The Feasibility of Using Spatial Interdependence Weighting Matrix to Model the Dependent Variable

In the main text, I discuss how spatial interdependence regression models do not yet offer a viable method for estimating the creation of multilateral alliances. I offer one reason in the text (the weighting matrix captures whether or not i and j have a connection, which is precisely what one needs to estimate) There is a second reason not discussed in the text.

Even if one can model the dependent variable, a second issue is sheer complexity. The state's decision to enter a particular alliance depends on other state's decisions, but not in a linear-additive way, as would be most-easily and directly captured by a **Wy** term. Instead, it would depend on which combinations of others entered that alliance, which is some large set of possible alliances that a state may enter or not enter. Conceptually, each possible alliance is an outcome. This would result in having N observations of 1 or 0 for entering that alliance for each of N states, or an $N * N!$ matrix. Moreover, one would want to specify a W of dimensions $N * N! \times N * N!$ that reflected properly how the dependence of each specific state's entry to that specific alliance depended on other states' entry decisions on that alliance and on this and other states' entry decisions on other possible alliances. Finally, one would need one such enormous and complicated W for each combination of others' decisions on their sets of entry decisions that we thought could be important to determining whether this specific state enters this specific alliance.