the strategy adopted by the other player.
We can find Nash equilibria by looking for each player’s best replies.

A player’s best replies indicate the choices that are ‘best’ for each of the possible choices that the other player might make.

If both players are doing the best they can given the strategy adopted by the other player, then neither player wants to unilaterally change their strategy – we have a Nash equilibrium.
Put yourself in the shoes of individual $A$.

1. What is your best reply if individual $B$ chooses to refrain?

2. What is your best reply if individual $B$ chooses to steal?
We have now identified the best replies for player $A$ to any choice made by player $B$.

Now let’s identify the best replies for player $B$. What is player $B$’s best reply if player $A$ refrains? We are now just looking at the top row of the payoff table where player $A$ refrains.

If player $B$ refrains, she will get a payoff of 3, and if she steals, she will get a payoff of 4 (recall that we are now looking at the second number in each cell, because we are trying to identify player $A$’s best replies are underlined.

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrain</td>
<td>3, 3</td>
</tr>
<tr>
<td>Steal</td>
<td>4, 1</td>
</tr>
</tbody>
</table>

Solving the State of Nature Game II

Steal is the best reply if individual $B$ refrains.
Steal is the best reply if individual $B$ steals.
Now put yourself in the shoes of individual $B$.

1. What is your best reply if individual $A$ chooses to refrain?

2. What is your best reply if individual $A$ chooses to steal?
**Figure 4.5** Solving the State of Nature Game III

<table>
<thead>
<tr>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Refrain</td>
<td>3, 3</td>
</tr>
<tr>
<td>Steal</td>
<td>4, 1</td>
</tr>
</tbody>
</table>

Steal is the best reply if individual A refrains.
say that both players have a dominant strategy—in this case their dominant strategy is to steal. The row player in a strategic form game has a dominant strategy whenever his best replies (underlined payoffs) are all in the same row and the column player has a dominant strategy whenever her best replies (circled payoffs) are all in the same column. Because both players in the State of Nature Game have dominant strategies, we have what is known as a dominant-strategy Nash equilibrium. The bottom line is that the expected outcome from our State of Nature Game is that refraining will be unlikely and that theft will be endemic.15

This is precisely why Hobbes described life in the state of nature as a “war of every man against every man” in which life was “solitary, poor, nasty, brutish, and short.”

Keep in mind that we have simplified the state of nature quite considerably here in order to isolate only the most important aspects of the environment in which player A and player B find themselves. For example, it is hard to imagine a world in which theft and mutual predation are constantly occurring. In the real world, even the weak are able to fend off attack some of the time. When both actors are equal in strength, attacks will be successful only in moments of temporary vulnerability. Nevertheless, in the absence of someone to keep the actors in a permanent state of “awe,” attacks will come when the opportunity arises. As a

15. This is the expected outcome when the State of Nature Game is played once. But what do you think happens if player A and player B get to play the game over and over again? Do you think things change? To find out, you’ll have to look at Box 4.1, “Can Cooperation Occur without the State?” at the end of the chapter (pp. 140–144).

Steal is the best reply if individual A steals.
say that both players have a dominant strategy—in this case their dominant strategy is to steal. The row player in a strategic form game has a dominant strategy whenever his best replies (underlined payoffs) are all in the same row and the column player has a dominant strategy whenever her best replies (circled payoffs) are all in the same column. Because both players in the State of Nature Game have dominant strategies, we have what is known as a dominant-strategy Nash equilibrium. The bottom line is that the expected outcome from our State of Nature Game is that refraining will be unlikely and that theft will be endemic.15

This is precisely why Hobbes described life in the state of nature as a “war of every man against every man” in which life was “solitary, poor, nasty, brutish, and short.”

Keep in mind that we have simplified the state of nature quite considerably here in order to isolate only the most important aspects of the environment in which player A and player B find themselves. For example, it is hard to imagine a world in which theft and mutual predation are constantly occurring. In the real world, even the weak are able to fend off attack some of the time. When both actors are equal in strength, attacks will be successful only in moments of temporary vulnerability. Nevertheless, in the absence of someone to keep the actors in a permanent state of “awe,” attacks will come when the opportunity arises. As a

15. This is the expected outcome when the State of Nature Game is played once. But what do you think happens if player A and player B get to play the game over and over again? Do you think things change? To find out, you’ll have to look at Box 4.1, “Can Cooperation Occur without the State?” at the end of the chapter (pp. 140–144).

