Nuclear Deterrence Is Not a Theoretical Game

By

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During the Cold War, strategists used applied math for insights into nuclear strategy. Their techniques included game theory, macroeconomics, and systems analysis. These models, brilliant as their creators were, had flaws. They led to equations that could be studied in fascinating detail, yielding great academic "publish or perish" rewards and even some Nobel Prizes, but had little to do with realpolitik and leaders who are willing to take big risks. With today's "three body problem," over-relying on such math could mislead again.

Flawed Modeling Assumptions

Game theory finds ideal tactics for conflicts between two opponents. It works great for something simple like checkers. But to get far it needs assumptions that, together, weaken the approach for something as tricky as convincing an adversary to never coerce or attack with nuclear arms.

In its basic form, game theory assumes both players have the same goals and want to avoid the same downsides. It also assumes all relevant information for the game is known fully and equally by both players, who are unbiased, unhurried, and perform all calculations perfectly. It assumes the game has a clear beginning and end, and moves are made in an orderly one-goes-then-the-other-goes manner.

Plainly, none of these apply well to states or blocs in a nuclear crisis or an escalating conventional shooting war. More subtly, game theory does not take account of tacit cooperation between opponents—such as to avoid nuclear Armageddon.

Modern game theorists are starting to study games with many players, in which different players have different goals and different information. But this research needs to mature more and be validated rigorously before it can be trusted enough to guide national defense.

Macroeconomics is a tool for understanding and managing the workings of a national economy. In its traditional form, macroeconomics assumes that everybody decides to buy or sell things based only on their price, and that all decisions are made with one hundred percent efficiency using complete information.

The difficulty of controlling a real-world economy is shown by the problems of fluctuating American inflation rates, recessions, and unemployment. While the conceptual framework of macroeconomics was adapted to analyze nuclear deterrence decades ago, there are practical limits to policy guidance obtained this way.

Modern research turned to what is called behavioral economics. This approach pays attention to the emotional reasons people do things. It also considers that different people seek different real and emotional rewards. Even sophisticated actors are driven by an irrational perception of risk. This emerging discipline seems promising, but still needs testing.

Systems analysis studies a problem, such as how to win a war, by breaking the warfighting into moving parts, then analyzes how those parts interact. The goal is to create statistics-driven procedures, such as body counts, that will achieve the desired outcome—victory.

Systems analysis has flaws for national defense policymaking. To get anywhere, it needs to make very difficult choices about exactly how to measure effectiveness, how to handle incomplete or absent data, how to take account of fundamentals and intangibles such as political will, and how to remove analyst bias. The near impossibility of doing all this successfully was demonstrated by the failure of systems analysis in the Vietnam Conflict.

Modern Threat Assessment

During the Cold War, other practical drawbacks of these technical tools were masked by the fact that the only major players of the nuclear deterrence game were the US and USSR. Neither became so aggressive or desperate as to resort to a nuclear attack. But there were close calls, such as the Cuban Missile Crisis, peacefully resolved by back-channel bargaining between strong-willed leaders. Details of the next nuclear crisis, if one occurs, will be totally different and difficult to model realistically in advance.

Today, there are several significant nuclear adversaries confronting the US and its allies. The chances seem high that equations cannot capture the many psychological subtleties and unknown-unknown interactions, especially when several authoritarian regimes can form an opaque axis of expansion.

A good way to test the utility of behavioral economics and modernized game theory is to see if it can yield insights on dealing better with enemies who use nuclear threats against the United States, such as to limit American support for a beleaguered ally. The cases of Ukraine and Taiwan come to mind.

Conclusion

It is not just an academic exercise to confront and prevent the possibility that Russia, China, and North Korea may take their nuclear brinksmanship beyond mere verbal threats and saber-rattling exercises. Arms control advocates and defense policymakers need to recognize that nuclear attack is not simply a verbal bargaining chip thrown around by foreign potentates who are unserious, bluffing, or who have purely defensive goals. There is no pause button. There are no do-overs.

Nuclear deterrence cannot be reduced to a blackboard puzzle. Doing it properly needs undivided attention to the subtle nuances and fine distinctions that can make all the difference in an outcome. It calls for all-out political commitment despite many daunting complexities. Above all, effective deterrence requires deep understanding of how to make adversaries feel the raw fear generated when what they value most is at risk.

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