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# **Economic Interdependence and Security: U.S. Trade and Investment Policy for a New Era**

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The Clinton Administration believes that high technology industries are crucial for U.S. military security, competitiveness in international trade, and domestic economic vigor. Key industries include telecommunications, computers, electronics, and advanced materials. Equally prominent are the Administration's convictions about the desirability of open flows of trade and investment in the international economy, multilateral cooperation to address global problems, and cooperative military burden-sharing.

Taken as a whole, this agenda is laudable. The challenge is to identify and pursue policies that contribute positively to at least some of its elements without adversely affecting others. In particular, controversy has arisen about the realism of continuing American policies that seek overwhelming national advantage in militarily relevant technology and industry, and, at the same time, international cooperation and openness with other industrialized nations.

Recent debate focuses on threats of foreign domination of generic families of technologies with major civil and military applications.<sup>1</sup> Protectionists and internationalists tend to agree on the basic premise that the United States requires access to cutting edge technologies and capacity in the industries related to them. Otherwise, America will decline in terms of relative — and perhaps even absolute — economic vigor, political auton-

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1. Michael Borrus & John Zysman, *Industrial Competitiveness and American National Security*, in *THE HIGHEST STAKES: THE ECONOMIC FOUNDATION OF THE NEXT SECURITY SYSTEM 7* (Wayne Sandholtz et al. eds., 1992).

omy, and military capacity. Protectionists argue for a host of unilateral measures to defend U.S. technological knowledge as well as domestic firms and markets. Yet protectionist policies to avert a future of national decline will impose their own costs on the U.S. economy and strain or even undermine badly needed cooperation with major allies. The results, the internationalists argue, will be the very decline that the protectionists seek to avoid.

We take the internationalist position with regard to advanced generic technologies and associated dual-use industries — industries whose manufacturing capacity and products are inherently useful for civil as well as military purposes. The protectionist position is fundamentally flawed in several respects. It misunderstands the sources of dangerous dependence on foreigners, as will be discussed in a later section. Even more fundamentally, it does not take into adequate account systemic changes in the global context in which U.S. policy operates. Yet the challenges facing U.S. policy can only be understood in light of those changes.

Little will be gained by making policy for a world that no longer exists. Current realities are not captured if we only substitute for the zero-sum military conceptions of U.S.-Soviet military rivalry of the Cold War period zero-sum economic conceptions of U.S. rivalry with Japan and the Asian Newly Industrialized Economies (NIEs). Nor will it suffice to reject that simplistic view while remaining committed to preserving the American world role based on unilateral supremacy in military and technology spheres.<sup>2</sup>

Internationalists and protectionists do not disagree much on U.S. national goals of security, prosperity, autonomy, and international standing.<sup>3</sup> The issues center on how to advance these goals. In this Article, we argue that the key to achieving these goals lies in a policy of interdependence with other industrialized nations. We then identify the potential threats that such a cooperative approach poses for U.S. national interests, and formulate a policy for dealing with such threats in a manner which facilitates maximum international cooperation.

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2. For discussion of various aspects of these issues, see Symposium, *Searching for Security in a Global Economy*, DAEDALUS, Fall 1991, at 1.

3. See Davis B. Bobrow and Robert T. Kudrle, *Midlevel Power Strategies for Changing International Niches: Experiences in the "Old World Order,"* 5 J. E. ASIAN AFF. 237, 240-41 (1991).

## I. SYSTEMIC CHANGES AS POLICY CHALLENGES

The United States no longer occupies the political-military, economic and technological position that provided a foundation for its previous trade and investment policies with regard to high technology. As a result, policies that hitherto were feasible and desirable in terms of American national goals have lost some of one or both of those attributes.

The compatibility and priority of relevant national instrumental objectives have changed as well. Our industrial competitiveness can no longer rest on obvious technological supremacy. Technology acquisition can only be harmed by total reliance on domestic sources. Unilateral efforts will no longer suffice to deny technology to others. Military technology and military security needs will no longer offer the inducements they once did for others to find dependence on the United States necessary and attractive. The United States must rethink how much it can "have its cake and eat it too" with regard to military, economic, and technological accomplishments.

### A. MILITARY CHANGES AND CHALLENGES

The dissolution of the Soviet Union has lessened the pressures on the United States for military modernization and expenditure as well as the benefits from such efforts. The multi-year defense budget plans of the late Reagan and the Bush administrations, yet to be significantly modified in aggregate by the Clinton Administration, reflect these changes. As measured in fiscal year (FY) 1991 dollars, the U.S. defense program will decline from more than 350 billion in FY 1985 to less than 240 billion in FY 1997.<sup>4</sup> The justification and feasibility of a large, purely national, techno-industrial base premised only on military modernization and production requirements has declined accordingly. The United States no longer needs to race as hard or to produce as massive amounts of military end use items to sustain military operations.

With the diminution of the threat from the military forces of the former Soviet Union, support for major unilateral U.S. military interventions has declined. Overseas military operations are increasingly likely to be multilateral affairs. The feasibility of such cooperative endeavors benefits from standardization and compatibility in weaponry and even more so in the communica-

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4. JOINT CHIEFS OF STAFF, 1991 JOINT MILITARY NET ASSESSMENT 3-4 (1991).

tions and information hardware and software on which multilateral coordination rests. Yet with the decline of the Soviet threat, the imperatives felt by other countries to "buy American" in order to gain U.S. military protection have declined, just as has American willingness to subsidize transfers to them.

Further, like the United States, key allies and recipients of U.S. military products have cut the share of their GDP devoted to defense spending. From 1986 to 1991 such reductions were made by major security partners in NATO (Germany, Canada, Turkey and the United Kingdom), the Pacific (Australia, South Korea), and the Middle East (Egypt, Israel, and Saudi Arabia).<sup>5</sup> Thus, the global defense industry finds itself in dramatic surplus capacity, a surplus worsened by cutbacks in military acquisition in the former Soviet Union.<sup>6</sup> That overcapacity feeds pressures for domestic procurement. Reliance on solely domestic procurement in turn works against the operational compatibility of multilateral forces. Yet, the desirability of compatible military forces remains strong.

These points do not argue for U.S. military inferiority, let alone for ignoring militarily relevant technology or industry. Cuts in standing military forces and defense budgets call instead for altered policies to ensure the availability of such technology and production capacity. Availability can no longer rest on a massive defense-only industrial base, on massive standing forces, or — for reasons introduced subsequently — on across-the-board unilateral supremacy in all relevant aspects of science and technology.<sup>7</sup>

The United States must find a preparedness posture in which advanced technology provides the defense potential captured in the phrase "long shadows and virtual swords."<sup>8</sup> In ef-

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5. U.S. CENTRAL INTELLIGENCE AGENCY, HANDBOOK OF INTERNATIONAL ECONOMIC STATISTICS 30 (1992).

