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Are U.S. Military Interventions Contagious over Time?

Intervention Timing and Its Implications for Force Planning

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Summary

Intervention Timing and Temporal Dependence

When Department of Defense (DoD) force planners use integrated security constructs and multiservice force deployment scenarios to estimate force requirements, their models assume that military deployments by U.S. forces occur as independent events that are not systematically correlated over time (i.e., that they are serially uncorrelated). However, the U.S. experiences in Southeast Asia during the 1960s, the Balkans during the 1990s, and the Middle East since 2001 suggest, at least anecdotally, that military interventions may not be serially independent. It is possible, instead, that they demonstrate *temporal dependence*, in which the likelihood of an event in one period is affected by the frequency of similar events in past periods. Temporal dependence would tend to produce event clusters as each incidence of a given event increases the likelihood of similar events in the near future.

If U.S. military interventions do in fact demonstrate temporal dependence, one would expect them to occur in clusters. This would result in a very different “demand signal” for U.S. military capabilities than the current DoD approaches to force planning, which assume serially uncorrelated interventions, produce. This study assesses whether there is empirical evidence of temporal dependence in U.S. military interventions.

Testing for Temporal Dependence

This report tests for temporal dependence by analyzing a set of 66 cases of U.S. Army involvement in “interventions” from 1949 to 2010. For the purposes of this analysis, an *intervention* is an Army deployment of company size or larger for contingency and peacekeeping (or peace enforcement) operations, thus excluding air strikes, airlift, humanitarian operations, sea- and air-based noncombatant evacuations, and small deployments of U.S. military advisers and trainers. To ensure that any finding of temporal dependence is not the result of underlying political (presidential popularity), economic (U.S. gross domestic product and unemployment), or other strategic factors (relative U.S. power, level of conflict, and period), the analysis includes other con-

control variables that may affect the likelihood of military interventions over time. Most important among these is the control for time, specifically the collapse of the Union of Soviet Socialist Republics (USSR), which marked a significant shift in the overarching geopolitical regime.¹ The analysis also specifies several models of international conflict, using controls for geopolitical regime, global economic health, population growth, and characteristics of the international security context (distribution of power, number of democracies) to assess the existence of dependent clustering in conflict onset that might affect the likelihood of interventions.² This analysis used both Poisson and ordinary least squares regressions and yearly data with the count of new interventions (or instances of conflict) as the dependent variable in the analyses.³

Results

The results show reasonable evidence that military interventions do occur in temporally dependent clusters but also make it clear that the strength of this dependent clustering effect is heavily influenced by the underlying characteristics and political dynamics of the governing geopolitical regime. The size and strength of the clustering effect varies across specifications, but overall, the empirical results suggest that an additional intervention in one period increases the likelihood of an additional intervention in the next by at least 20 to 25 percent (with an upper bound of as much as 50 percent). This is a fairly significant effect, especially compared with the serially independent distribution of interventions that force planners currently use.

¹ The term *geopolitical regime* is used here to denote the fundamental political dynamics of the international system, including the character and distribution of political and economic power, the nature of relationships among major powers, and the security issues around which the system is organized. The Cold War and post-Cold War geopolitical regimes are the two major regimes considered in this analysis.

² I use Uppsala Conflict Data Program at the Peace Research Institute Oslo's armed conflict database for the models of political conflict and the control for level of political conflict in the intervention model. The use of a two-stage model is unnecessary because the likelihood of interventions is not strongly associated with the level of instability and conflict.

³ Regression analysis is a statistical technique used to estimate the relationship between a dependent variable and potential predictors or independent variables, holding other factors constant. The ordinary least squares regression is appropriate when the dependent variable is normally distributed and estimates relationships between variables using a linear approximation. Poisson models are more appropriate for event count data and allow for unequal variance across a distribution.

Autoregressive integrated moving average (ARIMA) models are used with time-series data sets and are designed to capture correlations over time. The ARIMA model estimates the size of temporal correlation in the dependent variable using the correlation of the regression's residuals, or unexplained variation.

Implications for Force Planning

These findings have three broad implications for DoD force planning and the defense analytical community. First, the fact that U.S. military interventions tend to cluster together in time implies that force planning frameworks that assume a serially uncorrelated pattern of interventions, such as the integrated security constructs, may understate actual requirements for forces and capabilities during a period of clustered interventions. This would create operational and strategic risk, and DoD should consider modifying the integrated security constructs to incorporate serial correlation of interventions.⁴

Second, it appears that the likelihood and clustering of interventions are sensitive to the character of a geopolitical regime. This suggests that the pattern of future military operations projected by a force planning framework reflects important, if implicit, assumptions about the nature of the future geopolitical regime. It would be prudent for DoD to make these assumptions explicit and consider whether the existing set of force planning frameworks reflects the spectrum of potential future geopolitical regimes. As a corollary, alternative assumptions about the future geopolitical regime may provide a strategically coherent basis for developing alternative integrated security constructs.

Finally, in addition to quantitative metrics that provide insight into the likelihood of intervention clusters at given time, temporal dependence can be included qualitatively in force planning processes, by incorporating in planning documents an extended discussion of the concept and its implication; how it relates to intervention duration, frequency, and concurrency; and a description of the role the geopolitical regime plays in the likelihood and strength of clustering.

⁴ Estimates in this report should be considered preliminary and in need of refinement before being used in real force planning analyses.