

Reform of United States Weapons Acquisition Policy: Competition, Teaming Agreements, and Dual-Sourcing

William B. Burnett†
William E. Kovacic††

Attaining an adequate level of defense at an acceptable cost is as vital and elusive a goal as any the United States has pursued since World War II. No aspect of this goal has proven more vexing than the search for an effective process for purchasing armaments of reasonable price, satisfactory performance, and timely delivery.¹ News accounts abound with reports of serious deficiencies in weapons projects that are central to this country's defense.² Recently, the Department of Defense (DOD) and the

† Vice President, Charles River Associates, Washington, D.C.

†† Assistant Professor, George Mason University School of Law.

This Article is a revised and expanded version of a paper entitled *United States Department of Defense Weapons Acquisition Policy: Teaming Arrangements and Dual-Sourcing* presented to the 43rd Congress of the International Institute of Public Finance, Paris, France, August 27, 1987. The authors wish to thank Ian Byatt, Joseph F. Brodley, William Blumenthal, Charles L. Eger, Kathryn M. Fenton, J. Ronald Fox, Victor P. Goldberg, Kirk Johns, Robert J. Mackay, William P. Rogerson, F.M. Scherer, and the members of the Northwestern University Economics Department Industrial Organization Seminar for many useful comments, suggestions, and discussions. The authors also are indebted to Jeremy M. Jay for his assistance in performing the research for this Article.

1. The deficiencies of the weapons acquisition process since World War II have been identified and analyzed extensively in the reports of three blue ribbon commissions created by Congress or the President. See PRESIDENT'S BLUE RIBBON COMM'N ON DEFENSE MANAGEMENT, *A QUEST FOR EXCELLENCE—FINAL REPORT TO THE PRESIDENT* (1986) [hereinafter PACKARD COMMISSION]; BLUE RIBBON DEFENSE PANEL, *REPORT TO THE PRESIDENT AND THE SECRETARY OF DEFENSE ON THE DEPARTMENT OF DEFENSE* (1970) [hereinafter FITZHUUGH COMMISSION]; COMMISSION ON ORG. OF THE EXECUTIVE BRANCH OF GOV'T, *TASK FORCE ON PROCUREMENT, REPORT ON MILITARY PROCUREMENT* (1955) [hereinafter HOOVER COMMISSION TASK FORCE]. The findings of these studies are examined in Kovacic, *Blue Ribbon Defense Commissions: The Acquisition of Major Weapons Systems, in ARMS, POLITICS, AND THE ECONOMY: HISTORICAL AND CONTEMPORARY PERSPECTIVES* (R. Higgs ed.) (forthcoming) [hereinafter ARMS, POLITICS, AND THE ECONOMY].

2. See, e.g., Moore, *Problems Ground Most B1 Bombers*, Wash. Post, Aug. 28, 1988, at A4, col. 1; Rosenbaum, *Pentagon Fraud Inquiry: What Is Known to Date*, N.Y. Times, July 7, 1988, at A1, col. 3; Smith, *Cruise Missile Reported Late, over Budget*, Wash. Post, Apr. 21, 1988, at A37, col. 1; *Problems Reported in Secret Satellite Program*, Wash. Post, Apr. 19, 1988, at C3, col. 1; Read, *Northrop Missile Is Behind Schedule and Beset by Problems, Air Force Says*, Wall St. J., Mar. 24, 1988, at 18, col. 4; Wilson, *Navy Says Nuclear Subs over Budget*, Wash. Post, Mar. 8, 1988, at A3, col. 4; Harris, *Indictment Charges Rockwell, 2 Workers Double-Billed U.S. for Satellite Work*, Wall St. J., Jan. 27, 1988, at 34, col. 5; Moore, *MX Reliability in*

supplier community have been shaken by a flurry of disclosures and the first indictments emanating from the Department of Justice's investigation of allegations of corruption in weapons acquisition—"Operation Ill Wind."³ Accounts of inefficiency, poor system performance, and misconduct in individual programs are becoming so common that they obscure what is at stake. Quite simply, failure to solve the problems of weapons procurement will put both the country's economic well-being and its physical security at risk.

The latest round of scandal and investigation is occurring at the end of an already turbulent decade in weapons procurement policy. Since 1981 the United States has undertaken the largest program of peacetime expenditures for defense in its history.⁴ Even before the Ill Wind inquiry was disclosed, the sheer volume

Question, Wash. Post, Dec. 28, 1987, at A1, col. 1 [hereinafter Moore, *MX Reliability in Question*]; Moore, *GAO Sees \$6 Billion Rise in B-1 Costs*, Wash. Post, Oct. 26, 1987, at A10, col. 1. Stories concerning ongoing programs have not been uniformly gloomy. See, e.g., Carrington, *Trident II Missile Wins Panel's Praise as Lone Success in U.S. Strategic Triad*, Wall St. J., Mar. 28, 1988, at 24, col. 1.

3. On January 6, 1989, federal prosecutors disclosed the first results of an investigation that began in September 1986 under the supervision of the office of the United States Attorney in Alexandria, Virginia. The prosecutors revealed that Hazeltine Corp., a subsidiary of Emerson Electric Co., had agreed to pay almost \$2 million in criminal fines, civil penalties, and court costs, and had pled guilty to conspiring to defraud DOD. The government officials also stated that they had obtained an indictment against Teledyne Industries, Inc. for bribing a Navy contracting official to influence a contract award. In announcing the Hazeltine guilty plea and the Teledyne indictment, U.S. Attorney Henry E. Hudson predicted that "[o]ver the next few months, perhaps the next year, you'll see a great deal of additional activity." Murphy & Marcus, *Major Defense Firm Admits Conspiracy*, Wash. Post, Jan. 7, 1989, at A13, col. 6. The first trial resulting from the Ill Wind inquiry began on April 3, 1989 and resulted in the conviction of two Teledyne executives on charges of conspiracy and wire fraud. See Murphy, *Two Teledyne Officials Guilty in Pentagon Case*, Wash. Post, Apr. 14, 1989, at A4, col. 1.; Shenon, *First Pentagon Fraud Trial Opens*, N.Y. Times, Apr. 4, 1989, at D11, col. 1. Through the conclusion of the trial of the Teledyne officials, a total of two companies (Hazeltine and Teledyne) and 14 individuals had entered guilty pleas or had been convicted. See Murphy & Marcus, *Convictions, Guilty Pleas Rise as Pentagon Probe Progresses*, Wash. Post, May 10, 1989, at A1, col. 5; Murphy, *Consultant Pleads Guilty in Pentagon Buying Probe*, Wash. Post, Apr. 1, 1989, at A2, col. 5; Wines, *Company Adviser Files Guilty Plea in Pentagon Case*, N.Y. Times, Mar. 28, 1989, at A1, col. 4; Wines, *Ex-Unisys Official Admits Paying Bribes to Get Pentagon Contracts*, N.Y. Times, Mar. 10, 1989, at A1, col. 5.

The origin and content of the Ill Wind investigation are discussed in Shenon, *Inquiry Is Delayed in Pentagon Fraud*, N.Y. Times, Nov. 6, 1988, § 1, at 35, col. 1; Pound, *Weapons Inquiry Soon Will Provide a Look at Consultants' Role*, Wall St. J., July 19, 1988, at 1, col. 6; *The Enemy Within*, U.S. NEWS & WORLD REP., July 4, 1988, at 16; Wilson, *Defense Fraud Charges Said to Be Months Off*, Wash. Post, July 1, 1988, at A8, col. 5; Rosenbaum, *supra* note 2.

4. See J. EPSTEIN, *THE 1988 DEFENSE BUDGET 1-15* (1987); W. KAUFMANN, *A REASONABLE DEFENSE 23-30* (1986).

Weapons Acquisition Policy

of recent defense appropriations—more than \$2.02 trillion from fiscal years 1981 through 1988⁵—had intensified longstanding concerns about the adequacy of DOD weapons acquisition policies.⁶ Reports of mismanagement had aroused fears that these increased outlays had not correspondingly improved defense capability. These concerns moved Congress to match its unparalleled series of peacetime spending measures with new statutes intended to improve the weapons acquisition process.⁷ These congressional initiatives, coupled with the 1986 Packard Commission report on defense management,⁸ elicited new DOD procurement reform efforts and accelerated preexisting ones.⁹

5. See FISCAL YEAR 1989 DEP'T OF DEFENSE ANN. REP. TO CONG. 297 (Feb. 18, 1988) [hereinafter 1989 DOD ANN. FISCAL REP.]; FISCAL YEAR 1988 DEP'T OF DEFENSE ANN. REP. TO CONG. 325 (Jan. 12, 1987) [hereinafter 1988 DOD ANN. FISCAL REP.]; FISCAL YEAR 1987 DEP'T OF DEFENSE ANN. REP. TO CONG. 313 (Feb. 5, 1986) [hereinafter 1987 DOD ANN. FISCAL REP.]; FISCAL YEAR 1983 DEP'T OF DEFENSE ANN. REP. TO CONG. IV-3 (Feb. 8 1982) [hereinafter 1983 DOD ANN. FISCAL REP.]. For fiscal year 1989, Congress has authorized \$299.5 billion in defense spending. See Carrington & Yang, *Congress Clears \$299.5 Billion Package for Defense After Impasse Is Ended*, Wall St. J., Sept. 29, 1988, at 62, col. 5.

6. Since 1981 there have been many additions to the literature reviewing and criticizing specific weapons acquisition programs and defense procurement policy generally. For representative critiques of individual programs in this period, see N. KOTZ, *WILD BLUE YONDER: MONEY, POLITICS AND THE B-1 BOMBER* (1988); P. TYLER, *RUNNING CRITICAL—THE SILENT WAR, RICKOVER, AND GENERAL DYNAMICS* (1986) (discussing Navy's nuclear submarine program). For critical evaluations that address broader features of defense procurement, see W. ADAMS & J. BROCK, *THE BIGNESS COMPLEX 327-47* (1986); CENTER FOR STRATEGIC AND INT'L STUDIES, U.S. DEFENSE ACQUISITION: A PROCESS IN TROUBLE (March 1987); J. COATES & M. KILIAN, *HEAVY LOSSES: THE DANGEROUS DECLINE OF AMERICAN DEFENSE* (1985); J. FALLOWS, *NATIONAL DEFENSE* (1981); J. FOX, *THE DEFENSE MANAGEMENT CHALLENGE: WEAPONS ACQUISITION* (1988); J. GANSLER, *AFFORDING DEFENSE* (1989); R. HALLORAN, *TO ARM A NATION* (1986); J. LEHMAN, JR., *COMMAND OF THE SEAS* (1989); E. LUTTWAK, *THE PENTAGON AND THE ART OF WAR* (1985); T. McNAUGHER, *NEW WEAPONS, OLD POLITICS—AMERICA'S MILITARY PROCUREMENT MUDDLE* (1989) (forthcoming); D. PILLING, *COMPETITION IN DEFENSE PROCUREMENT* (1989) (forthcoming); D. RASOR, *THE PENTAGON UNDERGROUND* (1985); A. STUBBING, *THE DEFENSE GAME* (1986); *THE DEFENSE REFORM DEBATE* (A. Clark IV, P. Chiarelli, J. McKittrick & J. Reed eds. 1984); *What's Wrong with the Way We Buy Weapons—A Conversation with Lawrence J. Korb and Thomas L. McNaugher*, BROOKINGS REV., Fall 1988, at 3.

7. For a description of the chief legislative reform initiatives adopted in the 1980s, see Kaeser, *Major Defense Acquisition Programs: A Study of Congressional Control over DOD Acquisitions*, 34 FED. B. NEWS & J. 430 (1987).

8. PACKARD COMMISSION, *supra* note 1. See also Kovacic, *supra* note 1 (analyzing Packard Commission's findings and their influence upon DOD procurement policy).

9. See Cushman, *Pentagon Tightens Its Buying Rules*, N.Y. Times, Dec. 28, 1986, at E4, col. 3. Aside from the competition-oriented measures addressed below, Congress and DOD have pursued essentially four types of reforms in this decade. The first is to improve the management of the procurement process. Among important steps to this end was the creation in 1986 of the position of Under Secretary of Defense for Acquisition. See 1988 DOD ANN. FISCAL REP., *supra* note 5, at 114. The second is to require contractors to invest more of their own resources to finance early program development. See Stevenson, *New Risks in Military Deals*, N.Y. Times, Feb. 24, 1987, at D1, col. 3. The third is to increase the

The most striking feature of defense procurement reform in the 1980s has been its emphasis, previously unequalled, on competition-oriented strategies for buying major weapon systems.¹⁰ The recent competition initiatives constitute the country's boldest weapons acquisition reform since World War II. As a matter of form, the expanded use of rivalry-based purchasing methods departs sharply from past regulatory practice.¹¹ For most of the postwar era, defense procurement regulation was modelled after regulation used to control public utilities.¹² The recent competition experiment departs from this model and substitutes rivalry among defense suppliers to ensure good performance throughout the acquisition life cycle.¹³ Although rarely mentioned in scholarly

stability of major procurement programs through biennial budgeting and greater use of multiyear production contracts. See Lindsay, *Congress and the Defense Budget*, WASH. Q., Winter 1988, at 57. The fourth is to expand enforcement—including more frequent resort to criminal prosecutions—of contractor compliance with cost and pricing regulations and quality control requirements. See Overly, *Government Contractors, Beware: Civil and Criminal Penalties Abound for Defective Pricing*, 20 *LOV. L.A.L. REV.* 597 (1987); Shirk & Greenberg, *An Analysis of the Web of Civil and Criminal Liability for Defective Pricing of Government Contracts*, 33 *CATH. U.L. REV.* 319 (1984); Note, *Regulating Fraud in Military Procurement: A Legal Process Model*, 95 *YALE L.J.* 390 (1985).

10. See Burnett, *Competition in the Weapons Acquisition Process: The Case of U.S. Warplanes*, 7 *J. POL'Y ANALYSIS & MGMT.* 17 (1987); Stevenson, *Competition for Contracts Trims Costs for Pentagon*, N.Y. Times, Mar. 31, 1988, at A1, col. 2; Sugawara, *A Winning Strategy in Defense-Cost War*, Wash. Post, Feb. 12, 1989, at H1, col. 4. The term "major weapon systems" typically refers to "big-ticket" programs—aircraft, missiles, ships, tanks—that account for most of DOD's annual expenditures for research, development, and procurement. The armed services procurement statutes use the term "major defense acquisition program" to denote weapons acquisition projects whose costs exceed substantial dollar thresholds. See, e.g., 10 U.S.C.A. § 2430 (West Supp. 1988) (defining "major defense acquisition program" as acquisition program that, among other criteria, is estimated to exceed \$200 million—based on fiscal year 1980 constant dollars—in research, development, test, and evaluation expenditures or \$1 billion in total procurement outlays—also based on fiscal year 1980 constant dollars).

11. See *infra* text accompanying notes 45-61.

12. See *infra* text accompanying notes 32-44. The history of defense procurement reform since World War II can be described as an ongoing effort to determine and apply the optimal legal governance structure for buying weapons. Recent contributions from the new "institutional" economics have made it possible to identify with greater precision and sophistication the strengths and weaknesses of alternative regulatory regimes. See M. CREW & P. KLEINDORFER, *THE ECONOMICS OF PUBLIC UTILITY REGULATION* 146-65 (1986) (discussing contributions of new institutional economics in evaluation of governance structures for regulating public utilities).

13. This Article uses the terms "competition" and "rivalry" interchangeably. Competition, however, does not refer to or imply any form of pure or perfect competition that would result from the existence of large numbers of competitors, unencumbered flows of perfect information, or the absence of entry barriers. Such conditions exist for few, if any, major weapons programs during either system development or production. DOD competition policy has focused on creating a limited number of rival contractors that compete with one another at different stages of the procurement process. Thus, competition

discourse concerning adjustments in federal regulatory policy,¹⁴ the DOD competition initiatives of the 1980s constitute one of the country's most significant modern regulatory reform efforts.¹⁵

can at best encourage economic performance associated with duopoly or highly concentrated oligopoly market structures. In the context of weapons procurement, such rivalry may well be a potent stimulus for good economic performance (providing incentives for optimal system design, timely delivery, and efficient pricing), yet rivalry here is not without its limitations and risks. See Burnett, *supra* note 10, at 27-30. See also *infra* text accompanying notes 138-60. The application of rivalry in weapons acquisition is best described as a managed form of competition that holds the potential for securing improvement in the acquisition process.

14. General assessments of the federal government's choice and implementation of regulatory reform strategies in the 1970s and 1980s seldom have discussed (or even referred to) the defense acquisition competition reforms. See, e.g., M. DERTHICK & P. QUICK, *THE POLITICS OF DEREGULATION* (1985); G. EADS & M. FIX, *RELIEF OR REFORM? REAGAN'S REGULATORY DILEMMA* (1984); PUBLIC REGULATION: NEW PERSPECTIVES ON INSTITUTIONS AND POLICIES (E. Bailey ed. 1987); REGULATORY REFORM: WHAT ACTUALLY HAPPENED (L. Weiss & M. Klass eds. 1986); Meyer & Tye, *Toward Achieving Workable Competition in Industries Undergoing a Transition to Deregulation: A Contractual Equilibrium Approach*, 5 YALE J. ON REG. 273 (1988). This omission is characteristic of the cursory treatment weapons acquisition and, more generally, public contracting have received in the modern regulation literature. See Lipsky & Cople, *Defense Contracting: Is Antitrust the Right Cure?*, Legal Times, Oct. 14, 1983, at 8 (discussing literature on weapons procurement). Even in the leading comprehensive prescriptive works on economic regulation, it is uncommon to find more than a passing reference to the government's role in regulating the conduct of its suppliers. See, e.g., S. BREYER, *REGULATION AND ITS REFORM* (1982); A. KAHN, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INCENTIVES* (MIT ed. 1988); M. CREW & P. KLEINDORFER, *supra* note 12.

15. As Alfred Kahn has described it, regulatory reform since the mid-1970s has dealt with two general categories of industries. The first consists of "structurally competitive industries" and includes, among others, airlines, trucking, buses, and railroads. I A. KAHN, *supra* note 14, at xv-xvi. Regulatory reform in these industries often has taken the form of substantial loosening (and, occasionally, outright abandonment) of limits upon entry and pricing. *Id.* at xvi-xviii; see also S. MORRISON & C. WINSTON, *THE ECONOMIC EFFECTS OF AIRLINE DEREGULATION* (1985); Moore, *Rail and Trucking Deregulation*, in REGULATORY REFORM: WHAT ACTUALLY HAPPENED, *supra* note 14, at 14.

The second group contains "the more conventionally defined public utilities," including telephone and electric power companies. I A. KAHN, *supra* note 14, at xvi. For these industries, reform has involved some attenuation of limits upon entry and pricing and, more frequently, refinements of traditional regulatory practices to strengthen incentives to achieve cost reductions and greater productivity. *Id.* at xvi-xxxii; see also P. JOSKOW & R. SCHMALENSEE, *MARKETS FOR POWER: AN ANALYSIS OF ELECTRICAL UTILITY DEREGULATION* (1983). Refinements of the latter type have included the application of various productivity incentive tools. See Bellcore, *The Impact of Federal Price Cap Regulation on Interstate Toll Customers* (Mar. 17, 1988) (unpublished report on file with authors) (discussing price caps); Crew & Kleindorfer, *Productivity Incentives and Rate-of-Return Regulation*, in REGULATING UTILITIES IN AN ERA OF DEREGULATION 7 (M. Crew ed. 1987) (discussing use of total factor productivity incentives).

All of the foregoing reforms—from comparatively sweeping measures, such as the elimination of entry and price controls, to less extreme approaches, such as the use of price caps—often are lumped under the heading of "deregulation," even though each reform entails varying degrees of continuing government supervision of the affected industry. In speaking of "regulatory reform" or "deregulation" in the context of weapons procurement, this Article does not mean to suggest that weapons industries are suitable candidates for

The recent competition initiatives are distinctive not only for their break from previous regulatory policy, but also for how much Congress and DOD have staked on their success. Rivalry-enhancing procurement techniques have shaped the structure and management of numerous new weapons programs that will occupy crucial positions in the U.S. armaments inventory well into the next century. The emphasis on competition has emerged most vividly in policies that make dual-sourcing¹⁶ throughout the procurement cycle DOD's preferred acquisition method. In several significant cases, the means for executing this approach has been the formation of rival contractor "teams"¹⁷ that will compete against each other for design awards. In some instances, former "teammates" may be called upon to compete among themselves for production contracts after DOD has chosen a winning design.

In recent months, DOD's rivalry-based regulatory reforms have begun to emerge from relative obscurity because Operation Ill Wind has focused attention on military procurement and raised

measures such as the abandonment of entry and pricing limits one has witnessed in the commercial airline industry. Rather, we speak of regulatory reform in weapons acquisition to denote the attainment of efficiency-enhancing improvements within a regulatory scheme that will require substantial, continuing government intervention. In this sense, reform in defense acquisition is somewhat analogous to the Environmental Protection Agency's efforts to use market-oriented approaches such as the emissions trading program to reduce the cost of achieving pollution abatement objectives. See Tietenberg, *Uncommon Sense: The Program to Reform Pollution Control Policy*, in REGULATORY REFORM: WHAT ACTUALLY HAPPENED, *supra* note 14, at 269 (discussing EPA's emissions trading program); Tripp & Dudeck, *Institutional Guidelines for Designing Successful Transferable Rights Programs*, 6 YALE J. ON REG. 369 (1989). For a discussion of the specific reforms implemented in the area of defense acquisition, see *infra* text accompanying notes 45-61.

16. "Dual-sourcing" refers to a collection of methods through which DOD can establish a second source for the production of a given weapon system. DOD can choose to create a second source for production when development and production begin, or it can establish a second source after production has started through "breakouts" and "leader-follower" arrangements. See K. ARCHIBALD, A. HARMAN, M. HESSE, J. HILLER & G. SMITH, *FACTORS AFFECTING THE USE OF COMPETITION IN WEAPON SYSTEM ACQUISITION* 6-9 (Rand Corp., prepared for the Office of the Under Secretary of Defense for Research and Engineering) (1981) [hereinafter K. ARCHIBALD].

