

Simulating Alliance Formation and Better-Shot Global Public Goods*

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Abstract

In this paper, we examine the process of global order formation during the early days of the Cold War from the view point of global public goods (GPG), focusing on the expansion of the Eastern and Western blocs.

During the early days of the Cold War, both the United States (US) and the Union of Soviet Socialist Republics (USSR) enjoyed unparalleled power within each bloc, and had enormous influence over other countries within the bloc. The military power of each bloc was tantamount to the power of each superpower, so including a new country in the bloc brings virtually no additional power to the bloc. When we take account of the cost of expansion of the blocs, it might be safe to argue that both superpowers had no incentives to expand their blocs at their own costs. In reality, both the US and the USSR sought to include more countries in their spheres of influence until they divided the world into almost two blocs. What kind of model can account for such process?

This question is meant not just to describe what happened in the past, but to offer new perspectives towards the future. The post-Cold War global order faces unprecedented challenges. It seems fruitful to look back at the process of order formation and change during the Cold War when we think about what forms of global order is likely to emerge, to be maintained, and to evolve in the future.

In this analysis, the concept of GPG is quite useful. GPG is a good whose benefits are nonexcludable, nonrivalry, and spilled over the national border. A military alliance is a kind of GPG. We formulate enlargement process of both Eastern and Western blocs as a transformation process of two opposing alliances providing GPG, and the relationship between the contributions by member countries and the levels of the GPG as an aggregation technology of public goods. We conduct a computer simulation analysis using two types of models of aggregation technology: the summation type and better-shot type. Then, we examined which model better explains the process in which two blocs, headed by the US and the USSR, expanded to divide the world into almost two blocs.

The results of the simulation reveals that when we use a hypothetical data set based on the power balance of the immediate post World War II period, the better-shot type model reflects the expansion of the Eastern and Western blocs during the Cold War better than the summation type model. This suggests that the previous studies of the economics of military alliances based on the summation type model need to be reconsidered.

The results of the simulation based on the actual military spending in 1945 suggests that if the Western bloc overestimated the thread from the Eastern bloc, this overestimation might have accelerated the expansion of the both blocs. In this simulation, there was little difference in result between the summation type model and better-shot type model. This suggests that there are improvements to be made in the data set, modeling, and economic theories of alliances.

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