

Two Dismal Sciences Are Better Than One— Economics and the Study of National Security

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A Review Essay

Jack Hirshleifer, *The Dark Side of the Force: Economic Foundations of Conflict Theory*. New York: Cambridge University Press, 2001.

War is economics by other means. States may increase their wealth by developing their own resources and through the promotion of foreign trade, or instead by seizing the economies of other nations. As Jack Hirshleifer puts it in *The Dark Side of the Force*, "There are two main methods of making a living . . . the way of production and exchange versus the way of predation and conflict."¹

Why do states choose one strategy over another? Under what conditions will they threaten other governments, and when will they seek to appease them? Economic theory has played a key role in shaping the way that scholars grapple with these and many other questions in the field of security studies.

Have economic methods and models proved useful in advancing scholarly understanding of strategic interactions among nations? That question provokes a surprising amount of controversy within the academic community.² The publication of Hirshleifer's collected papers on conflict theory provides a fresh opportunity to assess the influence of economics on the study of national security since World War II.³

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The author wishes to thank Andrew John, Robert Powell, Andrew Rose, and the reviewers of *International Security* for their assistance and comments.

1. Jack Hirshleifer, *The Dark Side of the Force: Economic Foundations of Conflict Theory* (New York: Cambridge University Press, 2001), p. 1; henceforth page citations appear in parentheses within the text.

2. See Stephen M. Walt, "Rigor or Rigor Mortis? Rational Choice and Security Studies," *International Security*, Vol. 23, No. 4 (Spring 1999), pp. 5–48.

3. For a recent overview that emphasizes bargaining theory, see Robert Powell, "Bargaining Theory and International Conflict," *Annual Review of Political Science*, Vol. 5, No. 1 (2002), pp. 1–30.

Using Hirshleifer's pioneering work in conflict theory as a touchstone, this review essay makes three central arguments. First, economics has played a critical role in the institutionalization of security studies within the academy during the postwar era, by providing the field with theories and methods that were previously lacking. Second, the most important contribution of the economics approach to security studies—and one that should not be minimized—is as a heuristic device. This approach helps to sharpen academic arguments and analysis and to raise important security-related questions. Nonetheless, it has not lived up to its full potential in this respect, given the failure of economists to engage the broader public in informed debates over defense policy. Third, serious gaps remain in the economics-inspired literature on national security; in particular, the tools of modern political economy have not been appropriately exploited to probe important phenomena with respect to defense policy and military procurement. This suggests the worrying possibility that the current generation of economists is taking less of an interest in security problems than did its predecessors, a trend, if it is such, that the field should seek to reverse.⁴

In this essay I do not claim that economics is or should be the dominant approach to modern strategic studies. Indeed, I heartily concur with Stephen Walt when he asserts that “members of the security studies profession should actively strive to retain the intellectual and methodological diversity of our field.”⁵ Historians, political scientists, sociologists, and philosophers have all contributed to scholarly understanding of violent conflict, and economists would do well to develop greater familiarity with this body of literature. Further, Walt's demand for relevance is certainly not misplaced at a time when academic research on public policy, including security policy, risks marginalization from mainstream political debate, as if that has not already occurred to a significant extent. These caveats aside, I seek to demonstrate that a strong case can be made for the value-added of economics to national security studies and, as suggested above, to broader discussions of defense policy.

The essay proceeds as follows. First, I provide a brief history of the relationship between economics and national security studies, to establish the broader academic and policy context that stimulated Hirshleifer's research agenda in

4. As Berkeley economist Barry Eichengreen has written, “Economists rarely deal with international security affairs.” See Eichengreen, “Economic Integration and European Security,” in Beverly Crawford, ed., *The Future of European Security* (Berkeley: Berkeley Center of German and European Studies, University of California, 1992), p. 79.

5. Walt, “Rigor or Rigor Mortis?” p. 48.

conflict theory. Next, I examine a few signal contributions that economists have made, drawing both on Hirshleifer's corpus and on other research. In particular, Hirshleifer's work provides fresh insights into some of the fundamental issues in security studies and international relations, including the nature of anarchy; the relative versus absolute gains debate; the disproportionate influence that small powers may exercise in world politics; the problem of appeasement; and the prospects for international cooperation. Following this review, I analyze in greater depth two case studies that have been subject to intense research by economists and other social scientists—the interaction between domestic politics and international conflict, and alliance relationships—to emphasize both the economics value-added and the limitations of this methodological approach, as well as to highlight Hirshleifer's influence on the latest generation of defense economists. Finally, I conclude with suggestions for future research, with an emphasis on the potential contribution of modern political economy to security studies.

Two Dismal Sciences: Economics and National Security

Writing during World War II, J.B. Condliffe lamented, "Economists have not contributed in very large measure to the recent outpouring of publications on the causes, conduct, and consequences of war."⁶ By the turn of the millennium, however, the situation had changed so radically that Stephen Walt could equally lament the specter of economic theory dominating security studies. After reviewing some of the most prominent scholarship that had drawn on rational choice models, Walt concluded that "recent formal work has relatively little to say about contemporary security issues."⁷

There is a remarkable irony in Walt's comment, given the role that economic methods have played in helping to institutionalize the academic study of national security problems. It is only in the past forty or fifty years that the study of national security has emerged as a prominent and legitimate field for scholarly research. Since then, it has consistently had to contend with university detractors who believe that this line of work is inappropriate or even immoral for professors and their graduate students.⁸ One reason why security studies had

6. J.B. Condliffe, "War and Economics: A Review Article," *Journal of Political Economy*, Vol. 51, No. 2 (April 1943), pp. 157–165, at 157.

7. Walt, "Rigor or Rigor Mortis?" p. 8.

8. For a brief review of that history, see Joseph S. Nye Jr. and Sean M. Lynn-Jones, "International Security Studies: A Report of a Conference on the State of the Field," *International Security*, Vol. 12,

such difficulty in gaining an academic foothold was that it lacked solid theoretical grounding.⁹ As Thomas Schelling wrote in 1960, "Within the universities, military strategy in this country has been . . . supported on a scale that suggests that deterring the Russians from a conquest of Europe is about as important as enforcing the antitrust laws."¹⁰

Already, however, there were signs of change. As Schelling also noted, "The defense-studies programs and institutes now found on a number of campuses . . . are a novel and significant development."¹¹ What was responsible for growing academic interest in the field? Schelling argued that it was the promise that a theory of strategy could be developed, which would be rooted in game theory. Economists were thus present at the creation of modern, university-based security studies programs.

Writing before Schelling, Bernard Brodie had recognized that, if the study of national security were to become a respectable field within the academy, it would have to be viewed as "scientific." Brodie believed that economic methodologies, including but not limited to game theory, held the promise of providing the critical link between university disciplines and government agencies. Although it may be the case, as Richard Betts has complained, that "strategic studies developed a scientific strain and overreached," the contribution of economics in helping the study of national security win a place within universities is worth recalling.¹²

The conceptualization of defense policy in economic terms has become commonplace among social scientists from many disciplinary backgrounds, and it is due to the work of a relatively small number of researchers, with Hirshleifer and Schelling providing two prominent examples. Perhaps it is not surprising that their generation of economists would take a special interest in national security, given that World War II and the bipolar struggle between the nuclear powers that followed shaped its formative years. Hirshleifer himself served in the U.S. Navy during the war before taking his undergraduate and doctoral degrees at Harvard University (where he studied with Joseph Schumpeter); he then went on to join the RAND Corporation, considered the "magnet for those

No. 4 (Spring 1988), pp. 5–27; and Richard K. Betts, "Should Strategic Studies Survive?" *World Politics*, Vol. 50, No. 1 (October 1997), pp. 7–33.

9. Betts, "Should Strategic Studies Survive?"

10. Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Mass.: Harvard University Press, 1960), p. 8.