17. A "contractor teaming arrangement" is "an arrangement in which (a) Two or more companies form a partnership or joint venture to act as a potential prime contractor; or (b) a potential prime contractor agrees with one or more other companies to have them act as its subcontractors under a specified government contract or acquisition program." Federal Acquisition Regulations, 48 C.F.R. § 9.601 (1987). The rights and duties of individual team members ordinarily are specified in contractual documents called teaming agreements. The legal status of the participants' relationship depends principally upon the form and content of the teaming agreement. See *Experimental Eng'g, Inc. v. United Technologies Corp.*, 614 F.2d 1244 (9th Cir. 1980); *Air Technology Corp. v. General Elec. Co.*, 199 N.E.2d 538 (Mass. 1964); see also Note, "Team Ventures": *Air Technology Corp. v. General Electric Co.*, 17 HASTINGS L.J. 842 (1966).

questions about the wisdom of the competition-oriented reforms of the 1980s. Operation Ill Wind has led some observers to suggest that the imperative to succeed in a more acutely competitive environment has spurred contractors to use consultants to gather inside information about DOD's purchasing intentions.¹⁸ Other preliminary accounts indicate that contractors may have responded to the recent competition requirements by colluding with each other to rig bids and allocate contract awards.¹⁹ Legislators have reacted to the Ill Wind disclosures by proposing a collection of new procurement reforms, many of which would establish additional regulatory controls on the conduct of purchasing officials and suppliers.²⁰

The Ill Wind investigation has created strong sentiment among policymakers to forego competition and follow the path of most postwar reform efforts by adopting a more encompassing array of regulatory controls and procedural safeguards. This Article urges Congress and DOD to resist this impulse because it is unlikely that the weapons acquisition process would benefit from a torrent of new statutes that mandate more extensive regulatory controls. At best, such an approach would increase regulatory complexity and cost with few offsetting gains. At worst, it would deflect attention away from more serious institutional causes of poor performance in defense procurement.

This Article argues that Congress and the Bush administration should attempt to refine rivalry-based techniques for purchasing weapon systems and should reduce existing regulatory requirements. This endorsement of rivalry-based methods is not unqualified. DOD's willingness in the 1980s to rely more extensively on weapon rivalry as a governance regime has been worthwhile, but

18. See Carrington & Pound, *Pushing Defense Firms to Compete, Pentagon Harms Buying System*, Wall St. J., June 27, 1988, at 1, col. 6.

19. See Rosenbaum, *supra* note 2; Wilson, *supra* note 3.

20. Sugawara, *Legislators Draft Military Procurement Reforms*, Wash. Post, Jan. 17, 1989, at C1, col. 4; see Morrison, *Tinkering with Defense*, NAT'L J., Sept. 3, 1988, at 2178. *The Outlook for Legislative Activity Affecting Defense, Space, and Procurement Policy*, Fed. Cont. Rep. (BNA) No. 51, at 156, 160 (Jan. 23, 1989). Prominent among the suggested reforms are measures that would impose limits on the use of consultants, establish broader certification and reporting requirements, create a new DOD acquisition corps, and increase criminal penalties for violations of federal procurement regulations. See, e.g., S.2621, The Department of Defense Procurement Improvement Act of 1988, reprinted in Fed. Cont. Rep. (BNA) No. 50, at 140 (July 11, 1988) (controlling contractor use of consultants). As one response to the Ill Wind scandal, DOD has issued a rule requiring certain contractors to certify that they have not improperly obtained information relating to a pending contract award. See DOD Competitive Information Certificate and Profit Reduction Clause, 53 Fed. Reg. 42,945 (1988) (to be codified at 32 C.F.R. pt. 173).

DOD has depended excessively upon teaming and dual-sourcing in formulating competition strategies. The Article proposes that DOD use other competitive techniques and change the process by which it formulates competition policies.²¹ Adopting this approach would be part of a broader effort to simplify the procurement process, improve the quality of the government's purchasing personnel, and fundamentally redirect congressional and DOD monitoring and oversight energies.

This Article uses a perspective that is unusual in the academic literature concerning weapons procurement.²² Traditional legal scholarship in the procurement area has focused on the singular technical labyrinth of public contracting with only infrequent application of economic theory involving contracting, rivalry, innovation, and institutional behavior. At the same time, the relevant economic literature frequently makes only limited efforts to relate economic learning to the legal structures that govern purchaser and seller conduct in the public procurement arena. This Article attempts a synthesis of the two approaches by indicating how existing legal and regulatory regimes can be changed to attain important economic goals.

Part I of this Article reviews the regulatory framework within which the United States has purchased armaments for most of the period following World War II. It demonstrates the limited role of rivalry-based governance structures in this period. Part II examines legislative and executive initiatives since 1981 that have mandated or strongly influenced the use of competition-oriented strategies for acquiring major weapon systems. It focuses on policies that encourage teaming agreements to develop systems and dual-sourcing to procure major systems.

Part III analyzes selected characteristics of four new DOD aircraft procurement programs in which the extensive use of teaming arrangements and a pronounced emphasis on dual-sourcing are central elements of DOD's competition policy. It considers whether DOD has formulated and applied its competi-

21. See *infra* text accompanying notes 163-89 and 198-217.

22. Because of their paramount importance in DOD's procurement budget and the nation's defense structure, major weapon systems have served as the primary or exclusive focus of modern scholarly studies of defense procurement. See W. BALDWIN, *THE STRUCTURE OF THE DEFENSE MARKET 1955-1964* (1967); J. FOX, *ARMING AMERICA: HOW THE U.S. BUYS WEAPONS* (1974); J. FOX, *supra* note 6; J. GANSLER, *supra* note 6; J. GANSLER, *THE DEFENSE INDUSTRY* (1980); M. PECK & F. SCHIERER, *THE WEAPONS ACQUISITION PROCESS: AN ECONOMIC ANALYSIS* (1962); F. SCHIERER, *THE WEAPONS ACQUISITION PROCESS: ECONOMIC INCENTIVES* (1964); M. WEIDENBAUM, *THE ECONOMICS OF PEACETIME DEFENSE* (1974).

tion initiatives wisely in recent programs. Part IV presents a comprehensive approach for applying competition policy in defense procurement and offers alternative strategies for achieving DOD's goals. This approach is applied to the Army's Light Helicopter Experimental program to show how DOD's procurement policies might be improved. This Part also proposes changes in the processes DOD currently uses to formulate and implement competition strategies.

This Article concludes that reforms should center on improving the use of rivalry-oriented strategies to achieve better performance in the weapons acquisition process, particularly in the purchase of major weapon systems.

I. The Post-World War II Weapons Procurement Regulatory Environment

The purchase of arms to defend this country's borders and to protect its interests overseas has been the main concern of national policy since the earliest days of the republic.²³ However, the essential processes and institutions that the United States uses to buy arms today are of relatively recent vintage. Although antecedents of the defense establishment date back to the turn of the 20th century,²⁴ the mobilization program implemented immediately before and during World War II marked the birth of the basic public and private institutions through which weapons procurement takes place today.²⁵

23. See 1 COMM'N ON GOV'T PROCUREMENT, REPORT OF THE COMMISSION ON GOVERNMENT PROCUREMENT 163-84 (1972) (describing historical development of procurement process in the United States) [hereinafter COMM'N ON GOV'T PROCUREMENT]; see also E. BEACH, THE UNITED STATES NAVY—A 200-YEAR HISTORY 1-11, 31-34, 116-20 (1986) (discussing formation of naval fleet to fight War of Independence and War of 1812); Joy, *Eli Whitney's Contracts for Muskets*, 8 PUB. CONT. L.J. 140 (1976) (discussing federal government's early purchases of firearms); M. SMITH, HARPERS FERRY ARMORY AND THE NEW TECHNOLOGY: THE CHALLENGE OF CHANGE (1977) (discussing introduction in early 19th century of firearms manufactured with interchangeable parts).

24. See, e.g., B. COOLING, GRAY STEEL AND BLUE WATER NAVY—THE FORMATIVE YEARS OF AMERICA'S MILITARY INDUSTRIAL COMPLEX 1881-1917 (1979).

25. See Higgs, *Private Profit, Public Risk: Institutional Antecedents of the Modern Military Procurement System in the Rearmament Program of 1940-41*, in THE ECONOMIC HISTORY OF WORLD WAR II: AN INTERNATIONAL PERSPECTIVE (G. Mills & H. Rockoff eds.) (forthcoming) [hereinafter Higgs, *Institutional Antecedents*]; R. HIGGS, CRISIS AND LEVIATHAN: CRITICAL EPISODES IN THE GROWTH OF AMERICAN GOVERNMENT 211-15, 230-33 (1987) [hereinafter R. HIGGS, CRISIS AND LEVIATHAN]; Reppy, *The United States*, in THE STRUCTURE OF THE DEFENSE INDUSTRY 21, 22 (N. Ball & M. Leitenberg eds. 1983).

The World War II mobilization experience and the subsequent onset of cold war tensions determined three fundamental characteristics of United States weapons procurement. First, the United States' peacetime military establishment would be comparatively large and permanent. Fresh memories of desperate efforts to rearm following the Japanese attack on Pearl Harbor and the country's assumption of global responsibilities at the war's end made clear that the United States could not afford to rely on the equivalent of the small, weakly equipped, and poorly organized armed forces in place between the First and Second World Wars.²⁶ Thus, the central priorities of defense reform legislation enacted immediately following World War II were to improve the organization of the armed services, to sustain readiness in peacetime, and to strengthen defense planning.²⁷

Second, the war experience demonstrated that future armaments would rapidly evolve in capability and sophistication.²⁸ More than any other program, the wartime effort to develop the atomic bomb and its first delivery system (the B-29) foreshadowed new generations of weapon systems that would incorporate simultaneous state-of-the-art advances in several swiftly changing technical disciplines.²⁹ The perceived cold war imperative to attain

26. See J. Moore & R. Turner, *The Legal Structure of Defense Organization* 13-15 (Jan. 15, 1986) (memorandum prepared for Packard Commission) (on file with authors). Following World War I, the United States ended most new weapons development and largely liquidated its existing weapons inventories. Despite modest rearmament efforts championed by President Roosevelt after 1936, the United States entered World War II with weapons that, with few exceptions, were few in number and poor in quality. See R. SPECTOR, *EAGLE AGAINST THE SUN* 9-32 (1985).

27. The first and most significant postwar organizational reforms were adopted through the National Security Act of 1947, Pub. L. No. 80-253, 61 Stat. 495 (codified as amended in scattered sections of 5, 10 & 50 U.S.C.) and the National Security Act Amendments of 1949, Pub. L. No. 81-216, 63 Stat. 578 (codified as amended in scattered sections of 5 & 10 U.S.C.). Together these measures created DOD and its component Departments of the Air Force, Army, and Navy; established the Joint Chiefs of Staff as the principal military advisory body to the President and the Secretary of Defense; and established the National Security Council. C. BORKLAND, *THE DEPARTMENT OF DEFENSE* 1-56 (1968); A. JORDAN & W. TAYLOR, *AMERICAN NATIONAL SECURITY: POLICY AND PROCESS* 58-126 (1984); J. Moore & R. Turner, *supra* note 26, at 14-19. The proper organization and management of defense policymaking bodies have been major subjects of debate and reform legislation throughout the postwar period. See Gruetzner & Caldwell, *DOD Reorganization*, U.S. NAVAL INST. PROC., May 1987, at 136.

28. See B. BRODIE & F. BRODIE, *FROM CROSSBOW TO H-BOMB* 200-57 (1973); Reppy, *supra* note 25, at 23.

29. The development of the B-29—a project one observer has called “the greatest U.S. gamble of the war”—is recounted in E. LARRABEE, *COMMANDER IN CHIEF—FRANKLIN DELANO ROOSEVELT, HIS LIEUTENANTS, AND THEIR WAR* 580 (1987). The history of the Manhattan Project, which developed the first atomic bomb, is treated comprehensively in R. RHODES,

qualitative superiority, particularly in systems designed to deliver nuclear weapons or warn of a nuclear attack, ensured that scientific advances would be applied rapidly to existing and future armaments.

Third, privately owned firms substantially dedicated to manufacturing armaments would be the principal means for achieving large-scale peacetime weapons production. After decades of relying chiefly on a mix of public arsenals and ad hoc private efforts to produce weapons, the United States turned decisively to private companies to meet most of its armaments needs during World War II.³⁰ Soon after the War, Congress and DOD decided that, with limited exceptions, privately owned firms with substantial, permanent defense-related facilities would design and produce weapon systems in peacetime.³¹

Beyond establishing these general characteristics, World War II and the immediate postwar era defined more clearly the relationship between identifying national policy objectives and procuring arms to fulfill them. It was during this period that the weapons acquisition process assumed its modern form, consisting of the following five interrelated steps: (1) establishing the country's national security goals; (2) devising a military strategy for achieving these aims; (3) deciding which weapon systems are needed to carry out the chosen strategy; (4) buying the needed weapon systems; and (5) maintaining and upgrading the weapons throughout their operating lives. Because of the rate of technological change, the fourth of these steps—procurement—came to encompass three distinct activities: research and development leading to the identification of promising designs, the construction and testing of prototypes, and full-scale production.

THE MAKING OF THE ATOMIC BOMB (1986). The term "weapon system," which reflects the increasing technological complexity of modern armaments, came into use only in the late 1950s. See J. Fox, *supra* note 22, at 9.

30. See Higgs, *Institutional Antecedents*, *supra* note 25.

31. The Armed Services Procurement Act of 1947, Pub. L. No. 80-413, 62 Stat. 21 (1948) (codified as amended at 10 U.S.C. § 2301 (1982 & Supp. V 1987)), and subsequent postwar defense acquisition legislation assumed that private enterprise would be the virtually exclusive supplier of most defense hardware. See COMM'N ON GOV'T PROCUREMENT, *supra* note 23, at 171-80; see also R. HIGGS, CRISIS AND LEVIATHAN, *supra* note 25, at 214-15, 230-33. The main exceptions to this trend consisted of facilities for producing fissionable material to be used in manufacturing nuclear weapons. See R. HEWLETT & F. DUNCAN, ATOMIC SHIELD, 1947/1952 (1969). DOD laboratories and research centers also have been responsible for developing certain conventional weapon systems. See Fialka, *After Nearly 30 Years, Sidewinder Missile Is Still Potent, Reliable*, Wall St. J., Feb. 15, 1985, at 1, col. 1 (discussing development of Sidewinder air-to-air missile).

Since 1945, Congress and DOD have relied on essentially five strategies to ensure that private firms fulfill defense contracts at an acceptable cost, in a timely manner, and with suitable quality. These strategies are competition, disclosure and cost observation, profit controls, incentive contracts, and cost structure evaluation. The nature and mixture of the strategies have reflected a fundamental ambivalence about the correct approach for controlling the conduct of arms suppliers. In particular, the means chosen to move private contractors to serve the public's needs evince a basic tension between comprehensive public utility regulation on the one hand and the use of rivalry on the other.³² Each of these five strategies is described in turn below.

A. Competition

The use of competition to improve performance in the production of major weapon systems has been a stated aim of U.S. procurement policy since passage of the Armed Services Procurement Act of 1947.³³ For most of the postwar era, this goal has seldom been attained.³⁴ Although contractors often have competed intensely for initial design and development awards, until recently sole-source agreements usually formed the basis for full-scale development and production of most major weapon systems.³⁵ Dual-sourcing in production—the most frequently used competitive acquisition technique—typically occurred only in a

32. The parallels between regulatory approaches that govern, respectively, weapons contractors and public utilities such as electric companies are discussed in G. Hall, *Defense Procurement and Public Utility Regulation* (Rand Corp.) (Sept. 1967) (on file with authors); Weidenbaum, *Arms and the American Economy: A Domestic Convergence Hypothesis*, 58 AM. ECON. REV. 428 (1968); Weidenbaum, *The Effects of Government Contracting on Private Enterprise*, 35 GEO. WASH. L. REV. 378 (1966) [hereinafter Weidenbaum, *The Effects of Government Contracting*].

33. Pub. L. No. 80-413, 62 Stat. 21 (1948) (codified as amended at 10 U.S.C. § 2301 (1982 & Supp. V 1987)). The background of the 1947 Act is described in COMM'N ON GOV'T PROCUREMENT, *supra* note 23, at 171-72.

34. See Cohen, *The Competition in Contracting Act*, 14 PUB. CONT. L.J. 1, 10-23 (1983); *The Effort to Increase Competition in Procurement: A Twenty-Year Perspective*, Fed. Cont. Rep. (BNA) No. 42, at 1045 (Dec. 24, 1984).

35. See M. Rich, *Competition in the Acquisition of Major Weapon Systems: Legislative Perspectives* (Rand Corp.) (Nov. 1976) (on file with authors); *Competition in Defense Procurement: Hearings Before the Subcomm. on Antitrust & Monopoly of the Senate Comm. on the Judiciary*, 90th Cong., 2d Sess. 883 (1968) (report submitted by M. Weidenbaum, *The Military/Space Market: The Intersection of the Public and Private Sectors*) [hereinafter M. Weidenbaum Report].

small number of programs (most involving missiles) with relatively large annual and lifetime production runs.³⁶

B. *Disclosure and Cost Observation*

In 1962, Congress enacted the Truth in Negotiations Act,³⁷ which compels contractors to submit certain cost and pricing data to government negotiators before an agreement on the contract price may be reached. The disclosure mechanism was designed to give purchasing authorities stronger means for observing contractor costs and for evaluating the reasonableness of sole-source suppliers' pricing proposals.³⁸ The grant to the government of broad access to contractor records ensures that required disclosures are made.³⁹

C. *Profit Controls*

Congress and DOD have established nominal limits on the profitability of defense contracts by setting contract profit ceilings.⁴⁰ Below these ceilings, the target profit in any weapons acquisition contract typically is set through negotiations between the supplier and the purchasing authority. DOD occasionally conducts studies to evaluate the operation of profit limitations and

36. Dual-sourcing and other competitive acquisition strategies are more likely to yield net benefits when annual and lifetime purchases are made in large numbers. See *infra* text accompanying notes 153-60.

37. Pub. L. No. 87-653, 1962 U.S. CODE CONG. & ADMIN. NEWS (76 Stat.) 528 (codified as amended at 10 U.S.C. § 2306a (1982 & Supp. V 1987)). The statute's disclosure requirements are described in J. CIBINIC & R. NASH, FORMATION OF GOVERNMENT CONTRACTS 895-97 (2d ed. 1986); Preston, *The Truth in Negotiations Act: Is a New Definition of "Cost or Pricing Data" Necessary?*, 34 FED. B. NEWS & J. 448 (Dec. 1987).

38. See S. REP. No. 1884, 87th Cong., 2d Sess. (1962), reprinted in 1962 U.S. CODE CONG. & ADMIN. NEWS 2476, 2477.

39. See J. CIBINIC & R. NASH, *supra* note 37, at 877-82; Overly, *supra* note 9, at 611-12. See also Laffont & Tirole, *Using Cost Observation to Regulate Firms*, 94 J. POL. ECON. 614 (1986) (analyzing use of accounting data in negotiating procurement contracts).

40. See 10 U.S.C. § 2306(d) (1982); Federal Acquisition Regulations, 48 C.F.R. § 15.902 (1987); see also Burns, *Profit Limitation: Regulated Industries and the Defense-Space Industries*, 3 BELL J. ECON. & MGMT. SCI. 3 (1972); J. CIBINIC & R. NASH, *supra* note 37, at 909-36. For an analysis of the functions of government profit policy, see W. ROGERSON, PROFIT REGULATION OF DEFENSE CONTRACTORS AND PRIZES FOR INNOVATION: THEORY AND EVIDENCE (Center for Mathematical Studies in Economics and Management Science, Northwestern Univ., Working Paper) (Jan. 1988) (on file with authors). The impact of some modern competition experiments in defense acquisition upon contractor profitability is treated in Greer & Liao, *An Analysis of Risk and Return in the Defense Market: Its Impact on Weapon System Acquisition*, 32 MGMT. SCI. 1259 (1986).

to assess the effect of DOD policies on overall contractor profitability.⁴¹

D. *Incentive Contracts*

From the end of the postwar period, DOD relied heavily on "cost-plus-fixed-fee" contracts for major systems development and early production.⁴² Such agreements paid contractors for their actual costs and set a "fee" that was established as a percentage of initially estimated total costs. Concerned that such formulas encouraged firms to use resources inefficiently, DOD in the 1960s introduced incentive contracts that used a cost-reimbursement formula but that also made the contractor's profit depend in part on the firm's success in meeting negotiated cost targets.⁴³

E. *Cost Structure Evaluations*

DOD's cost oversight and disclosure systems initially focused on whether the contractor had in fact incurred certain costs and properly allocated them to its government contracts. In the 1970s DOD began to conduct periodic reviews of contractor operations to determine the extent to which suppliers were operating efficiently. This involved the use of "should-cost" and "design-to-cost" studies on specific contracts to determine whether a firm's production and management techniques were efficient.⁴⁴ One aim of these evaluations was to set cost negotiation targets based on what hypothetical efficient contractors would require to accomplish specific design and production tasks.

41. See F. ALSTON, M. WORTHINGTON & L. GOLDSMITH, *CONTRACTING WITH THE FEDERAL GOVERNMENT* 68-73 (2d ed. 1988); J. GANSLER, *supra* note 6, at 251-53. See also THE MAC GROUP, *THE IMPACT ON DEFENSE CAPABILITY OF CHANGES IN PROCUREMENT AND TAX POLICY* (Feb. 1988) (discussing overall effect of DOD and congressional procurement reforms in the 1980s upon contractor profitability). In recent years, GAO has proposed, without success, that Congress establish a separate government agency that would regularly gather and analyze data on defense contractor profits. See Carrington, *Defense Firms, Facing Budget Squeeze, Mobilize to Fight Plan for an Agency to Measure Profits*, Wall St. J., Jan. 21, 1987, at 50, col. 1.

42. See Nash, *Pricing Policies in Government Contracts*, 29 *LAW. & CONTEMP. PROBS.* 361, 365-66 (1964); M. Weidenbaum Report, *supra* note 35, at 898-99.

43. See J. Fox, *supra* note 22, at 240-43; F. SCHERER, *supra* note 22, at 134-37, 153-270; Nash, *supra* note 42, at 365-74.

44. See J. CIBINIC & R. NASH, *supra* note 37, at 907. See, e.g., Sovereign, *Application of the Conceptual Model for Setting Design-to-Cost Goals: The ffg-7*, in *AUCTIONS, BIDDING, AND CONTRACTING: USES AND THEORY* 473 (R. Engelbrecht-Wiggans, M. Shubik & R. Stark eds. 1983).

Weapons Acquisition Policy

In effect, cost structure analyses seek to use administrative oversight to achieve productivity gains that interfirm rivalry ordinarily elicits in commercial markets. The usefulness of these evaluation tools necessarily is limited by the uncertainty associated with efforts to establish the hypothetical performance baseline by which DOD's suppliers are to be measured. It frequently will be difficult for DOD personnel to pinpoint specific causes of inefficiency and to develop accurate estimates of the cost savings contractors could realize from improvements. Moreover, contractors often can respond to a cost structure evaluation by asserting that it is doing the best possible job and that DOD's conclusions to the contrary constitute misinformed speculation. The appeal of recent DOD competition experiments resides largely in their capacity to stimulate cost reductions not by reference to an administratively determined performance baseline, but by the need to surpass the efforts of a rival supplier.