6. See Steven Erlanger, *Russia's Workers Pay Price as Military Industries Fade*, N.Y. TIMES, Dec. 3, 1993, at A1.

7. See *infra* part I.C.

8. Richard L. Wagner, Jr. and Theodore S. Gold, *Long Shadows and Virtual Swords: Managing Defense Resources in the Changing Security Environment*, in SCIENCE AND INTERNATIONAL SECURITY 53, 53 (Eric H. Arnett ed., 1990). Wagner and Gold intend "long shadows" to mean a developed and demonstrated potential, that has arisen as a result of past R&D, to produce and deploy weaponry in general. This unrealized potential can affect the behavior of potential adversaries. Consequently, "the R&D casts a long shadow forward, its influence felt long before any deployment." *Id.* at 56. "Virtual swords," a similar concept, means specific weaponry that could be produced or deployed now as a result of previous R&D but which has not been so produced or deployed in actuality. *Id.* at 63.

fect, relevant technology and manufacturing capacity become a national strategic reserve.<sup>9</sup>

Much of that reserve, as well as improvements in existing capabilities, will involve technologies that provide relatively inexpensive force multipliers. Those tend to come from the very industries — such as electronics, computers, and informatics — that have important civil applications. Military superiority will suffer if the United States ignores superior foreign technologies that can contribute to those force multipliers. It will also suffer if the firms central to the national defense industrial strategic reserve are not competitive in civil markets.

Future military superiority will also depend on containing the financial costs of research and development, and of procurement. Reliance on purely domestic sources is not conducive to such cost control. With shrinking defense demand, the number of competing domestic producers of primarily military items will tend to decline further. The growth of monopoly power at home is not conducive to competition on quality or price, and thus will hinder the pursuit of affordable military superiority. Even before the impact of the U.S. defense budget cuts of the 1990s, the number of competitive suppliers was very small. A 1990 summary of the number of domestic U.S. suppliers for eighteen military items found more than two in only three cases.<sup>10</sup>

Major courses of action conducive to holding down the rapidly growing costs of military systems all involve constraints on unilateralism. The formation of research, development and production consortia that spread costs and risks across several national economies amounts to deliberate interdependence. Self-sufficiency also is reduced by the purchase of cost-effective foreign products (finished systems, sub-assemblies, components, and production equipment) and “renting” technical talent (scien-

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9. CARNEGIE COMMISSION ON SCIENCE, TECHNOLOGY, AND GOVERNMENT, *NEW THINKING AND AMERICAN DEFENSE TECHNOLOGY* 11 (1990)[hereinafter CARNEGIE COMMISSION].

10. JOINT CHIEFS OF STAFF, *supra* note 4, at 5-5. The products involved were: airborne radars, aircraft engines, aircraft landing gear, aircraft navigation systems, infrared systems, RPV/Missile/Drone engines, gun mounts, Doppler navigation systems, aluminum tubing, titanium sheeting, titanium wing skins, titanium extrusions, optic coatings, needle bearings, MILCSPEC-qualified connectors, radomes, image converter tubes, and specialty lenses. Those with three U.S. suppliers were aircraft landing gear, titanium sheeting, and MILSPEC-qualified connectors. *Id.*

tists and engineers) from others instead of relying on more expensive or inferior domestic alternatives.<sup>11</sup>

Warranted reliance on such interdependence rests on confidence in the future behavior of the governments and firms involved. That sort of confidence suffers when protectionist policies are pursued or are even under serious discussion. The potential gain from cooperation then seems a utopian illusion. Doubt gains strength when major powers withdraw or retrench from long standing joint projects, as with U.S. retrenchment on the space station and the supercollider.<sup>12</sup>

A further goal of U.S. military policy is the denial of technology to potentially hostile parties. Yet, the unilateral pursuit of international market dominance creates new security problems. Pursuing economies of scale through foreign sales implies the willingness to transfer the finished products that embody high technology. Such transfers may enable reverse engineering; at the very least they usually involve some transfer of know-how and maintenance/repair capacities.

The global contraction of demand for defense related goods discussed above means that there is intense competition for foreign sales. This competition presses sellers to lessen the sorts of conditionality the U.S. government would like to impose on buyers' military capabilities, arms control practices, and foreign policy toward third parties. Sales of technologies and products with even indirect military applications increase the extent to which the recipients are in a position to end-run U.S. efforts to deny military capacity to current or potential hostile third parties. They may lessen one security problem, by sustaining the United

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11. Costs can, of course, be contained by the deliberate use of civil projects, products and manufacturing capacities for military purposes with associated lower prices and sharing of research, development, and manufacturing base costs. Yet, that option only shifts the debate about the value of protectionist policies to their implications for competitiveness in and technology advance for civil markets. Civil products and the elements in their production are also much harder to wrap in the mantle of secrecy and export controls available for "defense only" matters.

12. See David E. Sanger, *Japan Ties Joint Projects to Space Station Plans*, N.Y. TIMES, May 28, 1991, at C7. Confidence involves identifying the national institutions with the authority and resources to make and honor appropriate commitments. U.S. credibility on that score has taken several blows recently. As the space station episode shows, the government bureau in whose domain the project lies (NASA) may well have an interest in an interdependent approach. It promises reduced costs, risk-spreading, and foreign pressures to pursue the project to its conclusion. The bureau wants to create commitments that make abandonment very difficult. Nevertheless, such self-interested bureaus may not have ultimate authority

States' defense relevant firms and industrial base, while creating another, e.g., proliferation of weapons of mass destruction. Satellite and super-computer sales to China provide but two examples.<sup>13</sup>

## B. ECONOMIC CHANGES AND CHALLENGES

The changes and challenges in the military realm are accompanied by equally profound changes in the roles of the United States and others in the world economy. The United States has become less dominant in many dimensions.<sup>14</sup> Between 1985 and 1991, the U.S. share of OECD GDP and G-7 GDP declined respectively from 46% to 39% and from 54% to 41% at current dollar prices. Asian NIEs increased their GDP by 186%, and the United States by 40%.<sup>15</sup> The U.S. share of world imports declined after 1986, while the share of world exports did no better than hold its own from 1981-91.<sup>16</sup> With regard to high technology product exports, the U.S. share fell from 1970 to 1986 from 28% to 22%, while that of Japan increased from 12% to 24%.<sup>17</sup> In semiconductors, U.S. companies share of worldwide sales declined from 1975 to 1991 from 64% to 36%, and that of Japanese companies increased from 19% to 50%.<sup>18</sup> The United States' share of the worldwide market for data processing equipment and services declined from 47% in 1984 to

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13. See *infra* note 130 and accompanying text.

