

United States Hegemony and the New Economics of Defense

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Liberal theory asserts that the need for cost-effective, technologically advanced weapons requires the United States to acquiesce to increasing defense globalization even as this restrains U.S. power. Realist logic dictates that the United States should resist defense liberalization to retain its self-sufficiency. This is a false choice; the United States encourages defense globalization in order to extend its international political influence. This paper proposes an alternate theory of technological hegemony that explains the U.S. policy of massive R&D investment in both the late Cold War and the current era of American preponderance. Modern weapons' complexity and economies of scale tend to produce monopolies, and the value chain for the production of these monopolistic goods is dominated by the systems integration techniques of prime contracting firms. In turn these prime contractors remain largely enthralled by U.S. market power. The United States gains international influence by controlling the distribution of these weapons. Put simply, technology with international political effects is likely to have international political origins.

The effect of military technology on international conflict has achieved heightened salience through the United States' application of the Revolution in Military Affairs (RMA) to conflicts from the Persian Gulf to the Balkans and back. The RMA's apparent success has generated a demand for costly, sophisticated weapons produced by a few multinational corporations at the

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top of a global supply chain. While receiving little examination in security studies, the newly diffuse, worldwide origins of a modern tank, plane, or missile hold potentially tremendous implications for international politics. Ironically, while the RMA extends the United States' ability to project massive power around the world, U.S. capacity to exercise this clout may be curtailed by the globalized nature of the new defense industry. Is the American enthusiasm for a capital- and technology-intensive military undermining the United States' ability to employ it unilaterally? Put more tantalizingly, is the United States effort to build realist power bringing about a liberal peace?

Stephen Brooks thinks so; defense industrial interdependence plays a crucial role in his theory of how the globalization of production leads to great power peace.¹ In *Producing Security*, Brooks makes an important contribution toward the integration of security studies and international political economy. The book accurately describes the bewildering complexity of the international supply chain required to produce the most important elements of a modern military. The resulting dependence on other states for the very tools of war, Brooks argues, dooms any attempt at unilateral conquest. No state, including the United States, can "run the tables," overturning the "fundamental nature of the system through force."²

Brooks offers a theory in which the technological and economic demands of modern warfare create a structural constraint that overrides, at least partially, the effects of the distribution of power as the mechanism behind international politics. Yet Brooks describes only part of the story. A closer look at defense interdependence reveals its severe asymmetry and the active role the United States plays in encouraging it; the world's preeminent military power is also the dominant weapons supplier. Such lopsidedness has a pacifying effect, not because of mutual dependence for weapons, but because it extends U.S. power more cheaply than would conquest. The United States need not run the tables; defense liberalization helps it to run the world.

Brooks correctly claims the characteristics of modern weaponry demand globalized production and thus have important effects on international politics. However, I argue that these same properties, combined with U.S. market power and its comparative advantage in the defense industry, result in a distribution of production that enhances American international influence. This essay undermines Brooks's case not by showing how little the United States participates in weapons globalization but how much. Indeed, the United States makes economic and technological sacrifices in order to extend the transnational production of weapons. The United States prefers the resulting

¹ Stephen G. Brooks, *Producing Security: Multinational Corporations, Globalization, and the Changing Calculus of Conflict* (Princeton: Princeton University Press, 2005).

² *Ibid.*, 214. Given the current distribution of power, one might reasonably ask why the United States should want to overturn the fundamental nature of the system at all.

asymmetric distribution of market power over self-sufficiency, since it cements its privileged place in the international system.

TECHNOLOGICALLY DETERMINED INTERNATIONAL POLITICS?

While Brooks describes the globalization of production as an “historical novelty,” the argument that interdependence leads to peace is not. From Immanuel Kant, John Stuart Mill, and Adam Smith through Norman Angell and on to present-day theorists, liberal scholars have produced increasingly sophisticated attempts to link international commerce and international stability.³ Brooks observes that to date these arguments have failed to measure up empirically. Extensive international trade and capital mobility did not prevent World War I, the Cold War saw little commerce and few direct militarized conflicts between the superpowers, and states today remain resolutely at the center of international politics.⁴

Brooks, acknowledging these previous failures, argues that the relatively recent phenomenon of globalized production, prompted by the new technology-induced imperative to draw on innovation from around the world, can generate this long-awaited pacifying effect. The book links globalized production to great power peace in three ways. First, the decentralized, knowledge-based economy necessary to compete in the global marketplace makes conquest unattractive, or at least unprofitable. Second, in some circumstances the need for foreign direct investment pressures states to form large regional trade agreements, which in turn can dampen security competition. Third, and most astonishing, states must rely on the global marketplace for the purchase of weapons, thereby giving up the ability to initiate conflict unilaterally.

While Brooks’s examination of the first two mechanisms joins important ongoing debates, the investigation of defense globalization and its implications is almost entirely novel. From an IR theoretical perspective, Brooks strikes deep into the traditional territory of realism. Realists claim that states are preoccupied with survival and that military power (or the potential to develop it) remains the principal guarantor of a state’s continued existence.⁵ Reliance on foreign sources for essential weapons components places the

³ Norman Angell, *The Great Illusion; a Study of the Relation of Military Power in Nations to Their Economic and Social Advantage* (London: W. Heinemann, 1910); Robert O. Keohane and Joseph S. Nye, *Power and Interdependence*, 2nd ed. (Glenview, IL: Scott, Foresman, 1989); Richard N. Rosecrance, *The Rise of the Trading State: Commerce and Conquest in the Modern World* (New York: Basic Books, 1986); Richard N. Rosecrance, *The Rise of the Virtual State: Wealth and Power in the Coming Century* (New York: Basic Books, 1999).