II. The Policy Framework for Recent Competition Reforms

As indicated above, the use of competition to improve the weapons acquisition process has been a nominal aim of defense procurement policy for most of the postwar era. What is distinctive about the procurement reform measures adopted since 1980 is the extent to which Congress and the Executive have mandated, and DOD has embraced, competition as the point of departure for planning and executing major systems acquisition. These measures have attempted to use interfirm rivalry to supplant, at least in part, administrative controls and governance structures common to public utility regulation.⁴⁵

A. *Congressional Initiatives*

Since 1981, Congress has enacted three significant measures designed to increase competitive procurement techniques in weapons acquisition. First, the Competition in Contracting Act of 1984 (CICA)⁴⁶ requires DOD to use "full and open competition"

45. The Navy's Competition Advocate General stated in 1986 that the Navy had "found that intensified management oversight of sole source contracts is not an equal substitute for competitive awards to motivated, cost-conscious contractors." FISCAL YEAR 1986 OFF. OF THE COMPETITION ADVOCATE GEN. OF THE NAVY REP. TO CONG. III-3 (Dec. 1986).

46. Pub. L. No. 98-369, 1984 U.S. CODE CONG. & ADMIN. NEWS (98 Stat.) 1175 (codified as amended in scattered sections of 10, 31 & 41 U.S.C.).

through the use of competitive purchasing procedures.⁴⁷ CICA created two mechanisms to ensure its effective implementation. First, it directed each executive agency and each major purchasing unit within each agency to establish a "competition advocate" to promote rivalry-based procurement.⁴⁸ Second, the statute strengthened the ability of disappointed contract-seekers to challenge contract awards that fail to conform with mandated competition procedures.⁴⁹

Second, the Defense Authorization Act of 1986⁵⁰ bars DOD from beginning full-scale development for major systems until the Secretary of Defense has given Congress an "acquisition strategy." This strategy must "provide that there will be competitive alternative sources available for the system (and each major subsystem) under the program throughout the period from the beginning of full-scale development through the end of production."⁵¹

Third, the Department of Defense Appropriations Act of 1987⁵² directs the Secretary of Defense to "use a competitive prototype

47. 10 U.S.C. § 2301(a)(5) (1982 & Supp. IV 1986).

48. 41 U.S.C. § 418(a) (1982 & Supp. IV 1986). CICA also requires that the head of the competition advocate's office within each of the armed services "shall be a general or flag officer if a member of the armed forces or a grade GS-16 or above . . . if a civilian employee and shall be designated to serve for a minimum of two years." 10 U.S.C. § 2318(b) (1982 & Supp. IV 1986). Furthermore, the competition advocate in each major purchasing unit is responsible for "promoting full and open competition" within the purchasing organization and for "challenging barriers to such competition." Federal Acquisition Regulations, 48 C.F.R. § 6.502 (1987). This provision also requires the agency to provide the competition advocate with a staff and other assistance to perform the advocate's duties.

49. As its most significant adjustment to existing bid protest procedures, CICA granted broader authority to the Comptroller General to hear challenges to contract awards. 31 U.S.C. §§ 3553-3554 (1982 & Supp. IV 1986). The statute also gave the Comptroller General power to suspend further performance on contracts pending resolution of certain protests filed with the General Accounting Office. In early 1988, the Supreme Court agreed to consider whether Congress, consistent with the doctrine of separation of powers, could properly give the Comptroller General authority to interfere with the timing of the award or performance of contracts between executive branch agencies and private parties. The Department of Justice subsequently requested and obtained dismissal of the case after Congress amended CICA to withdraw GAO's authority to stay procurement awards for more than 90 days. See *United States Army Corps of Eng'rs v. Ameron, Inc.*, 809 F.2d 979 (3d Cir. 1986), *cert. granted*, 108 S.Ct. 1218, *cert. dismissed*, 109 S.Ct. 297 (1988).

50. Pub. L. No. 99-145, 1985 U.S. CODE CONG. & ADMIN. NEWS (99 Stat.) 583 (codified as amended in scattered sections of 10 U.S.C.).

51. 10 U.S.C. § 2438(b)(1) (1982 & Supp. V 1987).

52. Pub. L. No. 99-591, 1986 U.S. CODE CONG. & ADMIN. NEWS (100 Stat.) 3341-83 (codified as amended in scattered sections of 10 U.S.C.).

program strategy" in developing major weapon systems.⁵³ The measure anticipated the fact that by building competitive prototypes, DOD and its suppliers would refine manufacturing cost estimates and reduce technical uncertainty because DOD could evaluate contrasting design approaches before starting production.⁵⁴

These statutes in effect have established a rebuttable presumption that competition is to be the primary acquisition technique throughout the procurement life cycle. All three measures permit DOD to waive the specified competition requirements under limited circumstances. Acceptable grounds for dispensing with the stated competition requirements typically include a finding by DOD that the mandated competition strategy will increase total program costs without commensurate, offsetting benefits.⁵⁵ Such findings ordinarily must be made in writing and, in some instances, reported first to Congress.⁵⁶

B. *Executive Initiatives*

The statutes described above have complemented and, in some instances, codified parallel executive branch initiatives to use rivalry more extensively in weapons procurement. DOD's recent efforts to use competition more extensively began in 1981 with

53. 10 U.S.C. § 2365(a) (1982 & Supp. V 1987). Congress approved a sunset provision that terminates the competitive prototype requirement on September 30, 1991. National Defense Authorization Act, Fiscal Year 1989, Pub. L. No. 100-456, § 802, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 1918, 2008 (to be codified at 10 U.S.C. § 2365(e)).

54. See M. Rich & E. Dews, *Improving the Military Acquisition Process: Lessons from Rand Research 39-41* (Rand Corp., prepared for United States Air Force) (Feb. 1986) (on file with authors). The elements for such an approach were suggested two decades ago by Professor Nash. See *Competition in Defense Procurement: Hearings on S. Res. 233 Before the Subcomm. on Antitrust & Monopoly of the Comm. on the Judiciary of the U.S. Senate, 90th Cong., 2d Sess. 193, 194-96* (1968) (testimony of Ralph Nash). For other endorsements see FITZLUUGH COMMISSION, *supra* note 1, at 79 (recommending "more use of competitive prototypes and less reliance on paper designs" in selecting production designs); PACKARD COMMISSION, *supra* note 1, at 56-57; G. Smith, A. Barbour, T. McNaugher, M. Rich & W. Stanley, *The Use of Prototypes in Weapon System Development 36* (Rand Corp., prepared for U.S. Air Force) (Mar. 1981) (on file with authors).

55. See 10 U.S.C. §§ 2365(c), 2438(c) (1982 & Supp. V 1987). Given Congress's present preference for competitive procurement techniques, DOD today cannot invoke these escape clauses at will. In addition to the competition measures discussed above, Congress in recent years has given serious attention to compelling DOD to dual-source specific major weapon systems. See, e.g., Wilson, *House Opens Debate on '88 Defense Bill*, Wash. Post, May 5, 1987, at A4, col. 3 (discussing consideration of measure to mandate dual-sourcing of the "Stealth" bomber).

56. See 10 U.S.C. §§ 2365(c), 2438(c) (1982 & Supp. V 1987).

the work of a DOD study group headed by then-Deputy Secretary of Defense Frank Carlucci. The Carlucci panel proposed that defense purchasing authorities establish management programs and plans for increasing competition.⁵⁷ These proposals received additional impetus in 1982 when President Reagan issued an executive order requiring executive departments to "[e]stablish criteria for enhancing effective competition and limiting noncompetitive actions."⁵⁸ In 1986, the Packard Commission recommended that "[f]ederal and DOD regulations should provide for substantially increased use of commercial-style competition, relying on inherent market forces instead of governmental intervention."⁵⁹

The combination of external and internal policy guidance has led the three services—especially the Navy—to make rivalry the basis of many major acquisition programs.⁶⁰ DOD's reports to Congress now commonly emphasize competition-related achievements on many existing and planned weapon systems, and reflect the armed services' current disposition to apply rivalry-based methods extensively.⁶¹

57. Among other effects, the "Carlucci Initiatives" helped stimulate Congressional consideration of measures ultimately enacted in 1984 as the Competition in Contracting Act. See S. REP. NO. 50, 98th Cong., 1st Sess. 7-9 (1983).

58. Exec. Order No. 12,352, 3 C.F.R. 137 (1983).

59. PACKARD COMMISSION, *supra* note 1, at xxvi.

60. Under the leadership of Navy Secretary John Lehman from 1981 to 1987, the Navy became DOD's leading sponsor of competitive purchasing techniques. See J. LEHMAN, JR., *supra* note 6, at 242-44; Keller, *The Navy's Brash Leader*, N.Y. Times, Dec. 15, 1985, (Magazine), at 31; Pyatt, *Procurement Competition at Work: The Navy's Experience*, 6 YALE J. ON REG. 319 (1989). In November 1985 Lehman issued Secretary of the Navy Instruction No. 4210.6, which announced that competition would be the Navy's preferred acquisition method for all programs entering full-scale engineering development. See FISCAL YEAR 1986 OFF. OF THE COMPETITION ADVOCATE GEN. OF THE NAVY REP. TO CONG., *supra* note 45, at III-2 to III-3. Although they are not as aggressive as the Navy, the other services have increased their use of competition-oriented purchasing methods significantly. See MORROCCO, *AF Touts Competition Bid Plan*, Defense News, Mar. 31, 1986, at 1, col. 5.

61. See, e.g., FISCAL YEAR 1986 OFF. OF THE COMPETITION ADVOCATE GEN. OF THE ARMY ANN. REP. TO CONG. ON COMPETITION IN ARMY PROCUREMENT 1-2, 5-12 (Dec. 1986); FISCAL YEAR 1986 OFF. OF THE COMPETITION ADVOCATE GEN. OF THE NAVY REP. TO CONG., *supra* note 45. Observing that "[c]ompetition has become the foundation of the Navy's acquisition strategy," the Navy Competition Advocate General's fiscal year 1986 report stated that "[a]ll new programs begin with the presumption that competition should be present in both the design and production phases wherever practical." *Id.* at III-2 to III-3.

III. Competition Policy: Selected Air Force, Army, and Navy Procurement Programs

This Part discusses the manner in which purchasing authorities have applied competition doctrines in four existing aircraft programs. Each service is now pursuing at least one major aircraft program for which dual-sourcing throughout the procurement cycle is either planned or under serious consideration. These programs also rely heavily on teaming, and some use teaming as the means through which dual-sourcing, particularly in production, will occur. This Part evaluates this procurement strategy in three parts. First, it identifies several important procurement policy and program characteristics of the aircraft procurements. Second, it examines how these basic characteristics have led suppliers to create teams to compete for design awards. Finally, it discusses the function and objectives of dual-sourcing in these programs and assesses the rationale for dual-sourcing and the relationship between teaming and the services' dual-sourcing aims.

A. *Basic Procurement Policy and Program Characteristics*

Typical of programs incorporating DOD's new procurement policies are the Air Force's Advanced Tactical Fighter (ATF), the Navy's Advanced Tactical Aircraft (ATA), the Army's Light Helicopter Experimental (LHX), and the Navy's V-22 Tilt-rotor aircraft (Osprey). Because of foreseeable funding constraints, these four programs (together with the B-2 Stealth bomber) probably are the largest aircraft projects DOD will initiate over the next ten to fifteen years.⁶²

Two overriding goals have shaped numerous aspects of the four programs. First, each program seeks simultaneous advances in several technological disciplines. Second, each program places greater weight upon competition and contractor risk-taking because of a basic dissatisfaction with past procurement policies.

62. The severity of current and future Pentagon funding problems is discussed in Cushman, *The Coming Crunch for the Military Budget*, N.Y. Times, Nov. 27, 1988, § 4 (Week in Review), at 1, col. 1; Wilson, *Pentagon Bracing for Two "Waves,"* Wash. Post, Nov. 13, 1988, at A1, col. 3; Morrison, *The Big Chill*, NAT'L J., June 18, 1988, at 1651.

1. *Simultaneous Advances in Technology*

Each of the new aircraft programs envisions dramatic advances in technology resulting in significant performance gains, improved maintainability, and lower life cycle costs.⁶³ Among other significant effects, pursuing state-of-the-art advances in several disciplines at once usually leads to high development and high unit production costs.⁶⁴ These high costs have two effects: the services start few new programs, and they buy relatively few units of each system each year.⁶⁵ The ATF, ATA, LHX, and Osprey systems promise to be more expensive to develop and to produce than earlier programs, and annual production rates probably will be modest.⁶⁶ Consistent with recent experience, each system probably will remain in production and service longer than the system it is intended to replace.⁶⁷

By continuing, and probably accelerating, the modern trend of fewer new program starts and lower annual/total program purchases,⁶⁸ the emphasis on technological innovations has planted

63. See, e.g., Cushman, *Plane Makers in Competition*, N.Y. Times, Oct. 30, 1986, at D4, col. 1 (discussing new technologies to be incorporated into ATA and ATF); Isikoff, *Expensive Fight for ATF Contract*, Wash. Post, April 26, 1987, at H1, col. 5 (discussing technological advances envisioned for ATF). An alternative acquisition strategy would be to pursue more modest advances in technology and to buy larger numbers of less sophisticated weapons. See generally F. SPINNEY, *DEFENSE FACTS OF LIFE* (1985); W. WHITE, *U.S. TACTICAL AIR POWER: MISSIONS, FORCES AND COSTS* (1971); Sprey, *The Case for Better and Cheaper Weapons*, in *THE DEFENSE REFORM DEBATE*, *supra* note 6, at 193.

64. The most striking recent illustration of this phenomenon is the B-2 bomber, which is being developed by Northrop on a sole-source basis for the Air Force. Because of its exotic technological features, the estimated unit cost of the B-2 now stands at \$516 million—roughly 40% more than original projections. Current plans call for the acquisition of 132 aircraft at a cost of \$68.1 billion. See Moore, *Stealth Bomber to Cost \$516 Million; Most Expensive Military Plane Ever*, Wash. Post, Dec. 17, 1988, at A2, col. 5; Pasztor & Read, *Air Force Halves Its 1990 Stealth Budget; Only Five of Northrop's Bombers Are Sought*, Wall St. J., Dec. 19, 1988, at A14, col. 1.

65. See Burnett, *supra* note 10, at 20-21; M. Rich & E. Dews, *supra* note 54, at 21-25.

66. The historical trend toward increased unit costs and lower annual production rates for military aircraft is discussed in J. GANSLER, *supra* note 6, at 172-177; Burnett & Scherer, *The Weapons Industry*, in *THE STRUCTURE OF AMERICAN INDUSTRY* (W. Adams ed. 1989) (forthcoming). See also Kennedy, *U.S. Naval Aircraft and Weapon Developments in 1988*, U.S. NAVAL INST. PROC., May 1989, at 194, 198 (discussing likely cost increases in forthcoming aircraft programs).

67. M. Rich & E. Dews, *supra* note 54, at 21-25. If the Air Force and Navy adhere to announced plans, neither service is likely to procure new fighter aircraft systems other than the ATF and ATA over the next 15 to 20 years. *Id.* at 22-26.

68. See Kristof, *Stern Times for Arms Makers*, N.Y. Times, July 3, 1986, at D1, col. 3. The principal current exception to this pattern for aircraft procurement is that of the General Dynamics F-16, which is being produced in relatively large numbers for both the Air Force and a number of allies of the United States. See Wrubel, *Cunning It*, FIN. WORLD,

the seeds of far-reaching structural change in the military aircraft industry. In the past quarter century, the drive to achieve sweeping qualitative improvements in new aircraft systems has meant that a small and declining number of firms have active production programs.⁶⁹ Since the mid-1960s, several firms have ceased combat aircraft production,⁷⁰ and current DOD acquisition plans make further structural realignment inevitable.⁷¹ The prospect of additional departures and consolidations requires an assessment of what number and configuration of suppliers is necessary to preserve adequate industry-wide capability and to ensure sufficient interfirm rivalry for new programs.

2. *Emphasis on Rivalry and Contractor Risk-Taking*

The second set of features driving current procurement actions are specific DOD policies incorporating new or renewed emphasis on competition and contractor risk-taking.⁷²

Mar. 8, 1988, at 22, 24.

69. Only a handful of firms today have active fighter aircraft production programs: McDonnell Douglas, General Dynamics, Grumman, Northrop, and Lockheed. See Burnett, *supra* note 10, at 17-19.

70. The most significant events include Douglas Aircraft's merger with McDonnell Aircraft, North American's merger with Rockwell, Republic's merger with Fairchild, and Vought's absorption into LTV. Fairchild recently exited the airframe industry, and the Vought Division of LTV now views itself as a subcontractor to major airframe manufacturers. *Id.*

71. Two of the likeliest candidates for exiting airframe integration and production are Grumman and Rockwell. See *Loss of A-6G Prompts Layoffs at Grumman*, Defense News, Dec. 19, 1988, at 7, col. 1 (discussing reductions in Grumman's work force in wake of Navy's decision not to convert existing A-6E aircraft into variant designated A-6G); Stevens & Pasztor, *Grumman Job on U.S. Bomber Is Threatened*, Wall St. J., Dec. 19, 1988, at A7, col. 1 (describing possible DOD cancellation of Grumman's A-6E aircraft production program and adverse affect such decision would have upon Grumman's ability to continue as major aircraft producer); Isikoff, *Bruising Defense Industry Shakeout Clouds Future for Grumman Corp.*, Wash. Post, Apr. 24, 1988, at H1, col. 4 (discussing possible exit of Grumman from airframe manufacturing and integration); Stevenson, *Military Contractors Squeezed*, N.Y. Times, Nov. 16, 1987, at D4, col. 4 (discussing possible exit by Rockwell from airframe manufacturing and integration).

72. These trends are identified and discussed in *Hearings on Department of Defense Authorization for Appropriations for Fiscal Years 1988 and 1989 Before the Senate Comm. on Armed Services*, 100th Cong., 1st Sess., pt. 7, at 3483-515 (1987) (testimony of defense contractor executives); see also Gladwell, *Are Defense Contracts Worth Cheating For?*, Wash. Post, July 10, 1988, at H1, col. 1 (presenting evidence that profit margins are low in defense industry).

a. *Competition Throughout Life of the Program*

Most of the aircraft projects mentioned above anticipate the maintenance of competition throughout the development and the production phases. For example, the Army will carry out all phases of the LHX program under competition.⁷³ Two competing LHX teams, each with two team leaders, are now in the concept exploration phase. After the Army picks a single design and the winning team finishes full-scale development, each team leader will become a prime contractor. After early purchases, each will compete year-to-year for a share of annual production. In addition, teams will develop every major LHX subsystem, each of which will be dual-sourced in production. The new LHX engines also are being developed under competition and will be dual-sourced during production.⁷⁴

b. *Prototyping with Competitive Fly-off*

Several forthcoming aircraft programs require production of competing prototype aircraft. The purchasing military service will conduct a competitive fly-off to determine which design it will select for full-scale development.⁷⁵ The Air Force expects to conduct its fly-off for the ATF in the early 1990s, and the Army has scheduled the LHX fly-off competition for 1993.

c. *Significant Contractor Financial Commitment*

In recent years, DOD has required contractors to bear greater financial responsibility for developing new systems.⁷⁶ Although the Air Force has issued fixed-price contracts valued at \$691 million

73. *Procurement Rules Are State of the Art*, Defense News, Oct. 20, 1986, at 30, col. 1.

74. Similarly, the Air Force has indicated that it will dual-source as much of the ATF as is feasible, and the Navy plans to dual-source the ATA. See Beyers, *AF to Insist Firms Vie for ATF Components*, Defense News, Nov. 10, 1986, at 2, col. 3 (discussing ATF); Wrubel, *supra* note 68, at 23 (discussing ATA).

75. See Cushman, *supra* note 9; Cushman, *supra* note 63.

76. See Isikoff, *U.S. Defense Firms Face Tight Times*, Wash. Post, Mar. 16, 1988, at F1, col. 2; Lachica, *Defense Firms Claim Reforms Hit Them Hard*, Wall St. J., Mar. 16, 1988, at 9, col. 3; Kitfield, *New Rules, New Risks, New Worries*, MIL. LOGISTICS F. July-Aug. 1987, at 10; Stevenson, *supra* note 71. Cf. Lachica, *Pentagon Backs Off from Two Cost Policies, Saying Suppliers Deserve Fairer Shake*, Wall St. J., Apr. 14, 1988, at 14, col. 3 (suggesting possible DOD retreat from this policy) [hereinafter Lachica, *Pentagon Backs Off*]. For a critique of this approach, see Charles, *Better Competition Means Cheaper Arms*, Wall St. J., Sept. 4, 1987, at 14, col. 3.

to both ATF teams to build prototypes, both teams will spend significantly more of their own funds—estimated at about \$1 billion for the two teams combined—on their prototypes.⁷⁷ Among other requirements, recent legislation and DOD policies compel suppliers to pay a larger part of the initial costs of developing new systems⁷⁸ and to provide stronger warranties for system reliability.⁷⁹

d. *Use of Fixed-Price Contracts*

Several of the aircraft projects anticipate using either firm fixed-price or fixed-price incentive contracts for both development and production. For example, the ATA contract that the Navy recently awarded to McDonnell Douglas and General Dynamics reportedly provides that early production of the new aircraft will take place under a fixed-price contract formula.⁸⁰

e. *Increased Contractor Management Responsibility*

DOD has delegated greater management authority for system acquisition to the prime contractors. The LHX team leaders, for example, will be responsible for managing competition between the dual-source subcontractors. They must assure that two producers are bidding on and are capable of producing each

77. See Stevenson, *supra* note 9; see also Kristof, *The Battle for a New Fighter*, N.Y. Times, Feb. 20, 1986, at D1, col. 3.

78. See 10 U.S.C. § 2329 (1982 & Supp. V 1987) (reimbursability of special tooling costs); DOD Federal Acquisition Regulation Supplement: Special Tooling and Special Test Equipment, 53 Fed. Reg. 6015 (1988) (to be codified at 48 C.F.R. pt. 25).

79. See 10 U.S.C. § 2403 (1982 & Supp. V 1987) (warranties). The statutory warranty requirements are evaluated in R. KUENNE, P. RICHANBACH, F. RIDDELL & R. KAGANOFF, *WARRANTIES IN WEAPON SYSTEM PROCUREMENT* (1988). J. Stucker & G. Smith, *Warranties for Weapons: Theory and Initial Assessment* (Rand. Corp.) (Apr. 1987) (on file with authors).

