

13.4 PROJECT

POWER DYNAMICS AT PLAY

In Section 13.4, you learned about weighted voting systems and the power that each player in the system has. In this project, you'll investigate power dynamics. Power dynamics are where weighted voting systems get interesting. Players may have opposing viewpoints that motivate them to desire different outcomes. Each player wants to win and wants to know the likelihood of winning.

Consider a small company with a small number of shareholders who disagree about the direction the company should take. Each member is likely to be acutely aware of how much their vote counts and with whom they need to align to be part of a winning coalition. Let's look at a few power dynamics at play.

1. Consider a scenario where player 1 is a dictator and is interested in selling some shares to another player, but wants to remain a dictator after the sale. Is this possible in the voting system $[20: 25, 5, 3, 1]$? Explain why this is or isn't possible. If it is possible, how many shares can player 1 sell?
2. Consider a scenario where player 1 and player 4 rarely vote in the same manner, while player 2 and player 4 often vote the same. In the voting system $[14: 12, 7, 3, 2]$, why would player 4 be glad to see player 1 sell two shares to player 2? (**Hint:** Consider the possible winning coalitions in each voting system.)
3. Using the same scenario as part 2, use the Banzhaf Power Index to describe in words how player 4's power changes if player 1 sells two shares to player 2.