⁴ Edward H. Carr, *The Twenty Years’ Crisis, 1919-1939: An Introduction to the Study of International Relations* (New York: Palgrave, 2001). Kenneth N. Waltz, *Theory of International Politics* (Reading, MA: Addison-Wesley, 1979). Brooks, *Producing Security*, 50-51.

⁵ Waltz, *Theory of International Politics*.

supply of the very tools of survival into the hands of other actors. Any concession of self-sufficiency in weapons production by powerful states therefore threatens to deal realism a sharp empirical blow.⁶

Producing Security argues that the unique nature of the contemporary defense industry, “a simultaneous increase in the importance of technological development and the escalation of cost, difficulty, complexity, and scale of developing new technologies,” undermines this quest for autonomy.⁷ While every state might prefer a self-sufficient defense industry, all states, including the United States, must now buy globally produced arms in order to lower costs and remain at the forefront of technology. According to Brooks, this reliance on firms and other states for weapons makes major power conflict increasingly unlikely for two related reasons. An autarkic state cannot develop the cutting edge weapons necessary for conquest; but a state possessing these weapons, and therefore the military potential for aggressiveness, must draw upon global defense production, leaving it vulnerable to supply cutoffs.⁸

In testing this linkage between globalization and stability, Brooks faces a challenge: the novelty of the technologically intensive, globalized defense industry, which originated in the 1970s and did not pick up speed until the 1980s, precludes finding variation in great power peace. Indeed, as long as defense production remains globalized, Brooks predicts little change in this dependent variable. Brooks must therefore fold back the causal logic and develop another empirical strategy to demonstrate globalization’s power to overcome a state’s intrinsic instinct for autarky. Appropriately, Brooks examines the hardest case for globalization, the United States. If all states crave self-sufficiency and the state best equipped to go it alone fails to do so, then the forces of globalization must be strong indeed. His case study convincingly shows that “the United States strongly shifted away from its default autarkic approach in the mid-1970s because the gains of globalization in weapons production—reduced costs and, especially, enhanced quality—were dramatic.”⁹

However, Brooks’s test is only powerful if the United States chooses autarky over *any* form of interdependence. Yet Brooks acknowledges that tradeoffs exist between self-sufficiency and security, noting that during late-Cold War policy debates, “the gains the United States derived from globalizing defense production were a source of *relative* advantage over the Soviets,” albeit at the expense of autonomy.¹⁰ The qualitative superiority of the

⁶ Ethan B. Kapstein, *The Political Economy of National Security: A Global Perspective* (Columbia, SC: University of South Carolina Press, 1992); James D. Morrow, “Arms Versus Allies: Trade-Offs in the Search for Security,” *International Organization* 47, no. 2 (1993); Waltz, *Theory of International Politics*, 104-07.

⁷ Brooks, *Producing Security*, 77.

⁸ *Ibid.*, 11.

⁹ *Ibid.*, 13.

¹⁰ *Ibid.*, 105 (Brooks’s emphasis).

transnational weapons produced by the United States and its allies played no small role in the Soviet Union's demise.¹¹

The book does not fully explore this autarky-security tradeoff due to a selection bias that removes politics from weapons procurement. States play a pivotal role in almost every international defense transaction ranging from regulations on technology transfer to downright market manipulation through offsets.¹² The United Kingdom, the paragon of a liberalized weapons consumer, requires offsetting domestic investment when buying weapons in which foreign-produced components exceed a paltry \$15 million in value.¹³ Only 7.7 percent of all offsets tracked by the United States are awarded to foreign companies; the rest are negotiated directly with foreign governments.¹⁴ Yet Brooks excludes this large set of international production cases because they "typically occur for political, not economic reasons" rather than being "driven by firms for quality and cost reasons."¹⁵ The book cannot test globalization's power over state behavior if it avoids examining globalization initiated by states rather than firms.

Most problematically, this bias prevents considering a crucial empirical challenge to the assumption that states prefer autarky at all times. Why, in an increasingly secure post-Cold War era, does the United States continue to invest aggressively in military research, fostering the very globalization that Brooks argues undermines its autonomy? The United States currently spends nearly four times as much on defense research as the rest of the OECD combined, intensifying the technological sophistication—and consequently the global production—of its weapons. This relative spending gap between the United States and other states has widened since the Cold War. Between 1999 and 2005, United States spending on defense R&D as a percentage of GDP rose from .45 percent to .63 percent, while the next two largest investors, the United Kingdom and France, stayed stable at roughly .24 percent. Military R&D made up 57 percent of all U.S. government research investment in 2005,

¹¹ Ibid; Stephen G. Brooks and William C. Wohlforth, "Power, Globalization, and the End of the Cold War: Reevaluating a Landmark Case for Ideas," *International Security* 25, no. 3 (2000); Matthew Evangelista, *Innovation and the Arms Race: How the United States and the Soviet Union Develop New Military Technologies* (Ithaca: Cornell University Press, 1988). Indeed, in this case, globalization had a destabilizing effect on international politics by helping the United States overturn the bipolar nature of the system.

¹² Offsets are industrial and commercial benefits demanded by governments from a foreign defense firm as conditions for purchasing that firm's weapons. For example, a firm would commit to buy weapon subcomponents from local industry.