80. See Carrington, *McDonnell, Dynamics Get \$4.38 Billion Job*, Wall St. J., Jan. 14, 1988, at 10, col. 1. In April 1988, DOD indicated that it might retreat from its emphasis upon fixed-price contracts during development. See Lachica, *Pentagon Backs Off*, *supra* note 76. Congress subsequently moved to discourage the use of fixed-price contracts in this stage of the weapons acquisition cycle. The Department of Defense Authorization Act for Fiscal Year 1989 directs the Secretary of Defense to revise existing DOD regulations to provide that DOD may award fixed-price contracts in development only if (a) the level of program risk permits realistic pricing, and (b) using a fixed-price contract permits "an equitable and sensible allocation" of program risk between DOD and the contractor. National Defense Authorization Act, Fiscal Year 1989, Pub. L. No. 100-456, § 807, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 1918, 2011.

subsystem, for soliciting and evaluating bids, and for apportioning production contracts.⁸¹

B. Teaming

A major result of the existing weapons acquisition environment and of the specific terms of current programs is that firms form teams to develop and produce systems. Although teaming on major aircraft programs is not novel,⁸² the extent of teaming and the number of team members on several projects represent significant departures from past practice.⁸³

Contractors have formed teams to develop each of the four aircraft mentioned above. Lockheed, General Dynamics, and Boeing are competing against Northrop and McDonnell Douglas in developing the ATF. The team of McDonnell Douglas and General Dynamics recently defeated the team of Grumman and Northrop for the right to pursue full-scale development of the ATA.⁸⁴ The competition for the LHX pits McDonnell Douglas/Bell against Boeing Vertol/Sikorsky. Because of the Army's dual-sourcing requirements, each major LHX subsystem has at least two teamed partners.⁸⁵ Bell and Boeing Vertol are teamed for the Osprey. An important feature of this array of relationships is that several firms are teammates for one project, but opponents for another closely related system.

1. Rationales for Teaming

Although the armed services have mandated teaming on some projects such as the LHX and have encouraged it on others such as the ATF, ATA, and Osprey, some degree of teaming flows

81. These features of the LHX program are discussed in *Procurement Rules Are State of the Art*, *supra* note 73.

82. The Navy's F/A-18 fighter aircraft, for example, was developed jointly by a team consisting of McDonnell Douglas and Northrop. I. DORFER, *ARMS DEAL: THE SELLING OF THE F-16*, 41-44 (1989). See also sources cited *infra* note 97.

83. This trend is discussed in Beltramo, *The Trouble with Contractor Teaming*, MIL. LOGISTICS F., Mar. 1988, at 35; Carrick, *Assessment of the Competitive Contractor Teaming Acquisition Strategy*, 18 NAT'L CONT. MGMT. J. 55 (1984); Morrison, *Up in Arms*, NAT'L J., July 11, 1987, at 1782; Waskul, *Is Teaming Good for Your Health*, INTERAVIA, Apr. 1987, at 327.

84. See Carrington, *supra* note 80; Halloran, *Navy Awards Contract for Bomber*, N.Y. Times, Dec. 24, 1987, at D1, col. 3.

85. The Army's LHX dual-sourcing requirements have yielded large aggregate teams. The McDonnell Douglas/Bell team now has approximately 10 members, and the Boeing Vertol/Sikorsky team has about 15 members.

naturally from current procurement policies and practices. Teaming reduces each firm's risk in an increasingly costly and risky procurement environment. One source of risk is the paucity of programs and, consequently, the shrinking number of production contracts that enable firms to maintain and extend their technical capability. As mentioned above, for several broad categories of weapons DOD plans few additional new program starts in the coming decades. Existing airframe manufacturers that fail to obtain a role in building the ATF or the ATA will face a difficult struggle to maintain the technological qualifications to participate in future development competitions.⁸⁶ Even with widespread teaming, some decline in the existing number of airframe producers appears to be inescapable.⁸⁷

Teaming also can reduce the financial risk arising from current requirements that force contractors to bear more of the costs of developing new systems, to provide stronger warranties, and to accept fixed-price contracts for relatively early phases of the procurement cycle. Teaming spreads costs and risks at a time when DOD policies have compelled firms to "bet their equity" far more often than before.⁸⁸ Although not fully analogous, the experience of Grumman and Lockheed in the early 1970s, when both suffered severe losses under "total package procurement contracts" for the F-14 and C-5A, respectively, is a sobering illustration of the losses participants in the new aircraft programs might incur.⁸⁹

86. See Isikoff, *supra* note 63, at H4, col. 6 (quoting McDonnell Douglas vice president as calling pending ATF competition "a high-risk poker game"); Kristof, *supra* note 77 (quoting General Dynamics official as calling ATF "a must-win program"); Morrison, *supra* note 83, at 1786.

87. For example, it is quite possible that Grumman will slowly exit airframe production and focus on defense electronics following the failure of the Grumman/Northrop team to win the ATA contract. See Isikoff, *supra* note 71. For other accounts predicting a decline in the number of airframe manufacturers, see Morrison, *supra* note 83, at 1786; Stevenson, *supra* note 71.

88. The Air Force initially discouraged teaming for the ATF program out of concern that teams would create "an airborne camel." When the Air Force added the requirement that contractors bear a large portion of the costs of prototyping, it came to recognize that even the larger ATF contenders viewed such expenses as very risky and even threatening to the viability of individual firms. The Air Force subsequently encouraged teaming. See Carrington, *Fighter Jet Initiates New Age of Procurement*, Wall St. J., Oct. 31, 1986, at 6, col. 1.

89. Under total package procurement contracts, firms committed themselves to a single, fixed price for the research, development, and production phases of the acquisition cycle. After signing total package procurement contracts to produce the F-14 and C-5A, respectively, Grumman and Lockheed discovered that they had seriously underestimated their likely costs and thereby incurred massive overruns. Both firms reached the edge of

In addition to serving as a source of risk reduction, teaming can be viewed as a response to DOD efforts to seek significant simultaneous technological gains in numerous areas.⁹⁰ Many of the aircraft program teams represent combinations of diverse individual company strengths. The Lockheed ATF team, for example, will use Lockheed's basic design proposal and will draw heavily upon Boeing's avionics capability and General Dynamics's armaments and supportability expertise. Teaming allows each team member to take advantage of the complementary strengths of all team members.⁹¹

Teaming also allows a firm to augment its strength in at least one other significant way. The weapons procurement process has a substantial political dimension. Congress deeply influences weapons acquisition policy,⁹² and legislators closely monitor the distribution of contracts to economic interests within their districts or states.⁹³ Programs that disperse benefits across a larger number of states and congressional districts ordinarily possess an advantage in the appropriations process.⁹⁴ Teaming at the prime

insolvency before DOD agreed to renegotiate the agreements and increase the firms' compensation. See I. DORFER, *supra* note 82, at 32 (discussing Grumman's overruns on F-14); A. SAMPSON, *THE ARMS BAZAAR* 218-19 (1977) (discussing Lockheed's overruns on C-5A).

90. Teaming to obtain defense contracts has a commercial parallel in the formation of joint ventures to pursue basic research and development that firms regard as too risky to pursue individually. See Hayes, *New M.C.C. Chief's Strategy: To Speed Payoff on Research*, N.Y. Times, June 24, 1987, at D6, col. 1 (discussing Microelectronics Computer and Technology Corporation research and development joint venture).

91. Federal procurement regulations single out this rationale as an important basis for permitting teaming agreements. Section 9.602 states that "[c]ontractor team arrangements may be desirable from both a Government and industry standpoint in order to enable the companies involved to (1) complement each other's unique capabilities and (2) offer the Government the best combination of performance, cost, and delivery for the system or products being acquired." Federal Acquisition Regulations, 48 C.F.R. § 9.602(a) (1987). The provision goes on to note that teaming "may be particularly appropriate in complex research and development acquisitions, but may be used in other appropriate acquisitions, including production." *Id.* § 9.602(b).

92. See G. ADAMS, *THE POLITICS OF DEFENSE CONTRACTING* (1981); A. COX & S. KIRBY, *CONGRESS, PARLIAMENT AND DEFENCE* (1986); W. WEIDA & F. GERTCHER, *THE POLITICAL ECONOMY OF NATIONAL DEFENSE* 22-27 (1987); Lindsay, *Congress and Defense Policy: 1961 to 1986*, 13 *ARMED FORCES & SOC'Y* 371 (1987).

93. See, e.g., N. KOTZ, *supra* note 6, at 123-38, 258-60; Higgs, *Hard Coals Make Bad Law: A Study of Congress and Defense Budget Waste*, 8 *CATO J.* 79 (1988); Wessel, *Pentagon's Anthracite Mound Will Be Monument to Congress and Coal Lobby*, *Wall St. J.*, Apr. 5, 1988, at 66, col. 1; Wilson, *House Panel Considers Defense Bill That Hints Strongly of Pork*, *Wash. Post*, Mar. 29, 1988, at A3, col. 1.

94. Such political considerations are thought to have influenced the Navy in its decision to increase the number of cities serving as home ports for Navy combat vessels. See Carlson, *Congress Smooths the Waters for Navy's Home-Ports Plan*, *Wall St. J.*, Mar. 3, 1987, at 35, col. 1.

contractor level enables suppliers and the purchasing military service to build more effective political coalitions by broadening the potential geographic base of congressional support for a forthcoming program. While political diversification may benefit contractors and the sponsoring service by insuring against program reduction or cancellation, this private gain can harm the acquisition process because it may protect a program that should be reduced or eliminated due to changes in military requirements, rising costs, or a failure to meet performance goals.⁹⁵

2. *Shortcomings*

Although teaming may entail significant benefits, it may also lead to substantial problems in current acquisition programs. Teaming requires close cooperation among team members, yet each teaming agreement is a potential source of conflict that might impede effective development or production. The potential for conflict appears most starkly when members of teams associated with different but highly related programs overlap. For example, McDonnell Douglas and Northrop are teamed for the ATF, but were rivals for the ATA, and McDonnell Douglas and General Dynamics teamed to win the ATA, but are rivals for the ATF. Bell and Boeing are on competing teams for the LHX, but are partners for the Osprey, the Tilt-rotor aircraft that will be able to perform some missions anticipated for the LHX.

The establishment of overlapping, mixed teams lays the foundation for at least two types of destructive internal conflict. The first takes the form of one firm's reluctance to provide a team member with proprietary data or know-how that the team member might employ in a second program in which the two firms are opponents. For example, if General Dynamics has superior expertise in certain areas, it may be reluctant to provide McDonnell Douglas access to such information for the ATA program out of concern that McDonnell Douglas will put the expertise to use on the ATF program. Similar concerns arise for

95. The rent-seeking "advantages" that teaming offers individual team members can also distort source selection in ways that reduce social welfare. This is particularly true when one team's skillful construction of an effective political coalition enables it to trump a rival whose political acumen is weaker but whose technical proposal and qualifications are superior. Cf. Lee, *Public Goods, Politics, and Two Cheers for the Military-Industrial Complex*, in *ARMS, POLITICS, AND THE ECONOMY*, *supra* note 1 (suggesting that efforts of private firms to build powerful political constituencies may be necessary to elicit adequate levels of defense expenditures).

the overlapping LHX-Osprey participants. At a minimum, overlapping team membership would seem to entail complex, costly efforts to ensure that proprietary data and know-how do not flow beyond the bounds of the collaborative venture.⁹⁶

The history of the McDonnell Douglas-Northrop teaming relationship on the F/A-18 program vividly illustrates the data rights problems team members can encounter.⁹⁷ The McDonnell Douglas-Northrop teaming agreements provided that each firm would build a distinctive variant of the F/A-18 for sale to the United States and to foreign governments. To facilitate interfirm data transfers, the teaming agreements attempted to delimit the uses to which each firm could apply proprietary data that its teammate had contributed for joint development tasks for the F/A-18 program.⁹⁸ Disputes over these data agreements contributed significantly to acrimonious litigation between the two firms. Northrop accused McDonnell Douglas of misappropriating its technology and engaging in industrial espionage to secure information concerning Northrop's proprietary aircraft designs.⁹⁹ McDonnell Douglas, on the other hand, alleged that Northrop had taken avionics data McDonnell Douglas had supplied exclusively for the F/A-18 project and had wrongfully used this information to enhance the capabilities of Northrop's F-20 fighter.¹⁰⁰ Each side claimed hundreds of millions of dollars in damages resulting from alleged breaches of the teaming agreement data clauses. The lawsuit consumed six years, at least \$40 million in out-of-pocket legal costs, and thousands of hours of time of the companies' highly skilled personnel before it was settled in 1985.¹⁰¹

A second drawback associated with teaming stems from resource allocation choices that individual team members might be required to make among different high-cost, high-risk

96. See Waskul, *supra* note 83, at 327.

97. The history of the McDonnell Douglas/Northrop teaming effort on the F/A-18 program is presented in *Northrop Corp. v. McDonnell Douglas Corp.*, 498 F. Supp. 1112 (C.D. Cal. 1980), *rev'd in part and aff'd in part*, 705 F.2d 1030 (9th Cir.), *cert. denied*, 464 U.S. 849 (1983). See also R. Nash, *Dual Sourcing*, in *Critical Issues in Contract Competition* (Feb. 13, 1987) (unpublished collection of articles, compiled by ABA Sec. of Pub. Contract L.) (on file with authors). The authors consulted for McDonnell Douglas in this litigation.

98. *Northrop*, 705 F.2d at 1037-39.

99. *Northrop*, 705 F.2d at 1038-39 & n.6.

100. See Sanford, *Northrop, McDonnell Settle Suit*, *St. Louis Post-Dispatch*, Apr. 9, 1985, at 1.

101. See *Navy to Recover Legal Fees Billed by McDonnell Douglas for F/A-18 Suit*, *Fed. Cont. Rep.* (BNA) No. 43, at 501 (Mar. 25, 1985).

programs. For example, firms participating in both the ATF and ATA competitions might find it necessary to place primary emphasis on one of the two programs.¹⁰² No firm has an unlimited supply of outstanding engineers, and one company's apprehension that a team member could be channelling its best engineers and other valuable resources to a separate, related program is a potential source of disharmony.¹⁰³ Even more disruptive is the possibility that a teammate on one program might devote its principal efforts and best resources to succeed in a second program that competes directly with the first.

Such potential tensions are evident in the LHX and Osprey programs. Bell is teamed with McDonnell Douglas to submit an LHX proposal, but also is teamed with Boeing Vertol to produce the Osprey. In 1987, Bell suggested to DOD that it might be desirable for the Army to purchase the Osprey to perform some missions for which the Army had planned to buy the LHX.¹⁰⁴ This suggestion could not have contributed to nurturing a harmonious relationship within the Bell-McDonnell Douglas team. Similar problems arose in the F/A-18 program, where Northrop accused McDonnell Douglas of inhibiting Northrop's efforts to sell a land-based variant of the F/A-18 to increase sales opportunities for McDonnell Douglas's F-15 air superiority fighter.¹⁰⁵

Even when teams do not contain overlapping membership, teaming may create tensions that inhibit effective, necessary cooperation.¹⁰⁶ When teaming and production dual-sourcing are mandated, current partners must anticipate future competition¹⁰⁷

102. The possibility that firms participating in both the ATF and ATA programs ultimately might be forced, because of limited internal resources, to favor one program and deemphasize contributions to the other is suggested in Stevenson, *supra* note 9. See also M. PECK & F. SCHERRER, *supra* note 22, at 324-85.

103. See Waskul, *supra* note 83, at 327.

104. See Wilson, *Alternative to Copter Project Offered*, Wash. Post, Apr. 23, 1987, at A11, col. 1.

105. *Northrop*, 705 F.2d at 1039.

106. Regardless of the industry setting, joint venture-type arrangements commonly confront the participants with difficult transactional problems that stem from the need to determine how the joint activities will be managed. See Brodley, *Joint Ventures and Antitrust Policy*, 95 HARV. L. REV. 1521, 1529 (1982); L. SILVIA, NOTE ON JOINT VENTURES IN WHICH FIRMS CONTRIBUTE COMPLEMENTARY INPUTS 16-17 (F.T.C. Working Paper No. 152) (May 1987).

107. For example, the team of McDonnell Douglas and General Dynamics is now proceeding jointly to build an ATA prototype to be completed in the next two to three years. Once the ATA prototyping effort is completed, the two firms will compete against each other for the bulk of the annual production run, with the lower bidder receiving roughly two-thirds of the annual award. See Halloran, *supra* note 84; Wrubel, *supra* note 68, at 23.

and therefore may fail to cooperate fully when exchanging pertinent design, production, and maintenance information.¹⁰⁸ Once again the McDonnell Douglas-Northrop F/A-18 litigation provides an example of how this type of problem might arise. Northrop alleged that McDonnell Douglas had withheld information essential to Northrop's efforts to design and to produce a land-based variant of the F/A-18 that Northrop planned to sell to the U.S. Air Force and to foreign governments. Northrop envisioned that its version of the F/A-18 would establish the company as a manufacturer of highly sophisticated, state-of-the-art aircraft.¹⁰⁹ Thus, it claimed that McDonnell Douglas had withheld data in order to impede Northrop's move into a market that McDonnell Douglas already occupied.

Team members for any system or subsystem are seldom equal, and, as suggested above, dual-sourcing can convert these differences into serious obstacles to effective cooperation. Technologically more advanced firms contemplating the equivalent of a prearranged divorce might balk at transferring data and know-how to less astute teammates who subsequently might use the information to compete for production awards. As is the case with situations involving overlapping team memberships, efforts to solve data transfer and use questions—for example, by contractual limitations and organizational structures designed to confine data use to discrete, limited purposes—are likely to be costly to implement and of questionable effectiveness.¹¹⁰ In the long run, a predisposition on the part of DOD to require teaming, coupled with defense firms' perception of weaknesses in regimes for appropriating the returns to innovation, may seriously weaken incentives for firms to invest in research and development. If firms believe that they will be required to team and doubt their ability to appropriate the returns on their own inventive activity,

108. Commercial joint ventures sometimes disintegrate because the participants cannot overcome problems associated with the prospect that the joint venturers might become rivals with respect to the product that is the subject of the two firms' collaboration. See Kneale & Putka, *Jet-Engine Pact of Rolls-Royce, GE Scrapped*, Wall St. J., Nov. 20, 1986, at 39, col. 1 (reporting that General Electric and Rolls-Royce had discontinued joint-production agreement "because the two companies' cooperation in making jet engines has turned into competition").

109. See I. DORFER, *supra* note 82, at 57-74; A. SAMPSON, *supra* note 89, at 141-53.

110. See Morrison, *supra* note 83, at 1785 (quoting Weyman B. Jones, Grumman's vice president for public affairs, as saying that "there's no question that there is an inhibition [on innovation] when you're working with folks that a year from now will be your competitors").

they are likely to decrease investments in desirable research and development.

Finally, intrateam tension also can arise from the efforts that each team member makes to claim credit for accomplishments achieved during the course of the collaboration. Defense contractors routinely seek to convince the U.S. armed services and potential foreign purchasers of their technical skill and production capability. For products developed or produced through teaming, this claiming of credit can cause each team member to attempt to persuade purchasers that its contributions to the joint program were superior to those of its teammate.¹¹¹

3. *An Approach to Teaming*

Although teaming may increase efficiency, it also may foster a distrustful environment that can lead to a general failure by contractors to resolve difficult issues. Optimal use of teaming requires a careful evaluation and balancing of potential costs and benefits, and each new program must be evaluated individually. However, several generalizations are appropriate. Teaming is more likely to have a net positive effect (1) when system costs are very high and (2) when the expertise needed to achieve technical targets requires the complementary skills of more than one firm and demands close cooperation of the firms that cannot be accomplished by less drastic contractual techniques, such as conventional prime contractor/subcontractor relationships.¹¹²

111. It also should be noted that the corporate cultures of team members typically vary, often significantly. Different aerospace company styles can result from conscious management decisions. Some firms cultivate an open-door, freewheeling atmosphere, while others establish a structured, formal tone. Different styles may also simply stem from the distinctive character that a geographic location, be it Long Island or Southern California, can impart to a firm's laborers and professional staff. Whatever their basis, such differences in corporate cultures often can yield strikingly different ways of approaching design, development, and production tasks. Such differences are not easily overcome and may generate serious conflict.

112. Teaming is only one form of contractual relationship among contractors. In the past, major systems usually have been developed and produced by prime contractors that subcontracted important portions of the total system to other firms. For example, Westinghouse developed and now produces the radar set for the F-16 under a subcontract with General Dynamics, the airframe manufacturer and systems integrator. Teaming takes interfirm cooperation one step further and integrates more fully total system design among several firms. Additionally, unlike most prime contractor/subcontractor relationships, the teams now assembled typically consist of horizontal competitors. Such teammates ordinarily regard themselves as prime contractors and, left to their own desires, would prefer to have sole or principal responsibility for designing, integrating, and assembling the system.

Second, despite its potential benefits, teaming can entail formidable costs, particularly as DOD has applied it to the aircraft programs discussed above. These costs are sufficiently high that DOD should approach new programs with a presumption disfavoring policies that mandate or strongly encourage teaming arrangements involving horizontal rivals.¹¹³ DOD should be especially wary of establishing teams when industry participants already are cooperating on closely related programs that incorporate closely related technologies. Teaming in these circumstances runs substantial risks and creates significant costs that promise to undercut the DOD's acquisition goals. Prominent among these risks are efficiency-reducing lapses in necessary interfirm cooperation and diminished incentives for individual companies to innovate. Similarly, the use of teaming as a platform for future dual-sourcing should be discouraged. Other strategies for qualifying a second source, while entailing nontrivial costs of their own, are likely to be less costly avenues to dual-sourcing. One such example is transferring data packages and know-how to a second supplier upon moving to full-scale production.¹¹⁴

More generally, policies that mandate or strongly encourage teaming among direct rivals are ill conceived because they more often than not will place decisions about choosing the appropriate structure for interfirm relationships in the wrong place. Compared to DOD, individual contractors have superior knowledge about the different transaction costs of doing business with other contractors and with using various types of integration to order their relationships with these firms. For this reason, it would be wise to presume that contractors are in the best position to determine what transactional form—contract, joint venture, teaming, or merger—will provide the most efficient path to designing and building a given weapon system.

Given the potential problems with teaming, defense suppliers already are adopting other strategies to adjust to ongoing changes in the procurement environment. The most notable of these is

113. As discussed below, we would weaken this presumption where foreign suppliers use teaming as a strategy for entering the U.S. market. See *infra* text accompanying notes 179-83.

