

Bargaining Power and Dynamic Commitment

We are studying strategic interaction between rational players. Interaction can be arranged, rather abstractly, along a continuum according to the degree of conflict inherent in the situation. This continuum ranges from pure cooperative situations where players share common interests and the only problems they might be facing are coordination ones (which can be addressed through tacit or explicit communication), to pure conflictual ones, where a gain for one player is an automatic loss for the other and where players have incentives to outguess each other.

The “grey” area between these “pure” situations is occupied by the most interesting type of strategic situation, one that exhibits potential for both conflict and cooperation, which we call **distributional conflict**. This name comes from the idea that players share an interest in achieving some outcome that cannot be secured by either of them acting in isolation of the other, and the outcome is such that the benefits may be distributed between the players in different ways, and each player’s preferred distribution conflicts with that of the other player.

All distributional conflict situations are occasions for **bargaining**, which is the process through which players try to influence each other’s expectations.

Bargaining power refers to the degree to which a player is able to influence the expectations of its opponent in a way that is beneficial to the interests of that player. That is, a player has bargaining power (relative to its opponent) if it is able, through its actions or words, to change the expectations of its opponent in such a way that the opponent acts in accordance with the player’s will.

- *Bargaining power is always relative, not absolute.* That is, a player may have bargaining power only relative to another player with whom he is involved in bargaining. It makes no sense to say that a nation is powerful without reference to another player and without reference to the issue being considered.
- *Bargaining power may not extend beyond some particular domain.* That is, a player may be quite powerful in some particular area but his power may not translate into another area. Therefore, being able to secure a better outcome on issue *A* does not necessarily imply that he will also be able to secure a better outcome on issue *B*. We say that power is **fungible** if it can be used across domains.
- *Bargaining power is strategic, not brute force.* We shall talk a bit more about this when we discuss deterrence and compellence. For now, all I want to say is that bargaining power differs from brute force in that it depends on the **potential** use of force, not its **actual** application. With brute force we can bomb an enemy, kill its soldiers, and

generally do all sorts of fairly destructive things to him. But with bargaining power we can get him to do our bidding.

To sum up, bargaining is the process through which players influence each other's expectations, and bargaining power is the ability of a player to effect such favorable changes. Since commitments (threats and promises) are the primary means through which players attempt to influence expectations, we want to know what makes such commitments effective.

A commitment is a pledge to take an action in the future. Some commitments are inherently persuasive, but many are not. The problem is that many commitments involve actions that a player would have no incentive to take when it eventually has to decide whether to do so or not.

This is a conundrum known as a **dynamic commitment problem**. It refers to the situation where it is in the interest of a player to commit today to carrying out an action that, if called on to carry out tomorrow, it will not be in its interest to do so.

The ability to establish credible commitments relates to bargaining power. We want to understand how players bargain in a situation of distributional conflict. Dynamic commitments can only work if they are understood by the opponent and if the opponent finds them credible.

1 Making Commitments Credible

So, we shall study bargaining power. What is it? How do we get it? How do we use it? The answer to this question revolves mostly around the ability make credible commitments. Our goal is to find ways of persuading the opponent to do our bidding. Here are some common widely-held beliefs that we must take a close look at:

- An effective threat must be one that hurts the opponent more than it hurts the threatener.
- Having more options is better when making decisions because that would presumably enable one to make the best possible choice according to the requirements of that situation.
- It is better to seize the initiative and not let the other side dictate the time, place, and terms of an agreement.

1.1 Burning a Bridge

The Red Army, having retreated to Stalingrad is facing the advancing *Wehrmacht* troops. If the Red Army stays, then it must decide whether to defend Stalingrad in the case of an attack or retreat across Volga using the single available bridge for the purpose. Each army prefers to occupy Stalingrad but fighting is the worst outcome for both. However, before the enemy can attack, the Red Army can choose to blow up the bridge (at no cost to it), cutting off its own retreat.

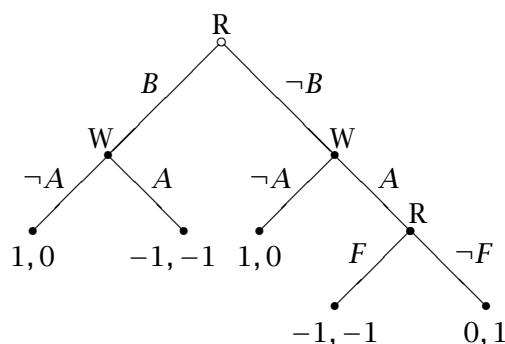


Figure 1: The Battle of Stalingrad.