11. *Ibid.*

12. Betts, "Should Strategic Studies Survive?" p. 11.

who wrestled intellectually with the strategic challenge of the nuclear revolution.”¹³ Veterans of that group (e.g., Herman Kahn, Thomas Schelling, James Schlesinger, and Albert Wohlstetter) include some of the most prominent scholars and practitioners of national security policy in the United States.

By the early 1960s, as a result of the early studies that had been conducted in the academy and in think tanks, notably RAND, economic methods and models were becoming more deeply rooted within the national security establishment. In 1961, “a group of economists . . . joined the Department of Defense [DoD] in positions which gave them the opportunity to take the initiative in applying the results of their research to the practical problems of policy planning and financial management.”¹⁴ Among other achievements, these “whiz kids” would help to create the Pentagon’s Planning, Programming, and Budgeting System (PPBS), which greatly modernized DoD decisionmaking. According to economist Alain Enthoven, a first-generation whiz kid, it was hard to believe how antiquated Pentagon management systems were in the early 1960s when he first arrived there. Even the basic tools for understanding the costs and benefits associated with alternative force structures and weapons platforms were lacking. At the same time, these economists were notably contributing to public debate over defense spending. Enthoven, for example, was the coauthor of a widely read book about military expenditure, entitled *How Much Is Enough?*¹⁵ It is unfortunate that defense economists are not playing a similar role today.

A review of the relationship between economics and national security by RAND’s Charles Hitch provides a sense of the variety of topics that economists were working on for the Pentagon (Hirshleifer, who was also at RAND at this time, was cited in this piece for his work on “war damage insurance,” a subject that has once again become tragically relevant in light of the terrorist attacks of September 11, 2001, and the ongoing insurance dispute over coverage of the World Trade Center’s Twin Towers).¹⁶ Topics included: (1) the analysis and measurement of economic strength for war; (2) the implications of large defense budgets in time of peace; (3) questions on the appropriate size of the de-

13. *Ibid.*, p. 12.

14. Alain C. Enthoven, “Economic Analysis in the Department of Defense,” *American Economic Review*, Vol. 53, No. 2 (May 1963), pp. 413–423, at 413.

15. Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough? Shaping the Defense Program, 1961–1969* (New York: Harper and Row, 1971). A brief history and critique of PPBS is found in Business Executives for National Security, *Special Report: Framing the Problem of PPBS* (Washington, D.C.: Business Executives for National Security, January 2000).

16. Charles J. Hitch, “National Security as a Field for Economics Research,” *World Politics*, Vol. 12, No. 3 (April 1960), pp. 434–452.

fense budget; (4) efficiency in using and managing defense resources; (5) institutional arrangements to promote efficiency; (6) military research and development; (7) military logistics; (8) the economics of alliances; (9) economic warfare and foreign economic policy; (10) mobilization; (11) civil defense; and (12) disarmament and arms control.

Among these topics, during the past decade or so, only four (topics 1, 8, 9, and 12) have benefited from extensive study. The subject of economic strength for war received considerable academic and public attention in the late 1980s, following the publication of Paul Kennedy's *Rise and Fall of the Great Powers*, which helped to launch a nationwide political debate over whether the United States was in a state of "decline."¹⁷ The economics of alliances and the issue of burden sharing have also become staples of academic analysis, a research program that has been built in large measure atop a pioneering paper by Mancur Olson and Richard Zeckhauser, which applied public goods theory to the alliance relationship.¹⁸ Hitch's subject (9), on economic warfare and foreign economic policy, has drawn scholars throughout the postwar period, a trend that has, if anything, accelerated since the end of the Cold War and the increasing use of sanctions as an instrument of U.S. strategy. Notable publications in this area have included David Baldwin's *Economic Statecraft*.¹⁹ Finally, major research programs on the subject of arms control and disarmament, largely financed by the Ford Foundation, were built at universities such as Harvard and Stanford. This topic has also received attention from economists since the end of the Cold War, as a result of public demands for defense "conversion" and a "peace dividend."²⁰ Interestingly, the sort of game-theoretic work that Thomas Schelling was so deeply involved in did not receive any special mention by Hitch (nor did it in Enthoven's review of the work of economists at the Pentagon, cited above), suggesting that the theory of strategy was not yet very prominent on the economist's radar screen, at least for those working within the government.

Much of the contemporary debate about the role of economic methodologies in security studies concerns its usefulness or relevance.²¹ Yet another critique

17. Paul M. Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987).

18. Mancur Olson Jr. and Richard Zeckhauser, "An Economic Theory of Alliances," *Review of Economics and Statistics*, Vol. 48, No. 3 (August 1966), pp. 266-279.

19. David Baldwin, *Economic Statecraft* (Princeton, N.J.: Princeton University Press, 1985).

20. For a review of this literature, see Ethan B. Kapstein, *The Political Economy of National Security: A Global Perspective* (New York: McGraw-Hill, 1992).

21. Walt, "Rigor or Rigor Mortis?"; and Betts, "Should Strategic Studies Survive?"

might be leveled that is, perhaps, of even deeper consequence. As this brief history suggests, the development of strategic studies in the postwar United States was part and parcel of the larger project of creating what Daniel Yergin once labeled the “national security state.”²² The growing connection between government and the academic community since World War II must raise questions about how social scientists, including economists, conceptualized their research tasks.

This relationship between the Pentagon and scholars has costs as well as benefits. On the negative side, the closeness of the relationship between state and university means that governments have arguably had an undue influence on the research agenda of scholars.²³ On the positive side, many scholars have been granted the opportunity to provide public officials with an impartial analysis of policy choices, and with tools of analysis that might otherwise be lacking in the corridors of power. Further, tangling with real-world and real-time policy debates is essential to the development of security studies.²⁴

The Economics of Conflict

Throughout their academic careers, most scholars are in search of a “big idea.” Hirshleifer’s big idea, stimulated by his work at RAND, came early and it was this: Economics is normally concerned with the analysis of productive activity, but there is a “dark side” that ought to be considered as well—the study of appropriation and conflict.²⁵ Simply stated, one can earn a living either by the sweat of one’s brow or by seizing that which another laborer has produced.

In recognizing that fundamental distinction, Hirshleifer drew his inspiration from Niccolò Machiavelli’s famous dictum that “it is not gold, but good soldiers that insure success . . . for it is impossible that good soldiers should not be able to procure gold” (p. 10). If it seems obvious today that economists should study conflict, it is largely because of this simple yet profound insight. Along the way, Hirshleifer would also develop many of the methodological approaches that are now commonplace to conflict theorists, making his work highly influential to economists in many different subfields. If he is less well

22. Daniel Yergin, *Shattered Peace: The Origins of the Cold War and the National Security State* (Boston: Houghton Mifflin, 1978).

23. For an exploration of some of these tensions, see Nye and Lynn-Jones, “International Security Studies.”

24. This point has also been made by Betts, “Should Strategic Studies Survive?”

25. I thank Jack Hirshleifer for sharing with me reflections on his career.

known than he should be among national security scholars, *The Dark Side of the Force* should help to remedy that deficit.

Hirshleifer's work, alongside that of many other economists and formal theorists in strategic studies, has emphasized four main themes: (1) the sources of conflict; (2) the technology of conflict and its influence on strategy; (3) the modeling of conflict; and (4) the consequences of conflict (p. 13). Below I say a few words about each before turning to Hirshleifer's signal contributions to the literature.

SOURCES OF CONFLICT

Williamson Murray has argued that "the basic problem that any government must master in diplomacy and peace as well as in strategy and war is the estimation of others' intentions."²⁶ In seeking insights into that problem, Hirshleifer has argued that three parameters—the agent's preferences, opportunities, and perceptions—are crucial in shaping an actor's optimization function (i.e., the decision regarding how best to allocate scarce resources between productive technologies and technologies designed for conflict).