14. It must be kept in mind, however, that relative U.S. decline and heightened competition are not equivalent to absolute national inferiority. See discussion *infra* notes 63-79 and accompanying text. Nonetheless, more intense competition in high technologies and the products that follow from them does mean that the national interest consequences of openness and cooperative arrangements must be taken more seriously rather than automatically be assumed to be benign. See *infra* part III for a full discussion of the potential threats posed by a policy of interdependence.

Part of the heightened attentiveness involves greater awareness of differences of interests between firms of a particular nationality and their home governments. Globalized firms may increase their R&D activities, sales, and market share in ways that in effect reduce their home nation's position on those factors. An example is the activities of American semiconductor firms in Japan.

15. BANK OF JAPAN, COMPARATIVE ECONOMIC AND FINANCIAL STATISTICS: JAPAN AND OTHER MAJOR COUNTRIES 25 (1993).

16. *Id.* at 131.

17. GOV'T. OF JAPAN, WHITE PAPER ON SCIENCE AND TECHNOLOGY 14 (1991). High tech products are: "aerospace; office machinery, computers; electronic components; drug, medicines; instruments; electrical machinery." *Id.*

18. U.S. CENTRAL INTELLIGENCE AGENCY, *supra* note 5, at 167.



38% in 1991,<sup>19</sup> while its share of global computer exports fell from 38.6% in 1980 to 24.2% in 1990.<sup>20</sup>

Nor have the trends been good with regard to industrial production and the machine tools central to it. For 1988-92, U.S. average annual growth in industrial production was less than that of the OECD, the G-7, and the Asian NIEs.<sup>21</sup> U.S. production of machines tools in 1989 was 72% of that in 1980 measured by value. The comparable performance for Japan was 277%, for Germany 145%, for China 274%, for Taiwan 415%, and for South Korea 551%.<sup>22</sup> During the period 1981-1990, the United States also lost ground as compared to other nations in the use of robots relative to employees in the manufacturing sector. The historical lead of Japan and Sweden continued, but the United States was also surpassed by such competitors as Belgium, Germany, Italy, and Singapore.<sup>23</sup>

At the same time, our dependence on the world economy grew. In foreign trade terms, exports increased between 1987 and 1992 from 5.6% to 7.5% while imports were steady at 9.3%,<sup>24</sup> as the economy adjusted to a more sustainable value for the dollar. Manufactures grew as a share of U.S. exports between 1970 and 1990 from 66% to 76%,<sup>25</sup> and of U.S. imports from 61% to 73%.<sup>26</sup> These are not developments compatible with low cost protectionism.

Developments at the firm level also saw a decline in autonomy with the substantial increase of international strategic alliances. The 1980-84 and 1985-89 periods were characterized by the following numbers of alliances in key sectors between U.S. and European and between U.S. and Japanese firms respectively: biotechnology — 103 and 178; automotive — 20 and 63; new materials — 48 and 92; aviation/military — 31 and 103; information technology — 291 and 388.<sup>27</sup> In short, numerous American firms in technology intensive industries in defense

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19. *Id.* at 201.

20. *Id.* at 200.

21. BANK OF JAPAN, *supra* note 15, at 50. The U.S. figure was 1.7%. The OECD figure was 1.9%, the G-7 figure was 2.9% The Asian NIEs (Korea, Taiwan, Hong Kong, Singapore) averaged 7.5%. *Id.*

22. U.S. CENTRAL INTELLIGENCE AGENCY, *supra* note 5, at 161.

23. *Id.* at 163.

24. BANK OF JAPAN, *supra* note 15, at 151.

25. U.S. CENTRAL INTELLIGENCE AGENCY, *supra* note 5, at 132.

26. *Id.* at 184..

27. OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, OTA-ITE-569, MULTINATIONALS AND THE NATIONAL INTEREST: PLAYING BY DIFFERENT RULES 120 (1993).

relevant sectors have decided that competitiveness requires interdependence and ongoing commitments to foreign firms. In making those alliances, they have been betting against the rise of protectionism bearing on investment and research and development as well as trade. At the same time, the alliances carry with them clear prospects for technology diffusion and global sourcing.

### C. TECHNOLOGY CHANGES AND CHALLENGES

With regard to technology *per se*, we are well into an era marked by the erasure of the line between cutting edge civil and military technology, and the diffusion of global technology competence and aspiration.

The changes to dual-use from only military or only civil technology are well illustrated by micro-electronics technology such as integrated circuits. In the micro-electronics industry, the 1990s, unlike the 1960s, finds defense users and markets to be relatively minor. More generally, between 1960 and 1990, the share of U.S. research and development (R&D) spending funded by the Department of Defense fell from one-half to one-third. The share of Western industrialized world R&D funded by the U.S. Department of Defense declined from one-third to one-sixth. In the United States, R&D spending by industry quadrupled in real terms, with only a doubling in national government spending.<sup>28</sup>

This essential pattern is not unique to microelectronics. The dominant technology role is now played by civil applications in industries which have diffuse global production and which are central to the economic growth of many countries. This means that technology development and acquisition will be driven largely by civil motives which are globally strong.

The implications are varied and important. First, denial of relevant technology will not be primarily a U.S. choice or a government choice. Attempts to deny the technology imply denying civil economic development. Second, the industrial base for military applications will be no stronger than the civil competitiveness of the relevant industries. Costs of the relevant technology to defense establishments will only go up with civil firm inefficiency and will moderate from competitive pressures on that industry. Requiring industries to use more expensive or inferior domestic products carries a bill for product competitiveness and

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28. CARNEGIE COMMISSION, *supra* note 9, at 11.

defense costs, and perhaps for military performance. Most generally, it becomes increasingly less viable to draw a fence around defense relevant technology and industry for special protectionist, nationalistic treatment.