114. In light of typical cost growth and the substantial uncertainty surrounding future DOD budgets, a program that at its inception appears to be a candidate for dual-sourcing ultimately may not be purchased in quantities sufficient to warrant such a procurement strategy when it enters production. See *infra* text accompanying notes 153-60.

expanded reliance on mergers and acquisitions.¹¹⁵ The prevailing trend toward fewer program starts and higher cost programs has caused some firms to diversify through mergers and thereby to increase the probability of participating in the new large projects. Other firms can be expected to diversify into related technologies when the transaction costs associated with teaming and other contractual forms of integration prove to be extremely high.¹¹⁶ Several aerospace industry acquisitions in recent years have appeared consistent with these motivations.¹¹⁷ DOD must give its contractors more freedom to select the transactional forms that they prefer. It should also focus more attention on preserving, in the face of increasing levels of defense industry mergers, enough actors in each industry for future design and production competitions.

C. *Dual-Sourcing*

As discussed in Part I, DOD's procurement reform initiatives either require or urge maximum use of competition in weapons acquisition. DOD's preferred competition strategy today is dual-sourcing, which is not a new weapons acquisition technique. For example, the United States used dual-sourcing extensively during World War II to produce fighter and bomber aircraft. In addition, DOD dual-sourced a number of systems and subsystems prior to 1980.¹¹⁸ Since 1980, however, dual-sourcing has increased dramatically, especially for important, expensive systems such as the Advanced Medium Range Air-To-Air Missile,¹¹⁹ the Tomahawk

115. Recent DOD and other federal contracting policies appear to have stimulated expanded merger and acquisition activity involving defense suppliers. See Morrison, *supra* note 83, at 1783; Sugawara, *New Federal Policies Thinning Ranks of Government Contractors*, Wash. Post, Apr. 25, 1988, § 5 (Washington Business), at 1, col. 1.

116. The use of mergers to overcome transaction costs problems is treated in O. WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM* 85-130 (1985); Klein, Crawford & Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J.L. & ECON. 297 (1978).

117. See Morrison, *Winter of Discontent*, NAT'L J., Dec. 19, 1987, at 3200, 3203. In 1986-87, Lockheed bought Sanders Associates, an electronics firm, Loral purchased Goodyear's aerospace division, and General Electric purchased RCA.

118. See F. SCHERER, *supra* note 22, at 119-26; Asher, *Cost-Quantity Relationships in the Airframe Industry (Rand Corp.)* (July 1956) (on file with authors); K. ARCHIBALD, *supra* note 16.

119. See Beltramo, *Missiles: Leaders Face Competition on Most Programs*, MIL. LOGISTICS F., July-Aug. 1987, at 112, 114-15.

cruise missile,¹²⁰ and fighter aircraft engines.¹²¹ Currently, the Navy is committed to dual-sourcing the Osprey, and the Army will dual-source the LHX and all major LHX subsystems. The Air Force is considering dual-sourcing the ATF, and although details of the ATA program remain highly classified, the Navy appears to be committed to dual-sourcing this new system.

1. *Advantages of Dual-Sourcing*

Proponents of dual-sourcing argue that it produces a variety of benefits associated with ongoing competition throughout the production phase.¹²² First, the use of dual-sourcing leads to lower short-run costs and prices to the government because of period-to-period rivalry among dual-sources. In theory, dual-sourcing places constant, dynamic pressure on firms to eliminate inefficiency and pass on these cost savings to DOD in the form of lower prices. The prospect of losing a significant portion of annual production orders provides incentives for contractors to move more aggressively to achieve cost-reducing process innovations and to curb waste than they would under a sole-source production regime.

Second, by increasing DOD's range of procurement options, dual-sourcing provides a tool for reducing contractor incentives to engage in postcontractual opportunism.¹²³ Private firms commonly diversify sources of supply to protect themselves against both accidental and deliberate supply interruptions.¹²⁴ Such diversification is most important when the potential costs of being

120. See Isikoff, *Bidding Battle Puts an Ax to Tomahawk Missile's Price*, Wash. Post, Apr. 12, 1987, at H1, col. 1.

121. See R. DREWES, *THE AIR FORCE AND THE GREAT ENGINE WAR* (1987); Behr & Potts, *Pratt Falls in Jet Engine Race*, Wash. Post, Feb. 12, 1984, at G1, col. 3.

122. See, e.g., COMPETITION ADVOCATE GEN. OF THE NAVY, *THE COMPETITION HANDBOOK* (1987); J. GANSLER, *supra* note 6, at 185-88; Yuspeh, *A Case for Increasing the Use of Competitive Procurement in the Department of Defense*, in *BIDDING AND AUCTIONING FOR PROCUREMENT AND ALLOCATION* (Y. Amihud ed. 1976); L. Kratz & J. Gansler, *Effective Competition During Weapon System Acquisition* (National Contract Management Association) (Dec. 31, 1985) (unpublished manuscript on file with authors).

123. For discussions of postcontractual renegeing and the appropriation of quasi-rents, see O. WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS* 26-30 (1975); Goldberg, *Regulation and Administered Contracts*, 7 *BELL J. OF ECON.* 426, 439-41 (1976); Klein, Crawford & Alchian, *supra* note 116.

124. See Haddock, *Basing-Point Pricing: Competitive vs. Collusive Theories*, 72 *AM. ECON. REV.* 289, 292-93 (1982).

cut off are high.¹²⁵ For example, it is likely that the Navy's commitment to dual-sourcing has stemmed significantly from its experiences with suppliers that used sole-source positions to gain what the Navy saw as unwarranted increases in the original contract price as a condition for continuing work on essential programs.¹²⁶

These first two benefits highlight a key feature of successful applications of dual-sourcing. In many instances the government's negotiating position is weakened by its inability to use credible threats to shift sources of supply.¹²⁷ Therefore, it may be rational for DOD to make relatively large initial expenditures early in a program to ensure that it has the option of making credible threats to shift production to another source if it encounters increased prices or opportunistic behavior. Without plausible alternative sources of supply, strategies used to blunt "supply hostage" situations are ineffective.

A third possible benefit of dual-sourcing is lower long-run costs obtained through faster rates of learning-by-doing. Maintaining competition during production may speed firms' movement on the learning curve: costs incurred in a dual-sourced program will fall over time more rapidly as the competing firms try to cut costs aggressively to secure a larger share of the following year's purchases than costs in programs with only a single contractor. The potential benefits of competition in this framework are manifested either in an increase in the slope of the learning curve or a reduction in the level of costs on early units produced.¹²⁸ By spurring greater contractor efforts to reduce costs, competition cuts costs more rapidly than sole-sourcing.

The fourth benefit from dual-sourcing is the creation of incentives to improve the quality of systems under production.¹²⁹ The existence of a rival producer may lead a firm to work harder

125. An example of such high costs is the strategic disadvantage the country might face when the completion of a vital addition to its weapons inventory is delayed.

126. Patrick Tyler's study of the Navy's nuclear submarine program has suggested that General Dynamics used its position as a sole-source supplier on the Trident missile submarine program to obtain a higher price for attack submarines the company was building for the Navy. P. TYLER, *supra* note 6, at 167-248; See also J. LEHMAN, JR., *supra* note 6, at 196-227. In addition to eliciting greater adherence to established timetables, discouraging this and other forms of opportunism may benefit DOD by raising the morale of government procurement personnel weary of dealing with "unresponsive" contractors.

127. See L. Kratz & J. Gansler, *supra* note 122, at 1-4 to 1-6.

128. See F. SCHERER, *supra* note 22, at 119-26. The Navy's experience on the Tomahawk cruise missile program is a good example of this. See Pyatt, *supra* note 60.

129. See Waskul, *supra* note 83, at 328.

to reduce quality deficiencies in production and to devise weapon system enhancements at lower cost. Creating a second source also can give the purchasing service valuable insurance against supply interruptions when the original source encounters production-related quality problems that place the delivery of satisfactory equipment in doubt.¹³⁰

Fifth, by helping maintain a sufficient number of contractors with relevant design experience and expertise, dual-sourcing may afford DOD an array of possible contractors to provide alternative technical approaches for future programs and may assist in preserving adequate surge capacity to accommodate sharply increased demands for arms in times of war. Sustaining two production lines is one way to increase the probability that a greater number of firms will have the design and systems integration capability necessary to participate in future competitions and to increase production at the outbreak of war. Indeed, some services see the latter aims as so important that they are willing to sacrifice some production efficiencies to maintain the industrial base and future diversity in design approaches.¹³¹

Sixth, dual-sourcing provides a means to avoid the burdensome disclosure and oversight requirements of the Truth in Negotia-

130. In 1987 the Air Force decided to establish Rockwell as a second source to Northrop on the MX missile's guidance unit after discovering serious quality control deficiencies and production delays in Northrop's assembly operations. The Air Force chose to create a second source even though it plans to buy a total of only 239 of the guidance units. See Cushman, *Northrop's Struggle with the MX*, N.Y. Times, Nov. 22, 1987, § 3 at 1, col. 4; Moore, *MX Reliability in Question*, *supra* note 2.

131. Some commentators have said that interservice rivalry within DOD has led the services to sustain a level of industry capacity that exceeds genuine national requirements and to engage in wasteful duplication of weapon systems. See, e.g., R. HALLORAN, *supra* note 6, at 144-75. As one means of preventing the services from maintaining excess capacity and pursuing needless duplication of individual system capabilities, several members of Congress have introduced legislation to create a central DOD purchasing authority that would acquire arms on behalf of the individual services. See Morrison, *supra* note 20, at 2178. Opponents of such measures have argued that a central procurement organization would tend to overlook legitimate needs of each service. More generally, some observers have contended that interservice rivalry yields net benefits to society because it ensures that the poor judgment of one purchasing service does not preclude the development of promising weapon designs or the adoption of useful, overlapping systems by another service. See *Concurring Statement of Dr. George J. Stigler*, in FITZHUGH COMMISSION, *supra* note 1, at 198. Some measure of functional redundancy may be valuable as insurance against the failure of any single approach to solving a problem. For example, it was initially believed that the operation of the space shuttle would render production of nonreusable launch vehicles largely unnecessary. In the aftermath of the Challenger disaster, substantial continued output of unmanned rockets has come to be recognized as a crucial hedge against problems with the space shuttle. See Sawyer, *Air Force Braces as Pace of Unmanned Space Launches Soars*, Wash. Post, Nov. 28, 1988, at A4, col. 1.

tions Act.¹³² The statute permits DOD to waive the requirement that contractors provide cost or pricing data if, among other grounds, the contract price is based on "adequate price competition."¹³³ In some circumstances dual-sourcing may stimulate a level of price competition sufficient to satisfy this standard.¹³⁴ Abandoning the disclosure duty and its related oversight requirements would remove a substantial and costly administrative burden from the shoulders of the contractor and DOD alike.¹³⁵

Seventh, as is true with teaming arrangements, dual-sourcing can yield private political benefits to contractors that, while offering little in the way of cost savings, may appeal to purchasing officials and Congress.¹³⁶ Allocating production contracts to a larger number of states and congressional districts can broaden the base of congressional support and provide greater political protection if a weapon system is threatened with cutbacks or termination.¹³⁷ Dual-sourcing also can help generate public and congressional support for defense expenditures by suggesting that because defense contractors are exposed to the same types of

132. Pub L. No. 87-653, 76 Stat. 528 (1962) (codified as amended at 10 U.S.C. § 2306a (1982 & Supp. V 1987)).

133. *Id.* § 2306a(b). For conventional negotiated contract awards, the contractor provides the government's negotiation team with a substantial body of information to support its proposed price. The existence of adequate price competition supplies a basis for waiving the requirement that such data be provided. Thus, in some instances, dual-sourcing would permit the government and the contractor to dispense with one major stage of disclosure and review.

134. Some accounts of the Justice Department's Ill Wind investigation suggest that collusion between rivals for new systems is one focus of the inquiry. *See supra* note 3. Fragmentary reports of the inquiry have indicated that some contractors may have agreed to submit noncompetitive bids in return for promises of subcontracting work from their rivals. The ultimate soundness of these allegations surely would influence the desirability of retaining cost and pricing observation by DOD.

135. The size and scope of DOD regulatory structures designed in large part to compensate for the absence of effective market-based constraints is staggering. *See J. GANSLER, supra* note 6, at 150-54; Augustine, *Defense: A Case of Too Many Cooks*, *FORTUNE*, Dec. 15, 1988, at 219; CENTER FOR STRATEGIC AND INT'L STUDIES, *supra* note 6, at 29-30; Fossedal, *More Audits Won't Curb Defense Waste*, *Wall St. J.*, June 30, 1986, at 22, col. 3.

136. *See Morrison, supra* note 117, at 3203. *See also supra* note 93 and accompanying text. As is the case with the potential political consequences of teaming, the political "benefits" of dual-sourcing may be wholly private to the firms holding production contracts. *See supra* note 95 and accompanying text. Social utility, for example, may be reduced if the splitting of an award increases the program's political appeal but diverts a portion of total production to an inferior firm.

137. For example, recent scholarship has suggested that prime contractors rely heavily on expansive geographic distribution of subcontracts to maximize a program's political appeal. *See Mayer, Patterns of Congressional Influence in Defense Contracting*, in *ARMS, POLITICS, AND THE ECONOMY, supra* note 1; *see also N. KOZL, supra* note 6.

constraints that confront companies operating in commercial markets, taxpayers are receiving their money's worth.

2. *Disadvantages of Dual-Sourcing*

a. *Specific Disadvantages*

Despite its potential significant benefits, dual-sourcing also entails formidable costs.¹³⁸ Prominent among these are costs associated with the technology transfers that dual-sourcing strategies typically require.¹³⁹ Technical data packages, including voluminous technical specifications and blueprints, must be prepared, exchanged, interpreted, and implemented. The efficient transfer of such information often requires that the developing party cooperate fully in giving the recipient firm knowledge that the developing party gained in creating and applying the data.¹⁴⁰ Because a firm's design data and related practical knowledge frequently are among its most important assets, such cooperation may only be given grudgingly, if at all. Failure to achieve an acceptable level of cooperation may delay the establishment of a second source and may result in quality deficiencies as the recipient of another firm's data attempts to apply the data by trial and error. In many cases, the receiving firm will replicate the developing firm's errors.¹⁴¹ In addition, as is the case with teaming, technologically progressive firms may devote fewer

138. See, e.g., Greer & Liao, *Competitive Weapon Systems Procurement: A Summary and Evaluation of Recent Research*, 17 NAT'L CONT. MGMT. J. 37 (1984).

139. See Halloran, *Navy Asks G.E. to Share Contract*, N.Y. Times, Oct. 3, 1984, at D1, col. 1 (discussing transfer of data from General Electric to Pratt & Whitney to enable Pratt & Whitney to become second source for General Electric's F-404 engine).

140. Communicating "know-how" or "show-how" information sometimes entails relocating some of the developing party's technical personnel in the recipient party's plant to advise the recipient's design and industrial engineers.

141. See K. ARCHIBALD, *supra* note 16, at 26 (discussing costs of transferring production technology). Public accounts of the Navy's efforts to replace the wings of its older A-6 aircraft underscore the transaction costs associated with the types of compulsory data transfers that dual-sourcing requires. After receiving competing bids for the wing replacement program from Boeing and Grumman (the original manufacturer of the A-6), the Navy awarded the contract to Boeing in 1985. To design the replacement wing so that it fit the A-6, Boeing first had to obtain thousands of blueprints from Grumman. Officials from the Navy and Boeing later claimed that Grumman deliberately delayed the delivery of necessary drawings, causing the project to lag substantially behind schedule. Boeing had to send a series of teams of technicians to Grumman's Long Island facilities to speed the transfer of the blueprints. Carley, *Contractor's Mishaps in New Technology Made the Navy Seethe*, Wall St. J., Jan. 11, 1989, at A1, col. 6.

Weapons Acquisition Policy

resources to research and development as they contemplate a forced transfer of the fruits of their work to another firm.¹⁴²

A second category of expenses consists of fixed costs that frequently must be duplicated at a second facility.¹⁴³ Foremost among these expenses are the nonrecurring costs of equipping the second source with the tooling required to build the system and with testing devices to ensure quality. After the second source obtains the necessary capital assets, some administrative fixed costs such as program-specific management, inspection, and reporting systems will also be replicated within the organization of the second-source contractor.¹⁴⁴

A third type of expenses involves administrative costs. Dual-sourcing typically can impose higher levels of certain administrative costs on the purchasing authority. For the DOD program office and the program manager, dual-sourcing strategies ordinarily require more time and effort to plan and oversee than sole-source purchasing arrangements.¹⁴⁵ These additional administrative expenditures also occur early in the program life cycle when managers feel bound to reduce outlays lest higher costs expose the program to attack from rival programs and their constituencies. As it implements a dual-sourcing program, the acquiring service must increase staffing to monitor the financial performance and quality control of two or more producers rather than a single contractor. On the whole, conceiving and carrying out a dual-sourcing strategy also may force risk-averse DOD managers to make harder decisions and exercise greater responsibility than they would prefer.

A further source of difficulty is the assumption that rivalry between two sources for annual production awards will drive both firms to reduce costs. This assumption may not always be accurate. Although the development of a new weapon system usually presents neither the industrial setting nor the product

142. Industry officials have warned that extensive use of compulsory data exchanges will diminish the incentives of individual firms to innovate and to spend their own resources on research and development. See Beltramo, *supra* note 83. The definition of the government's rights in data related to public contracts is an ongoing matter of contention between DOD and its suppliers. See Logistics Management Inst., *The Department of Defense and Rights in Technical Data*, in PACKARD COMMISSION, *supra* note 1, Appendix at 111-51.

143. See F. SCHERER, *supra* note 22, at 127; K. ARCHIBALD, *supra* note 16, at 26-27.

144. Careful attention to quality control is especially important if DOD is to obtain systems from both sources that are interchangeable for purposes of operations and maintenance.

145. See K. ARCHIBALD, *supra* note 16, at 17-20, 27-28.

characteristics most conducive to successful collusion, some firms may attempt to collude explicitly or tacitly to set higher prices.¹⁴⁶ A more significant concern arises from the possibility that DOD may need to guarantee each contractor a minimum annual share of production—for example, a minimum of twenty-five percent—to convince it to incur program-specific costs.¹⁴⁷ Rather than bid aggressively, some firms might be satisfied with being a high-cost producer of a lesser share of annual awards.¹⁴⁸ In addition, when DOD attempts to induce a contractor to bid for a share of an ongoing program that was previously a single supplier's domain,

146. The potential for collusion generally is believed greatest when, among other conditions, the products in question are comparatively undifferentiated, there is a large number of small buyers, and transactions are frequent. See F. SCHERER, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* 169-228 (2d ed. 1980); G. STIGLER, *THE ORGANIZATION OF INDUSTRY* 39-45 (1968); Asch & Seneca, *Characteristics of Collusive Firms*, 23 *J. INDUS. ECON.* 223 (1975); Clark, *Price-Fixing Without Collusion: An Antitrust Analysis of Facilitating Practices After Ethyl Corp.*, 1983 *Wis. L. REV.* 887, 891-99; Hay, *Oligopoly, Shared Monopoly, and Antitrust Law*, 67 *CORNELL L. REV.* 439, 447-51 (1982). None of these conditions is satisfied in the competition for major weapons development contracts. Design proposals from rival contractors are highly differentiated, the purchasing entities (the three armed services) are formidable and few in number, and new weapons development contracts are awarded infrequently. See F. SCHERER, *supra* at 201; J. GANSLER, *supra* note 6, at 183-84; Burnett, *supra* note 10, at 27-29; *Hearings on Competition in Defense Procurement Before the Subcomm. on Antitrust & Monopoly of the Senate Comm. on the Judiciary*, 90th Cong., 2d Sess. 119, 127-28 (1968) (testimony of F. Scherer). Even after the purchasing service chooses one design for full production and decides to split production awards between two companies, both firms usually will have strong incentives to pursue design refinements to incorporate improvements stemming from ongoing research in swiftly moving technological disciplines. As indicated above, however, an important (and, as yet, unanswered) question arising from the Justice Department's Ill Wind inquiry is whether direct rivals have colluded regularly on major forthcoming programs. See sources cited *supra* note 19.

147. The need for such a guarantee could arise regardless of when in the production phase DOD decides to establish a second source. Such commitments probably will be necessary to induce a firm to bid against an established producer that has enjoyed several years of experience under a sole-source contract for the system in question. DOD likewise may need to offer minimum production guarantees even when the entire production run will be dual-sourced and no single supplier will enjoy a learning advantage. Without the guarantees, suppliers in the latter situation may decline to invest their own funds in the development and prototyping efforts that would precede the award of production contracts.

148. To diminish such complacency, DOD would need the ability to reduce a lethargic second source's share to zero in any one year, yet this may reduce the pool of firms willing to participate in dual-sourcing programs. See J. Anton & D. Yao, *Split Awards, Procurement, and Innovation* (Research Paper No. 293) (Aug. 1987) (discussing possible outcomes under split-award and winner-take-all auctions) (on file with authors). Whether a firm would choose such a strategy depends in part on the magnitude of learning-by-doing effects. If a firm consistently wins the smaller share of annual awards, it may find itself at an increasing cost disadvantage over time if learning effects are large and its rival significantly lowers cost by accumulating output.

the potential second source is likely to face information asymmetries that could yield perverse bidding results.¹⁴⁹

A fifth difficulty is that the "savings" that DOD seeks from competition between two producers may not consist solely, or even predominantly, of contractor efforts to eliminate waste and inefficiency. Instead, contractors may reduce overall program costs by gradually liquidating, among other units of the firm, organizations that contain the companies' technical expertise.¹⁵⁰ If this scenario occurs, short-term cost savings will come at the cost of long-term ability to produce qualitatively superior new systems, as DOD in effect reduces the financial returns defense firms previously have realized for innovation.¹⁵¹ This could have serious

149. By virtue of its production experience to date, an established supplier of a given system ordinarily possesses private information about its true costs. Notwithstanding its auditing and information gathering powers, DOD may find it difficult to obtain such data in order to enable the second source to make sound cost estimates. See Anton & Yao, *Second Sourcing and the Experience Curve: Price Competition in Defense Procurement*, 18 RAND J. ECON. 57 (1987); Tirole, *Procurement and Renegotiation*, 94 J. POL. ECON. 235, 240-41 (1986). DOD has tried a number of methods to give potential follow-on bidders a solid basis for estimating the cost of building a system currently produced by a sole-source contractor. See, e.g., Elliott, *The Navy in 1987*, U.S. NAVAL INST. PROC., May 1988, at 146, 156 (describing how Navy gave Tenneco's Newport News shipyard contract to overhaul Trident missile submarine to give Newport News better idea of what it would cost to build Trident vessel in competition with General Dynamics, the system's sole-source supplier). In the face of production cost information asymmetries, some potential second sources will submit highly cautious bids that exceed the prices DOD already pays to the original producer. Others may err in the other direction and mistakenly bid too low. Excessively low bids may generate overruns, forcing the second source to seek further payments from DOD to finish the contract. In addition, the original producer may choose to engage in limit pricing. Although this may be a better outcome for the purchasing service than unrestrained monopoly (more specifically, bilateral monopoly or oligopoly) pricing, it highlights the limited effectiveness of some forms of dual-sourcing. Significant benefits may be deferred until the second source accumulates sufficient aggregate production to compete "effectively" with the original sole-source. In a procurement environment in which programs often are terminated earlier than originally planned, anticipated dual-sourcing benefits may not be achieved.