¹³ Alexander Moens, *European and North American Trends in Defence Industry: Problems and Prospects of a Cross-Atlantic Defence Market* (Ottawa: Canadian Department of Foreign Affairs and International Trade, 2001), 23.

¹⁴ U.S. Department of Commerce, "Offsets in Defense Trade," *The DISAM Journal* (1999): 70.

¹⁵ Brooks, *Producing Security*, 82-83.

compared to less than a third for the United Kingdom, its closest competitor.¹⁶ Progress in weapons technology would not continue at its current pace without U.S. investment.

While Brooks acknowledges the tremendous technological edge and market size of the United States, and the resultant power vis-à-vis smaller states, Brooks does not give the United States much credit for generating this outcome.¹⁷ Rather, Brooks concludes that states face a structural imperative to globalize in order to remain on weapons technology's cutting edge, but this begs the question by assuming the need for these weapons in the first place. Neither arms racing nor technological development occur in a vacuum; a political impetus behind weapons production must exist. While Brooks takes pains to reject accusations of determinism, by claiming that "all states now face a structural imperative to give up the benefits of autarkic defense production," his book argues that technology has an independent effect on international politics.¹⁸ The theory's prediction of peace may be probabilistic, but the mechanism underpinning it is strongly determined by technological and economic forces.¹⁹ This may be the case, but no examination of a technology's political effects is complete without acknowledging that the development of technology, especially military technology, is itself a political process.²⁰ In the context of international politics, a theory of technology must ask: why do states choose certain military technologies, and what do states, particularly the most powerful ones, gain from these choices?

INTERNATIONAL POLITICAL ORIGINS OF DEFENSE TECHNOLOGY

A technology with international political effects is likely to have international political origins. Accepting the claim that military technology now favors the globalization of production, I offer an alternate theory of defense globalization as a hegemonic strategy that shows how these same characteristics also lead to market concentration and extended U.S. power. By assuming states care about relative rather than absolute interdependence, the theory better explains the massive asymmetry in defense transnationalism. In contrast to Brooks, it explains continued American support for increased technological intensiveness and global defense production during both the Cold War

¹⁶ "OECD Science, Technology and Industry: Scoreboard 2005," (OECD, 2005), 34. Reaction to the 9/11 attacks explains much of this increase, but does not explain why the majority went toward technology-intensive "transformation" rather than increases in ground forces.

¹⁷ Brooks, *Producing Security*, 235-39.

¹⁸ *Ibid.*, 57.

¹⁹ On technological determinism, see Bruce Bimber, "The Three Faces of Technological Determinism," in *Does Technology Drive History? The Dilemma of Technological Determinism*, ed. Merritt Roe Smith and Leo Marx (Cambridge, MA: The MIT Press, 1994); Brooks, *Producing Security*, 11-12.

²⁰ Thomas J. Misa, "Retrieving Sociotechnical Change from Technological Determinism," in *Does Technology Drive History?*

TABLE 1 Comparing Theories of Defense Globalization

	As Structural Constraint	As Hegemonic Strategy
Theoretical Mechanism	Military technology development drives interdependence Interdependence overrides states' goal of autarchy	The United States drives military technology development Asymmetric interdependence enhances U.S. goal of relative power
Cases Explained	U.S. Cold War policy Firm-initiated globalization	U.S. Cold War policy U.S. post-Cold War policy Firm-initiated globalization State-initiated globalization
Theoretical Prediction	Great power peace	Great power peace Small-state peace Arms trade as coercion

and post-Cold War eras. My theory addresses not only economically motivated firm-to-firm transactions but also the government-initiated examples excluded by Brooks. Finally, it makes different predictions for the dependent variable of international stability, allowing for competitive theory testing. Table 1 compares the two theories.

States Do Not Live by Autonomy Alone

Interdependence itself, rather than increased technology access and lower costs, is defense globalization's principal benefit for the United States. A state may prefer autarky to mutual interdependence but will prefer favorably asymmetric interdependence over autarky due to the enhancement of its relative power and therefore its chances of survival. Liberals and realists alike have long recognized that unevenly distributed economic interdependence can be a source of power. Liberal interdependence theorists of the 1970s, while focusing on the undermining of state authorities' power, readily acknowledged that "a less dependent actor in a relationship often has a significant political resource, because changes in the relationship (which the actor may be able to initiate or threaten) will be less costly to that actor than to its partners."²¹

Realist responses to interdependence theory focused on the advantages interdependence provides to the system's most powerful state.²² A leading

²¹ Keohane and Nye, *Power and Interdependence*, 11.

²² Robert Gilpin and Jean M. Gilpin, *The Political Economy of International Relations* (Princeton: Princeton University Press, 1987); Joanne S. Gowa, *Allies, Adversaries, and International Trade* (Princeton: Princeton University Press, 1994); Stephen D. Krasner, "State Power and the Structure of International Trade," *World Politics* 28, no. 3 (1976).

state can be expected to encourage interdependence when doing so extends its relative political influence.²³ An especially powerful state may possess the means to alter the status quo unilaterally, giving less powerful states the choice to cooperate and be less worse off than if they failed to join with the initiator. The continued American enthusiasm for military technological development and defense production interdependence is just such an exercise of what Lloyd Gruber calls “go-it-alone power.”²⁴