Preferences, which are at the heart of game-theoretic research, designate not just strategies but ultimately the outcomes that an actor desires. For Hirshleifer, preferences are not simply a reflection of material interests; he has also incorporated irrational factors, including hatred and xenophobia, in his work (see notably pp. 198–219). Interestingly, he finds a strong biological basis for these "irrational factors" or, more precisely, for their converse, namely "strong group identification" (p. 14). Indeed, he finds much that is persuasive in sociobiology and anticipates a far deeper relationship between economics and biology in the years ahead. (It is likely, too, that political scientists will find much of interest in genetic research, with a possible revival of what was once called "biopolitics").²⁷

Opportunities refer to whether the agent can bring about its preferred outcomes, and whether conflict or productive exchange is "more profitable on the margin" in this respect (p. 13). The fundamental resource allocation decision for any actor is whether to invest in technologies of production or technologies of conflict, and because the actor is necessarily involved in strategic interac-

26. Williamson Murray, *The Change in the European Balance of Power, 1938–1939: The Path to Ruin* (Princeton, N.J.: Princeton University Press, 1984), p. 355.

27. See, for example, Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (New York: Farrar, Straus and Giroux, 2002).

tions with others, its opportunities will be defined not just by its preferences but also by their decisions.

Finally, perceptions, which occupy that shady middle ground between knowledge and uncertainty, are a further input to the actor's strategy. Hirshleifer expresses sympathy with Geoffrey Blainey's view that "war would never occur save for over-optimistic perceptions" (p. 14), which amounts to the delusion that one is stronger than one actually proves to be on the battlefield.²⁸ This focus on the importance of decisionmakers' perceptions has naturally led formal theorists inside the "black box" of domestic politics and political psychology.

The case of appeasement illustrates Hirshleifer's use of these three variables.²⁹ In contemporary thought and among policymakers, appeasement has become a dirty word, owing to its association with the failed policies of Britain and France toward Nazi Germany before the outbreak of World War II, and especially the infamous Munich Agreement of 1938, made at the expense of Czechoslovakia. As Jeffrey Record has written, "The main lesson the democracies, including the United States, drew from the Munich agreement was simple and clear: appeasement of aggression only invited more aggression." These lessons of Munich, he argues, have exerted a "powerful influence on U.S. decision-makers."³⁰

Hirshleifer suggests, however, that there may be situations in which appeasement is a rational strategy for policymakers to adopt. The question then becomes, Under what conditions is an enemy appeasable? Let us assume two actors *A* and *B* with incomes, respectively, of Y_a and Y_b . State *A* seeks to extract some of state *B*'s income and issues a threat (thus, *A* prefers resource appropriation to its own domestic resource development). State *B*'s response to the threat, however, will not simply be a reflection of state *A*'s preferences—*B* will not necessarily relent—but will also be conditioned by its view of *A*'s opportunities and perceptions. If, for example, *B* believes that *A* recognizes that going to war would be costly, and that state *A* could be satisfied by some alternative wealth-sharing arrangement (say through foreign direct investment or a free trade agreement; thus, *B* assumes that *A* really prefers greater income to resource appropriation), then *B* may rationally seek appeasement. In short, *B*

28. Geoffrey Blainey, *The Causes of War* (New York: Free Press, 1973).

29. Jack Hirshleifer, "Appeasement: Can It Work?" *American Economic Review*, Vol. 91, No. 2 (May 2001), pp. 342–346.

30. Jeffrey Record, *Perils of Reasoning by Historical Analogy: Munich, Vietnam, and American Use of Force since 1945*, Occasional Paper No. 4 (Maxwell Air Force Base, Ala.: Air War College, March 1998), p. 4.

comes to the view that *A* is appeasable because it prefers to accumulate income through peaceful means rather than through appropriation, and perceives that going to war over *B*'s resources would be costly.

Hirshleifer argues that these conditions did not apply at Munich in 1938. Consequently, Germany could not be appeased. He asserts that Britain and France focused too much on Germany's opportunities and not enough on its preferences and perceptions. Thus, they overestimated Germany's relative military power and miscalculated that a later war would be more favorable to them.³¹ This led directly to appeasement. Had they accepted that Adolf Hitler was fundamentally unappeasable (the British cabinet already considered that he was mad), and that he preferred war to peace (i.e., he preferred resource appropriation even at the cost of entering into a military conflict with Britain and France), they might instead have risked war over Czechoslovakia in 1938 rather than sought to put it off. As this brief example shows, game-theoretic approaches to historical cases can help scholars to think more clearly about the various elements that constitute an actor's strategy, incorporating psychological as well as material factors. It may also lead them to reconsider the conventional wisdom when it comes to strategic interactions.

THE TECHNOLOGY OF CONFLICT

Unlike many students of national security, Hirshleifer has always been more interested in what he calls issues of "macrotechnology" as opposed to the impact of specific weapons platforms on strategic behavior. What he means by this is the complex of production processes, demographics, and information systems that shape militaries and the way in which countries fight wars. Specifically, some countries may be more able than others to combine high levels of conflict-specific capital with less labor, just as some countries have a comparative advantage in producing capital-intensive over labor-intensive goods. These particular combinations of capital and labor as applied to the technology of war fighting, he argues, have been woefully ignored by economists in comparison to the sorts of production functions that make up much of modern microeconomic theory and industrial organization.

Drawing on these models of technological development and change, and especially the theory of increasing returns, Hirshleifer has posited that, as states *A* and *B* increase their investment in military technology, it may be revealed that one of them has a comparative advantage in "fighting activity." If military

31. See Murray, *The Change in the European Balance of Power, 1938–1939*, pp. 217–263.

technology is driven by the logic of increasing returns, it raises the theoretical possibility that one country could become the site for all new military development, just as one country could corner the market for research and development in some civilian good or service. Should a single country evolve toward monopoly power in military technology, any conflict between it and other states “is likely to end up with all the resources under one party’s control,” or “vertical domination” of the international system (p. 126). The possibility of increasing returns suggests that it may be optimal to pursue an imperial strategy, and according to Joseph Nye, some Washington pundits are currently promoting this line of argument.³²

But Hirshleifer has also devoted particular attention to the surprising role that small powers often play in world politics. It is a body of work that the Washington pundits might read with profit before pushing their imperial views any further. After all, why is it that the relatively labor-intensive North Vietnamese army could beat the capital-intensive Americans? Why is it that terrorists or guerrillas sometimes see their demands met by great powers? Why is it that some conflicts (e.g., Israel-Palestine) seem to be never-ending even when one side has greater military power? As Todd Sandler and Keith Hartley have written, “Dissatisfied groups may be able to cause great havoc and impose huge costs on a strong government when such groups resort to guerrilla warfare tactics.”³³ Why is that the case?

This question has occupied historians, political scientists, and psychologists—as well as economists—for decades, and it is likely to remain a prominent topic as students of national security turn their attention increasingly toward problems of modern terrorism.³⁴ From an economics perspective, Hirshleifer has proposed that small powers may often exercise disproportionate influence because “the initially disadvantaged group is typically motivated to fight harder” (p. 45). Briefly, because the status quo benefits the more powerful side, it has no initial interest in sharing its “income” with the small and weak. Should these aggrieved groups threaten conflict or wage war, however, the preferences of the rich may change. Of course, the weak may also suffer from inaccurate beliefs about their relative military capacity—or, perhaps more

32. For a critique, see Joseph S. Nye Jr., “Lessons in Imperialism,” *Financial Times*, June 17, 2002, p. 10.

33. Todd Sandler and Keith Hartley, *The Economics of Defense* (New York: Cambridge University Press, 1995), p. 305.

34. For an overview of terrorist activity, see Walter Enders and Todd Sandler, “Patterns of Transnational Terrorism, 1970–1999: Alternative Time-Series Estimates,” *International Studies Quarterly*, Vol. 46, No. 2 (June 2002), pp. 145–165.

accurately, their extractive capability—and thus fail to achieve their strategic objectives. Still, in a variety of settings—whether it is the case of unions against corporations in setting wages or the poor against the rich in shaping fiscal policy—the weaker side has often extracted income from the stronger.