150. Defense industry analysts predict that some firms may react to DOD's dual-sourcing policies by declining to seek future defense contracts and focusing their attention on commercial markets. These analysts suggest that companies that lack attractive commercial options will continue to compete for new contract awards but will gradually liquidate their technical organizations. See Stevenson, *supra* note 10.

151. See W. ROGERSON, *supra* note 40 (analyzing impact of DOD profit policies upon incentives to innovate); Morrison, *supra* note 83, at 1783 (quoting Lockheed chairman Lawrence Kitchen as stating that DOD presently is forcing contractors to "cost-share in development programs and to absorb added risks without opportunity for commensurate reward"); see also Goldberg, *supra* note 123, at 432-36 (discussing role of limits on entry in eliciting optimal amount of service in regulated industries).

adverse implications for U.S. defense policy, which places a premium on technological superiority.¹⁵²

A sixth problem is that the production of such technologically complex products as airframes and related electronics systems may be subject to technology-based economies of scale. Given unavoidably high fixed costs, the reduction of output rates per period resulting from split purchases can impede the exploitation of technology-based economies and may force producers to operate at higher average and marginal costs. In essence, dual-source firms may operate on higher short-run average cost curves, along a declining long-run average cost curve, than would a single firm. Dual-sourcing, therefore, is less attractive when there are economies of scale and annual unit purchases are small.

A seventh difficulty is that under some conditions dual-sourcing's learning-related benefits may not materialize. Under dual-sourcing, each producer typically will build fewer total units than a single producer and consequently will accumulate total production at a slower rate. Each doubling of output takes longer. Thus, for dynamic cost considerations, both the annual rate of output and anticipated total system purchase quantities determine the cost effectiveness of dual-sourcing. Small annual DOD purchases and limited total purchases render dual-sourcing less attractive as a cost-reduction device. The tradeoffs between these effects depend on the nature of the underlying technologies and production processes. Given a set of planned annual buys and total lifetime production runs, dual-sourcing may make sense for some systems or components but not for others.

b. *Long-Term Trends Disadvantageous to Dual-Sourcing*

Focusing on the importance of both the rate of output and length of the production run reduces confidence that future funding and military requirements actually will result in expected production levels. Experience with past and present programs shows that actual requirements and purchases often fall below early plans. Costs rise, requirements change, and funding may not

152. See *Biting the Bullet—Defense Chief Carlucci Aims for Economy and Quality*, BARRON'S, Apr. 4, 1988, at 70, col. 2 (DOD Secretary Carlucci: "Our advantage is in technology, and if we fail to modernize we give up our advantage. Certainly we can't match the Soviets in quantity . . ."); 1989 DOD ANN. FISCAL REP., *supra* note 5, at 64-65; U.S. OFFICE OF TECHNOLOGY ASSESSMENT, THE DEFENSE TECHNOLOGY BASE: INTRODUCTION AND OVERVIEW—A SPECIAL REPORT 3 (Mar. 1988).

materialize. Indeed, a central feature of the weapons acquisition process is uncertainty, both internal and external to the procurement process.¹⁵³

Rising costs and budgetary pressures are unlikely to allow procurement in the 1990s at rates the services are now projecting. In each of the last five years, Congress has appropriated funds at levels below Reagan Administration budget requests,¹⁵⁴ and it is very doubtful that the real growth in defense spending that occurred in the early to mid-1980s will soon be repeated.¹⁵⁵ Thus, purchase plans based on projected annual increases in real defense spending almost certainly will not be realized. Even DOD's recent budget requests have shown significant cuts for the coming years.¹⁵⁶

A further complication arises from current plans for a significant number of "big-ticket" projects to come on-line at about the same time in the mid-1990s. The new systems include the ATF, ATA, LHX, Osprey, the B-2 bomber, a new attack submarine, and two new nuclear-powered aircraft carriers. If annual purchases decline from currently anticipated levels, mandatory dual-sourcing becomes a less attractive tool for cost-reduction. "Stretch-out" of system purchases likewise works against dual-sourcing. Costs are immediate and often large. Benefits are chiefly delayed and uncertain and therefore must be discounted. Even if cost-benefit calculations based on current projections of both annual and total purchases indicate that dual-sourcing will yield positive returns,

153. See M. PECK & F. SCHERER, *supra* note 22, at 17-54; Burnett, *supra* note 10, at 19-20.

154. See, e.g., Wilson & Kenworthy, *Panel Adds to Pentagon Budget Cuts*, Wash. Post, Apr. 28, 1987, at A8, col. 1.

155. See Cushman, *A Little Here, a Little There Is Not the Carlucci Style*, N.Y. Times, Apr. 3, 1988, at E5, col. 1; Moore, *Defense Department in Fiscal Retreat: "Where Are We Headed?"* Wash. Post, Jan. 6, 1988, at A21, col. 1; *Military Services Ordered to Cut Budgets \$30 Billion*, Wash. Post, Dec. 5, 1987, at A8, col. 5; Moore, *Carlucci Inherits a Pentagon Facing Bleakest Months of the Reagan Era*, Wash. Post, Nov. 6, 1987, at A14, col. 4. Carrington, *The Pentagon's Spending Specialists Boldly Go Where Congress Isn't Remotely Likely to Follow*, Wall St. J., Aug. 21, 1987, at 38, col. 1.

156. In its fiscal year 1988 five-year defense plan, DOD requested a total of \$1,061 billion in total budget authority for 1988-90. Its fiscal year 1988 request for 1988-90 fell to \$970 billion, and Congress is likely to reduce that amount further. See Wilson, *Army Facing \$100 Billion Shortfall*, Wash. Post, Nov. 19, 1986, at A1, col. 1; see also Wilson, *Carlucci Hasn't Planned for Worst-Case Cuts*, Wash. Post, Mar. 11, 1988, at A25, col. 1; Carrington, *Grumman A-6F Work Is Among Projects Military Will Drop to Meet Budget Cuts*, Wall St. J., Dec. 16, 1987, at 30, col. 1; Morrison, *supra* note 117, at 3200.

schedule stretch-outs could reverse the result by deferring uncertain benefits further into the future.¹⁵⁷

It is hardly obvious that dual-sourcing of the aircraft systems discussed above makes economic sense from a cost-saving perspective. For example, the LHX program, which is now in the design phase, currently mandates dual-sourcing for all major systems and subsystems.¹⁵⁸ With LHX production at least six years away, it seems ill-advised to predicate the program's entire structure upon dual-sourcing—notably, by requiring teaming that anticipates mandatory dual-sourcing for full production—if cost reduction is the overriding aim. Moreover, there is already significant doubt that LHX purchases ever will reach anticipated levels.¹⁵⁹

Because the LHX is expected to be purchased in relatively large quantities, some of its systems may be candidates for dual-sourcing on cost grounds. However, the cost-reduction potential for the other programs is more questionable because they will produce aircraft in far smaller numbers. The Air Force expects to buy approximately 750 ATF units, and it plans to purchase approximately 900 Osprey units with maximum annual purchases of 132. The number of ATA's to be purchased has been estimated at 450. Dual-sourcing weapon systems that will be purchased in

157. The significant uncertainties inherent in the weapons acquisition process suggest that a relatively high discount rate is appropriate. Recent Army cutbacks in a number of major programs indicate the extent to which purchases may be trimmed. The Army now plans to buy 6882 Bradley Fighting Vehicles rather than the planned 11,519. It has proposed scaling back purchases of the Apache attack helicopter from 1031 to 593, and has suggested trimming its total acquisition of the Blackhawk transport helicopter from 1775 units to 1107. The Multiple Launch Rocket System will be bought at low annual rates (44 per year), and the total purchase will be 681 rather than the originally estimated 1381. See Donnelly, *Army Plans to Sacrifice Weapons in Wake of Shrinking Budgets*, Defense News, Mar. 16, 1987, at 9. Congress, however, may require additional purchases above those requested by the Army. See Donnelly, *Programs Hit Snag in Subpanel Markup*, Defense News, Apr. 6, 1987, at 1, col. 3.

158. See *supra* text accompanying note 73.

159. See U.S. GEN. ACCOUNTING OFFICE, ISSUES CONCERNING THE ARMY'S LIGHT HELICOPTER FAMILY PROGRAM (May 1986); *Army Again Changes LHX Acquisition Plan*, AVIATION WEEK & SPACE TECH., Apr. 20, 1987, at 24. In 1987 the Army announced that it had cut its anticipated LHX buy from 5000 to 4168. The Army previously had estimated maximum annual buys of 480-500 LHX units for the late 1990s. At current unit cost estimates (which the General Accounting Office doubts will be achieved), 480 units per year at a fleet average cost of \$5.3 million could cost roughly \$2.35 billion. This exceeded the Reagan Administration's 1987 budget request for all Army rotary wing aircraft plus modification of all Army aircraft in every year from 1986-89. In February 1988, DOD announced that it now anticipates "a future production requirement of about 2000 LHXs." See N.Y. Times, Jan. 17, 1988, at 26, col. 1 (late edition) (reporting Army move to halve its previously planned \$66 billion program to purchase of 4168 LHX units).

such limited quantities cannot likely be justified on cost grounds.¹⁶⁰ For these programs, a rational decision to dual-source must rest on other grounds, such as sustaining an adequate number of independent design centers to ensure a diversity of technical approaches for future programs or to maintain the country's mobilization base.

3. *A Balanced Approach to Dual-Sourcing*

Dual-sourcing, like teaming, presents a variety of potential costs and benefits. Although each system that is considered as a candidate for dual-sourcing must be evaluated individually, taking into account the particular characteristics of the program and feasible alternative strategies, several generalizations are possible. Dual-sourcing to minimize costs makes economic sense only when purchases are expected to be reasonably large and will be made over a number of years. It is unjustifiable on cost grounds to dual-source expensive systems that will be built either in small numbers each year or in small numbers over the life of the program. Under low output conditions, the anticipated benefits of securing period-to-period competition—driving costs down in both the short-run and in the long-run—will seldom, if ever, offset the sacrifice in duplicated costs and lost learning that results from splitting the purchase of the system. Thus, if cost savings is the overriding criterion, dual-sourcing should be used only in two manners—as the procurement method for high-volume programs, and as a selective tool for ameliorating a longstanding pattern of irresponsible behavior by a sole-source supplier.

It is true that noncost rationales for dual-sourcing and teaming sometimes may justify the higher costs that these strategies can entail. Indeed, many of the perceived noncost benefits of dual-sourcing and teaming discussed above reasonably may be viewed

160. It is possible that the number of each system could increase. The Navy believes that the Osprey has potential commercial applications. It also seems possible, in light of anticipated tight DOD budgets, that the Navy could purchase a "navalized" version of the ATF, and the Air Force a version of the ATA. Should this occur, and should the additional units of each be similar enough to systems already under production, the rationale for dual-sourcing becomes stronger as both single-year purchases and the total production run increase. See, e.g., Kennedy, *U.S. Naval Aircraft and Missile Development in 1986*, U.S. NAVAL INST. PROC., May 1987, at 80. Nonetheless, for the ATF and the ATA, it seems unlikely that either would be produced in sufficient numbers annually to warrant dual-sourcing. In the case of the ATF, this view is reinforced by the fact that a "navalized" version of the aircraft would require significant system changes and therefore would have little in common with the Air Force variant.

as insuring against the possibility of failure. Having two sources ensures that if one producer allows costs to rise unacceptably, another supplier can be called upon to step in. Dual-sourcing also provides a ready producer if a catastrophe were to eliminate one supplier.¹⁶¹ Teaming to maintain technical capability similarly insures against the inability of any one design team to meet military threats in the future. Thus, teaming and dual-sourcing sometimes may be rational acquisition strategies even when they are more costly. Yet DOD seldom emphasizes these noncost concerns as justifications for teaming and dual-sourcing. Rather, the purchasing services have preferred to stress their cost-saving and price-reducing possibilities. Rational selection of any procurement technique requires more explicit consideration of cost and noncost objectives, as well as a careful determination of precisely which goals support the choice of a given strategy.¹⁶²

IV. A Comprehensive Approach to Competition Policy in Weapons Acquisition

DOD's current acquisition policies have two desirable objectives: the use of rivalry to elicit better supplier performance, and the preservation of an essential level of industry design and manufacturing capability. There appears to be a narrow, almost single-minded focus on dual-sourcing as the best method of achieving competition and, secondarily, of sustaining capability. In several significant cases, dual-sourcing is unlikely to achieve the rivalry-driven performance goals DOD hopes to attain.¹⁶³ Only noncost considerations can justify such procedures for programs with small-to-modest anticipated production runs.

Several features of the existing emphasis on teaming arrangements raise similar concerns. The emergence of overlapped team members and the use of teaming arrangements as the foundations

161. See, e.g., Wilford, *Shortage of Rocket Fuel Creating New Crisis for U.S. Space Flights*, N.Y. Times, June 8, 1988, at A1, col. 5 (discussing consequences of explosion that destroyed one of two U.S. facilities for manufacturing critical ingredient of solid rocket fuel).

162. Rivalry itself may be viewed as a means of insuring against the possibility that other control mechanisms, such as auditing and cost observation, may fail. Using rivalry in addition to other regulatory controls may reduce the risk that other controls will fail to hold costs in check.

163. Recent proposals—ultimately abandoned—to dual-source the Northrop B-2 bomber (with an estimated total production run of 132 aircraft) would have been unsupported on cost savings grounds. See Cushman, *Stealth-Project Competition Rejected*, N.Y. Times, Oct. 9, 1987, at D1, col. 3.

for dual-sourcing pose serious problems for the programs examined in this Article. These trends are so prone to conflicting interests that the difficulties that beset any teaming arrangement or joint venture, particularly problems associated with accomplishing an efficient two-way flow of data and know-how, may become crippling impediments to acceptable performance.

The potential costs and risks of dual-sourcing and teaming have not received adequate consideration in congressional and DOD evaluations of program structures for acquiring existing and forthcoming weapon systems. This deficiency appears to stem both from a failure to give full consideration to alternative approaches to accomplishing competition-related objectives and from weaknesses in the existing institutional processes through which competition plans are formulated and implemented. This Part outlines a range of options that purchasing authorities should consider in devising a competition strategy for any given system. It then uses the LHX program to demonstrate how this acquisition program would have evolved if Congress and DOD had acknowledged the shortcomings of teaming and dual-sourcing discussed above. This Part concludes by proposing adjustments in the decisionmaking process that would lead to sounder judgments about the desirability of each option for individual programs.

A. *Alternative Competition Strategies*

Dual-sourcing will not necessarily result in competitive prices, and a narrow focus on dual-sourcing obscures other potentially less costly methods for achieving the services' cost and noncost goals.¹⁶⁴ Dual-sourcing should be viewed as one of several means for affording DOD a range of supplier options sufficient to ensure cost discipline and seller responsiveness by causing contractors to view the weapons markets they serve as subject to credible challenge by other suppliers.

1. *Funding Capability Directly*

DOD could fund the technical organizations of valued contractors to sustain the capability of a critical mass of suppliers and thereby preserve its purchasing options and a diversity of design

164. See, e.g., Burnett, *supra* note 10, at 29-34.

approaches.¹⁶⁵ Direct funding of technical capability can take several forms, including contracts for specific research and development projects or contracts to construct prototypes.¹⁶⁶ Under such a system, DOD would pay contractors to keep their engineering teams intact to compete for future program awards. This approach appears to be partly responsible for Lockheed's emergence as a major force in the manufacturing and integration of fighter aircraft systems in the late 1970s and early 1980s, well after its F-104 assembly line closed in 1967.¹⁶⁷

Developing prototypes also can yield benefits beyond maintaining contractor capability to compete for future program awards. Even when DOD ultimately declines to undertake full production, the possibility that DOD might order full production based on prototype tests can constrain the pricing discretion of sole-source suppliers on closely related programs.¹⁶⁸ In 1985, Northrop offered to sell the Air Force 396 F-20 fighter aircraft under a firm fixed-price contract for \$15 million per airplane.¹⁶⁹ Northrop had built three F-20 prototypes largely at its own expense, and it hoped to convince the Air Force to buy the F-20 as a partial substitute for General Dynamics's F-16. General Dynamics responded by offering the Air Force a modified F-16 for \$13.5

165. This approach is suggested in J. Fox, *supra* note 22, at 470. To some extent, DOD presently funds technical capability directly by reimbursing contractors for certain independent research and development (IR&D) expenditures. DOD's funding of IR&D outlays is described and evaluated in U.S. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 152, at 47-51.

166. This approach essentially would entail greater reliance on DOD programs presently in place. In fiscal year 1987, DOD awarded \$21.8 billion in research contracts to profit and nonprofit entities. See Black, *McDonnell Douglas Tops Research List*, Wash. Post, Mar. 31, 1988, at B1, col. 6; see also Pollack, *Sematech's Weary Hunt for a Chief*, N.Y. Times, Apr. 1, 1988, at D1, col. 3 (discussing DOD funding for consortium of U.S. firms to perform semiconductor research).

167. To maintain design capability other than by teaming and dual-sourcing, DOD could enter into research/design contracts with defense firms, without anticipation of major production contracts. DOD essentially would pay a contractor to keep its design team intact. From 1967 until the late 1970s, Lockheed had no major aircraft production contract. Lockheed's design team, however, was maintained and its capability preserved in part through development and low-level production on the U-2, TR-1, and SR-71 reconnaissance aircraft. See Harris, *Back from the Brink, Lockheed Shows Signs of Prospering Again*, Wall St. J., May 12, 1983, at 1, col. 6. In the late 1970s, the Air Force awarded Lockheed a contract to produce a top secret stealth fighter called the F-117A. Lockheed has delivered over 50 of these aircraft to the Air Force. See Wilson, *Secrecy's Veil Lifted from "Stealth" Jet*, Wash. Post, Nov. 11, 1988, at A3, col. 1.

168. See Burnett, *supra* note 10, at 31.

169. See Hiatt, *Northrop Offers Lower-Cost Fighter in Bid for Some Air Force Business*, Wash. Post, Apr. 5, 1985, at A6, col. 2.

million each, about \$6 million less than the fully equipped version of the aircraft.¹⁷⁰

2. *Extend and Upgrade Existing Systems*

Most weapon systems are durable goods with useful lives of twenty years or more.¹⁷¹ A second general method for sustaining capability and stimulating competition is to upgrade existing systems rather than to purchase new systems.¹⁷² With respect to aircraft procurement, DOD sometimes can defer beginning a new program by modernizing existing aircraft.¹⁷³ This approach may offer competitive options and sustain capability at costs less than those associated with dual-sourcing.¹⁷⁴ Contracts to refurbish and to refit aircraft also can be allocated to sustain desired levels of capability across firms.

3. *Employ Close Substitutes*

DOD might obtain lower prices for a sole-sourced system by threatening to use a close substitute that mirrors the system's

170. See Carrington & Harris, *Northrop's Tigershark Continues Uphill Fight*, Wall St. J., Nov. 7, 1985, at 6, col. 1; Duke, *Pentagon Gets Cut-Rate Offer for F-16 Jets*, Wall St. J., June 21, 1985, at 4, col. 2.

171. For example, between 1955 and 1979 McDonnell Douglas built over 5000 F-4 fighter aircraft. Thousands of F-4s remain in service in the inventories of the United States and its allies. See B. YENNE, *McDONNELL DOUGLAS: A TALE OF TWO GIANTS* 212-17 (1985). Similarly, over 200 B-52 bombers remain in service in the U.S. Air Force even though Boeing completed the last of these aircraft in 1962. See 1989 DOD ANN. FISCAL REP., *supra* note 5, at 236-38.

172. The capacity of recycled or reconditioned durable goods to constrain the pricing discretion of original equipment manufacturers is treated in Swan, *Alcoa: The Influence of Recycling on Monopoly Power*, 88 J. POL. ECON. 76 (1980); Gaskins, *Alcoa Revisited: The Welfare Implications of a Secondhand Market*, 7 J. ECON. THEORY 254 (1974); Fisher, *Alcoa Revisited: Comment*, 9 J. ECON. THEORY 357 (1974).

173. The capabilities of existing aircraft can be increased by adding new engines, upgrading electronics systems, and replacing fatigued structures. See, e.g., Friedman, *First F-14A(Plus) Is Delivered*, U.S. NAVAL INST. PROC., Feb. 1988, at 120 (discussing improvements to F-14 aircraft built in early 1970s).

174. See Burnett, *supra* note 10, at 32-33; M. Rich & E. Dews, *supra* note 54, at 44-45. In the course of deciding how to modernize its fleet of strategic bombers, it appears possible that the Air Force used the option of upgrading or extending production of Rockwell's B-1 bomber to pressure Northrop to improve its performance on the B-2 program. See *Will the B-1B Win the Battle of the Bombers?*, BUS. WEEK, Nov. 5, 1984, at 68; Wilson, *Firm Offers Price Cut on 48 More B1 Bombers*, Wash. Post, Mar. 22, 1986, at A8, col. 5; Beazley, *Rockwell Cirds for Showdown on B-1 Bomber*, Wall St. J., Dec. 18, 1985, at 6, col. 1.

capabilities.¹⁷⁵ DOD has used this substitution strategy to gain price reductions for jet engines used in F-15 and F-16 aircraft.¹⁷⁶ Similarly, purchasing services occasionally can use a mix of two dissimilar systems as an acceptable substitute for purchasing a new multi-role system. The Navy appears to have applied this strategy successfully when it used the threat of increased purchases of Grumman's F-14 and A-6 aircraft to induce McDonnell Douglas to reduce the price of the F/A-18.¹⁷⁷ This demonstrates that a purchasing service may be able to confront its suppliers with credible substitution scenarios by pointing to weapons within its own inventory. This obviates the need to resort to less persuasive threats of acquiring a somewhat dissimilar system, or mix of systems, from another service.¹⁷⁸

4. Increase Recourse to Foreign Suppliers

DOD increasingly might look to foreign weapons suppliers to fulfill some of its needs as a way of constraining the behavior of domestic suppliers.¹⁷⁹ Past efforts to use this approach have provoked powerful congressional opposition.¹⁸⁰ However, one

175. See Burnett, *supra* note 10, at 31.

176. See sources cited *supra* note 121.

177. See J. LEHMAN, JR., *supra* note 6, at 229-35; *Navy Signs for 168 F/A-18s, 21 AV-8Bs Worth \$5.9 Billion*, AVIATION WEEK & SPACE TECH., Nov. 28, 1983, at 30; Mossberg, *Navy Is Said to Threaten Cut in Purchases of McDonnell Douglas F-18 Due to Price*, Wall St. J., Aug. 3, 1982, at 10, col. 1. During Lehman's tenure as Navy Secretary, the Navy used a similar substitution approach with Kaman's SH-2 helicopter to induce Sikorsky to reduce costs and cure production problems on the SH-60 helicopter. J. LEHMAN, JR., *supra* note 6, at 236-37.