Killer Applications

Rather than relying strictly on the independent effects of technology and the new economy, a theory that acknowledges the political advantages of asymmetric interdependence explains why the United States chose to sponsor these globalizing technologies and why it continues to aggressively fund research despite emerging from the Cold War without a rival. Economic theories of strategic trade and network effects suggest that this push has two important consequences—the increasing importance of systems integration technology in arms production and a natural monopoly in the supply of weapons systems—which help to enhance U.S. influence.²⁵

As defense products require increasing numbers of subcomponents supplied by many firms, the influence of the prime contractors, the companies at the top tier of weapons production, has actually grown. Curiously, while *Producing Security* examines the rising influence of other multinational corporations (MNCs), its selection bias excludes these giant globalized firms from consideration because “at this level, the U.S. government made many of the crucial choices on American weapons parameters. Moreover, *many of these production decisions were not made primarily on the basis of economic efficiency.*”²⁶

Prime contractors control the most important link in the armaments supply chain through their ability to assemble subcomponents into a coherent and lethal whole. U.S. firms and workers uniquely dominate this technology of systems engineering, and other states have difficulty acquiring it, as Brooks himself illustrates through the struggles of the Brazilian and Japanese military aircraft industries.²⁷ Brooks’s example of the Aegis cruiser provides a useful

²³ Krasner, “State Power and the Structure of International Trade”; Susan Strange, “The Persistent Myth of Lost Hegemony,” *International Organization* 41, no. 4 (1987).

²⁴ Lloyd Gruber, *Ruling the World: Power Politics and the Rise of Supranational Institutions* (Princeton: Princeton University Press, 2000).

²⁵ “Killer application” is a recent business term describing products whose value increases with use. Email is one example; the more people with an email account, the more valuable email becomes to every user. Larry Downes and Chunka Mui, *Unleashing the Killer App: Digital Strategies for Market Dominance* (Boston: Harvard Business School Press, 1998).

²⁶ Brooks, *Producing Security*, 124 (emphasis mine).

²⁷ Ashton B. Carter and John P. White, *Keeping the Edge: Managing Defense for the Future* (Cambridge, MA: MIT Press, 2001); Judith Reppy, “Dual-Use Technology: Back to the Future?” in *Arming the Future: A*

demonstration of systems engineering's importance. In making the case for a diminished U.S. autonomy, Brooks notes that 75 percent of the ship's computing power comes from commercial sources, much of it quite possibly coming from abroad.²⁸ Yet no other state has developed a comparable shipboard air defense system. One can buy three quarters of the parts but be no closer to deploying Aegis.

Dual-use components such as semiconductors and other information technology elements are essential to modern weapons, but they are also commodities. Actors seeking to dominate the supply chain should eschew these lower tier components and instead encourage diversification since "globalization increases the ease of substitution and thereby makes evading a limited supply cutoff easier."²⁹ To dominate the global arms industry one does not have to control the entire value chain, only the systems integration portion. The daunting and expensive task of developing and assembling these systems contributes to a concentration of market power in a small number of prime contractors mostly based in the United States.³⁰

The industry's unique technologies and economies of scale further facilitate the consolidation trend. Since most states purchasing a weapons system also supply components, every additional customer can reduce production costs and enhance the available technology. This leads to a "network effect," in which the weapon's value for all consumers rises with every new customer/supplier. Such a positive externality exerts monopolistic pressures on the market, and an industry standard tends to emerge, as Microsoft Windows did for personal computer operating systems.³¹

To illustrate, consider a hypothetical competition between two weapons programs, one backed by the United States and the other by a small consortium of equally sized, second-tier states, with third party states able to purchase from either one. Given the size of Pentagon orders, U.S. weapons programs will enjoy economies of scale, even if the United States were the

Defense Industry for the 21st Century, ed. Ann R. Markusen and Sean S. Costigan (New York: Council on Foreign Relations, 1999); Brooks, *Producing Security*, 224-36.

²⁸ Brooks, *Producing Security*, 84.

²⁹ *Ibid.*, 213.

³⁰ Thirty-eight of the one hundred largest defense companies (and six of the top ten) are U.S.-based, versus twelve in the United Kingdom, nine in France, six in Germany, and Europe-wide EADS. American firms account for 63 percent of all arms sales worldwide, excluding China. Stockholm International Peace Research Institute (SIPRI), *SIPRI Yearbook 2005: Armaments, Disarmament and International Security*, ed. Alyson J. K. Bailes (Oxford: Oxford University Press, 2005), 384.

³¹ Joseph Farrell and Paul Klempner, "Coordination and Lock-In: Competition with Switching Costs and Network Effects," in *Handbook of Industrial Organization*, ed. Mark Armstrong and Robert Porter (London: Elsevier, forthcoming); Michael L. Katz and Carl Shapiro, "Systems Competition and Network Effects," *Journal of Economic Perspectives* 8, no. 2 (1994): 102. Ethan Kapstein predicted this monopoly based on rising production costs and falling defense budgets but did not examine the U.S. role behind it. Ethan B. Kapstein, "The Changing Economics of Arms Production and Sales: Advanced Industrialized Countries," in *Cascade of Arms: Controlling Conventional Weapons Proliferation*, ed. Andrew J. Pierre (Washington, DC: Brookings Institution Press, 1997), 75.

sole customer.³² By collaborating with the United States, smaller client states not only receive a cheaper, higher performance weapon, they also worry less about defection. No matter how many states participate in the American program, only one can hold up production, an inherent advantage that no consortium of equal-sized states can match since any one state can endanger the entire program by dropping out. Defense firms understand this. “We absolutely need defence integration and to have common defense procurement in Europe,” pleaded the CEO of the defense firm EADS, “We are asking for one customer.”³³

Compare the development of the American Joint Strike Fighter (JSF or F-35) to that of the rival Eurofighter. The Pentagon’s winner-take-all competition—one firm’s winning model bought by the Air Force, Navy, and Marines—not only delivers economies of scale but also a costly signal of commitment. The United States has put all its eggs (2,443 planes) in one basket. In contrast, four EU states with stakes varying from 14 to 37 percent produce the Eurofighter, giving any one state the power to hold up production by withdrawing funding, as Germany did for two years beginning in 1992.