THE MODELING OF CONFLICT

Hirshleifer has been a central player in developing many of the tools employed by formal theorists. Moving away from classical economic theory, with its emphasis on perfect competition, Hirshleifer has focused his attention on games with small numbers, drawing on the work of Cournot, Stackleberg, and other giants of game-theoretic research. For Hirshleifer, the critical question for formal theory is, “Who fights whom, and how hard?” (p. 18). In conducting experimental trials drawn from this question, he has hit on some surprising results. In particular, I show below that his careful modeling work has also placed him at odds with the important findings of Robert Axelrod with respect to the evolution of cooperation.³⁵

THE CONSEQUENCES OF CONFLICT

The consequences of conflict were a natural worry for scholars who were laboring in the early nuclear age, and who perceived as a feasible end game the annihilation of the human race. Books and films also touched on that theme, as in Neville Shute’s novel *On the Beach* and the classic movie *Dr. Strangelove*.

But, again reflecting his interest in biology, or what he calls “bioeconomics,” Hirshleifer has turned more recently to thinking about “the implications of the conflict option for the very fabric of human nature” (p. 19). How has conflict shaped the most fundamental aspects of what it means to be human? How have humans tried to harness the conflict option in the pursuit of peace, and to what extent can they succeed? Hirshleifer does not claim to have answered any of these fundamental questions, but in suggesting the need for more interdisciplinary work, drawing on biology, he points security studies in a new and exciting direction.

Advances in Conflict Theory

The key concept that distinguishes the field of international relations is anarchy, which refers to the absence of central authority in the international system.

35. Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984).

For realists, this assumption of anarchy, along with the further assumptions that states are the primary actors within the anarchic environment and that there is no effective restraint on their actions, means that the threat of war is “omnipresent.”³⁶ Accordingly, states must, as Thomas Hobbes argued, spend their time building and attacking forts.

No state, however, devotes all its resources to the technology of conflict, even during wartime. As Hirshleifer points out, anarchic competitors must “divide their efforts between two main types of activities: (1) productively exploiting the assets currently controlled and (2) seizing and defending a resource base” (p. 104). Correspondingly, states must develop technologies both of conflict and of production, and the balance between the two must be a central preoccupation of decisionmakers. How they strike the balance has prompted research that uses models drawn from both game theory and modern political economy.³⁷

The issues that decisionmakers face in allocating scarce resources between defense and production may, quite naturally, be thought of in economic terms. From the perspective of microeconomics, they are problems that can be conceptualized in terms of optimization, or achieving the “preferred balance of productive effort versus conflict effort,” and equilibrium, or the interaction of the separate optimizing decisions made by each state (p. 105). Equilibrium, it should be stressed, may be found in a wide variety of strategic interactions—from a stable relationship among the parties to, at the extreme, in state *A*’s taking complete control over state *B*’s resources. Even within a particular conflict scenario, multiple equilibria are feasible.³⁸ An essential point to be drawn from this line of analysis is that it is not anarchy alone that points toward a state of war, but the optimization functions of each agent as well. Further, it is conceivable that a contending party can strategically alter a state’s optimization function, as through the promise of increased foreign trade.

Hirshleifer hypothesizes that anarchy is most likely to “break down” when two factors are present: first, a belief by state *A* that it maintains a decisive military advantage over state *B*; and second, that state *A* suffers from “income inadequacy,” meaning an inability to develop the domestic resources needed to sustain its population.

36. For a review of the alternative definitions of anarchy in the international relations literature, see Michael W. Doyle, *Ways of War and Peace: Realism, Liberalism, and Socialism* (New York: W.W. Norton, 1997), p. 45.

37. For a game-theoretic account, see Robert Powell, “Guns, Butter, and Anarchy,” *American Political Science Review*, Vol. 87, No. 1 (March 1993), pp. 115–132.

38. For more on this, see Powell, “Bargaining Theory and International Conflict.”

As an example of these conditions, take the case of Nazi Germany. In the mid-1930s, Germany engaged in rearmament alongside its constant expressions of need for more *Lebensraum*. The Germans had been largely shut out of the overseas European colonial adventure and on the continent felt hemmed in by France in the west and the Soviet Union in the east. Owing to the Great Depression and the imperial structure of commercial policy, Germany's "trade expectations"—to borrow Dale Copeland's phrase—with other great powers were low.³⁹ Apparently British Prime Minister Neville Chamberlain shared this overall assessment. According to Williamson Murray, he "doubted whether the strengthening of Germany's economic situation would be a bad thing. A better economic situation might result in fewer political adventures."⁴⁰

By 1939, Germany was confident in its military advantage over its adversaries, but remained convinced that it needed additional territory to meet its growing population's requirements for food and fuel. The outcome was a series of threats toward its neighbors and, ultimately, war with them. One could speculate that a similar combination of factors was at work inside the Kremlin at the end of World War II—that is, a belief in the Soviet Union's military superiority over much of Europe combined with a fear of income inadequacy—leading to Josef Stalin's imperial strategy in the East.

But what explains the relative stability of the bipolar Cold War order, or at least the absence of great power war? Why did the Soviet Union not continue to expand westward to the Atlantic in search of greater income? In this case, neither Russia nor the United States possessed decisive conflict technology; and by the 1950s, as the pace of Soviet economic growth and technological development quickened, Moscow perhaps felt less constrained by income inadequacy as well. Copeland argues that, with the coming of détente during the late 1960s, the Soviet Union's trade expectations with the West began to grow, and with them the promise of higher income.⁴¹ Together these factors helped to promote peace among adversaries.

These examples suggest that, if states are always tempted to battle over the division of some collective pool of resources in the face of income inadequacy—if war really is economics by other means—they might seek instead to expand their joint product to satisfy each other's needs. Hirshleifer's modeling of conflict suggests that a "potential settlement region" (PSR) generally exists

39. Dale C. Copeland, "Economic Interdependence and War: A Theory of Trade Expectations," *International Security*, Vol. 20, No. 4 (Spring 1996), pp. 5–41.

40. Murray, *The Change in the European Balance of Power, 1938–1939*, p. 170.

41. Copeland, "Economic Interdependence and War."

in which parties can find a theoretical solution to their resources conflict, assuming that the costs and benefits of war are always uncertain (p. 28).⁴² If that is the case, then expanding the PSR will likely widen the zone of peace. Knowing this, states might seek to engage potential enemies, for example, in free trade agreements, because “trade enlarges the opportunities associated with peace” by increasing the incomes of each trading partner (p. 28). This theoretical result corresponds nicely with the empirical findings presented by Edward Mansfield in *Power, Trade, and War*, in which he shows a high degree of correlation between economic interdependence and peace.⁴³

Hirshleifer’s research also offers illumination into the issue of why it is that periods of free trade seem to correspond with the presence of a dominant or “hegemonic” power that establishes the economic rules of the game for small states.⁴⁴ At first glance, the condition of hegemonic free trade presents an economic puzzle, given that these states might extract greater income through either the seizure of resources from smaller powers or, more modestly, the use of optimal tariff policies, which shift the terms of trade in their favor. Why do they not pursue these strategies instead? Hirshleifer does not address this question directly, but he hypothesizes that wealthier states may be more willing to engage in cooperative undertakings than poorer states because trading arrangements will ultimately operate to their security benefit. How does this seemingly paradoxical result come about?

Imagine states *A*, *B*, and *C*, with incomes respectively of Y_a , Y_b , and Y_c , that are in strategic interaction over a combined pool of income $Y = Y_a + Y_b + Y_c$. Assume that $Y_a > Y_b + Y_c$, but that *A*’s military technology is not much superior to that of *B* and *C* combined (thus, increasing returns in conflict technology are absent). Under this condition, states *B* and *C* may have an incentive to ally and invest additional sums in weaponry in the hope of achieving military decisiveness over state *A*, with which to capture some of Y_a . Knowing this, state *A* can allocate scarce resources to invest in more military technology itself, with all the uncertainty that a heightened risk of war brings, or it can seek instead to help states *B* and *C* increase their incomes to help satisfy their material requirements. Again, this theoretical approach supports Copeland’s argument about the importance of trade expectations in promoting peace. State *A* might there-

42. Thomas C. Schelling was perhaps the first to claim that states were unlikely to go to war under the condition of perfect information if they assessed the costs to be high. See Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966).