178. Contractors are aware of each service's strong institutional preference for buying weapons dedicated entirely to that service's particular needs. See R. HALLORAN, *supra* note 6, at 144-75. One service's resistance to adopting a weapon system from another's inventory is not insurmountable, however. In the 1960s and 1970s, for example, the Air Force acquired (albeit unenthusiastically) substantial numbers of A-7 and F-4 aircraft, both of which originated as Navy programs. Differing service needs and institutional rivalry will continue to inhibit interservice substitution, although current and foreseeable budget pressures may make interservice switching threats more credible. A service might be more inclined to tell its suppliers that they must improve performance or face the prospect that cost-cutting DOD and congressional leadership will force the service to use a weapon not of its own choosing.

179. This technique is endorsed in M. WEIDENBAUM, *supra* note 22, at 83.

180. This opposition rests on two basic concerns. First, there is fear that domestic firms will suffer a decline in revenues if DOD awards contracts to foreign firms. See Morrison, *Made in America*, NAT'L J., Nov. 28, 1988, at 3036. Second, the United States is believed to have become dangerously dependent on foreign producers for various components, used to manufacture armaments, such as ball bearings. See Carrington, *Military's Dependence on Foreign Suppliers Causes Rising Concern*, Wall St. J., Mar. 24, 1988, at 1, col. 6.

factor that may temper opposition to foreign purchases is the stated sentiment among the country's NATO allies that European nations should reduce or forego purchases of U.S. weapons unless the United States reduces barriers to the importation of European weaponry.¹⁸¹ The need for the United States and its NATO allies to get the most from their collective defense outlays by pursuing common designs and production programs also may reduce resistance to purchases from foreign contractors.¹⁸² Joint ventures or teaming arrangements between European and U.S. firms may provide the best means for foreign companies to establish themselves as DOD suppliers without drawing severe congressional rebuke.¹⁸³

5. *Rely on Data Generated by the Government*

For some weapons and weapon components, DOD might consider relying more extensively upon DOD research centers and laboratories to perform research and development tasks and to generate data to be used in acquisition programs.¹⁸⁴ Perhaps the best model for such an approach is the Naval Weapons Center at China Lake, California. The China Lake facility was responsible for developing the highly successful Sidewinder air-to-air missile and has accounted for significant improvements in its original design.¹⁸⁵ The fruits of DOD's internal research and development

181. See A. Cox & S. Kirby, *supra* note 92, at 183-84.

182. See Greenhouse, *Warplane Makers Feel Pressure to Cooperate*, N.Y. Times, June 8, 1987, at D1, col. 1; Carrington, *Budget Woes Force U.S., Europe to Collaborate on New Weapons*, Wall St. J., Dec. 19, 1986, at 22, col. 1.

183. DOD presently is purchasing the AV-8B Harrier II fighter for the Marine Corps from McDonnell Douglas and British Aerospace, which are producing the aircraft through a joint venture. Great Britain also is buying Harrier aircraft produced by the joint venture for its own use. See A. Cox & S. Kirby, *supra* note 92, at 179-210; see also Sugawara, *French Defense Firm Moving U.S. Offices to Crystal City*, Wash. Post, Nov. 16, 1987, § 5 (Washington Business) at 39, col. 1; *Two Joint Ventures in Weapons Set*, N.Y. Times, Apr. 8, 1988, at D4, col. 1. For foreign companies, the Omnibus Trade and Competitiveness Act of 1988 is likely to increase the attractiveness of forming joint ventures with American firms to penetrate the market for weapons sales to DOD. Section 5021 of the statute gives the President authority to curb foreign acquisitions of domestic firms where such acquisitions pose a threat to national security. Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, § 5021, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 1107, 1425 (to be codified at 50 U.S.C. App. § 2158). The Act can be invoked to bar acquisitions, mergers, and takeovers, but it does not apply to joint ventures.

184. DOD's existing network of government-owned and operated research institutions and their activities are described in U.S. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 152, at 85-92.

185. *Id.* at 89.

efforts might be made available to private firms to bid for contracts to develop and produce new systems.¹⁸⁶

6. *Dual-Sourcing*

In some circumstances dual-sourcing is an appropriate competition strategy. The case for dual-sourcing is strongest when reasonably anticipated production quantities can justify the duplication of fixed costs associated with the maintenance of two production lines.¹⁸⁷

When DOD chooses to dual-source a system in production, DOD should take every possible opportunity to cease applying regulatory structures created to ensure acceptable performance in the absence of market constraints. The elimination or drastic curtailment of data disclosure and auditing requirements is a desirable consequence of the rivalry that dual-sourcing (and other competition strategies) presumably will generate.¹⁸⁸ Achieving this result will entail steadfast efforts by DOD competition advocates and other DOD leaders to resist efforts by DOD auditing and oversight bureaus to insist that full data disclosure take place on programs using dual-sourcing or other strategies that promise to

186. This approach to establishing a basis for competition in the production phase of the acquisition cycle is suggested in *Competition in Defense Procurement: Hearings Before the Subcomm. on Antitrust & Monopoly of the Senate Comm. on the Judiciary*, 90th Cong., 2d Sess. 3, 22-23, 28-29 (1968) (testimony of Murray Weidenbaum, Prof. of Economics, Wash. Univ.).

187. See *supra* notes 153-60 and accompanying text. However, this is not meant to imply that dual-sourcing is invariably inappropriate for programs involving comparatively small numbers of total units, large unit costs, and low annual production runs. Even though dual-sourcing may not be justified for the program at hand, selective use of dual-sourcing may yield desirable spillovers across programs by discouraging sole-source supplier opportunism. Such an approach also could convince sole-source suppliers that their contracts are, at least in theory, contestable. This fact might induce them to limit costs more extensively. For procurement episodes that may involve applications of this strategy, see Read, *Northrop Could Face More Scrutiny, Competition in Stealth Bomber Project*, Wall St. J., Nov. 16, 1987, at 64, col. 1 (Air Force consideration of second-sourcing B-2 bomber); Cushman, *supra* note 9 (Navy threat to second-source Trident submarines); Keller, *U.S. Seeks Plane Competition*, N.Y. Times, Sept. 18, 1985, at D5, col. 1 (Navy threat to second-source F/A-18 fighter). It is also conceivable that, wholly apart from any serious intent to initiate a second source, DOD sometimes solicits competitive bids from a potential second supplier and the incumbent producer mainly to gain cost data and other information useful to DOD. See Anton & Yao, *supra* note 149; Goldberg, *Competitive Bidding and the Production of Precontract Information*, 8 BELL J. ECON. 250 (1977).

188. As suggested above, dual-sourcing may justify the waiver of the requirement that contractors disclose and certify cost or pricing data before an agreement on the contract price is reached.

create significant incentives to improve performance.¹⁸⁹ Even in ambiguous cases, it may be worthwhile initially to forego certain disclosure requirements and instead monitor contractor conduct to determine whether acceptable performance is forthcoming.

B. *The LHX Program Reconsidered*

The LHX program is useful for indicating how our approach to teaming and dual-sourcing would dictate adjustments in DOD's use of these acquisition strategies. As discussed above, the LHX program uses far-reaching applications of teaming, both at the prime contractor and subcontractor levels, and contemplates the use of teaming as a foundation for dual-sourcing during full-scale production.¹⁹⁰ In the words of the LHX Program Manager, "Competition is the central focus of the LHX acquisition strategy."¹⁹¹ This Section assesses the wisdom of the Army's insistence upon teaming and dual-sourcing the LHX program.

1. *The Decision to Team*

The Army's goal in pursuing its LHX teaming strategy has been to ensure that two firms will be able to produce the new helicopter.¹⁹² The formation of rival contractor teams, Boeing Vertol/Sikorsky and McDonnell Douglas/Bell Helicopter, to compete for the LHX design award flowed from explicit guidance from the Army program office.¹⁹³ The Army not only preferred teaming, but it also appears to have played a substantial part in determining the composition of the individual teams. Thus, despite McDonnell Douglas's apparent preference to proceed uni-

189. Industry officials have complained that DOD too often has persisted in using auditing and oversight techniques in conjunction with competition-oriented measures the implementation of which should have obviated the need for most of the auditing and oversight controls. See *Hearings on Dep't of Defense Authorization for Appropriations for Fiscal Years 1988 and 1989 Before the Senate Comm. on Armed Services, 100th Cong., 1st Sess. 3483-3515* (1987) (testimony of defense contractor executives).

190. Comprehensive descriptions of the LHX program appear in U.S. GEN. ACCOUNTING OFFICE, WEAPON SYSTEMS—ISSUES CONCERNING THE ARMY'S LIGHT HELICOPTER FAMILY PROGRAM (May 1986); Anderson, *Light Helicopter Family (LHX) Program Overview*, U.S. ARMY AVIATION DIG., Jan. 1987, at 38; Donnelley, *Challenging Program Aims to Remedy Deficiencies in Army's Helicopter Fleet*, Defense News, Oct. 20, 1986, at 29.

191. Anderson, *supra* note 190, at 41.

192. See McDonnell, *Bell Helicopter Form Team to Bid on LHX*, AVIATION WEEK & SPACE TECH., Apr. 14, 1986, at 25.

193. See Donnelley, *Insiders Hear LHX Wedding Bells for McDonnell Douglas, Bell*, Defense News, Apr. 7, 1986, at 3, col. 1.

laterally or to pursue another teaming partner, the firm seems to have yielded reluctantly to the Army's urging that it ally itself with Bell—a firm that McDonnell Douglas is reported to have viewed skeptically due to the aging condition of Bell's military production facilities.¹⁹⁴ Moreover, both Bell and McDonnell Douglas had expressed serious reservations about collaborating on the new helicopter program in light of Bell's substantial existing commitment to the Navy's Osprey V-22 Tilt-rotor development project.¹⁹⁵

Several considerations should have weighed heavily against the Army's approach. First, there should exist a presumption that the contractors, not the Army, are best situated to evaluate what type of business structure is most likely to yield a superior design at low cost. For example, it is probable that both McDonnell Douglas and Bell are aware of the costs of collaborating with another producer and are capable of determining when these costs are outweighed by the need to spread financial risk or to acquire needed technical expertise.

Second, even if DOD prefers teaming, forced partnerships of firms that have low regard for each other are likely to incur significant costs in executing a joint endeavor. McDonnell Douglas's apparently unfavorable assessment of Bell's manufacturing capabilities is unlikely to contribute to a harmonious relationship.

A final factor against the LHX teaming configuration and others like it is the conflicting interests of some teammates. Bell and Boeing are teamed to produce the Osprey for the Navy, yet the two companies are opponents in the LHX competition. The LHX rivalry probably not only impedes desirable cooperation between Bell and Boeing on the Osprey, but it diminishes the likelihood that Bell and McDonnell Douglas will work together effectively on the LHX. McDonnell Douglas probably has a continuing concern about whether Bell's commitment to the Osprey program will drain resources away from the LHX. Moreover, the ability of the Osprey to perform certain missions slotted for the LHX already has led Bell to suggest to the Army that it reduce the scope of the LHX in favor of acquiring the

194. *Id.*

195. See Donnelly, *McDonnell Douglas, Bell Team Up to Snare LHX Billions*, *Defense News*, Apr. 14, 1986, at A2, col. 1.

Osprey.¹⁹⁶ Bell's suggestion could not have been received enthusiastically by McDonnell Douglas.

The sole consideration that might support the Army's fostering of teaming arrangements like that of the LHX is the desire to establish a foundation for later dual-sourcing in full production, or to maintain industry capability. Given the serious problems associated with the existing LHX teaming arrangements, the pursuit of alternative strategies would better enable the Army to achieve its ends. For example, direct funding could sustain the technical capability of valued helicopter manufacturers that do not participate in the LHX. This type of funding could include the letting of contracts for discrete research and development projects.

2. *The Commitment to Dual-Sourcing*

The Army's commitment to dual-source the LHX also suffers from serious drawbacks. The first stems from the use of teaming as a platform for dual-sourcing. Firms that anticipate a future period of head-to-head competition for a share of annual production contracts are likely to experience substantial intrateam tensions while pursuing joint design and development tasks. The Army's current LHX strategy places the two prime contractors on the winning team in the awkward position of having to compete against one another for production awards.

The second problem with the Army's dual-sourcing plans is the enormous uncertainty associated with the future size of the LHX program. From a peak of 5000 planned units, the current projected lifetime production run for the LHX now stands at roughly 2000. In the last two years, severe funding pressures have put the program's very survival at risk.¹⁹⁷ Because further curtailments are a strong possibility, it seems unwise to structure the entire LHX program—and to invest in the development of dual LHX assembly capabilities—on the assumption that two firms will share in the annual production awards.

Early commitments to dual-sourcing should occur only when the purchasing service can be reasonably confident that a

196. See Wilson, *supra* note 104.

197. See Baker, *Army Spares LHX from Budget Ax*, *Defense News*, Apr. 24, 1989, at 1, col.1 (discussing pressures to reduce funding substantially for LHX in DOD's fiscal year 1990 budget); Carrington, *Army Expected to Eliminate Copter Project*, *Wall St. J.*, Jan. 13, 1988, at 6, col. 4 (describing plans to delete LHX from fiscal year 1989 budget).

program's weapons will be purchased in adequate numbers and at sufficient annual rates. Only when it is apparent that the lifetime and annual production runs will be substantial should the service invest in the qualification of a second source. Such an approach does not preclude the identification of subsystems for which the establishment of second sources early in the program life cycle would be justified (based on cost criteria) even if total purchases were relatively modest. In addition, if a sole-source supplier of the LHX were to perform poorly, the Army could use other strategies already mentioned above, such as substituting helicopters within its own inventory or within the inventories of its allies, giving prototype contracts to other manufacturers whose capability DOD has sustained, or threatening the introduction of a second source to achieve a better result.

C. Institutional Prerequisites and Improvements

If DOD is to devise and apply competition strategies successfully, several institutional preconditions must be fulfilled. This Section analyzes the necessary institutional elements of a program that develops and implements sensible competition strategies for acquiring major weapon systems. Some of these elements are already in place, but others require additional action by Congress, DOD, and other federal agencies.

1. Effective Monitoring of Implementation of Legislative Competition Reforms

Recent statutes advocating competition-oriented defense acquisition reforms have sought to alter fundamentally the constraints and incentives facing DOD purchasing authorities. Although these measures establish a procedural and substantive bias favoring rivalry-based procurement techniques, they necessarily confer substantial discretion upon DOD officials to determine how the competition mandate will be applied and, significantly, when exceptions to the use of rivalry will be invoked.¹⁹⁸

198. The modern public choice literature has identified the limits on the ability of legislatures to deny their "agents"—public agencies and departments—discretion to make far-reaching policy choices in implementing legislative commands. "Modern government is complex and many-sided, so much so that it would be impossible for legislatures to make more than a tiny fraction of all genuine policy decisions," writes James Buchanan. "Discretionary power must be granted to bureaucrats over wide ranges of decision."

Thus, the effectiveness of rivalry-enhancing measures will depend on the willingness of DOD to apply, and the skill with which it implements, such policies, and on how effectively Congress monitors and evaluates DOD's execution of the competition mandate.¹⁹⁹

As one approach for making its competition reforms take hold in defense procurement, Congress wisely mandated creation of an institutional force within each DOD purchasing service—the Office of the Competition Advocate—to promote the use of rivalry. To ensure that DOD's competition advocates function effectively, Congress must ensure that these officers possess the means to guide DOD purchasing authorities toward fulfilling the commands of the recent competition legislation. DOD should appoint high-ranking military and civilian officers to head the competition offices and assign sufficient numbers of capable personnel to carry out the duties of the advocates' offices. Sustained congressional support is essential if the advocates are to discourage purchasing authorities from foregoing competition strategies in favor of sole-source techniques that involve fewer initial administrative burdens and require program officers to make fewer difficult judgments.

The President can help Congress by appointing DOD leadership that is sympathetic to the aims of recent reform legislation. The degree to which services embrace rivalry-based procurement methods depends crucially upon the preferences of the Secretary of Defense and the service secretaries.²⁰⁰ Careful selection of high appointees and scrutiny of their work are essential to future success of the competition experiments.

Buchanan, *Politics Without Romance: A Sketch of Positive Public Choice Theory and Its Normative Implications*, in 2 *THE THEORY OF PUBLIC CHOICE*, 11, 19 (J. Buchanan & R. Tollison eds. 1984).

199. By "monitoring" and "evaluation" we refer to public policy counterparts of the metering, policing, and observation activities economists have identified as essential tasks in the organization and administration of private firms. See Alchian & Demsetz, *Production, Information Costs, and Economic Organization*, 62 *AM. ECON. REV.* 777 (1972). The landscape of weapons acquisition policy since World War II contains the wreckage of numerous reform efforts that failed for want of effective congressional monitoring. See Kovacic, *supra* note 1.

200. In discussing John Lehman's pivotal role as Navy Secretary in promoting competition, the Navy Competition Advocate General's report for fiscal year 1986 said, "These last three and one half years have been marked by a profound change in the way the Navy does business; this has been brought about more by people as opposed to regulations . . ." *FISCAL YEAR 1986 OFF. OF THE COMPETITION ADVOCATE GEN. OF THE NAVY REP. TO CONG.*, *supra* note 45, at III-2. See generally Pyatt, *supra* note 60.

2. *Personnel*

The competition reforms discussed in this Article place a premium on skillful planning and implementation. No feature of the effort to rely more heavily on rivalry can succeed unless the government personnel charged with carrying out the reforms are equal to the task. If Congress and DOD wish to see competition strategies improve the efficiency of weapons procurement, each institution must commit itself to raising the capability of DOD's acquisition personnel. As many informed observers have emphasized, significant, enduring improvements in weapons acquisition will not occur without sustained efforts to increase the skills and experience of those who represent the government in the contracting process.²⁰¹ To be applied effectively, rivalry strategies require a sophisticated understanding of the contracting process, the nature of the defense industry, and the technical requirements of the weapon systems. They also demand the benefits of knowledge gained from repeated experience in grappling with difficult problems. The ideal program office would consist of a comparatively small number of exceptionally capable and experienced individuals.

These are precisely the conditions that the current acquisition process seldom provides. Contractor personnel are, on average, better trained, better paid, more experienced, and more highly motivated than their government counterparts. The proliferation of regulatory controls can best be understood as a second-best strategy to compensate for weaknesses in the government's procurement corps. Because the government's acquisition personnel are no match for the contractors, Congress and DOD have attempted to balance the field by adding layers of procedural "safeguards" and extensive internal review processes, all of which are designed to reduce the likelihood of error. This tactic has enormous costs. Programs move at a glacial pace, authority is dispersed so widely that accountability is severely attenuated, government payrolls expand, and contractors hire legions of accountants and contract administration personnel to respond to DOD's requests. This Article's rivalry-oriented recommendations require a level of institutional skill that is the antithesis of this layering tactic, and capable personnel are its first ingredient.

201. See, e.g., J. FOX, *supra* note 6; J. GANSLER, *supra* note 6, at 207-14, 331-32; PACKARD COMMISSION, *supra* note 1, at 66.

3. Administration

It is not enough to hire and retain capable procurement personnel. It is vital that they receive the authority to manage programs effectively. A central theme of postwar blue ribbon defense commissions has been that clear lines of authority and lean program structures are essential to give program managers and acquisition specialists the incentives and power to manage acquisition programs successfully.²⁰² Program managers must have the flexibility and responsibility to execute their duties and to be made fully aware that they will be rewarded for success and held accountable for failure. "If a program succeeds with cost savings and quality performance, then the man or woman in charge should be rewarded," writes former Navy Secretary Lehman.²⁰³ "If a program gets in trouble through ill management or inattention, the program manager should be sacked."²⁰⁴

4. Competition Expertise

Congressional and DOD competition reforms have taken place in a relative vacuum; little effort has been made to seek out contributions from the government's various reservoirs of competition policy expertise, including the Antitrust Division of the Department of Justice and the Federal Trade Commission (FTC). DOD's competition advocates rarely consult with the federal antitrust agencies and seldom hire individuals with competition policy expertise that matches the industrial organization capabilities attained by the attorneys and economists of the Antitrust Division and the FTC.²⁰⁵

202. See, e.g., FRIZZUGH COMMISSION, *supra* note 1, at 79-81; PACKARD COMMISSION, *supra* note 1, at 53-55.

203. J. LEHMAN, JR., *supra* note 6, at 265.

204. *Id.*

205. DOD and Antitrust Division cooperation has consisted chiefly of joint efforts to facilitate the identification and prosecution of firms engaged in bid-rigging on DOD contracts. See *DOD's Inspector General Offers Guidance on Identifying, Investigating Bid Rigging*, Antitrust & Trade Reg. Rep. (BNA) No. 52, at 545 (Mar. 19, 1987); Cox, *Agency Investigations of Anticompetitive Conduct: Techniques and Focus*, 57 ANTITRUST L.J. 579 (1988). Since 1986 the Antitrust Division has made bid-rigging by defense contractors a high priority of its horizontal restraints enforcement program. See *Ginsburg Will Continue Direction of Division, Won't Revise Vertical Guides*, Antitrust & Trade Reg. Rep. (BNA) No. 50, at 55 (Jan. 9, 1986); Whalley, *Priorities and Practices: The Antitrust Division's Criminal Enforcement Program*, 57 ANTITRUST L.J. 569 (1988).

Since 1970, both agencies have made their competition expertise available to federal, state, and local policymakers through review and comment procedures that address the wisdom of existing or contemplated regulatory measures.²⁰⁶ The agencies could expand these competition advocacy efforts to include DOD. Most important, Antitrust Division and FTC personnel could advise DOD on formulating competition strategies for pending and contemplated procurement programs,²⁰⁷ and they could counsel DOD purchasing officials on issues such as the desirability and consequences of encouraging specific teaming arrangements or dual-sourcing specific programs.