Other benefits beyond assured supply—more frequent upgrades, better logistics and training, compatibility with U.S. military networks, and of course demonstrated combat effectiveness—further raise the relative value of American weapons.³⁴ Improved relations with the world’s sole superpower also drive arms acquisitions. Socialization pressures may push states to model their military hardware on that of the system’s most powerful state.³⁵ As the U.S. program’s value grows, the relative costs of rival programs increase while technological benefits decline. If costs and technology diverge sufficiently, states left behind may face the prospect of potential rivals affording larger, more advanced armed forces. As more states sign on to the American program, laggards will be tempted to join as well, resulting in monopoly.

The United States Prefers Interdependence to Autarky

Given its massive budget and comparative advantage in systems engineering, any profit-driven, firm-to-firm transnational production (the kind Brooks

³² Werner Antweiler and Daniel Trefler, “Increasing Returns and All That: A View from Trade,” *American Economic Review* 92, no. 1 (2002). See also the classic arguments on “k-groups” in Thomas C. Schelling, *Micromotives and Macrobehavior*, 1st ed. (New York: Norton, 1978).

³³ Daniel Michaels, “European Defense: More Bang for Buck,” *Wall Street Journal*, 9 March 2001.

³⁴ Richard Aboulafia, “June 2003 Letter,” in *World Military and Civil Aircraft Briefing* (Fairfax, VA: The Teal Group, 2003).

³⁵ Theo Farrell, “Transnational Norms and Military Development: Constructing Ireland’s Professional Army,” *European Journal of International Relations* 7, no. 1 (2001); John Lovering, “Which Way to Turn? The European Defense Industry after the Cold War,” in *Arming the Future*. Brand reputation can help establish a network good; see Katz and Shapiro, “Systems Competition and Network Effects,” 107.

exclusively examines) will favor the United States. However, Brooks cannot explain why the United States pushes transnationalism when the economic benefits are less clear. This section shows that the United States avoids gains in technology and reductions in price while extending the global production of weapons, thus undermining Brooks's key assumption (that states always prefer autonomy when it comes to weapons) and the book's mechanism behind globalization (the inexorable pressures of costs and technology acquisition). The United States, preferring the current transnational arrangement to defense autarky, makes economic and technological sacrifices to consolidate its commanding position.

Relative defense spending provides one simple measure of u.s. market power. Its 2004 budget accounted for 47 percent of global military spending in dollars; the Herfindahl-Hirschman Index, a common measure used in antitrust cases, reaches a minimum value of 2,209, evidence of an extremely concentrated industry.³⁶ Such market share delivers significant monopsonistic power.³⁷ Additionally, since much of this budget goes to American companies, these firms enjoy economies of scale and scope, allowing them to dominate the "liberalized" defense market.³⁸ Defense trade is one of the few areas where the United States enjoys a positive trade balance. The United States imports a tenth of its defense purchases, compared to a third for Britain.³⁹ In 1997 u.s. defense exports to Europe totaled \$4.3 billion, while European exports to the United States were \$0.7 billion.⁴⁰ Even at the subcomponent level, where Brooks focuses, the United States dominates. Between 1993 and 1996, the United States exported \$14.8 billion in major systems and \$18.9 billion in weapons parts and components. In the market for defense electronics subcomponents, the United States is responsible for 48 percent of the world's exports while importing only 7 percent.⁴¹

The United States promotes this asymmetric interdependence in many ways. Its contracts are especially lucrative; the Pentagon's "cost-plus" policy guarantees defense firms a return on their investment regardless of cost

³⁶ SIPRI, *SIPRI Yearbook 2005*, 319. The index is the sum of the squares of the market share of each actor competing in the market. Markets in which the sum exceeds 1800 are sufficiently concentrated to justify anti-competition investigation by the u.s. Department of Justice.

³⁷ On massive state-consumers' market power, see Daniel Drezner, *All Politics Is Global: Explaining International Regulatory Regimes* (New York: Princeton University Press, 2007).

³⁸ For a discussion of economies of scale as a source of comparative advantage in international trade, see Antweiler and Trefler, "Increasing Returns." Much of my argument resembles that of "Strategic Trade Theory," although I consider political rather than economic externalities resulting from u.s. subsidization of emerging military technologies. Marc L. Busch, *Trade Warriors: States, Firms, and Strategic Policy in High-Technology Competition* (Cambridge; New York: Cambridge University Press, 1999); Paul R. Krugman, ed., *Strategic Trade Policy and the New International Economics* (Cambridge, MA: MIT Press, 1986).

³⁹ *Financial Times*, "Fog Lights," 17 December 2005.

⁴⁰ Christophe Cornu, "Fortress Europe - Real or Virtual?" in *Chailot Papers*, ed. Burkard Schmitt (Alençon, France: Institute for Security Studies of Western European Union, 2001), 59.