43. Edward D. Mansfield, *Power, Trade, and War* (Princeton, N.J.: Princeton University Press, 1994).

44. For the classic statement, see Stephen Krasner, “State Power and the Structure of International Trade,” *World Politics*, Vol. 28, No. 3 (April 1976), pp. 317–343.

fore propose a trade agreement with states *B* and *C*, which would increase the wealth of each party. State *A* therefore receives both additional income and additional security from a trade deal even if, in relative gains terms, Y_b and Y_c may increase by more than Y_a .

Free trade agreements are appealing to states *B* and *C* because they give them a path toward achieving higher incomes without resorting to violence; further, state *A* may pay most of the institutional costs associated with that agreement. This model may be suggestive of why President Bill Clinton's administration, for example, encouraged Chinese membership in the World Trade Organization with such vigor.

Realists might be tempted to suggest that there can be no peaceful economic solution within some hypothetical PSR because states must always worry about relative as opposed to absolute gains.⁴⁵ Indeed, the debate over cooperation within the context of a distributive international system—that is, a system in which the costs and benefits of cooperation are unequally shared among the participants—is one of central importance to modern international relations theory. It suggests, for example, that hegemony must inevitably break down as new centers of power emerge to challenge the leader.⁴⁶ But this outcome necessarily rests on certain assumptions about preferences, opportunities, and perceptions. Hirshleifer would agree that there are cases where cooperation must break down, as his study of appeasement suggests. Again, the answer as to why conflicts occur must be found inside the black box.

In analyzing the prospects for international cooperation, Hirshleifer has taken on what is perhaps the most influential rebuttal to the relative gains argument: namely Robert Axelrod's famous result that tit-for-tat represents the stable strategy in an iterated or multiple-play prisoner's dilemma game (PDG).⁴⁷ The iterated PDG is a game where the "shadow of the future" looms large and where considerable uncertainty may exist with respect to who wins and who loses, say from a trade agreement, over an infinite time horizon.

Hirshleifer has disputed this result on both theoretical and methodological grounds (pp. 220–250). Theoretically, he observes that other classes of games besides prisoner's dilemma are also useful for understanding strategic interactions. In addition, he suggests that PD's preeminence is due to its insights into the "free rider" problem, which of course is important but hardly the sole or

45. Joseph M. Grieco, "Anarchy and the Limits of Cooperation," *International Organization*, Vol. 42, No. 3 (Summer 1988), pp. 485–507.

46. Robert Gilpin, *War and Change in World Politics* (New York: Cambridge University Press, 1981).

47. Axelrod, *The Evolution of Cooperation*.

even necessarily the most significant issue in international relations. Methodologically, he has questioned the way in which Axelrod's round-robin tournaments were conducted (specifically, why they were limited to this type of play).

However, even when PD is played in a variety of conditions—that is, when the numbers of players are increased and the type of play is varied—Hirshleifer discovered that different results obtain, most notably that “punisher” or superpredator strategies are also successful in this game-theoretic setting. His significant and politically suggestive finding is that, although the tit-for-tat result may hold ideological appeal for those who seek cooperation in anarchy, it is by no means necessarily the best strategy in a complex world. Again, a deeper understanding of the optimization functions of states is necessary.

Under what conditions, then, can cooperation be expected to occur? In seeking to answer this question, Hirshleifer (like Axelrod) has turned to biology for insight and has found in it a richness and variety of responses. Cooperation arises in a wide array of social contexts, some of which are associated with kinship and reciprocity (which promote tit-for-tat strategies), others not (a lioness, for example, has been known to care for rather than eat a wounded antelope, while a lion will not abide such sympathy). Further, he reminds us that the definition of cooperation requires careful specification, varying as it does from reciprocal agreements among equals to unilateral deference by the weak toward the powerful. This overview of the great variety of cooperative outcomes is certainly valuable to students of international relations, who have limited themselves in overly large measure to prisoner's dilemma models, with their (misleading?) promise of cooperation in reciprocity.

Hirshleifer's models of anarchy and its consequences point sharply away from the rigid world of structural realism. Looking inside the black box of domestic politics is required to understand the sources of the various optimization functions observed among states. This is a path that other formal theorists have taken as well. In *War and Reason*, for example, Bruce Bueno de Mesquita and David Lalman argued that, using the realist assumption in which decisionmakers are unconstrained by domestic political forces and attach uncertainty to conflict outcomes, the only rational outcome of strategic interactions is either negotiation or continuation of the status quo. The causes of war, therefore, must be found within domestic political systems.⁴⁸ Interestingly,

48. Bruce Bueno de Mesquita and David Lalman, *War and Reason: Domestic and International Imperatives* (New Haven, Conn.: Yale University Press, 1992).

much of the work in modern security studies now leads in the direction of domestic politics, whether it is animated by mainstream or constructivist theories.⁴⁹ While democratic peace theory is perhaps the most influential domestic-level framework in analyzing world politics, theories of identity formation and how societies come to divide the world into “us” and “them” are of increasing interest, especially to students of ethnic conflict.

In short, Hirshleifer’s research has helped to illuminate some of the key issues in international conflict, including the nature of anarchy, the relative versus absolute gains debate, appeasement, the big influence of small powers in world politics, and the prospects for international cooperation. At the same time, his models have refined the tools with which to analyze these complex problems, with his critique of Axelrod providing only a single case in point. All told, the analysis of conflict has been greatly advanced by the economic approach that Hirshleifer has brought to bear. In the following section, I trace his influence on some recent research.⁵⁰

Economic Models and Case Studies

Beyond his broad theoretic contributions, Hirshleifer has contributed to the analysis of some of the most significant contemporary debates in modern security studies, including the interaction between domestic politics and international conflict, and alliance relationships. Economic theories have suggested new ways to think about these case studies, but more empirical work is still needed to advance these research programs.⁵¹

As Robert Powell writes, “One of the oldest debates in international relations theory is over the relative importance of domestic or structural explanations.”⁵² That debate has been fueled more recently by an empirical observation, namely the democratic peace. Providing a theoretical basis to that observation has become a major industry within the subfield.⁵³

In an article that builds explicitly on Hirshleifer’s work, Michelle Garfinkel draws on political economy models to attack this issue.⁵⁴ Specifically, she ex-

49. Betts, “Should Strategic Studies Survive?”

50. For more on this point, see Todd Sandler, “Economic Analysis of Conflict,” *Journal of Conflict Resolution*, Vol. 44, No. 6 (December 2000), pp. 723–729, and the accompanying articles in this special issue.

51. Walt, “Rigor and Rigor Mortis?”

52. Powell, “Bargaining Theory and International Conflict,” p. 22.

53. For a collection of essays on this subject, see Michael E. Brown, Sean M. Lynn-Jones, and Steven E. Miller, eds., *Debating the Democratic Peace* (Cambridge, Mass.: MIT Press, 1996).

54. Michelle Garfinkel, “Domestic Politics and International Conflict,” *American Economic Review*, Vol. 84, No. 5 (December 1994), pp. 1294–1309.

amines “the effects of electoral uncertainty associated with political competition on a nation’s allocation of resources among peaceful production activities and military spending.”⁵⁵ The problem is as follows. During any given administration, a leader must allocate scarce resources to national security, which provides the protective umbrella beneath which productive activity can take place. Yet the incumbent leader who invests in national security today will provide voters with less peaceful production and thus economic warfare than they would like and may, as a result, be voted out of office tomorrow. Garfinkel suggests that this electoral logic imparts a negative bias to defense spending, one that all democracies share. As a result, democracies are likely to be confident that each of them will choose peaceful production over military spending, which in turn lends material support to their “democratic peace.” Through this election-driven mechanism, democracies unwittingly “cooperate” in the form of greater disarmament than leaders would otherwise provide.