**Figure 4.6  Solving the State of Nature Game IV**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrain</td>
<td>3, 3</td>
</tr>
<tr>
<td>Steal</td>
<td>4, 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrain</td>
</tr>
<tr>
<td>Steal</td>
</tr>
</tbody>
</table>

The Nash equilibrium is where both players are playing best replies.
say that both players have a dominant strategy—in this case their dominant strategy is to steal. The row player in a strategic form game has a dominant strategy whenever his best replies (underlined payoffs) are all in the same row and the column player has a dominant strategy whenever her best replies (circled payoffs) are all in the same column. Because both players in the State of Nature Game have dominant strategies, we have what is known as a dominant-strategy Nash equilibrium. The bottom line is that the expected outcome from our State of Nature Game is that refraining will be unlikely and that theft will be endemic.15

This is precisely why Hobbes described life in the state of nature as a “war of every man against every man” in which life was “solitary, poor, nasty, brutish, and short.”

Keep in mind that we have simplified the state of nature quite considerably here in order to isolate only the most important aspects of the environment in which player A and player B find themselves. For example, it is hard to imagine a world in which theft and mutual predation are constantly occurring. In the real world, even the weak are able to fend off attack some of the time. When both actors are equal in strength, attacks will be successful only in moments of temporary vulnerability. Nevertheless, in the absence of someone to keep the actors in a permanent state of “awe,” attacks will come when the opportunity arises.

---

**Figure 4.6 Solving the State of Nature Game IV**

<table>
<thead>
<tr>
<th></th>
<th>Refrain</th>
<th>Steal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrain</td>
<td>3, 3</td>
<td>1, 4</td>
</tr>
<tr>
<td>Steal</td>
<td>4, 1</td>
<td>2, 2</td>
</tr>
</tbody>
</table>

Nash equilibrium: (Steal; Steal)

Observed outcome: Both individuals steal.

Payoffs: Individual A obtains 2 and individual B obtains 2.
A player has a **dominant strategy** if that strategy is a best reply to all of the other player’s strategies.

A **dominant-strategy Nash equilibrium** occurs when both players have a dominant strategy.
A player has a **dominant strategy** if that strategy is a best reply to all of the other player’s strategies.

A **dominant-strategy Nash equilibrium** occurs when both players have a dominant strategy.

Is the Nash equilibrium (Steal; Steal) a **dominant-strategy** Nash equilibrium?
Both players have a dominant strategy to steal.
(Steal; Steal) is a dominant-strategy Nash equilibrium.
Individuals will live in a persistent state of fear when there is nobody to keep them in a state of “awe.”

The state of nature may seem abstract but . . .

- Iraq under U.S. occupation, Darfur region in Sudan, New Orleans after Hurricane Katrina.

Nobel Laureate Robert Fogle argues that Hobbes’ state of nature describes most of human history.
say that both players have a dominant strategy—in this case their dominant strategy is to steal. The row player in a strategic form game has a dominant strategy whenever his best replies (underlined payoffs) are all in the same row and the column player has a dominant strategy whenever her best replies (circled payoffs) are all in the same column. Because both players in the State of Nature Game have dominant strategies, we have what is known as a dominant-strategy Nash equilibrium. The bottom line is that the expected outcome from our State of Nature Game is that refraining will be unlikely and that theft will be endemic.15

This is precisely why Hobbes described life in the state of nature as a “war of every man against every man” in which life was “solitary, poor, nasty, brutish, and short.”

Keep in mind that we have simplified the state of nature quite considerably here in order to isolate only the most important aspects of the environment in which player A and player B find themselves. For example, it is hard to imagine a world in which theft and mutual predation are constantly occurring. In the real world, even the weak are able to fend off attack some of the time. When both actors are equal in strength, attacks will be successful only in moments of temporary vulnerability. Nevertheless, in the absence of someone to keep the actors in a permanent state of “awe,” attacks will come when the opportunity arises. As a 15. This is the expected outcome when the State of Nature Game is played once. But what do you think happens if player A and player B get to play the game over and over again? Do you think things change? To find out, you’ll have to look at Box 4.1, “Can Cooperation Occur without the State?” at the end of the chapter (pp. 140–144).