⁴¹ Paul Dowdall, Derek Braddon, and Keith Hartley, "The UK Defence Electronic Industry: Adjusting to Change," *Defence And Peace Economics* 15, no. 6 (2004): 585.

overruns. Since foreign firms qualify as well, this cannot be dismissed as pork-barrel spending. In 2004 the British-based firm BAE reported zero profits on such big European programs as the Nimrod maritime aircraft, Astute submarine, Typhoon fighter, and the Type 45 destroyer. Consequently, a large portion of the firm's profit came from the much smaller JSF development program and its guaranteed return.⁴²

U.S. defense firms provide especially generous offsets (industrial benefits to sweeten international arms deals) that almost always impose added costs to their systems.⁴³ Over half of these offset products are non-defense goods, increasing the American defense trade surplus at the expense of efficiency and technology transfer. In 2003, Poland chose to buy forty-eight Lockheed-Martin F-16s (over Swedish Gripens and French Mirages) for \$3.5 billion, largely due to Lockheed's promised investment of \$6 billion in the Polish economy. Additionally, the Polish government purchased the planes through a low-interest loan from the U.S. Congress.⁴⁴

An equally interesting element of the Polish sale is the waiver of the R&D recoupment requirements by the U.S. government, indicating U.S. willingness to pay for research and yet distribute much of its fruits to other states.⁴⁵ Nine countries have partnered with the United States to develop the JSF; yet of all the program's unclassified "critical technologies," only two cases of a foreign company acting as developer or supplier (and both in cooperation with American firms) emerge, demonstrating not only a lack of significant technology transfer into the United States but also the tremendous control the United States has over the plane's technology as a whole.⁴⁶ One Defense Science Board analysis notes that in defense coproduction efforts, the United States is "more likely to export than to import needed technology." The report goes on, "Even in most of the international ventures considered successful, U.S. companies had little need for the foreign partners' technologies."⁴⁷

⁴² BAE Systems plc, *BAE Systems Annual Report 2004* (London: BAE Systems plc, 2005), 12.

⁴³ U.S. Department of Commerce, "Offsets in Defense Trade," 62.

⁴⁴ John Tagliabue, "Lockheed Wins Huge Sale to Poland with Complex Deal," *The New York Times*, 19 April 2003.

⁴⁵ Ethan B. Kapstein, "Capturing Fortress Europe: International Collaboration and the Joint Strike Fighter," *Survival* 46, no. 3 (2004); William W. Keller and Janne E. Nolan, "Mortgaging Security for Economic Gain: U.S. Arms Policy in an Insecure World," *International Studies Perspectives* 2, no. 2 (2001).

⁴⁶ House Committee on Small Business, *Joint Strike Fighter Acquisition: Observations on the Supplier Base*, report prepared by GAO, 108th Cong., 2d sess., 2004.

⁴⁷ Defense Science Board, *Report of the Defense Science Board on Joint Advanced Strike Technology (JAST) Program*, report prepared for Office of the Undersecretary of Defense for Acquisition and Technology (Washington, DC: 1994). This willingness to export technology increases only to a point. One of the main contributions to cost overruns for the JSF is the anti-tampering technology for many of the most sensitive components to be exported. See House Committee on Small Business, *Joint Strike Fighter Acquisition*.

The United States Prefers Monopsony to Efficiency

The United States does not stop at sacrificing gains to other states; it also encourages consolidation of the industry into a small number of large, specialized firms. Given the current importance of dual-use technology, such a strategy undermines the quest for the most technologically sophisticated and cost-effective products. Beyond these inefficiencies, critics claim the policy empowers oligopolistic firms to an extent rivaling states as international actors.⁴⁸ In fact, this strategy leads to tightening U.S. control of these MNCs, regardless of their national identity, if indeed these firms still have one.

Faced with shrinking budgets in the 1990s, U.S. planners and firms faced two options: diversify into civilian sectors or consolidate into pure play defense firms. Diversification would provide the benefits of increased competition (by keeping more firms alive) and superior weapons (by encouraging more dual-use technology development), Brooks's twin causal mechanisms. However not only did the United States authorize industrial consolidation, it spent \$3-5 billion to cover the costs, a move one analyst described as "hard to understand on cost-saving grounds" as well as unjustifiable in terms of improved weapons quality.⁴⁹ The Pentagon chose to trade gains in competition, efficiency, and technology for industrial control.

By contrast, only 28 percent of the European aerospace sector is defense-oriented. EADS owns 80 percent of Airbus and consequently relies on defense for less than a quarter of its sales.⁵⁰ Airbus rival Boeing, despite its sizable civilian aircraft business, derives 48 percent of its sales from defense. Boeing is a paragon of diversification compared to Lockheed Martin, Northrop Grumman, Raytheon, and General Dynamics whose defense shares range from 75 to 87 percent.⁵¹ These firms simply cannot exist without the U.S. government's patronage. The defense industry may be evolving into an oligopoly, but it faces a virtual monopsony.

The influence of the U.S. budget and technological dominance is not confined to American-based firms. Large Europe-based MNCs covet access to the U.S. budget. Finmeccanica, while partially owned by the Italian government, plans for over a third of its 2007 sales to come from the United States.⁵² BAE, nominally a British company, only derives a fifth of its sales from the United Kingdom, and its American subsidiary employs more people than

⁴⁸ Brooks, *Producing Security*; Ann R. Markusen, "The Rise of World Weapons," *Foreign Policy* (1999).