However, in their article “War and Democracy”—a work that combines careful modeling with empirical evidence—Gregory Hess and Athanasios Orphanides contest this view and the associated political economy model.⁵⁶ They dispute the assumption that leaders can be modeled as ciphers who simply reflect and carry out some collective will. Instead they argue, “citizens elect leaders as their agents and do not therefore control the day-to-day operations of government. Accordingly, imperfections may arise from the reelection motive . . . of leaders. Specifically, the desire of incumbent leaders with unfavorable economic performance to hold on to power generates an incentive for actions that demonstrate their leadership abilities and allow them . . . to salvage their position.”⁵⁷ In short, even democratically elected leaders may be tempted to engage in diversionary wars.⁵⁸

Hess and Orphanides then introduce a further complication into their model, which again reflects an early insight of Hirshleifer: There may be situations under which “conflicts that are appropriative in nature” are “welfare-improving.” In short, there may be cases when it pays to grab resources from

55. *Ibid.*, p. 1295.

56. Gregory Hess and Athanasios Orphanides, “War and Democracy,” *Journal of Political Economy*, Vol. 109, No. 4 (August 2001), pp. 776–810.

57. *Ibid.*, p. 779.

58. For a view on the debate over democratically elected leaders and conflict that focuses on preventive rather than diversionary wars, see Randall L. Schweller, “Domestic Structure and Preventive War: Are Democracies More Peaceful?” *World Politics*, Vol. 44, No. 2 (January 1992), pp. 235–269.

others rather than to develop them domestically. The question they thus raise is, "Under what circumstances (would) a democratic leader seize an opportunity for an appropriative war?"⁵⁹

Hess and Orphanides suggest two cases where leaders would be tempted to launch such an extractive campaign: first, when the spoils from conflict are so large that it would make war beneficial even for leaders who heretofore had been disinclined to use military force—a possibility also raised by Peter Liberman in his work on the economics of conquest⁶⁰—and second, if the war would boost the leader's re-election chances by further demonstrating his "competence" before uncertain voters. This is most likely to occur when the leader has already highlighted his war-handling abilities, perhaps during a conflict with a weak nondemocracy.⁶¹

If diversionary and resource wars may occur even among republics, what institutional modifications could be introduced domestically and internationally to reduce the chances of its occurrence? With respect to domestic politics, one intriguing notion is to involve voters more directly in foreign policy decisionmaking, on the assumption, as suggested by Garfinkel, that rational voters would generally prefer peaceful production to the technology of conflict. Indeed, this suggestion harkens back, though the authors do not mention it, to Adam Smith's argument that all wars should be funded by immediate taxation to test public support for the conflict, an idea that has particular relevance when one considers, for example, President Lyndon Johnson's refusal to subject the American people to higher taxes to support the costs of the Vietnam War.

On the international level, Hess and Orphanides posit that democracies might reduce the chances for conflict among them by joining together in a military alliance. Naturally, the members of the alliance would somehow have to credibly commit to a collective security arrangement, but here they do not rely on Garfinkel's political economy model for support. Instead, they assert that an alliance must be maintained by the knowledge that if democratic state *A* attacks its ally *B* in period 1, *A* can be certain that it will be attacked in period 2

59. Hess and Orphanides, "War and Democracy," p. 795.

60. Peter Liberman, "The Spoils of Conquest," *International Security*, Vol. 18, No. 2 (Fall 1993), pp. 125–153.

61. For a related analysis that emphasizes why economic interdependence should not be expected to minimize international conflict, see Eugene Gholz and Daryl G. Press, "The Effects of Wars on Neutral Countries: Why It Doesn't Pay to Preserve the Peace," *Security Studies*, Vol. 10, No. 4 (Summer 2001), pp. 1–57.

by the other members of the alliance. Thus the desire to avoid a future attack is ultimately what underpins the alliance arrangement.⁶² This argument, however, does not seem to satisfy the commitment problem, as for various reasons allies might fail to meet their defensive obligations to one another.

This leads to my second case study, alliance relationships. In this area economists have addressed several subtopics, including the division of labor within alliances or “burden sharing,” armaments cooperation, and the problem of credibility of commitment. In what follows I use the example of armaments cooperation in a way that enables an examination of these other two issues of burden sharing and credibility as well.⁶³

Once again, it is useful to recall Hirshleifer’s admonition that game-theoretic models of international cooperation can lead to many different outcomes, depending on the number of players and the game that is played. In alliance theory, one game—the prisoner’s dilemma—and one outcome—free riding—have dominated much of the economics and policy analysis. But even the PDG can produce different outcomes as the number of parties is increased and assumptions about their motivations are loosened or changed. In some models, for example, two weaker allies may join to exploit a third, stronger ally. In others, the strong may exploit the weak. Clearly, the richness of relations among the NATO allies is not easily reducible to any single type of game, given the presence of both domestic and international factors in shaping the strategic interactions among the member states.

Indeed, a variety of economic models have been used to address the alliance relationship. Drawing on Hirshleifer’s fundamental insights with respect to resource allocation decisions, nations must choose between developing weapons domestically (“arming”) and importing defense equipment from friends and allies—or some combination of the two. As James Morrow has written of these choices, “Arming produces a more reliable improvement in security. . . . Alliances produce additional security quickly but with less reliability.”⁶⁴

Whether to arm or import when it comes to weapons procurement decisions presents an interesting puzzle for defense economics. Take the public goods approach to alliances, as pioneered by Olson and Zeckhauser. Using the U.S.

62. For an alternative view on why democracies might seek to build alliances, see Schweller, “Domestic Structure and Preventive War.”

63. For a further elaboration of these arguments, see Ethan B. Kapstein, “Allies and Armaments,” *Survival*, Vol. 44, No. 2 (Summer 2002), pp. 141–156.

64. James Morrow, “Arms versus Allies: Trade-offs in the Search for Security,” *International Organization*, Vol. 47, No. 2 (Spring 1993), p. 214.

nuclear umbrella over Western Europe as their example, they assumed that security was a single good, and that once this public good was produced by the dominant member of an alliance, the smaller members would be able to enjoy a free ride, spending little on their own defense.⁶⁵ Olson and Zeckhauser's analysis was supported with data on defense spending among NATO member states, which demonstrated the lopsided contribution made by the United States

If this theory is accurate, however, why do the allies spend any money at all on armaments? Recalling Garfinkel's model of political economy, we know that from the purely electoral standpoint of public officials, these funds could be used more effectively for campaign purposes by investing in other public goods such as schools, hospitals, and public pensions. Free riding should always be the preferred strategy for decisionmakers in small states, but it seems clear that most allies spend more on their defense than might have been predicted by the public goods model.

A second influential theory of alliance economics argues that allies should pursue free trade as the basis of their procurement policies. Free trade means that the allies should adopt a division of labor when it comes to their security. As Sandler and Hartley have written, "An optimal alliance might . . . be characterized by specialization based on comparative advantage with the principle applied to both armed forces and defense industries."⁶⁶

Scholars have argued that free trade would bring in its train important benefits from a political, economic, and security standpoint. Drawing on Albert Hirschman's fundamental insight about the "supply effects" of trade, Joanne Gowa and Edward Mansfield have emphasized that international commerce promotes "security externalities," meaning that the efficiency gains that come from trade permit states to release more resources for defense than would otherwise be possible; as a result, "trade enhances the potential military power of any country that engages in it."⁶⁷ For an alliance as a whole, free trade would promote efficiency in weapons production, because each would specialize in building what it does best. The oft-expressed fear of excessive de-

65. Mancur Olson and Richard Zeckhauser, "An Economic Theory of Alliances," *Review of Economics and Statistics*, Vol. 48, No. 3 (August 1966), pp. 266–279.

66. Todd Sandler and Keith Hartley, "Economics of Alliances: The Lessons for Collective Action," *Journal of Economic Literature*, Vol. 39, No. 3 (September 2001), p. 889.