Let's solve this game by backward induction. Starting at the end, $(\neg B, A)$, Red Army's optimal action is to retreat across the bridge, or $\neg F$. Given this action, the *Wehrmacht* strategy following history $(\neg B)$ would be to attack, or A . Its strategy after history (B) is not to attack, or $\neg A$. Thus, the Germans' optimal strategy is $(\neg A, A)$. Given this strategy, the Red Army strictly prefers to burn the bridge. So, the unique SPE is $((B, \neg F), (\neg A, A))$. The outcome is that the Red Army burns the bridge and the Germans don't attack.

This example demonstrates a rather profound result of strategic interaction: If you limit your choices and do so in a way that is observable by the opponent, then you may obtain better outcomes. This is because unless the Red Army burns the bridge, it cannot credibly commit to fighting in order to induce the Germans not to attack. (Their threat to fight if attacked is not credible, and so deterrence fails.) However, by burning the bridge, they leave themselves no choice but fight if attack, even though they don't like it. This makes the threat to fight credible, and so the Germans are deterred.

A commitment is not credible if it will not be in the interest of the committing party to carry out its promises should it have to do so. In our language, its threats/promises are not subgame perfect. **Limiting one's choices in an observable way may help establish credible commitments by eliminating an embarrassing richness of choices that provide one with a temptation to bow out of the commitment.**

This is probably obvious by now but sometimes people get it completely wrong. Take the Trojans who tried to burn the Greeks' ships! Had they succeeded in doing so, this would have only made the Greeks fight so much harder. William the Conqueror and Cortez got it right when they burned *their own* ships, forcing the soldiers to fight to the end and compelling some of the opposition to surrender.

1.2 Relinquishing Initiative

In certain situations it is best to leave yourself no option and let the other party decide what to do. In the example with the bridge, the Red Army, having burned the bridge, could sit tight and let the Germans decide whether they wanted to incur the costs of fighting a desperate enemy who had no choice but to fight.

Here's another example, this one taken from the Cuban Missile Crisis of 1962. After

finding out about the Russians secretly placing nuclear missiles in Cuba, the U.S. considered several options, from the mildest (quarantine, which is what got implemented), to progressively more dangerous and escalatory ones, like a limited air strike designed to take out the missile sites, a massive air strike, and even a land invasion.

The quarantine stood apart from the more military responses in terms of who had to take the next escalatory step. Suppose the U.S. can choose between a military action, (M), and a blockade (B). If it chooses the military, then the USSR can respond by fighting or not. If it fights, a war results where both suffer greatly. If it does not, the U.S. wins and the USSR loses a lot. In fact, because of failing to respond to a direct military challenge of the rival superpower, it loses more than by fighting a limited engagement over Cuba.

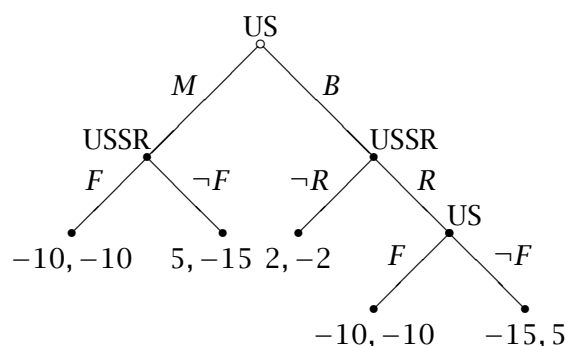


Figure 2: A Stylized View of the Cuban Missile Crisis.

If the U.S. picks the blockade, the USSR can choose whether to run it or not. If it does choose to run it, the U.S. can decide whether to initiate the military option or not. Again, if the U.S. fails to respond militarily to direct Soviet challenge, the Soviets gain and the Americans lose badly. If it does respond, war results. If the USSR does not run the blockade, the Americans win concessions from them.

We solve by backward induction. Given blockade and the Soviets running it, the U.S. prefers to fight. Given that the U.S. would fight should they run the blockade, the Soviets prefer not to run it. On the other hand, given a military action by the U.S. the Soviets prefer to fight. Given that the Soviets would fight a military action but would not run a blockade, the U.S. strictly prefers to impose a blockade instead of risking war.