⁴⁹ Ann R. Markusen, "The Post Cold War Persistence of Defense Specialized Firms," in *The Defense Industry in the Post-Cold War Era: Corporate Strategies and Public Policy Perspectives*, ed. Gerald I. Susman and Sean O'Keefe (Oxford: Elsevier, 1999); Michael Oden, "Cashing in, Cashing out, and Converting: Restructuring of the Defense Industrial Base in the 1990s," in *Arming the Future*.

⁵⁰ BAE owns the other 20 percent.

⁵¹ SIPRI, *SIPRI Yearbook 2005*.

⁵² David Gow, "The Italian Job," *The Guardian*, 15 November 2005.

the parent organization in Britain.⁵³ As long as the United States controls the technology and dominates global defense spending, the location of the firm's headquarters will grow increasingly irrelevant.

TRADING EFFICIENCY FOR INFLUENCE

Political rather than economic reasons explain U.S. enthusiasm for defense globalization. Instead of leveraging its market dominance through monopolistic pricing, the United States foregoes a portion of the economic and technological gains in order to enjoy security rents. Brooks's central prediction—the increased likelihood of great power peace—still holds but through a different mechanism. In great power politics, growing dependency on the United States as both supplier and consumer raises the expected costs of second-tier balancing and makes the rise of a peer competitor increasingly remote.⁵⁴ This influence also allows the United States to manage conflict among smaller powers, and thus my illiberal approach ironically makes more optimistic predictions than Brooks on the prospects for peace among less-developed states.⁵⁵ My theory enjoys the additional benefit of being easier to test since it predicts increased American use of weapons supplies as a foreign policy tool (and few cases of other states doing the same to the United States) and a decline in small-state conflict as U.S. market dominance grows.

Brooks argues that even the system's most powerful state must now rely on international sources for weapons components; a concerted effort at hegemonic conquest will be met by near-universal denial of supply by other states. However, attention to asymmetric interdependence suggests a more appropriate question: who is militarily worse off if defense production ties between the United States and rest of the world are severed? The United States possesses the world's most powerful standing military, spends almost as much on defense as every other state combined, and enjoys a massive defense trade surplus. Conceivably, the rest of the world's ability to produce modern weapons and to fight extended wars would be hurt more.

My theory of technology promotion as a hegemonic management tool predicts a two-tiered system keeping allies dependent and excluding potential adversaries.⁵⁶ Brooks demonstrates this to be the case in the Cold War.⁵⁷ Little reason exists for the United States to eschew this strategy with

⁵³ "The New Protectionism: Escalating Rhetoric Worries U.S., European Leaders," *Defense News*, 14 June 2004.

⁵⁴ On the prohibitive costs of balancing in unipolarity, see William C. Wohlforth, "The Stability of a Unipolar World," *International Security* 24, no. 1 (1999): 28-37.

⁵⁵ Brooks, *Producing Security*, 220-34.

⁵⁶ Gowa, *Allies, Adversaries, and International Trade*. For a somewhat different discussion of alliances, trade, and economies of scale, see Joanne S. Gowa and Edward D. Mansfield, "Alliances, Imperfect Markets, and Major-Power Trade," *International Organization* 58, no. 4 (2004).

⁵⁷ Brooks, *Producing Security*, 125.

the Soviet Union's demise. Not surprisingly, the United States leverages its market power to contain the military power of China, its most likely peer competitor, and Russia, which supplies 95 percent of China's considerable weapons imports.⁵⁸

This arrangement is not a given; other manufacturing sectors take advantage of low-cost Chinese production and its massive market. Russia still possesses expertise in such vital areas as diesel submarines, fighter planes, and surface-to-air missiles that the United States could import. Yet not only does the United States deny Russia and China access to its defense trade, it leverages its market power to force others to do the same. EU states recently came close to dismantling the arms embargo hindering access to China's \$15 billion defense modernization effort only to reverse their stance after U.S. protests (backed by congressional threats of trade barriers to European weapons components).⁵⁹ In response to Israel's proposed sale of unmanned aerial vehicle parts to China, the United States suspended access to the JSF program, forcing Israel to cancel the transaction with Beijing.⁶⁰

Besides dampening hegemonic rivalry, global dependency on American weapons also furthers U.S. interests vis-à-vis smaller states, as demonstrated by the recent release of F-16s to Pakistan in exchange for cooperation on terrorism. Brooks also makes this argument.⁶¹ Contrary to Brooks, however, this asymmetry reduces the likelihood of conflict among smaller states. Higher weapons prices due to American cartelization will reduce the severity of arms races.⁶² Alternatively, the hegemon can employ more active measures.⁶³

As the world's principal source of high-end weapons, the United States can calibrate military balances between India and Pakistan, Israel and the Arab States, and elsewhere. My theory predicts a state will feel tremendous pressure to join the American network if its rival is a participant. Despite the severe damage to its Tejas fighter program caused by American sanctions, India is considering U.S.-made planes to replace the delayed indigenous plane in the wake of Pakistan's own F-16 acquisition.⁶⁴ This appears to create a perverse incentive for the United States to encourage spiraling arms races, but consider the alternative. Given the small production runs of jointly produced projects such as Eurofighter (consortium members will purchase at most 620 planes compared to the U.S. order of 2,443 JSFs), every additional order dramatically lowers per unit costs, resulting in a strong motivation to

⁵⁸ John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: Norton, 2001), 396–400.

