

The Cascading Dynamics of War Expansion: An Agent-Based Computational Model

KYLE A. JOYCE

Advanced Academic Programs, Johns Hopkins University

Why do some international wars expand while others do not? And of those that do expand, why do some grow to include only a few additional states while others explode to include many states? I argue that the key mechanism that answers these two questions is the interdependent nature of third parties' decisions. I develop an agent-based model of war expansion, the central feature of which is the interdependence between a single third party's decision to join an ongoing war and all other third parties' decisions. In the model, this interdependence is captured by allowing each third party to forecast which other third parties are expected to join the war in the future, and on which side, and condition its contemporaneous joining decision on these expectations. Comparing the simulated wars to the historical record, the agent-based model accurately predicts both the percentage of actual wars that expanded and the percentage of states that joined in wars that expanded. Thus, in order to understand and explain war expansion we must account for the interdependence of third-parties' joining decisions.