**Figure 4.6** Solving the State of Nature Game IV

![Game Table](image)

What’s weird about this equilibrium?
Both players could do better if they refrained.
Individual rationality leads to an outcome that is inferior in the sense that *both* players agree that some alternative outcome is better.

It’s not enough for the actors to recognize their mutually destructive behavior.

How comforted would you feel if the other individual promised, perhaps in a contract, not to steal from you?
Civil Society and the Social Contract

Hobbes’ solution to the state of nature was to create a sovereign with sufficient force that people would stand in awe.

Individuals should transfer power to the sovereign in exchange for protection.
Individuals would give up their natural rights in return for civil rights.

- **Natural rights** are universal and exist in the state of nature.

- **Civil rights** do not exist in the state of nature but are instead created by states through laws.
This exchange would be achieved with the help of a social contract.

A social contract is an implicit agreement among individuals in the state of nature to create and empower the state. In doing so, it outlines the rights and responsibilities of the state and the citizen in regard to each other.

Social contract theorists have differed over the extent to which individuals should delegate authority to the state.
Social contract theorists view the state as a third-party enforcer that can dole out punishments to individuals who engage in socially destructive behavior that violates the social contract.

These punishments would be structured in such a way that ‘steal’ is no longer a dominant strategy for individuals in society.

But how does this work?
structured in such a way that “steal” would no longer be a dominant strategy for individuals in society. How does this happen?

Figure 4.7 illustrates the exact same stylized interaction between two people, A and B, as we saw in the state of nature, except that now there is a “passive player”—the state—lurking in the background who has sufficient physical force to punish those people if they choose to steal rather than refrain. We refer to this as the Civil Society Game because social contract theorists use the term *civil society* to describe the situation in which individuals live with a state. Again, each player must decide whether to steal or refrain. The state will dole out a punishment of value $p$ to anyone who steals. We assume, for simplicity, that the state can see every infraction by the players and always doles out this punishment in response. The four possible outcomes are the same as before: both players refrain, both players steal, player A steals but player B refrains, and player A refrains but player B steals. To keep the discussion that follows as simple as possible, we will now treat the payoffs in the Civil Society Game as though they were cardinal payoffs. Unlike ordinal payoffs, cardinal pay-offs tell us exactly how much more a player values one outcome compared with another. In other words, a player values an outcome with a payoff of 4 four times as much as an outcome with a payoff of 1. Now that we have determined the payoff table for the Civil Society Game, we can examine whether the creation of a state that can dole out punishments is sufficient to induce good behavior on the part of the individuals in question. As is often the case in this book, the answer is “it depends.”

We can see exactly what it depends on by solving the Civil Society Game for Nash equilibria in the same way that we solved the State of Nature Game earlier. Recall that we start by identifying the best replies for player A. What is player A’s best reply if player B refrains? We are now Civil Society Game

<table>
<thead>
<tr>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrain</td>
<td></td>
</tr>
<tr>
<td>Refrain</td>
<td>3, 3</td>
</tr>
<tr>
<td>Steal</td>
<td>4 – p, 1</td>
</tr>
</tbody>
</table>

*Note: $p$ = the value of the punishment doled out by the state to anyone who steals.*

**Cardinal payoffs** allow us to know how much more the players prefer one outcome to another.
structured in such a way that "steal" would no longer be a dominant strategy for individuals in society. How does this happen?

Figure 4.7 illustrates the exact same stylized interaction between two people, A and B, as we saw in the state of nature, except that now there is a "passive player"—the state—lurking in the background who has sufficient physical force to punish those people if they choose to steal rather than refrain. We refer to this as the Civil Society Game because social contract theorists use the term *civil society* to describe the situation in which individuals live with a state. Again, each player must decide whether to steal or refrain. The state will dole out a punishment of value $p$ to anyone who steals. We assume, for simplicity, that the state can see every infraction by the players and always doles out this punishment in response. The four possible outcomes are the same as before: both players refrain, both players steal, player A steals but player B refrains, and player A refrains but player B steals. To keep the discussion that follows as simple as possible, we will now treat the payoffs in the Civil Society Game as though they were cardinal payoffs. Unlike ordinal payoffs, cardinal payoffs tell us exactly how much more a player values one outcome compared with another. In other words, a player values an outcome with a payoff of 4 four times as much as an outcome with a payoff of 1. Now that we have determined the payoff table for the Civil Society Game, we can examine whether the creation of a state that can dole out punishments is sufficient to induce good behavior on the part of the individuals in question. As is often the case in this book, the answer is "it depends."