The latter consideration has become increasingly significant in the current procurement environment. Federal acquisition regulations do not confer antitrust immunity on teaming arrangements,²⁰⁸ yet the enthusiasm with which DOD now encourages firms to pursue such collaboration may lull firms into believing that such agreements will not receive federal antitrust scrutiny.²⁰⁹

206. For example, in fiscal year 1985 the FTC and its staff made over 70 appearances before federal, state, and local bodies to discuss the competitive effects of existing or proposed legislation and regulations. See FISCAL YEAR 1985 FED. TRADE COMM'N ANN. REP. 89-100 (1985); see also Kovacic, *Built to Last? The Antitrust Legacy of the Reagan Administration*, 34 FED. B. NEWS & J. 244 (1988) (discussing intervention activities of federal antitrust agencies during Reagan Administration); Kovacic, *The Federal Trade Commission and Congressional Oversight of Antitrust Enforcement: A Historical Perspective*, in PUBLIC CHOICE AND REGULATION: A VIEW FROM INSIDE THE FEDERAL TRADE COMMISSION 63, 87, 93 (R. Mackay, J. Miller III & B. Yandle eds. 1987) (discussing development of modern FTC intervention program).

207. The defense industry poses unusual and difficult market definition and market power analysis issues. See McMillan, *Special Problems in Section 2 Sherman Act Cases Involving Government Procurement: Market Definition, Measuring Market Power, and the Government as Monopsonist*, 51 ANTITRUST L.J. 689 (1982). Among other contributions, the federal antitrust agencies could assist DOD in correctly evaluating the competitive significance of individual defense suppliers and devising strategies to offset the efforts of individual suppliers to attain and exploit market power. The antitrust agencies also could advise DOD about the wisdom of various regulatory requirements that affect rivalry in various markets and determine the price and quality of systems purchased by DOD. Economists at the Antitrust Division and the FTC have accumulated expertise in a number of areas that might usefully be applied to problems DOD confronts regularly, including warranties, innovation and rules governing property rights in intellectual property, and the theory of contracts.

208. The Federal Acquisition Regulations set out limitations on the operation of contractor teaming arrangements, stating that "nothing in this subpart authorizes contractor team arrangements in violation of antitrust statutes . . ." Federal Acquisition Regulations, 48 C.F.R. § 9.604 (1987).

209. On the application of federal antitrust doctrine to teaming arrangements among government contractors, see Bergstrom *Antitrust Immunity or Exemption for Activities Involving Government Contracts—"Weapon Systems" and "Team Bidding"*, 59 NW. U.L. REV. 433 (1964); Chierichella, *Antitrust Considerations Affecting Teaming Agreements*, 57 ANTITRUST L.J. 555 (1988); Eger, *Contractor Team Arrangements Under the Antitrust Laws*, 17 PUB. CONT. L.J. 595 (1988); Hibner, *Antitrust Considerations of Joint Ventures, Teaming Agreements, Co-Production and Leader-*

Compounding this potential source of complacency are DOD policies that promote wide-ranging swaps of technical data. The emphasis on teaming and data transfers may become a latent source of antitrust exposure for companies that assume DOD's support, for such activities implicitly exempted them from the application of the antitrust laws. Closer coordination between DOD and the federal antitrust agencies on these issues would serve to make clear that certain types of conduct—for example, the exchange of pricing data—remain forbidden, notwithstanding the existence of a teaming agreement that has DOD's blessing.²¹⁰

An expanded role for federal antitrust authorities in defense matters would have other benefits. Becoming more familiar with the defense industry would place the Antitrust Division and the FTC in a stronger position to assess the competitive significance of mergers and acquisitions among defense firms, of which there will likely be an increase.²¹¹ Conditions of chronic overcapacity in some areas coupled with efforts by firms to reposition themselves to provide a different array of products are likely to confront the antitrust agencies with mergers in defense-oriented markets whose features the Antitrust Division and the FTC have examined infrequently in the past.²¹²

Follower Agreements, 51 ANTITRUST L.J. 705 (1982); Owens, *Preparing Team Agreements for Government Contracts*, 46 N.Y. STATE B.J. 29 (1974); Van Gemert, *Teaming Agreements: A Planning Guide*, THE GOVERNMENT CONTRACTOR: BRIEFING PAPERS, Apr. 1969, at 1. See also Kovacic, *Illegal Agreements with Competitors*, 57 ANTITRUST L.J. 517 (1988) (discussing antitrust prohibitions upon agreements between direct rivals for government contracts).

210. For example, it is conceivable that episodes of alleged "collusion" that have surfaced in public accounts of the Ill Wind investigation may prove to have stemmed from DOD or service encouragement that contractors cooperate with their rivals.

211. Current trends indicate that many forthcoming acquisitions are likely to be motivated by contractors' efforts to improve their capability in electronics. See Morrison, *supra* note 83, at 1783 (reporting that one defense industry analyst had identified 70 transactions involving acquisition of electronics firms by defense contractors in 1986 alone).

212. Examples of past defense-related mergers that have come under government antitrust scrutiny include PPG Industries's attempted acquisition of Swedlow in 1986 and LTV's attempted purchase of Grumman in 1981. See *FTC v. PPG Indus., Inc.*, 798 F.2d 1500 (D.C. Cir. 1986); *Grumman Corp. v. LTV Corp.*, 665 F.2d 10 (2d Cir. 1981); see also FED. TRADE COMM'N, *FIRST YEAR OF THE NEW ADMINISTRATION: A PROGRESS REPORT* 12 (Oct. 20, 1982) (describing FTC decision in 1981 to seek preliminary injunction to bar LTV's takeover of Grumman). These and similar transactions involving defense suppliers are likely to confront the antitrust agencies and courts with particularly difficult market definition and market power measurement tasks in industries characterized by rapid technological change. On the special problems that accompany market definition and market power analysis in technologically dynamic industries, see Baxter, *The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies*, 53 ANTITRUST L.J. 717 (1984); Ordover & Willig, *Antitrust for High Technology Industries: Assessing Research Joint Ventures and Mergers*, 28 J.L. & ECON. 311 (1985).

Finally, as purchasing policies come to rest more explicitly on competition, and sales opportunities for some types of weapon systems diminish, the antitrust agencies may receive more allegations of exclusionary conduct by defense suppliers. Possible theories suggested by recent antitrust literature and private antitrust litigation involving defense firms include price-based predation,²¹³ nonprice predation based on efforts, such as the manipulation of the contracting process, to raise the costs of rival suppliers,²¹⁴ and refusals to deal concerning access to what might be described as "essential facilities."²¹⁵ Here too the antitrust agencies could profit from greater familiarity with the markets and regulatory structures in which the relevant transactions take place. Even if such issues continue to be raised solely in the context of private litigation, some tribunals might welcome amicus appearances by the Antitrust Division and the FTC to sort out difficult antitrust issues in what many federal judges no doubt view as a complex and alien industry.

5. Evaluation

The development of sound competition policies requires ongoing efforts to assess the impact of specific competition initiatives. To make enlightened judgments about the appropriate path of future programs, Congress and DOD must systematically evaluate programs in which competition strategies have been

213. See *Pacific Eng'g Co. v. Kerr-McGee Corp.*, 551 F.2d 790 (10th Cir.), cert. denied, 434 U.S. 879 (1977); *Ovitron Corp. v. General Motors Corp.*, 295 F. Supp. 373 (S.D.N.Y. 1969); Isikoff, *U.S. Claims Goodyear Overcharged Pentagon*, Wash. Post, Mar. 1, 1988, at C3, col. 1 (discussing predatory pricing suit filed by Irvin Industries against Goodyear Aerospace Corp. concerning sales of bomb parachute to Army); Isikoff, *Goodyear Accused of Contract Ploy*, Wash. Post, Nov. 4, 1986, at E1, col. 2 (same); see also Sherrer, *Predatory Pricing: An Evaluation of Its Potential for Abuse Under Government Procurement Contracts*, 6 J. CORP. L. 531 (1981); *Prosecuting Contractors for Predatory Pricing Isn't Priority, Conferees Told*, Fed. Cont. Rep. (BNA) No. 42, at 460 (Oct. 1, 1984).

214. See *Northrop Corp. v. McDonnell Douglas Corp.*, 705 F.2d 1030 (9th Cir.), cert. denied, 464 U.S. 849 (1983). For a comprehensive exposition of emerging theories of exclusion that involve strategies to raise rivals' costs, see Krattenmaker & Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 YALE L.J. 209 (1986).

215. Such theories would build on the "essential facilities" doctrine articulated in such cases as *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985) and *Northwest Wholesale Stationers, Inc. v. Pacific Stationery & Printing Co.*, 472 U.S. 284 (1985). The potentially broad reach of *Aspen* is examined in Areeda, *Monopolization, Mergers, and Markets: A Century Past and the Future*, 75 CALIF. L. REV. 959, 962-65 (1987). See also Shockro, *An Antitrust Analysis of the Relationship Between Prime Contractors and Their Subcontractors Under a Government Contract*, 51 ANTITRUST L.J. 725, 731-34 (1982) (discussing refusals to deal).

employed.²¹⁶ Especially important matters for analysis include cost, quality, and schedule effects. Such assessments are particularly significant given the high level of uncertainty about the effects of past and ongoing dual-sourcing initiatives.²¹⁷

To assess the effects of legislative and policy reforms accurately, Congress must forego the temptation to enact new reform legislation over the next few years. If the cascade of military reform legislation that began in 1981 continues unabated, it will not only become an intolerable administrative burden, but it also will impede efforts to determine what specific results have flowed from individual reforms. A fundamental flaw of defense acquisition reform measures since World War II has been the failure to follow through. Seeing a comparatively smaller number of reforms to their conclusion is likely to be more valuable than executing a multitude of measures that cannot be monitored.

Conclusion

The competition experiments of the 1980s are hardly the first, and are surely not the last, wave of attempted reforms to sweep over the defense acquisition process.²¹⁸ However, even if utilization of competition in defense procurement proves to be merely the latest short-term fascination of policymakers, competition theories are deeply affecting several programs of lasting significance to U.S. defense policy. How skillfully the armed services apply competition doctrine in current acquisition programs is a matter of genuine consequence.

The importance of competition reforms in this decade extends beyond their influence upon specific acquisition programs. The Justice Department's ongoing investigation into defense procurement practices has provided yet another occasion for policymakers to consider the appropriate shape of this country's weapons acquisition process. The fragmentary revelations from the current inquiry have led numerous legislators to propose new statutory and regulatory controls for purchasing officials and contractors.

216. The need for ongoing evaluation and suggested subjects for study are discussed in K. ARCHIBALD, *supra* note 16, at 58-59; M. Rich & E. Dews, *supra* note 54, at 47. From our discussions with DOD procurement officials, it is apparent that DOD is doing some work of this type.

217. There is considerable dispute and uncertainty concerning the cost results of past dual-sourcing episodes. See K. ARCHIBALD, *supra* note 16, at 53-55; M. Rich & E. Dews, *supra* note 54, at 49-50.

218. See Kovacic, *supra* note 1; J. Fox, *supra* note 22, at 1-7.

Many of these proposals explicitly or implicitly assume that existing procurement policies—including the competition initiatives of this decade—confer excessive discretion upon defense suppliers and purchasing authorities.

However, the Ill Wind investigation has not discredited the use of rivalry in weapons procurement. Some commentators have attributed the recent acquisition scandal to DOD's expanded use of rivalry-based procurement strategies.²¹⁹ This interpretation is superficially appealing, but suspect. If any change in the defense procurement process has intensified incentives to engage in fraud and other misconduct, it is more likely to have been the ongoing decline in new program starts rather than the competition-oriented reforms of this decade. The true underlying force probably has been each supplier's realization that failure to secure a role in one or more of a declining number of programs forces the company's withdrawal from major markets or from defense contracting altogether. This pressure has been far more intense than any imposed by the prospect of dual-sourcing.²²⁰

Perhaps the greatest harm of the Ill Wind scandal is that the preoccupation with contractor and purchaser fraud will deflect attention away from equally important efforts to eliminate deep-seated institutional and structural causes of weak management and poor performance. The Packard Commission's 1986 report correctly concluded that "[t]he nation's defense programs lose far more to inefficiency than to dishonesty Though government oversight is critically important to the acquisition process, no conceivable number of additional federal auditors, inspectors, investigators, and prosecutors can police it fully, much less make it work more effectively."²²¹ Indeed, as several observers have emphasized, a chief cause of inefficiency in weapons acquisition

219. See Carrington & Pound, *supra* note 18.

220. Put another way, abandoning dual-sourcing as an acquisition strategy will hardly weaken the incentives for contractors to work their way into one or more of the ever smaller number of major new programs. Almost all of the misconduct alleged to date in the Ill Wind investigation has dealt with the predesign award phase of the procurement cycle, rather than efforts by contractors to manipulate the outcome of a split award in a dual-sourcing regime. If collusion is established, vigorous enforcement of existing criminal sanctions is appropriate and, we believe, sufficient to control such behavior—just as such remedies are applied to collusion in commercial settings.

221. PACKARD COMMISSION, *supra* note 1, at 77-78.

is the extraordinary complexity of the regulatory process with which DOD and its suppliers must contend.²²²

Accordingly, the existing Justice Department inquiry does not provide a basis for the immediate imposition of new regulatory controls. Put in its starkest terms, the acquisition process would be well served if Congress enacted no substantial new procurement legislation in 1989. The Ill Wind inquiry has moved at a slower pace than originally predicted, and it is too early to base major policy adjustments upon the limited results of the investigation released to date. Moreover, a moratorium on new legislation would permit weapons acquisition policymakers to begin to assess more clearly the consequences of the considerable body of legislation that Congress already has enacted in this decade.²²³ The relentless annual stream of major new procurement legislation since 1980 has made it virtually impossible to determine which acquisition reforms have been effective and which have not. Little will be lost, and much could be gained, from only a year's pause in this activity.

222. The Packard Commission in 1986 warned that "the legal regime for defense acquisition is today impossibly cumbersome." PRESIDENT'S BLUE RIBBON COMMISSION ON DEFENSE MANAGEMENT, A FORMULA FOR ACTION—A REPORT TO THE PRESIDENT ON DEFENSE ACQUISITION 18 (1986) [hereinafter FORMULA FOR ACTION]. John Lehman's account of his service as Navy Secretary provides a graphic indication of the complexity of the regulatory system. "By actual measurement in 1985, existing legislation and case law governing navy procurement alone had grown to 1,152 linear feet of shelf space in the library." J. LEHMAN, JR., *supra* note 6, at 191; see also J. GANSLER, *supra* note 6 at 150-54; Weidenbaum, *Whether It's Bombers or Cookies, Filling Pentagon Orders Is a Drag*, Christian Sci. Monitor, Nov. 15, 1988, at 12; Kelman, *Defense Bureaucracy's Corrupting Influence*, Wall St. J., July 6, 1988, at 22, col. 3.

223. In 1986, the Packard Commission observed that "[o]ver the years, Congress and DOD have tried to dictate management improvements in the form of ever more detailed and extensive laws or regulations." FORMULA FOR ACTION, *supra* note 222, at 18. The Packard panel added that "[t]he sheer weight of such requirements often makes well-conceived reform efforts unavailing. At operating levels within DOD, it is now virtually impossible to assimilate new legislative or regulatory refinements promptly or effectively." *Id.* The Packard Commission's observation has had no evident effect upon legislative policymaking. In 1988 alone, Congress enacted eight statutes embodying major substantive changes to the regulatory framework governing the activities of DOD and its suppliers. See Anti-Drug Abuse Act of 1988, Pub. L. No. 100-690, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 4181; Business Opportunity Development Reform Act of 1988, Pub. L. No. 100-656, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 3853; Department of Defense Appropriations Act, 1989, Pub. L. No. 100-463, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 2270; Major Fraud Act of 1988, Pub. L. No. 100-700, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 4631; National Defense Authorization Act, Fiscal Year 1989, Pub. L. No. 100-456, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 1918; Office of Federal Procurement Policy Act Amendments of 1988, Pub. L. No. 100-679, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 4055; Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 1107; Prompt Payment Act Amendments of 1988, Pub. L. No. 100-496, 1988 U.S. CODE CONG. & ADMIN. NEWS (102 Stat.) 245.

This Article has proposed refinements to what is a desirable commitment by Congress and DOD to rely more upon competition to elicit better performance in the acquisition of major weapon systems. Since 1981, Congress and DOD have established much of the necessary statutory and institutional foundation for making broader reliance on rivalry-based strategies an integral, useful element of DOD major systems procurement.

To ensure that competition approaches have lasting, favorable effects in future DOD acquisition activities, Congress and DOD must devote their immediate attention to accomplishing four goals. First, Congress and DOD should sustain their overall commitment to competition-oriented purchasing techniques as the central ingredients of DOD weapons acquisition policy. Although competition has made substantial inroads in DOD procurement practice, the emphasis on rivalry remains vulnerable to forces inside and outside the Pentagon that would prefer to abandon competition in all but a small number of circumstances. Suppliers who recall the comfort of largely uncontested contractual relationships and purchasing authorities who prefer the simpler administrative tasks and easier judgments associated with non-rivalry based policies may resist continued use of competition-oriented approaches.²²⁴ It is well worth Congress's expenditure of monitoring resources to make clear that a preference for consideration of rivalry-based strategies—albeit a rebuttable preference—is here to stay.²²⁵

Although a commitment to consider competition strategies seriously is sound policy, significant refinements to current approaches to using rivalry in weapons acquisition are also appropriate. Reassessment and adjustment are essential steps in undertaking a successful transition from one regulatory scheme to another.²²⁶ Thus, a second necessary condition for success in

224. It is possible that the Navy's almost single-minded dedication to dual-sourcing has stemmed from its concern that any apparent retreat from a total commitment to competitive procurement strategies might signal the faltering of its institutional will and might spur opponents of the competition initiatives to topple the program.

225. It is essential that Congress and DOD, having set competition policies in motion, allow them to operate long enough to obtain meaningful, measurable results and to convince the armed services and their suppliers that the emphasis upon competition is not a short-term phenomenon so typical of procurement "reforms" in defense purchasing. Numerous postwar reforms have foundered for want of the necessary commitment to monitor their implementation over the medium- and long-terms. See Kovacic, *supra* note 1.

226. See Breyer, *Antitrust, Deregulation, and the Newly Liberated Marketplace*, 75 CALIF. L. REV. 1005 (1987); Kahn, *Comment: Deregulatory Schizophrenia*, 75 CALIF. L. REV. 1059 (1987).

applying the recent defense acquisition competition reforms is that DOD and Congress evaluate rivalry approaches critically and improve the mechanism through which competition strategies are devised and executed.

The evaluation of existing policies should include more complete consideration of the potential disadvantages of using teaming arrangements—particularly collaborations that overlap related programs—as foundations for dual-sourcing. Congress should adopt a presumption *against* employing policies that mandate teaming arrangements among horizontal rivals. Similarly, DOD should reexamine its overriding focus on dual-sourcing as the chief means for promoting rivalry. Such a strategy is appropriate in a comparatively small number of instances. Dual-sourcing should be seen as one of a collection of techniques for achieving the principal objectives, such as superior performance on individual programs and the maintenance of contractor capability, that DOD has sought to attain.

The formulation of competition-oriented acquisition options and the choice of optimal strategies likewise would benefit from an effort to improve the institutional processes through which competition concerns are considered. In particular, the participation of attorneys and economists with experience in industrial organization and antitrust—topics directly related to the competition issues now confronting DOD acquisition personnel—would advance the goal of devising and applying effective rivalry strategies in weapons acquisition. Professionals with such experience could easily be added to the competition advocacy offices of each service and, if appropriate, assigned to specific programs.

Furthermore, stronger ties between DOD and the federal antitrust agencies would strengthen the quality of DOD competition analysis. A closer liaison with the Justice Department's Antitrust Division and the FTC would give DOD a sounder basis for analyzing defense markets, identifying methods for stimulating rivalry, and assessing the soundness of policies, such as those involving data rights, pricing terms, and warranties, that affect the price and quality of major systems. Greater familiarity with defense industry markets and DOD procurement regulations and practice also would place the antitrust enforcement agencies in a stronger position to analyze, among other things, an increasing number of mergers and acquisitions involving defense suppliers.

Devising and executing sensible rivalry strategies supplies the basis for achieving the third necessary condition of successful competition reform: the deemphasis of regulatory controls

predicated on the absence of rivalry as a constraint upon contractor discretion.²²⁷ Where the influence of rivalry is substantial, the role of financial oversight and auditing must diminish. As contractors assume greater risks, the financial rewards for success must increase accordingly. Moving in these directions will also serve to achieve leaner program structures in which government and private officials assume more responsibility for selecting efficient acquisition methods and have sharper incentives to choose wisely.²²⁸

None of these proposals can succeed if DOD lacks the human capital necessary to execute rivalry strategies capably. Thus, a fourth major object of policymaking concern should be the recruitment and retention of capable professionals to oversee and to manage DOD's major acquisition programs. Despite repeated, hard-edged warnings from numerous authorities, the United States has spent most of the postwar era indulging the illusion that it can get superior acquisition results from an acquisition corps that too often lacks the responsibility, motivation, skills, and experience to do the job well. In major respects, the sheer mass and complexity of the defense procurement system is a dismal concession to the limitations of the people who buy the systems; costly, time-consuming procedural and oversight "safeguards" are established to compensate for shortcomings in staff skill and experience.

The Bush Administration and Congress face difficult questions about how to satisfy weapons procurement needs amid pressures to reduce or to hold constant the level of overall defense expenditures. The path for acquisition policymaking presented in this Article offers a promising way to increase the defense capability that the government attains from a given level of outlays. It creates incentives for improved contractor performance

227. In major respects the appeal of emphasizing competitive purchasing techniques resides in their capacity to displace, at least in part, a costly and unsatisfactory system of regulation. "Encouraging defense contractors to rely more heavily on their own resources through the strengthening of competition," Murray Weidenbaum wrote in 1974, "will help bring about a reconstitution of the self-regulating mechanism of free enterprise, which is still the best guarantee of innovation, efficiency, and lower costs. The existing practice of extensive government regulation clearly has not worked, and we need to try another approach." M. WEIDENBAUM, *supra* note 22, at 85.

228. The Packard Commission observed that "DOD must displace systems and structures that measure quality by regulatory compliance and solve problems by executive fiat. Excellence in defense management can not be achieved by numerous management layers, large staffs, and countless regulations in place today." PACKARD COMMISSION, *supra* note 1, at xiii.

Weapons Acquisition Policy

and provides a basis for significant reductions in the number of DOD and contractor personnel assigned to perform contract administration functions. Rather than requiring substantial, additional legal authority, this Article's policy prescriptions apply and refine a mandate already in place. The crucial question is whether Congress, President Bush, and DOD have the institutional will, perseverance, and discipline to see this and other reform programs through to successful implementation.