67. Joanne Gowa and Edward D. Mansfield, "Power Politics and International Trade," *American Political Science Review*, Vol. 87, No. 2 (June 1993), p. 408. For the classic statement, see Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley: University of California Press, 1945).

pendence on a trading partner, or of being abandoned (i.e., cut off) during a conflict, could be dealt with through such policies as the stockpiling of weapons and the diversification of arms imports, issues that have also been addressed in recent years using economic models.⁶⁸

Finally, from a political standpoint, a NATO free trade policy could help to strengthen alliance relationships, something that is sorely needed at a time when transatlantic tensions seem to be running high.⁶⁹ According to Walt, U.S. officials, for example, have asserted that “increasing American arms transfers will help ‘revitalize American alliances.’”⁷⁰ Free trade represents a political and economic signal that one ally can send to another about the importance of their relationship.

These benefits would seem to argue strongly for a policy of free trade in weapons among allies, and indeed that policy has its strong supporters in certain quarters of the defense establishment. A 1999 study by a trio of analysts at RAND asserted that “the allies and the United States should work toward open trade and investment in defense and information technology” so as to create a transatlantic market for promoting the revolution in military affairs.⁷¹ But that policy does not appear to have much influence in the Pentagon or its alliance counterparts.

Instead, the allies maintain a whole series of import and export controls that are targeted not just against third parties and President George W. Bush’s “axis of evil,” but against one another as well. Both bureaucrats and members of Congress, for reasons not just of national security but also domestic political economy, have supported these controls as well. The Buy American Act of 1933, for example, bolsters U.S. defense producers by giving them a cost advantage over foreign firms in any Pentagon-sponsored procurement competition. In fact, defense markets on both sides of the Atlantic remain protected from competition by a web of formal and informal rules and regulations.

Why is that the case? David Lake draws on joint production or transaction economics in seeking an answer in his book *Entangling Relations*.⁷² From his

68. Stephen G. Brooks, “The Globalization of Production and the Changing Benefits of Conquest,” *Journal of Conflict Resolution*, Vol. 43, No. 5 (October 1999), pp. 646–670.

69. See Kapstein, “Allies and Armaments,” pp. 141–156.

70. Stephen M. Walt, “Alliance Formation and the Balance of World Power,” *International Security*, Vol. 9, No. 4 (Spring 1985), p. 232.

71. David Gompert, Richard Kugler, and Martin Libicki, *Mind the Gap: Promoting a Transatlantic Revolution in Military Affairs* (Washington, D.C.: National Defense University Press, 1999), p. 65.

72. David A. Lake, *Entangling Relations: American Foreign Policy in Its Century* (Princeton, N.J.: Princeton University Press, 1999).

perspective, advocates of free trade miss out on something important when they focus their gaze too narrowly on the efficiency gains that arise through adoption of the division of labor. As a consequence, they fail to take into account the costs that will also arise in free trade, for example with respect to the monitoring and enforcement of agreements. In short, we return to the problem of credibility of commitment.

By way of illustration, imagine that states *A* and *B* strike a free trade agreement, in which *A* specializes in the production and export of guns and *B* of butter. While adopting the division of labor delivers economic benefits to both sides, *A* and *B* must also be confident that each country is sticking to its side of the bargain, and that necessarily entails some monitoring costs. If *A* continues to produce both guns and butter while *B* has gone ahead and given up its guns, *B* may find itself in a vulnerable position (or left, in game-theoretic terms, with a “sucker’s payoff”); *B* will therefore have an incentive to invest some of its gains from trade in monitoring and enforcement technology (and similarly for *A*). Thus, although benefits certainly flow from adopting the division of labor, costs come with ensuring that agreements are respected. It is, of course, the role of institutions to structure arrangements that maximize transaction benefits and minimize transaction costs.⁷³

In terms of military relationships, Lake argues that countries will weigh the costs and benefits associated with defense alliances, cooperating to the point where the costs (in economic, political, and security terms) outweigh the benefits. This joint production model predicts that an incomplete division of labor among security partners will emerge. The division of labor is incomplete because the costs of monitoring and enforcing free trade will, at some point, outweigh the benefits.

Some joint production will occur, however, because “the cost of producing security can be enormous,” and countries “may consume fewer resources by pooling efforts with others.”⁷⁴ Thus, even though the pressures generated by the international system may make internal arming a country’s preferred acquisition strategy, the economic, political, and security costs of autarky must not be overlooked or underestimated. Arming diverts resources away from other societal goods, such as education, health care, and infrastructure, which voters may prefer. Economically, protection of the defense-industrial sector is

73. The relevance of this model to arms control should also be apparent, given that arms control agreements also entail heavy monitoring costs.

74. Lake, *Entangling Relations*, p. 44.

inefficient and costly. Finally, in security terms, the choice for internal arming may simply result in the production of poorer weapons systems and less battlefield capability than imported systems would deliver.

The view of transaction or joint production economics, therefore, creates the expectation that military allies will adopt some mix of arming and importing. Further, in pursuing even a limited division of labor, they will create institutions that will act to maximize economic and security benefits while minimizing monitoring and enforcement costs. By sharing information and decisionmaking authority, for example, and by engaging in armaments cooperation, institutions such as NATO may contribute to the “locking-in” of security commitments by the member states. These initiatives are designed to promote the credibility of commitment among states that is required if alliances are to play a role in promoting the democratic peace.

As these cases demonstrate, economic models and methods have been used to address a diverse set of issues in modern security studies, helping scholars to sharpen arguments and to raise new and important questions with respect to international conflict and defense policy. These models and methods are hardly monolithic; economists disagree vehemently among themselves over basic assumptions and modeling decisions, and that has also driven developments in the field. Hirshleifer’s work—alongside that of other economists who pioneered the use of this body of theory to military problems, notably Thomas Schelling and Mancur Olson—has animated much of that contemporary literature, by introducing approaches to security problems that have proved amenable to a progressive research agenda. Still, much work remains to be done.

Conclusion: Political Economy and the Future of Security Studies

This review essay has sought to provide a nontechnical analysis of some of the major contributions of modern economic theory to the study of conflict and national security. I have tried to hint at the rich tradition that has been created and the continuing relevance of this analytical approach. Yet there are significant gaps in the economics literature that ought to be addressed. That is not surprising, because few economists are concentrating on security studies as their primary field of inquiry. A few overlooked topics provide a sense of future research needs.

First, with the partial exceptions noted in the previous section, such as the economic work on democratic peace theory, there has been a paucity of effort

in recent years to employ political economy models to address macro- and microeconomic issues in defense policy—including, for example, changes in the size of the defense budget and weapons procurement decisions. This is surprising in that, on the one hand, political economists have devoted significant attention to the topic of the level of government spending in general while, on the other, military expenditures are usually regarded as the single most important discretionary tool at a president's disposal for pumping federal monies into the national economy; this phenomenon is sometimes called "military Keynesianism."⁷⁵ Bringing these two elements together would seemingly lead scholars to develop a vibrant research program on the political economy of defense spending, but that has not been the case.

The contemporary political economy literature is much more complex than the simple models discussed earlier, which conceptualized politicians as simple vote maximizers. Recent work has also analyzed the influence of rules and institutions on budgetary outcomes, and surely these must be relevant in the defense case as well, where, for example, relevant congressional committees play a significant role in shaping military expenditure decisions. Again, it should be emphasized that this body of work goes well beyond the traditional public-goods notion of government spending, in which public officials are assumed to be social-welfare maximizers.

Complementing these electoral and institutional models of political economy that focus mainly on the behavior of politicians, other important models that are applicable to defense spending and weapons procurement—and perhaps other issues in national security policy as well—include those that analyze rent seeking by special interest groups: that is, the ability of particular groups to extract income or favors from government—and by extension, from society as a whole. In the classic article on this topic, Anne Krueger developed a simple model of rent seeking in which special interest groups weigh the costs and benefits of lobbying governments to adopt a desired policy.⁷⁶ That model has been extended over the years to the study of corruption and bribery in government more generally, the role of campaign finance and public action

75. For an overview of the literature on the political economy of government spending, see Allan Drazen, *Political Economy in Macroeconomics* (Princeton, N.J.: Princeton University Press, 2001); for a discussion of debates over defense spending, see Ethan B. Kapstein, *The Political Economy of National Security: A Global Perspective* (New York: McGraw-Hill, 1992).