Of course, this is a very simple setup that does not do justice to many other considerations that went into the frenzied weeks of October 1962. However, the basic feature is clear: imposing the blockade shifted to the Soviet Union the responsibility of making the escalatory step that would have resulted in war. Note that we have *not* assumed that the Russians would not fight if challenged. On the contrary, we assumed that both the Russians and the Americans would fight if they had to! However, saddling the Russians with the choice to initiate the war conferred a great advantage on the U.S., causing the Russians to back down.

The U.S. relinquished initiative. Instead of initiating the military strikes (and thereby ensuring an automatic reprisal by the Soviets), the U.S. put up the blockade and let the Russians take the initiative in running it. Having been maneuvered in this position the

Russians had no choice but back down or start a war.

Relinquishing initiative saddles the other side with the painful choice of making the last step that results in disaster for both. If the other side has a chance of backing down, it will take it. Therefore, it is also important to remember *not to maneuver the other side in a position from which they cannot retreat*. The worst-case scenario is to relinquish initiative when the other side has been committed to a course of action already and cannot take the exit option!

1.3 The Hurt-More Criterion

Let's assume that war is two times costlier for the U.S. than it is for the Russians. We modify the Cuban Missile Crisis payoffs to war to reflect this.

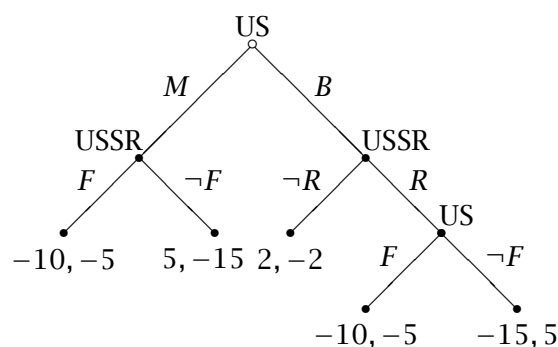


Figure 3: War Hurts the Americans Much More.

We do the backward induction again and we find that our results are completely unchanged. In other words, in this setup, the U.S. still manages to compel the Soviets to back down even though it threatens with a war that would damage it ten times more than it would the Russians. Does this go against your intuition? What's going on here?

It does not matter how much the U.S. hurts itself in war. What matters is how much the Soviet Union gets hurt *compared to its other choices*. However costly the war is for the U.S., the relevant calculation that the Russians make is the one where they compare *their* costs of backing down versus *their* costs of fighting a war. None of these include the U.S. costs and so it is not surprising that these do not matter in the end. All that matters is that war is sufficiently painful to the Russians given the pain of backing down. If war is more painful, they will back down.

This is not to say that U.S. costs do not matter at all. They do, but only for the calculations of the Americans. The threat to go to war must be credible if the Russians are going to believe it. If war is so costly that even backing down in response to a direct military challenge is preferable, then the U.S. has no viable threat. However, we assumed here that the U.S. would fight if challenged, so this was not a problem.

We conclude that **the threat does not depend on the threatener having to suffer less than the threatened party**. All that matters is that the threatened party would suffer more if it does the action it is being threatened not to do compared to another action. However,

we must keep in mind that for the threat to be credible, the threatener must have an incentive to carry out the threat.

2 Summary

- Between pure cooperation and pure conflict are the **distributional conflict** situations, where players have incentives to agree on an outcome but disagree over its terms;
- These are occasions for **bargaining**, which is the process of influencing expectations;
- **Bargaining power** refers to the ability to influence expectations of the opponent, and
 - it is relative, not absolute,
 - it may not extend beyond a particular domain,
 - it is strategic, not brute force.
- Players influence expectations through making **commitments** (threats/promises)
- **Dynamic commitment problems** occur when one pledges to carry out an action that would not be in its interests to fulfill; in these cases we say that commitment is **not credible**
- **Subgame perfection** ensures that commitments are credible, and so agreements self-enforcing in anarchy
- We can establish credible commitments by
 - **constraining our choices** (burning bridges), which refers to eliminating options that we would be tempted to take; if we eliminate the loopholes in the agreement, then we cannot be tempted to make use of them, which in turn makes the opponent concede;
 - **relinquishing initiative**, which refers to letting the opponent make the most painful choice; given the option of a graceful exit (i.e. if he has not burned his bridges yet), the opponent would take the tempting alternative and leave us with the better outcome.
- We found that the **hurting-more criterion** is not rationally and logically valid; it is not necessary for an action to hurt the threatened party more than it would hurt the threatener to make it an effective threat.