⁵⁹ It must be acknowledged that aggressive Chinese statements regarding Taiwan during the European embargo debate probably played a role as well.

⁶⁰ Miles A. Pomper, "U.S., Israel Reach China Arms Deal," *Arms Control Today* 35, no. 7 (2005).

⁶¹ Brooks, *Producing Security*, 237.

⁶² Paul Levine and Ron Smith, "The Arms Trade Game: From Laissez-Faire to a Common Defence Policy," *Oxford Economic Papers-New Series* 52, no. 2 (2000).

⁶³ Ethan B. Kapstein, "America's Arms-Trade Monopoly," *Foreign Affairs* 73, no. 3 (1994).

⁶⁴ R. Prasanna, "Who Wants F-16?" *The Week*, 25 April 2005.

export, particularly to countries where U.S. weapons do not compete.⁶⁵ For a European state the security loss from proliferation may be smaller than gains resulting from a better value weapon. Counterproliferation may be a benefit that only U.S. market dominance can realistically provide.

GLOBALIZATION FOR REALISTS

The United States is not being hoist with its own globally produced petard. Although Brooks establishes a crucial link between defense interdependence and great power politics, the book's exclusive focus on the technological and economic benefits of globalization not only results in bias regarding case selection but also prevents acknowledging the political motivations underlying the American choice to encourage globalization. Paying attention to the asymmetry of defense interdependence, I proposed an alternate theory of technological hegemony that explains the U.S. policy of massive R&D investment in both the late Cold War and the current era of American preponderance.

Modern weapons' complexity and economies of scale tend to produce monopolies, and the value chain for the production of these monopolistic goods is dominated by the systems integration techniques of prime contracting firms. In turn, these prime contractors remain largely enthralled by U.S. market power. The United States gains international influence by controlling the distribution of these weapons. By showing that the United States forgoes technological and economic gains in pursuit of globalization, I undermined the liberal explanation for transnational production in favor of this more realist-oriented approach.

While tying defense globalization to a hegemonic strategy provides a superior explanation for both firm- and state-sponsored defense globalization during and after the Cold War, three questions requiring further research arise. First, much of my argument rests on the importance of systems integration and the unassailable lead the United States possesses in this essential technology. The experience to date of other states' systems integration efforts supports this claim, but such a lead may not be permanent.⁶⁶ Similarly, increased defense spending by the rest of the world, especially Europe and China, may undermine U.S. market power.⁶⁷

Second, hegemonic stability theory suggests paradoxically that dominant states provide the seeds of their own relative decline by supplying certain

⁶⁵ "Eurofighter GmbH, Current Order Status," *Eurofighter Typhoon*, <http://www.eurofighter.com/Typhoon/Programme/> (accessed 20 June 2006).

⁶⁶ Reppy, "Dual-Use Technology."

⁶⁷ That said, such a development would allow for theory testing; Brooks would predict that security competition would be even more unlikely should more state actors and firms participate in global production, whereas my theory predicts an increase in instability.

public goods.⁶⁸ Second-tier states seem to enjoy an inordinate amount of military technology transfer and industrial development subsidized by the United States in its effort to increase its market share.⁶⁹ However, while defense globalization exhibits externalities resembling those of public goods, one important exception exists: the supply of weapons is excludable by the hegemon.⁷⁰ The United States has interests beyond extending its network as far as possible, hence the isolation of China and Russia. Nonetheless, more careful research should compare U.S. security benefits to the economic costs of aggressive globalization.

Finally, given this excludability, an increasingly “locked in” world provides more room for hegemonic exploitation as the cost of developing rival products escalates. This leads back to the post-Cold War puzzle for realism, the absence of balancing against the United States.⁷¹ I offer a partial explanation by showing how the network characteristics of modern weapons make the collaborative provision of rival goods even tougher than the difficult process of building a balancing coalition. Nonetheless, evidence exists that other states, particularly those of Europe, are unsatisfied with the current arrangement, resulting in such costly European programs as the A400M military transport plane and the Galileo global positioning system (in which China has now invested). Time will tell if pressures to balance (soft or otherwise) will overcome the rising cost.⁷²

Despite these important questions, my central point remains valid. Concerns over relative international influence color every aspect of state action, including military technological development and the globalization that results. Defense planners understand this; a 1996 Defense Science Board report views transnational weapons cooperation “first and foremost, as an important means of attaining U.S. geopolitical and military objectives.”⁷³ Scholars should do the same.

⁶⁸ Gilpin, *War and Change*; Duncan Snidal, “The Limits of Hegemonic Stability Theory,” *International Organization* 39, no. 4 (1985).

⁶⁹ Kenneth Flamm, “Redesigning the Defense Industrial Base,” in *Arming the Future*, 31. Also see Robert Gilpin, *U.S. Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment* (New York: Basic Books, 1975).

⁷⁰ Katz and Shapiro, “Systems Competition and Network Effects.”

⁷¹ G. John Ikenberry, *America Unrivaled: The Future of the Balance of Power* (Ithaca: Cornell University Press, 2002); Robert A. Pape, “Soft Balancing against the United States,” *International Security* 30, no. 1 (2005).

⁷² For one analysis, see Seth G. Jones, *The Rise of European Security Cooperation* (Cambridge: Cambridge University Press, 2007).

⁷³ Defense Science Board, *Report of the Defense Science Board Task Board on International Armaments Cooperation in an Era of Coalition Security* (Washington, DC: 1996), i.