76. Anne Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review*, Vol. 64, No. 3 (June 1974), pp. 291–303.

committees, and the politics of regulation. This body of research might be employed to good effect with respect to the macro- and microeconomics of defense spending as well. And, echoing a point made earlier, this work would not be of academic value alone, but could contribute significantly to public debates over the military budget and defense policy.

Second, there has been little attention paid in the recent literature to the economics of arms control agreements. To be sure, economists after the Cold War did some work on conversion and the peace dividend, but less on arms control agreements per se. Arms control and disarmament decisions would, *prima facie*, fit nicely into the sorts of models that Hirshleifer has developed with respect to resource allocation decisions and that have since been extended by other scholars. The work of David Lake on the monitoring costs associated with international agreements is relevant here as well. Bringing these various approaches together to enhance academic understanding of why states enter into arms control agreements has the potential of bearing fruit, and again could complement scholarship in this area that has focused, for example, on norms and the role of epistemic communities.⁷⁷ What role do economic calculations play in arms control? Can a weapons agreement be usefully conceptualized as a carrot given by a wealthier state to a poorer one—a wealth-sharing device—in the hope of enhancing the rich country's national security? These are questions that economists have not yet tackled to any great extent.

Third, with few exceptions, economists have not devoted much attention to the arms trade.⁷⁸ As Paul Levine and Ron Smith put it, "The arms trade is interesting because it is where foreign policy concerns such as security, human rights, and international order interact most directly with economic concerns such as trade, jobs, and profits."⁷⁹ Within the political science literature in security studies, the arms trade has been a topic of some importance since the Nixon Doctrine of the late 1960s, much of it critical of U.S. policy, but this work has benefited little from economic analysis.⁸⁰

77. See Emanuel Adler, "The Emergence of Cooperation: National Epistemic Communities and the International Evolution of the Idea of Arms Control," *International Organization*, Vol. 46, No. 1 (Winter 1992), pp. 101–145.

78. A prominent exception to this rule is provided by the work of Paul Levine and Ron Smith. See Levine and Smith, "Arms Export Controls and Proliferation," *Journal of Conflict Resolution*, Vol. 44, No. 6 (December 2000), pp. 885–895; and Paul Levine and Ron Smith, "The Arms Trade," *Economic Policy*, No. 25 (October 1997), pp. 337–370.

79. Levine and Smith, "Arms Export Controls and Proliferation," p. 885.

80. See, for example, James Adam, *Engines of War: Merchants of Death and the Arms Race* (New York: Atlantic Monthly Press, 1990); and Michael Klare, *American Arms Supermarket* (Austin: University of Texas Press, 1984).

Indeed, the existing literature has hardly begun to settle the most basic debates. In a recent study, for example, William Keller and Janne Nolan have asserted that “the motivations behind arms sales have become largely economic.”⁸¹ Yet in his classic study of the defense trade, Andrew Pierre says the opposite: “Arms sales must be seen, essentially, in political terms.”⁸² Surely, Levine and Smith are correct when they state, “Explanations of the [arms] trade that emphasize just economics or just politics must be unsatisfactory: both matter.”⁸³

The problem, then, is to model both the domestic interaction between economics and politics, on the one hand, and the international or strategic interactions among states between more arms sales or less, on the other. As the reader can appreciate, the sorts of models discussed in this essay are relevant to this set of issues. In recent work by Levine and Smith, for example, governments set their defense expenditures and arms sales in order to maintain the military production capacity that optimizes a given domestic welfare function.⁸⁴ Consistent with the security dilemma, however, arming by one state increases military expenditure by another, and so both states spend more on defense than they would like. Arms control agreements, including limits on overseas arms sales, would solve this collective action problem by establishing an arrangement such that each side maximizes its utility, or its welfare-maximizing combination of domestic and military production. But the two parties are trapped inside a prisoner’s dilemma game, from which they can be liberated only if they find instruments designed to enhance their mutual credibility of commitment or of treaty enforcement.

This simple discussion suggests the way forward for a progressive research agenda on the arms trade and on arms control more generally. Because monitoring and enforcement problems are so central to these sets of issues—and to many others in security studies as well (and indeed, to very different problems of international relations, such as enforcing global climate change agreements)⁸⁵—theoretical breakthroughs in this area could have wide-reaching effects for academic research. Economists motivated by the commitment prob-

81. William W. Keller and Janne E. Nolan, “Mortgaging Security for Economic Gain: U.S. Arms Policy in an Insecure World,” *International Studies Perspectives*, Vol. 2, No. 2 (May 2001), pp. 177–193, at 182.

82. Andrew Pierre, *The Global Politics of Arms Sales* (Princeton, N.J.: Princeton University Press, 1982), p. 3.

83. Levine and Smith, “Arms Export Controls and Proliferation,” p. 885.

84. *Ibid.*

85. I thank Oran Young for this insight.

lem might do well to examine the arms trade and arms control, in so doing contributing both to security studies and to topics of broader academic and public concern.

Recalling Charles Hitch's earlier list of defense topics, there are at least a couple that stand out in the present security climate that have received little attention from economists in recent years. Civil defense, for example, has never attracted much in the way of academic interest; and even now, in light of the seemingly heightened risks associated with terrorism, it does not appear to be drawing scholarly attention. The Bush defense buildup, for example, includes the allocation of millions of dollars for vaccinations against biological weapons; and given these sorts of policy measures, the economics and political economy of civil defense would seem to warrant some dispassionate analysis.

Another topic that could benefit from greater economic study is military research and development, especially because growing concentration in the defense industry has potentially significant implications for innovation and competition. Much of the literature in this area has been journalistic rather than scholarly, and could benefit from economic treatment.⁸⁶ Many further examples of research needs could be provided, but the above sampling serves a dual purpose: that of demonstrating the potential utility of applying economic theory to problems of national security, and that of enticing those who use that toolbox to employ it on behalf of this critical subfield.

Indeed, if this essay is primarily about the contribution of economics to the study of national security, it might be asserted that the pathway also runs in the opposite direction, and that national security problems have contributed mightily to the development of modern economics as well. The sorts of game-theoretic tools that are now so widely used throughout the academy grew in large part out of the analysis of security problems, as did a number of other modeling and econometric techniques. Just as military research and defense procurement have produced spin-offs that have benefited civilian industries, so too has the study of national security created widespread spin-offs for academic research in economics as in other fields. The demise in interest in national security studies among economists, if that is indeed occurring, may not simply reduce our stock of knowledge about defense matters but could have broader theoretical consequences as well.

86. See, for example, Gordon Adams, *The Iron Triangle: The Politics of Defense Contracting* (New York: Council on Economic Priorities, 1981).

At a time when the Bush administration is calling for a large increase in defense spending in the wake of the September 11 terrorist attacks, it should be obvious that economists alongside other national security specialists ought to be leaders in shaping public debate about policy alternatives and how best to use additional resources, if such are needed in the new security environment.⁸⁷ Does the current defense buildup represent a rational response to the threats that the United States now faces, or did September 11 provide defense-industrial rent seekers with a unique opportunity to raid the treasury? Economics can and should help in the political task of asking hard questions about defense policy, and that gives it a crucial role as part of the democratic project. In short, economics is both illuminating and important as an analytical tool, and from that perspective, scholars might agree that the world needs even more of it in the study of such critical issues as national security.

87. For one critique, see Michael E. O'Hanlon, *Limiting the Growth of the U.S. Defense Budget*, Brookings Policy Review, No. 95 (Washington, D.C.: Brookings, March 2002).