ARMS RACES AND THE OPPORTUNITY FOR PEACE

Igitur qui desiderat pacem, praeparet bellum.
Vegetius, Artes Latinae

ABSTRACT. We model the evolution of international conflict as a game of sequential decisions and show that arms races are neither necessary nor sufficient for peace or war. Peaceful intentions are not adequate to insure peace, even when both rivals wish to avoid violence. Peaceful intentions together with complete information are sufficient for peace. A preference for forcefully pursuing foreign policy goals also is not sufficient to preclude the peaceful resolution of disputes, and this is true even if there is complete information. In some circumstances, the absence of an arms race can precipitate violence, even giving the military advantage to a nation that unilaterally stopped getting ready for a war it would initiate. Finally, we also show that empirical research is likely to be biased in favor of the hypothesis that deterrence leads to peace.

Vegetius's widely quoted aphorism admonishes those who desire peace to prepare for war. This view endorses military preparedness as the surest route to peace. Others fear that military preparations spiral uncontrollably to war. Our purpose is to specify the connection between the acquisition of arms and the peaceful resolution of international disputes. We hope to dispel at least some of the conventional wisdom that inextricably links arms races or arms control to peace. We model the evolution of international conflict as a game of sequential decisions (Kreps and Wilson 1982, Brito and Intriligator 1985, Cho and Kreps 1987, Morrow 1987, Powell 1987) and show that arms races are neither necessary nor sufficient for peace or war. We also show that empirical research is likely to be biased in favor of the hypothesis that deterrence leads to peace.

The literature on arms races increasingly is at odds with the conventional wisdom of those who believe either that arms races lead to war or that arms acquisition provides insurance against war. Since Richardson's pioneering study of arms races (1960), attention has been focused on the construction of models of arms competition, sometimes in the context of the Soviet-American rivalry (McGuire 1965, Enthoven and Smith 1971, Gray 1976, Baugh 1977, Cusack
and Ward 1981), often in a more abstract analytic framework (Intriligator 1975, Brams Davis and Straffin 1979, Dacey 1979, Brito and Intriligator 1985, Brams and Kilgour 1987). Recently, some theorists have begun to investigate the association between arms races and the likelihood of stable deterrence (Brams and Kilgour 1987, Zagare 1987, Kugler and Zagare 1987, Organski and Kugler 1980, Kugler 1984). Others have attempted systematic assessments of the empirical association between arms races and war (Wallace 1979, 1982, Altfeld 1983, Bueno de Mesquita and Riker 1982). But these studies have not completely sorted out the alternative outcomes that can follow from an arms race. We do so in a manner that illuminates both budgetary constraints on arms expenditures and the connection between arms acquisition strategies and the prospects for settling disputes peacefully.

ASSUMPTIONS

Assume two nations, i and j, each led by a rational, expected utility maximizing leader who dictates foreign policy. Outcomes are defined by ordered strategies for i and j. i, moving first, can elect to use force (denoted Fi) or not to use force (~Fi). j, moving second, possesses analogous choices. If the ordering of strategies is (~Fi, ~Fj), then nations i and j are said to engage in negotiations with one another without resorting to violence. If both i and j elect the strategy of using force then a war is said to ensue. If i initially chooses to fight and j makes the same strategic choice (Fi, Fj), then the war is initiated by i and denoted as Wari. If i initially selects not to use force, and j then uses force, i has the opportunity to capitulate to j by repeating its non-use of force (~Fi, Fj, ~Fi). We call such an event a military intervention by j and denote it as Intj. Alternatively, i can switch strategies by selecting to use force in response to j's attack (~Fi, Fj, Fj). Such a circumstance leads to a war initiated by j and denoted as Warj. Finally, i may initially use force and j may respond by not using force (Fi, ~Fj), resulting in a military intervention by i (Inti). The combinations of force strategies lead, then, to five distinct events: Negotiation, Intj, Warj, Inti and Wari.

Although the game structure is quite simple, it captures the sequence of events surrounding international conflict. Generally, research on international conflict focuses on war and peace as if they are mutually exclusive and exhaustive events (Singer, Bremer and...