Accordingly, attempts to block the globalization of defense relevant firms amount to hindering the competitiveness of major industries in domestic and foreign civil markets. As a practical matter, the pursuit and achievement of military and civil technology and manufacturing excellence are inextricably tied together.<sup>29</sup>

At the same time, it is increasingly clear that no single country or its firms can rely on a high technology monopoly.<sup>30</sup> Instead, each nation must compete globally by using the world's technology as its own resource.<sup>31</sup> This is particularly a change for the United States, and there is no reason to expect it to be reversed.<sup>32</sup>

Of the twenty-one critical technologies identified and assessed by the Department of Defense in 1991, there are none in which the United States leads our NATO allies in "all important respects."<sup>33</sup> Japan leads in some aspects of five (machine intelligence/robotics, photonics, semiconductor materials and microelectronic circuits, superconductivity, and biotechnology materials and processes), and matches the United States in three others (composite materials, high energy density materials, and simulation and modeling). NATO allies match the United States in seven (air-breathing propulsion, composite materials, machine intelligence/robotics, biotechnology materials and processes, high energy density materials, simulation and

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29. See DAVID B. FRIEDMAN & RICHARD J. SAMUELS, M.I.T. JAPAN PROGRAM, *HOW TO SUCCEED WITHOUT REALLY FLYING: THE JAPANESE AIRCRAFT INDUSTRY AND JAPAN'S TECHNOLOGY IDEOLOGY* (1992).

30. See NATIONAL ACADEMY OF ENGINEERING, *National Interests in an Age of Global Technology*, in *PROSPERING IN A GLOBAL ECONOMY* (Thomas H. Lee & Proctor R. Reid eds., 1991).

31. See Thomas J. Welch, *Technology Change and Security*, 13 WASH. Q. 112 (1990).

32. See YUZO MURAYAMA, M.I.T. JAPAN PROGRAM, *HIGH-TECH WEAPONS, DUAL-USE TECHNOLOGY AND STRATEGIC ALLIANCE* (1992).

33. U.S. DEP'T OF DEFENSE, *CRITICAL TECHNOLOGIES PLAN I-3* (1991). The technologies were: air-breathing propulsion, composite materials, machine intelligence/robotics, passive sensors, photonics, semiconductor materials and microelectronic circuits, sensitive radars, superconductivity, biotechnology materials and processes, computational fluid dynamics, data fusion, high energy density materials, hypervelocity projectiles, parallel computer architectures, pulsed power, signal processing, signature control, simulation and modeling, software producibility, weapons system environment. *Id.*

modeling, and weapon system environment).<sup>34</sup> In the others, both Japan and NATO allies have at least some promising activity.<sup>35</sup> In still another critical technology, that of flexible manufacturing,<sup>36</sup> Japan and the NATO allies hold "possible leadership in some niches of technology" and are "capable of important contributions" in two of four key elements and "may be capable of contributing in selected areas" of the other two.<sup>37</sup>

Trends in relative standing with respect to future R&D and product introduction are also germane. U.S. Department of Defense assessments of eleven emerging technologies with respect to U.S. and Japanese performance<sup>38</sup> find a relative U.S. decline for future R&D in five (advanced materials, biotechnology, digital imaging technology, sensor technology, and superconductors). With respect to future product introduction, the United States is expected to slip in eight (advanced materials, advanced semiconductor devices, biotechnology, digital imaging technology, high density data storage, high-performance computing, opto-electronics, and superconductors). Products are, of course, the military and civil payoffs from new technology, and according to the Department of Defense, the United States is ahead in only three — artificial intelligence, biotechnology, and high performance computing.<sup>39</sup>

Japanese government assessments give more primacy to the United States, and the Department of Defense may have obvious parochial reasons to overestimate rather than underestimate Japan's achievements and potential. Yet even Japan's Science and Technology Agency survey of twelve emerging technologies<sup>40</sup> finds Japan ahead in three (advanced semiconductor devices, high-density data storage, and flexible computer-

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34. *Id.*

35. *Id.* at Annex B, 1-16, 2-12, 3-12, 4-13, 5-11, 6-14, 7-15, 8-19, 9-14, 10-8, 11-12, 12-14, 13-13, 14-21, 15-13, 16-9, 17-13, 18-15, 19-12, 20-10, and 21-13.

36. The Department of Defense defines flexible manufacturing as, "[t]he integration of production process elements aimed at efficient, low cost operation for small, as well as high, volume part number variations, with rapidly changing requirements for end product attributes." *Id.* at I-3.

37. *Id.* at Annex B, 21-13.

38. JOINT CHIEFS OF STAFF, *supra* note 4, at 5-4. The technologies are: advanced materials, advanced semiconductor devices, artificial intelligence, biotechnology, digital imaging technology, computer-integrated manufacturing, high-density data storage, high-performance computing, opto-electronics, sensor technology, and superconductors. *Id.*

39. *Id.*

40. GOV'T OF JAPAN, *supra* note 17, at 5. The technologies are: "biotechnology, medical devices and diagnostics, advanced materials, superconductors, advanced semiconductor devices, digital imaging technology, high-density

integrated manufacturing)<sup>41</sup> and equal in five others (advanced materials, superconductors, digital imaging technology, optoelectronics, and sensor technology).<sup>42</sup> Japan is viewed as gaining relative to the United States in all but the three areas in which it is held to be ahead already, and holding its lead in those.

These judgments suggest that simple protectionism may deny to the U.S. government and U.S. firms the advanced technology associated with products that are superior in terms of uniqueness, quality, and cost. Yet equality or even superiority in those terms is essential to military strength and civil competitiveness.<sup>43</sup>

Some aggregate patterns reinforce the sense of America being overtaken. By 1985, Japan and Germany at least matched the United States in share of GNP devoted to R&D and have continued to do so.<sup>44</sup> As long ago as 1971, those countries passed the United States in the percentage of GNP devoted to non-defense R&D.<sup>45</sup> In constant dollars, the Japanese increase in non-defense R&D for the 1980s amounted to 69% and that of the United States to only 21%. While U.S. government spending for R&D concentrated on defense (66% in 1989), the Japanese (5%) and Germans (22%) had different priorities.<sup>46</sup>

Patents granted by the United States showed a substantial shift toward foreigners, and especially the Japanese from 1970 to 1989. The 1970 percentage for all foreigners was 27% (4% Japanese).<sup>47</sup> In 1989, for all foreigners it was 47.5% (Japanese 21.1%). That same year, foreigners were awarded only 13.5% of the patents granted in Japan (U.S. 6%).<sup>48</sup>

In the military, economic and technological context we have sketched, the United States stands out for its predominantly

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data storage, high-performance computing, optoelectronics, artificial intelligence, flexible computer-integrated manufacturing, and sensor technology." *Id.*

41. *Id.*

42. *Id.*

43. FUMIO KODAMA, ANALYZING JAPANESE HIGH TECHNOLOGIES: THE TECHNO-PARADIGM SHIFT (1991).

44. NATIONAL SCIENCE BOARD, SCIENCE & ENGINEERING INDICATORS - 1989 287 (1989); GOV'T OF JAPAN, INDICATORS OF SCIENCE AND TECHNOLOGY 1993 16 (1993); AGENCY OF INDUSTRIAL SCIENCE AND TECHNOLOGY, TRENDS OF PRINCIPAL INDICATORS ON RESEARCH AND DEVELOPMENT ACTIVITIES IN JAPAN 3 (1991).

