Class Game
Multi-Dimensional Voting

This experiment illustrates McKelvey's so called chaos theorem, and the effect that a second dimension has on majority rule voting.

Objective
The experiment helps students gain first-hand experience with voting in committees. It also shows them the difference between majority voting in a single dimensional space and a multidimensional space, and its effects on equilibrium concepts such as the core.

Time
Roughly 15-20 minutes in class, without discussion.

Administration
Prior to class, write a pair of numbers down for each student, which will be their ideal point in two dimensional space (a cartesian coordinate). Each number in the pair should range from 0 to 10. Remember to leave enough room for students to write their name on the paper. Create enough coordinates so that each student in the class could get one. You don't have to be systematic about which ones are not used because you will not make a prediction in class. Fold papers and put them in a box.

When you arrive in class, ask students not to communicate during the experiment (to avoid contamination). Then have them randomly draw their ideal point from the box. Next, show them the power point slide 2D voting.pptx. Allow them to read the directions, then go over the directions as a class. If you ran the single dimensional game, you might even go through the theatrics of writing down "nothing" on a piece of paper, folding it in half, and announcing to the class that you have written something that you will reveal later (optional).

Write two columns on the board, with the headers "status quo" and "proposal." Write "nothing" under "status quo" and announce no one will get extra credit points if nothing is the final outcome. Then ask for proposals. Students will raise their hand, call on the first one raised, and ask if the proposal is seconded. If it is, write the cartesian coordinate proposed down under the proposal column. Then say, "all those in favor of the proposal raise your hands." If you have a majority, write the coordinate proposed in the next row under status quo, then ask for another proposal. If it is not seconded, or you don't have a majority, write the coordinate listed under the status quo down in the next row under status quo, then ask for another proposal. Repeat this process until a student proposes to adjourn, another student seconds it, and a majority agree to adjourn. The final outcome is the status quo when a vote to adjourn succeeds. You can now reveal what you wrote on your paper (nothing) and compare it to what students agreed to as a group. Tell them you don't have the same type of equilibrium prediction that you had for a single dimension, but you might note whether the outcome is in the Pareto set (Dougherty and Edward 2012). Before leaving, collect papers from each student so you can give them credit.

Electronic Responses

If you want to go paperless, perhaps because your class is remote, give each student an ideal point in the course grade book (ELC, Blackboard, etc) and replace "(randomly drawn out of a hat)" on the second line of the power point with "(which you can find in the grade book of ELC)." With this approach, you don't have to hand out ideal points or pick them up, but you still need to bring a list of the preassigned ideal points so you can 1) calculate the median after striking those who do not attend, and 2) give ideal points to students who did not bring their computer.