We can see exactly what it depends on by solving the Civil Society Game for Nash equilibria in the same way that we solved the State of Nature Game earlier. Recall that we start by identifying the best replies for player A. What is player A's best reply if player B refrains? We are now

**Figure 4.7** Civil Society Game

<table>
<thead>
<tr>
<th></th>
<th>Refrain</th>
<th>Steal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrain</td>
<td>3, 3</td>
<td>1, 4 - p</td>
</tr>
<tr>
<td>Steal</td>
<td>4 - p, 1</td>
<td>2 - p, 2 - p</td>
</tr>
</tbody>
</table>

*Note: p = the value of the punishment doled out by the state to anyone who steals.*

How big does the punishment need to be for the individual to prefer refraining?
looking at the left column of the payoff table where player B refrains. If player A refrains, he will get a payoff of 3, and if he steals, he will get a payoff of $4 - p$. It is relatively easy to see that he will refrain if $3 > 4 - p$. This means that player A can be encouraged to give up his criminal ways if the state sets the punishment for stealing sufficiently high. How high is sufficiently high? A tiny bit of algebra should convince you that as long as the punishment is greater than 1 (that is, bigger than the difference between 4 and 3), then player A will refrain.

Presumably, the state has a relatively easy job in getting player A to refrain if player B is going to refrain. But what if player B steals? We are now looking at the right column of the payoff table where player B steals. If player A refrains, he will get a payoff of 1, and if he steals, he will get a payoff of $2 - p$. It is easy to see that he will refrain if $1 > 2 - p$. This means that as long as the state chooses a punishment greater than 1 (that is, bigger than the difference between 2 and 1), then player A will "do the right thing" and refrain.

Because player B's payoffs are symmetrical to player A's—they are the same in the equivalent situation—we know that player B will also refrain under the same conditions under which player A refrains, namely, when $p > 1$. Figure 4.8 indicates the best replies for players A and B when $p > 1$. As you can see, when the punishment doled out by the state is sufficiently high, $p > 1$, the unique Nash equilibrium is (Refrain; Refrain). The expected outcome is that both players refrain and the payoff to each player is 3. Note that both players now have a dominant strategy to refrain. In other words, as long as the punishment level imposed by the state is sufficiently high, players will refrain no matter what the other player decides to do.

It seems that by creating a third-party enforcer, the state, that dutifully doles out punishments for bad behavior, we can get individuals to give up the sorts of behavior that made life in the state of nature "solitary, poor, nasty, brutish, and short." Problem solved, right? Well, as you might suspect, the fact that we're still studying politics some three hundred and fifty

**Figure 4.8** Civil Society Game When $p > 1

<table>
<thead>
<tr>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refrain</td>
</tr>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Refrain</td>
<td>3, 3</td>
</tr>
<tr>
<td>Steal</td>
<td>4 - p, 1</td>
</tr>
</tbody>
</table>

Nash equilibrium: (Refrain; Refrain)
Observed outcome: Both individuals refrain.
Payoffs: Individual A obtains 3 and individual B obtains 3.
Problem solved, right?
Problem solved, right?

But why would anyone want to do us all a favor by acting as our policeman?
One common story is that members of civil society are engaged in an exchange relationship with the state.

The sovereign agrees to act as a policeman in exchange for ‘taxes’ that the citizens pay.
Given that the state will demand tax revenue to carry out its job, it is not immediately obvious that the citizen will choose to leave the state of nature for civil society.

When is civil society preferred to the state of nature?
The Origins of the Modern State

Years after Hobbes wrote suggests that there are some problems with his solution. Start by asking yourself why anyone would want to be the sovereign and why she would be willing to do us all a favor by acting as our policeman.