45. NATIONAL SCIENCE BOARD, *supra* note 44, at 288.

46. AGENCY OF INDUSTRIAL SCIENCE AND TECHNOLOGY, *supra* note 44, at 34.

47. NATIONAL SCIENCE BOARD, *supra* note 44, at 356.

48. GOV'T OF JAPAN, *supra* note 44, at 160-161.

outward flow of technology to its major competitors,<sup>49</sup> especially Japan. In 1988, the ratio of U.S. technology exports to imports was 5.24 to 1, while for Japan, the United Kingdom, France, and the Federal Republic of Germany, the ratio was less than one.<sup>50</sup> In 1989, the United States provided almost two-thirds of Japan's technology imports while receiving about one-third of Japan's.<sup>51</sup> The net outward flow from the United States to Japan was particularly pronounced in key dual-use sectors. The ratio of Japanese to U.S. technology transfers was: ceramics .30; electronics and communication .26; non-motor vehicle transportation .02; and precision instruments .04.<sup>52</sup>

## II. POLICY CHOICES

### A. THE NATIONALIST TEMPTATION

It is hardly surprising that the changes and challenges just sketched have led to vigorous support in some quarters for policies to maximize self-sufficiency in defense-related R&D, trade, and direct investment. The advocates of such measures pursue a vision in which all R&D and production is performed in the United States by domestic firms. This aims to avoid asymmetric dependence and to provide enhanced U.S. national security through comprehensive technology leadership and defense industrial capacity with positive spillovers to the civil sector.

Congressional initiatives linked to Defense Department, foreign economic policy, and industrial policy bills have called in a variety of ways for "buy American" requirements. The initiatives have focused on such measures as constraints on international defense industrial cooperation, denial of incoming direct investment in defense-related firms, and restriction of R&D funds to work conducted in the United States and even to only U.S.-owned organizations. The Exon-Florio Amendment<sup>53</sup> gives the President authority to block incoming foreign direct investment for (otherwise unspecified) "national security" reasons.<sup>54</sup>

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49. Concerns about the threats to technology leadership posed by the efforts of others are compounded by apparently exceptional U.S. generosity in sharing the fruits of its R&D efforts.

50. AGENCY OF INDUSTRIAL SCIENCE AND TECHNOLOGY, *supra* note 44, at 54.

51. *Id.* at 44.

52. *Id.* at 53.

53. Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 110-418, tit. V, § 5021, 102 Stat. 1107, 1425-26 (amending the Defense Production Act of 1950, 50 U.S.C. App. § 2170 (1988)) [hereinafter Exon-Florio Amendment].

54. See generally, Edward M. Graham & Michael E. Ebert, *Foreign Direct Investment and U.S. National Security: Fixing the Exon-Florio Process*, 14

The Sematech consortium to boost U.S. semiconductor competence, which is partially supported by the Pentagon, bars foreign participation.<sup>55</sup>

Bills introduced in the 101st Congress indicated a desire for more protection. The Walgren Amendment<sup>56</sup> to the Defense Production Act of 1950<sup>57</sup> tried to extend Presidential takeover authority to "essential technologies," while the Dixon bill<sup>58</sup> sought to amend the same legislation to give the President broad authority to "shape defense preparedness programs and to take appropriate steps to maintain and enhance the defense industrial and technology base."<sup>59</sup>

The most prominent economic (i.e. wealth-increasing) arguments for these lines of policy rest on some version of "strategic trade theory." Assume that nation A (usually Japan) has a substantial domestic market and an advanced technology industry in a dual-use area with significant economies of scale and important cumulative learning curve effects. Assume further that nation A effectively shields its innovative enterprises from effective competition and provides them with competitive advantages. Nation A's firms will come to dominate because they will serve a world market, while U.S. firms will be handicapped by access only to a part of the world market and perhaps by other competitive disadvantages. If these conditions persist, the economic implications for U.S. competitiveness may well involve a spiral of decline, and the ultimate defense implications are also plain. The decline will sooner or later translate into inferiority in the development, prototyping, manufacturing and production, and product improvement stages for defense relevant dual-use technologies.<sup>60</sup>

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WORLD ECON. 245 (1991) (discussing the background of the Exon-Florio Amendment).

55. See generally, LAURA D'ANDREA TYSON, WHO'S BASHING WHOM? TRADE CONFLICT IN HIGH-TECHNOLOGY INDUSTRIES 149-54 (1992) (discussing the Sematech project).

56. H.R. 5225, 101st Cong., 2d Sess. § 1 (1990).

57. Defense Production Act of 1950, 50 U.S.C. App. §§ 2061-2170 (1993).

58. S. 1379, 101st Cong., 1st Sess. § 101 (1989).

59. *Id.*

60. Many analysts characterize the technology life cycle as composed of five rather distinct stages: basic research, development through prototyping, manufacturing and production, product improvement, and maintenance and repair. In general, the keys to the objectives previously set out lie primarily in the stages of development through prototyping, manufacturing and production. A nation's relative and absolute performance in these stages will determine performance in product improvement.

This perilous defense prospect arguably warrants nationalist policies even in the face of persuasive arguments against strategic trade policies on narrowly economic grounds: risks of lower national income following a reduction of nationally gainful trade, higher costs of capital, greater national R&D burdens, and foreign retaliation. But most analysts doubt that the U.S. Government will be able to pick out truly critical technologies and industries and that U.S. politics will allow for a regime that discriminates in favor of selected industries for special protection from foreign involvement.<sup>61</sup>

#### B. PRAGMATIC INTERNATIONALISM BASED ON AMERICAN STRENGTHS

Another set of views finds the nationalist measures a policy mirage, albeit one that may be useful for bargaining purposes. As indicated earlier, we favor this view. We advocate the creation of a level playing field for an international defense-relevant technological and industrial community within the advanced industrialized democracies. This calls for positive policies, detailed below, to achieve a satisfactory outcome across those national objectives that remain viable. Otherwise, security cooperation will suffer, the United States will miss out on attractive technology, and U.S. industry will lose opportunities in foreign markets and the increased competitiveness associated with globalization. This policy impulse is manifest in the Nunn-Quayle legislation<sup>62</sup> for cooperative defense projects.

It is crucial to note that we do not advocate accepting interdependence out of weakness. Before choosing a policy direction, we must remind ourselves of some major American strengths for successful rather than submissive interdependence.

Strengths in the military area are most obvious. Massive defense budget and force reductions cannot deny U.S. standing as the predominant military power in the world. The U.S. lead in many defense products is substantial. Furthermore, turbu-

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61. See, e.g., Paul Krugman, *Is Free Trade Passé?*, 1 J. ECON. PERSPECTIVES 1 (1987); J. David Richardson, *The Political Economy of Strategic Trade Policy*, 44 INT'L ORG. 107 (1990).

62. The Nunn-Quayle-Warner Amendment called for equal financing of codevelopment projects with NATO allies. Department of Defense Authorization Act of 1986, Pub. L. No. 99-145, § 1102, 99 Stat. 583, 708 (1985) (amending the Arms Export Control Act, 22 U.S.C. § 2767). The Nunn-Quayle Amendment inserted "or for procurement by the United States of munitions from the North Atlantic Treaty Organization or a subsidiary of such organization" after "member country" in clause (C) of 22 U.S.C. § 2767(b)(1)(C) (1990).



lence and uncertainty in much of the world continue to create non-trivial appetites for U.S. security relationships.

In the economic area, relative decline is only that. Scale still matters. The United States remains the world's largest single economy, exporter, and importer in absolute terms.<sup>63</sup> The rate of growth in its export volumes surpassed that of each of the other G-7 countries in each of the years from 1987 through 1991.<sup>64</sup> As of 1991, North America provides by far the world's largest national market for data processing equipment and services.<sup>65</sup> The United States provides the world's largest market for telecommunications equipment and services,<sup>66</sup> and machine tools.<sup>67</sup> In the decade from 1980 to 1990, American share of global exports of high technology products increased in microelectronics (18.3 to 27.5%), telecommunications equipment (10.9 to 15.9%), aerospace (47.6 to 50.3%), medicine and biologicals (11.4 to 13.5%), and organic chemicals (13.9 to 14.9%).<sup>68</sup> The U.S. national share in computers and scientific/precision equipment remained larger than that of any other country.<sup>69</sup>

These are hardly signs of a fundamental and general loss of competitiveness in high technology products. The growth of corporate international strategic alliances surely follows in part from the attractiveness foreigners find in American skills, production technologies and markets. Those alliances cost both the foreign countries and the United States some autonomy.

With regard to the U.S. technology base, there are also significant strengths. U.S. 1992 R&D expenditures in purchasing power parity terms equaled the combined expenditures of Japan, Germany, France and the United Kingdom,<sup>70</sup> as did the number of researchers.<sup>71</sup> Even during the period of priority for defense spending of the mid-1980s, the United States was able

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63. BANK OF JAPAN, *supra* note 15, at 1, 129, 130, 131.

64. U.S. CENTRAL INTELLIGENCE AGENCY, *supra* note 5, at 51.

65. *Id.* at 166.

66. *Id.* at 201.

67. *Id.* at 203.

68. *Id.* at 200.

69. *Id.*

70. GOV'T OF JAPAN, *supra* note 44, at 3; BANK OF JAPAN, *supra* note 15, at 193-94. It should be noted that "revisionists" contend that the U.S. and the Japanese governments have underestimated R&D spending by the Japanese private sector which would allegedly bring Japan at least to a matching level. See William J. Broad, *In Realm of Technology, Japan Seizes a Greater Role*, N.Y. TIMES, May 28, 1991, at C1.

71. GOV'T OF JAPAN, *supra* note 44, at 10-11.

to outspend Japan on non-defense R&D by about 1.8 to 1.<sup>72</sup> U.S. manufacturing firms during the 1980-91 period did not fall behind a surging Japan in the percent of net sales spent on R&D, and Japanese firms show signs of pulling back on R&D expenditures.<sup>73</sup> Foreign demand for U.S. technology in terms of the excess of exports over imports<sup>74</sup> surely indicates strength as well as a lack of protectiveness.

Indeed, there is evidence which suggests that a shift to protectionism would have particularly adverse impacts on the high technology parts of the American economy. Those are the parts of American manufacturing that stand out for the portion of their products exported (by a ratio ranging from 1.5:1 to 2:1 for 1978 through 1986).<sup>75</sup> High-tech is the sector of U.S. trade in manufactures for which exports and imports have been in rough balance rather than deficit.<sup>76</sup> While that balance has weakened, the United States has still maintained a predominant share of its home market for domestic producers.<sup>77</sup> An open flow of international investment also has been more important for the U.S. high tech industry than for other parts of the U.S. economy. By the mid-1980s, high tech manufacturers had 42% of their assets in foreign affiliates,<sup>78</sup> compared to only 30% for other types of manufacturing firms.<sup>79</sup>

In sum, the United States retains the central role in the world high technology system and in its trade and investment elements. It stands to lose by high-technology protectionism in research and development, trade, and investment — as do its Japanese and European competitors. By contrast, a policy of interdependence stands to benefit the United States both domestically and in the global market.

### III. TRADE, INVESTMENT, AND FOREIGNNESS

What does interdependence as a central element of U.S. strategy imply for trade and investment policy? How can the cooperative course meet objections that it involves unacceptable

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72. NATIONAL SCIENCE BOARD, *supra* note 44, at 288.

73. GOV'T OF JAPAN, *supra* note 44, at 150; Andrew Pollack, *Japanese, in a Painful Recession, Trim Industrial Research Outlays*, N.Y. TIMES, Nov. 29, 1993, at A1.

74. See *supra* text accompanying notes 49-50.

75. NATIONAL SCIENCE BOARD, *supra* note 44, at 376.

76. *Id.* at 379. Data are for 1970-87.

77. *Id.* at 374.

78. *Id.* at 155.

79. *Id.* at 381.

and avoidable costs by inducing U.S. dependence on others, eroding technology supremacy, and reducing military sustainability?

In a world of limited international cooperation, it is surely necessary to be alert to threats of foreignness to national objectives. Much of the putative threat is held to lie in the areas of trade and incoming foreign direct investment separate from, or in association with, technology monopoly. Understanding the ways in which the foreignness of trade and investment affect U.S. national objectives suggests the need for remedies, and the need to avoid endangering the benefits from cooperation in defense relevant technology.

#### A. BASIC THREATS OF FOREIGNNESS

Three categories of threat from foreignness in trade and investment require attention: monopoly, foreign ownership, and foreign location. We will discuss them in this section, and then turn to some policy proposals for constraining the threats they may pose.

##### 1. Monopoly

Total monopoly allows for denying supplies at the discretion of the monopolist and charging exorbitant prices. Reality is usually characterized by some degree of less than total monopoly. The degree of monopoly, usually indexed as the level of price above marginal cost, is partly a function of the concentration of sellers, i.e., the extent to which a few firms or governments control a high percent of the total market, thereby facilitating collusion. The other critical ingredient consists of barriers to entry and exit — advantages that keep other firms from dissolving the position of those exploiting market power. The threat to national security from monopoly power is then three-fold. The first is that of commercial exploitation through the price mechanism. The second is the capacity to maintain barriers to entry and exit and thus make others politically dependent on the continuing goodwill of the monopolistic supplier. The supplier can set conditions that interfere with the autonomous pursuit of national security capabilities and their application. The third is the discretion of the monopolist to supply security goods and technologies to third parties, thus strengthening their relative security position against other purchasers. The capacity to eschew export controls is of course greatest if the monopolist is foreign in control and location.

## 2. Foreign Ownership

In the absence of substantial monopoly power, foreign ownership of firms located in another country affords little more than an information gathering opportunity for those firms, including an opportunity for technology acquisition. It is not obvious, however, that it provides a uniquely superior means to acquire technology compared to other mechanisms ranging from unrestricted access to technological information to facilities gained by licensing arrangements. Restrictions on incoming investment hardly obstruct technology diffusion if other channels of access to the technology base are largely open, as they are in the United States. Much of the output of the U.S. research establishment, particularly that produced in the universities, goes immediately into the public domain. Further, firms license their technologies without any government interference unless they have immediate and direct military relevance.

## 3. Foreign Location

Aside from considerations of monopoly or ownership, location of production in other countries may endanger military supplies by exposing the importer to delay or interdiction by foreign powers. Delays or more permanent disruption could even arise in an unconcentrated industry consisting entirely of domestic firms with foreign operations. The problem becomes more likely as the firms are spatially concentrated in a single foreign location, particularly if it is distant and lanes of transit must pass through geographic bottlenecks. In the absence of monopoly, the supply cut-off threat can be invalidated by stockpiling measures proportionate to demand during the cutoff period and does not require trade or investment controls. Stockpiles may consist of finished products, components and sub-assemblies, raw materials, or production capacity (e.g., cold lines of machine tools).

Stockpiling does not counter another threat from foreign location, that of spillover reduction. Economic activity can have positive spillover effects (externalities) that decline sharply with geographic distance. Unappropriable gains in knowledge and human capital may occur abroad even when foreign production is owned by domestic firms and where a high level of competition prevails. Also, the R&D activities of firms may be considered as an independent form of production whose output is not fully embodied in the products subsequently produced. Foreign location of R&D then becomes a distinct concern with possible security implications.

## B. SUMMARY

Most of the threat of foreignness comes from a combination of two or more of the three characteristics discussed above, rather than from one of them in isolation. Some substantial level of monopoly power combined with foreign ownership forms most of the basis of the threat to national security. Monopoly power can have negative consequences whether exercised by a foreign or a domestic owner. Yet the U.S. government has legal means to assure supply even from a foreign monopolist when its operations are located in the United States through the Act of October 6, 1917 ("Trading With the Enemy Act")<sup>80</sup> and the International Emergency Economy Powers Act of 1976 (IEEPA).<sup>81</sup>

The special emergency measures do not apply when the source of supply is located outside U.S. jurisdiction. Moreover, because incoming foreign direct investment (IFDI) — unlike importation — almost necessarily involves some irreversible investment, some human and physical capital formed by the foreign investor becomes sunk cost, and its partial redeployment by the host jurisdiction is possible. This creates host leverage in case of conflict between the host country and either the foreign investor or its home government. Some residual supply capacity may well remain even in cases where disputes are not resolved. Nevertheless, foreign firms, even within U.S. jurisdiction, are open to influence by their home country governments. The threat of purely commercial exploitation including choices of development and product line emphasis and policy manipulation are lessened but not eliminated by firm location in the United States.

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80. Act of Oct. 6, 1917, 50 U.S.C. App. § 5(b) (1990).

81. 50 U.S.C. §§ 1701-1706 (1976). Under section 5(b) of the Trading With the Enemy Act, the President may "investigate, regulate, direct and compel, nullify, void, prevent or prohibit, any acquisition, holding, withholding, use, transfer, withdrawal, transportation, importation or exportation of, or dealing in, or exercising any right, power, or privilege with respect to or transactions involving, any property in which any foreign country or any national thereof has any interest . . ." 50 U.S.C. App. § 5(b).

Because the original focus of this legislation was wartime enemies of the United States and its use for other purposes was merely allowed as an apparent afterthought, perhaps subject to presidential abuse, the Congress passed IEEPA. While court interpretations of the Trading With the Enemy Act had allowed the President to take title to foreign property, IEEPA, which applies to situations short of war, only allows for seizure and operation, not actual ownership. 50 U.S.C. § 1702. See EDWARD M. GRAHAM & PAUL R. KRUGMAN, *FOREIGN DIRECT INVESTMENT IN THE UNITED STATES* 105-06 (2nd ed. 1991).

We conclude that each type of foreignness poses some dangers, but not completely unmanageable ones. Questions then arise about how much increasing interdependence should be avoided and how much it should be pursued with the safeguard of particular threat-constraining policies.

#### IV. DEVELOPING NATIONAL POLICY

Both the nationalist and internationalist schools agree that positive policy measures are needed in the new global environment. They disagree on what outcomes are feasible and of greatest priority, and thus on what means are wise. Analysts favoring a greater level of cooperation in security-relevant R&D, direct investment, and trade have advanced several proposals for reconciling interdependence with U.S. security.

##### A. CONCENTRATING ON CONCENTRATION

Theodore Moran seeks to gain the benefits of cooperation while avoiding the threats of foreign monopoly power.<sup>82</sup> The key is the threshold of concentration that warrants nationalist measures. Moran advocates a "4/50" rule.<sup>83</sup> That is, a *prima facie* case for various government interventions, outlined below, exists when either four firms or four countries account for fifty percent or more of the arms-length market for any good or service important for military purposes.<sup>84</sup> Concentration below the level of his rule "denotes the absence of any rationale for preserving the local producers,"<sup>85</sup> even when the viability of domestic production is endangered.

Under Moran's proposal, foreign firms should be given an open opportunity to participate in publicly-funded R&D so long as the R&D takes place in the United States and subsequent foreign siting of production is located outside the foreign firm's home country or any of the four largest national production sites — if four countries or four companies supply more than 50 percent of the arms length world market.<sup>86</sup>

With respect to IFDI, a market not falling within the strictures of the rule should be open to all comers. A friendly take-over would generally be allowed if R&D and production

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82. Theodore H. Moran, *The Globalization of America's Defense Industries: Managing the Threat of Foreign Dependence*, 15 INT'L SECURITY 57 (1990).

83. *Id.* at 82-83.

84. *Id.*

85. *Id.* at 85.

86. *Id.* at 83.

remained in the United States, or if production was to be moved to an offshore site that was neither the investor's home country or one of the top four producing countries. Otherwise, the "4/50 Rule" could be used to block it.<sup>87</sup>

Moran stresses that his approach needs refinement and admits problems of output classification by standard industrial classification (SIC) categories. These are very serious problems. In determining SIC categories, the Census Bureau must gather data from individual firms. It therefore uses definitions corresponding to firms' production classifications rather than the substitution-in-use criterion which comes closest to the economist's view of a product as defined by a gap in the chain of substitutes.<sup>88</sup> Moran does not discuss these difficulties.

The SIC system provides data on domestic production concentration at various levels of aggregation from two-digit "industry groups" to seven-digit "product" or "commodity" categories. Within each larger category, there may be considerable concentration variation in constituent subgroups.<sup>89</sup> Moreover, the data requirements of Moran's proposal differ in two ways.

First, Moran proposes world-wide concentration ratios that would necessarily be based on somewhat incomparable national data. Further, data such as those gathered by the Census Bureau are for production only, and the data draw no distinction between foreign and domestic owners. To gain a picture of concentration in the domestic market it is necessary to subtract exports and add imports.

Second, Moran advocates the use of "arm's length" transactions, i.e., General Motors engine output for its own cars would not count, but only its other engine production.<sup>90</sup> No government entity in any country collects such data.

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87. *Id.* at 94-99.

88. See generally F.M. SCHERER & DAVID ROSS, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE*, 73-79 (3rd ed. 1990) (discussing limitations of SIC data).

89. For illustration, we constructed the weighted average four-firm concentration ratio of the five digit "product classes" that constitute a four digit "industry"—machine tools, metal-cutting types—and also their (weighted) standard deviation. The average is .51 while the standard deviation is .58. This yields a coefficient of variation of 1.14, which indicates high variability within the category. Defining the product somewhat differently, either in terms of category or level of aggregation, may thus yield quite different concentration estimates.

90. Whether arm's length transactions would yield higher or lower concentration ratios than those based on production or use depends on the structure of the specific industry.

Unfortunately, the data problems of Moran's approach pale by comparison with the conceptual difficulties. Concentration ratios are meaningful only if they say something about competitive conditions in an industry. For example, Department of Justice (DOJ) Merger Guidelines of 1982<sup>91</sup>, 1984<sup>92</sup> and 1992<sup>93</sup> do not take published concentration ratios at face value for any level of disaggregation.<sup>94</sup> In one alternative application, DOJ defines a "market" by attempting to determine the smallest group of products which, if their prices were raised together by five percent, could hold that price without sales erosion within a year. This recognizes that short-run substitution may come on the demand side from products not included in a particular definition and, alternatively, that the supply of the product considered may sometimes be augmented quite easily by existing firms not originally making them. Understandably, each "market" must be handcrafted and subjective judgment plays a part; published data seldom provide much help.<sup>95</sup>

One can certainly claim that critical levels of concentration may differ for security-related output policies from those for antitrust policy as a whole, but we found no carefully defended case in the new literature. Moran acknowledges that the level of concentration he suggests might not be the appropriate general standard,<sup>96</sup> and, indeed, for ordinary firm output, "4/50" is quite a low level of concentration.<sup>97</sup> Interestingly, Moran fails to note that a large amount of militarily relevant domestic output comes

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91. 47 Fed. Reg. 28,493 (1982).

92. 49 Fed. Reg. 26,823 (1984).

93. 57 Fed. Reg. 41,552 (1992).

94. See Steven C. Salop, *Symposium On Mergers and Antitrust*, 1 J. ECON. PERSPECTIVES 3 (1987); Lawrence J. White, *Antitrust and Merger Policy: Review and Critique*, 1 J. ECON. PERSPECTIVES 13 (1987); Franklin M. Fisher, *Horizontal Mergers: Triage and Treatment*, 1 J. ECON. PERSPECTIVES 23 (1987); and Richard Schmalensee, *Horizontal Merger Policy: Problems and Changes*, 1 J. ECON. PERSPECTIVES 41 (1987).

95. Considering the fruits of successful R&D illustrates the general problem. For example, to what "industry" is an innovation to be assigned? If the innovation is a unique product, then by some definition a monopoly is immediate. If a new development is a proprietary production improvement, then the new process must have some similarity to others.

96. Moran, *supra* note 82, at 83-84.

97. *Id.* In fact, under most circumstances, the Department of Justice would find concentrations meeting Moran's suggested standard too low even to warrant investigation. The Department of Justice employs the Herfindahl-Hirschman index of concentration rather than a four-firm concentration ratio, but four-firm ratios of 50 typically correspond to H-H values of 800 to 1000; official attention usually begins above that level. SCHERER & ROSS, *supra* note 88, at 185.



from industries with much higher concentration than his cut-off.<sup>98</sup> Yet, no dangers of purely domestic concentration are cited, and no policies are put forward. Foreign monopoly is ostensibly special on national security grounds. Yet domestic monopoly also threatens national welfare; that is why the United States has antitrust laws.<sup>99</sup> On the other hand, we fail to see why the apparent conditions for purely commercial exploitation, i.e., "excess profits," are more important in defense-related industries than elsewhere, particularly given the considerable bargaining power the U.S. government frequently brings to its purchases. In the private sector, powerful buyers can offset seller monopoly power, and this potential is recognized in the DOJ guidelines.<sup>100</sup>

Moran also does not address the other major element of monopoly power besides concentration: barriers to entry and exit. In the simplest theory of competition, concentration is usually viewed as a necessary but insufficient condition for the exploitation of market power. Fewness of incumbent sellers may tempt them to explicitly or tacitly collude to raise prices. But unless there are factors that render entry (and low cost exit) difficult, attempts to raise price above cost simply provide an irresistible lure bringing other sellers into the market. As noted, one DOJ definition of the market takes short-run entry directly into account. In addition, it defines "easy" entry as a situation in which the elevation of price over cost by as little as five percent would be eroded by new sellers between one and two years.

While Moran's use of concentration as a guide to monopoly power by competing firms may be suggestive if imprecise, the use of a similar standard for nations — even if the exact numbers were different — strikes us as odd. The effects of *tacit* collusion among nominally competing firms have contributed to the development of rules of thumb. But nothing prevents governments from colluding explicitly and allowing or even fostering collusion by firms in their own jurisdictions. Absent information about political cohesion of the pertinent states or the extent of

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98. Concentration in airframes or aircraft propulsion units, for example, greatly exceeds the guideline. Moran's citation of overall defense supplier concentration as 54 percent in 1982, up from 33 percent in 1955, