Simultaneous Games

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We have already discuss about a kind of strategic situations in which players moves simultaneously. Let come back one more time back to the same kind of game to think more carefully about what we are assuming.

Consider the following scenario involving two neighboring countries, Country A and Country B, each with valuable natural resources along their shared border. Both countries are undergoing economic difficulties and urgently need to exploit these resources to boost their economies.

Country A and Country B have had historical territorial disputes over the border region where these resources are located, leading to tensions but no outright conflict. Besides, both are now facing a decision: they can either negotiate to share the resources, which would likely result in a stable but potentially unequal distribution, or they can attempt to assert full control over the resources unilaterally.

If both countries choose to negotiate, they might settle on a compromise that is less than what each might hope for but avoids conflict. If one country decides to assert control while the other seeks to negotiate, the assertive country could potentially gain a larger share of the resources, gaining economically but increasing political tension and possibly inviting international condemnation. However, if both countries decide to assert full control simultaneously, it could lead to a military standoff or conflict, risking international isolation and severe economic sanctions, thus harming their economies even more.

The leaders of Country A and Country B must now decide their course of action without knowing the decision of the other, understanding that their choices will significantly impact their nations' economic and political futures. This situation involves strategic decision-making where each country's choice affects the outcome for both, reflecting the interdependent nature of their decisions.

We are going to think on this situation on the basis of four relevant assumptions:

1. Individual's decisions are interrelated. In the sense that what each do affects the other. This is the least controvertial of all the assumptions.
2. We are going to assume that rationality is a common knowledge among the players (in this case, two players). This means that each player is rational and knows that the other players are rational as well. Moreover, everyone knows that everyone is rational, and everyone knows that everyone knows this, and so on.
3. The players make their decisions (or moves) at the same time, or at least without knowing the moves of the other players beforehand. This aspect is crucial in distinguishing simultaneous games from sequential games

And finally, the assumptio about which we are going to think more carefully later:

4. Although the moves are made simultaneously, the structure of the game, including the strategies available to each player and the payoffs for each combination of strategies, is known to all players. If this is not the case, and players have private information, then the game would typically be modeled as a game of incomplete information. In other words: we assume *complete information*.