One common answer to this question portrays the members of civil society as being engaged in an exchange relationship with the sovereign. In effect, the sovereign agrees to police us in exchange for taxes that citizens pay.16 One of the uses of this taxation will be to build up the state's "comparative advantage in violence" (North 1981) and its "control over the chief concentrated means of violence" (Tilly 1985) so that it can keep the citizens in awe and carry out its duties as a state. Given that a sovereign will demand tax revenue to carry out his job, it is not immediately obvious that the citizens will choose to leave the state of nature for civil society; much will depend on the level of taxation imposed by the state. In other words, citizens will not always choose to create a state.

To illustrate this point, compare our State of Nature Game and our Civil Society Game in Figure 4.9. The Civil Society Game now illustrates that the state will impose a tax of size \( t \) on the citizens for allowing them to live in civil society. We indicate this by subtracting \( t \) from the payoffs of each player in each cell.

Note: \( p = \) the value of the punishment doled out by the state to anyone who steals; \( t = \) the value of the tax imposed by the state. It is assumed that \( p > 1 \). Payoffs associated with the best replies of player \( A \) are underlined. Payoffs associated with the best replies of player \( B \) are circled. The expected outcomes of the two games are shown in the shaded cells.

<table>
<thead>
<tr>
<th></th>
<th>State of Nature</th>
<th>Civil Society</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refrain</td>
<td>Steal</td>
</tr>
<tr>
<td>Refrain</td>
<td>3, 3</td>
<td>1,4</td>
</tr>
<tr>
<td>Steal</td>
<td>4, 1</td>
<td>2,2</td>
</tr>
</tbody>
</table>

16. Most obviously, we can think of these "taxes" as money that citizens give to the state in return for security. It is possible, however, to conceptualize these taxes more broadly. For example, we might think of required behavioral patterns—such as regularly attending religious institutions or following dress codes, such as wearing a burqa—as a kind of taxation that citizens give in exchange for state-provided security.
Civil society is preferred to the state of nature only if

1. The punishment imposed by the state is sufficiently large that individuals prefer to refrain rather than steal.
   
   and

2. The tax charged by the state for acting as the policeman is not so large that individuals prefer the state of nature to civil society.

In our particular game, these conditions require \( p > 1 \) and \( t < 1 \).
The comparison between the responsibilities that the state imposes on its citizens and the benefits that the citizen obtains from living in civil society is central to the very nature of politics.
Hobbes lived through civil and religious war and was therefore willing to allow the state to impose almost any level of taxation in return for protection.

Locke saw the state of nature as workable, if inefficient, and so wanted more restrictions on the state.

Contemporary debates about civil liberties and the power of the state focus on the same tradeoff.
The creation of the state *may* solve the problem individuals have with each other, but it creates a problem between individuals and the state.

If we surrender control over violence to the state, what is to prevent the state from using this power against us?
Predatory View of the State

The *contractarian view of the state* focuses on the conflicts of interest *between individuals*.

The *predatory view of the state* focuses on the potential conflicts of interest *between individuals and the state*.

When will states enforce rules and foster cooperation rather than use their comparative advantage in violence to prey upon the citizenry?
States are like individuals in the state of nature.

States face their own security dilemma in that they have potential rivals constantly vying to take their place.

The concern for security leads states to use their power to extract resources from others.
Charles Tilly: States should be viewed as extortion or protection rackets.

As before, the state trades security for revenue.

The difference is that the seller of security represents a key threat to the buyer’s continued security.

Monty Python, click here
If we didn’t trust individuals in the state of nature, why should we trust representatives of the state who have even more power?

What explains the emergence of the modern state?
If we didn’t trust individuals in the state of nature, why should we trust representatives of the state who have even more power?

What explains the emergence of the modern state?

*Charles Tilly*: “War makes the state … States make war.”
The need to compete with external and internal rivals creates a need for rulers to raise revenues to fight wars.

The elimination of internal rivals and the development of the capacity to extract resources is the process of state making.

The modern state did not rise intentionally, but as a by-product of leaders’ attempts to survive.
The need to extract resources from their subjects placed constraints on the predation of some early modern leaders.

• Leaders could simply seize the assets of their subjects.
  
  or

• Leaders could try to extract the resources they needed through “quasi-voluntary compliance.”
Quasi-voluntary compliance refers to a situation in which the subject feels she is getting something in return for the tax dollars the state is extracting.

By regulating their predatory instincts, rulers could opt to increase their net extractive capacity by reducing the costs of conducting business and by taking a smaller portion of a larger pie.

But why did some leaders choose to limit their predation more than others?
An Aside

Can cooperation occur in the state of nature?

Cooperation was not possible when the State of Nature Game was played only once.
An Aside

Can cooperation occur in the state of nature?

Cooperation was not possible when the State of Nature Game was played only once.

But it turns out that it is possible if the State of Nature Game is infinitely repeated.
A discount factor tells us the rate at which future benefits are discounted compared with today’s benefits; in effect, it tells us how much people value the future.
Example: Choice of $1,000 today or $1,000 in a month’s time.

• If it didn’t matter to you whether you received the money today or in a month’s time, your discount factor, \( d \), would be 1.

• If receiving the money in a month’s time was worthless to you, then your discount factor would be 0.

The discount factor is bounded, \( 0 \leq d \leq 1 \).
Another way to think about the discount factor is that it captures the probability that you will be around in the next period to receive your ‘future’ payoff.

The higher your discount factor, the more you care about the future.
The present value of a stream of benefits tells us how much this stream of future benefits is worth to us today.
Example: Promise of $1 every day from now into the future.

\[
\text{Present Value (Promise)} = 1 + 1d + 1d^2 + 1d^3 + \ldots + 1d^\infty
\]

\[
= 1 + d + d^2 + d^3 + \ldots + d^\infty
\]

\[
= \frac{1}{1 - d}
\]

The present value of a promise of $5 = \frac{5}{1-d}$ etc.
How will the individuals in the state of nature play a repeated State of Nature Game?

One strategy they might employ is known as a grim trigger strategy.

1. If you refrain, I will refrain.

2. If you steal, I will always steal.
Principles of Comparative Politics

We can now add these payoffs to the normal form game shown in Figure 4.1. The new game is shown in Figure 4.2. Player A’s (the row player’s) payoffs are shown first in each cell; player B’s (the column player’s) payoffs are shown second. A comma separates the payoffs for the players in each cell. Thus, player A receives a payoff of 1 if he refrains and player B steals; player B receives a payoff of 4 in this situation. Player A receives a payoff of 4 if he steals and player B refrains; player B receives a payoff of 1 in this situation. Each player receives a payoff of 3 if they both refrain, and they each receive a payoff of 2 if they both steal.

Solving the State of Nature Game

Now that we know the players, the choices available to them, and how they value each possible outcome, we are ready to solve the State of Nature Game. We refer to this game as a State of Nature Game because of the topic under discussion. As we note later in the chapter (pp. 122–125), however, games with this same payoff structure are more familiarly known as Prisoner's Dilemma games. Prisoner's Dilemma games are used widely in political science to examine a whole host of phenomena, ranging from arms races and democratic transitions to resource exploitation and international cooperation. They are also commonly used in other disciplines such as biology, economics, and sociology.

\[
\text{Present Value (Refrain)} = 3 + 3d + 3d^2 + 3d^3 + \ldots + 3d^\infty = \frac{3}{1 - d}.
\]
We can now add these payoffs to the normal form game shown in Figure 4.1. The new game is shown in Figure 4.2. Player A’s (the row player’s) payoffs are shown first in each cell; player B’s (the column player’s) payoffs are shown second. A comma separates the payoffs for the players in each cell. Thus, player A receives a payoff of 1 if he refrains and player B steals; player B receives a payoff of 4 in this situation. Player A receives a payoff of 4 if he steals and player B refrains; player B receives a payoff of 1 in this situation. Each player receives a payoff of 3 if they both refrain, and they each receive a payoff of 2 if they both steal.

Solving the State of Nature Game

Now that we know the players, the choices available to them, and how they value each possible outcome, we are ready to solve the State of Nature Game. In the previous chapter, we saw that political scientists solve extensive form games, like the Exit, Voice, and Loyalty Game, for something called a subgame perfect equilibrium (SPE). When it comes to strategic, or normal, form games like the State of Nature Game, though, political scientists solve them for something called a Nash equilibrium (NE). A Nash equilibrium is a combination of strategies, one for each player, such that each player in the game would not want to change their strategy given what the other player is doing.

---

**State of Nature Game with Payoffs**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Refrain</td>
<td>3, 3</td>
</tr>
<tr>
<td>Steal</td>
<td>4, 1</td>
</tr>
</tbody>
</table>

**Present Value (Steal)**

\[
\text{Present Value (Steal)} = 4 + 2d + 2d^2 + 2d^3 + \ldots + 2d^\infty \\
= 4 + 2d(1 + d + d^2 + d^3 + \ldots) \\
= 4 + 2d \left( \frac{1}{1 - d} \right) \\
= 4 + \frac{2d}{1 - d}.
\]
1. The present value of refrain is \( \frac{3}{1-d} \).

2. The present value of steal is \( 4 + \frac{2d}{1-d} \).

Whether individuals prefer to refrain rather than steal depends on the discount factor.
Present Value (Refrain) > Present Value (Steal)

\[
\frac{3}{1-d} > 4 + \frac{2d}{1-d}
\]

\[
\frac{3}{1-d} > \frac{4 - 4d + 2d}{1-d}
\]

\[
\frac{3}{1-d} > \frac{4 - 2d}{1-d}
\]

\[
3 > 4 - 2d
\]

\[
2d > 1
\]

\[
d > \frac{1}{2}.
\]

If \(d > \frac{1}{2}\), individuals will prefer to refrain rather than steal.
Cooperation is possible in the state of nature without needing to create a state.

Individuals must care enough about the future and their interactions must be infinitely repeated.

Thus, the state is not strictly necessary for cooperation.
Should we all become anarchists?
Should we all become anarchists?

Probably not.

Cooperation is only one of the possible outcomes of the repeated State of Nature Game.

- (Steal; Steal) continues to be a Nash equilibrium as well.
Moreover, it is costly for individuals to cooperate in the state of nature.

• Individuals have to monitor each other’s behavior and be willing to punish non-compliance.

Thus, relying on cooperation to come about through a decentralized process without the state may not be the best thing to do.
Some Additional Game Theory Examples
Golden Balls

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Split</td>
<td>Steal</td>
</tr>
<tr>
<td>A</td>
<td>50, 50</td>
<td>0, 100</td>
</tr>
<tr>
<td>Steal</td>
<td>100, 0</td>
<td>0, 0</td>
</tr>
</tbody>
</table>

- Golden Balls I, click [here]
- Golden Balls II, click [here]
4: The Origins of the Modern State

The payoff table for this Game of Chicken is shown in Figure 4.12.

a. Use the numbers in each cell of the payoff table in Figure 4.12 to write out the preference ordering for Ren and Chuck over the four possible outcomes.

b. Solve the Game of Chicken for Nash equilibria. Hint: There are actually two possible Nash equilibria.

c. Does either Ren or Chuck have a dominant strategy? If so, what is it?

d. What strategic situations in comparative politics might fit the basic structure of the Game of Chicken? In other words, provide a specific example in which actors might have preferences and interactions like those in the Game of Chicken.

5. The Stag Hunt Game

In Discourse on the Origin and Foundations of Inequality among Men, the French philosopher Jean-Jacques Rousseau ([1755] 1997, 163) describes a strategic situation in which a group of hunters are trying to catch a stag. To keep things simple, imagine that there are just two hunters. The hunters have two options: They can work together and pursue the stag, or they can hunt independently and catch a hare. If both hunters pursue the stag, they catch it and share it equally. If either of the hunters chooses to go after the hare, they catch one but the stag escapes. Each hunter prefers a share of the stag to a hare. The strategic situation that Rousseau describes has come to be known by political scientists as the Stag Hunt Game. The payoff table for the Stag Hunt Game is shown in Figure 4.13.

---

**Figure 4.12 A Game of Chicken: The Tractor Face-Off**

<table>
<thead>
<tr>
<th></th>
<th>Chuck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swerve</td>
<td>3, 3</td>
</tr>
<tr>
<td>Drive Straight</td>
<td>2, 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Chuck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swerve</td>
<td>4, 2</td>
</tr>
<tr>
<td>Drive Straight</td>
<td>1, 1</td>
</tr>
</tbody>
</table>

---

- Tractor Faceoff, click [here](#)
- Deficit Reduction 2011 (2:57-16:56), click [here](#)
The Evolution of Trust, click here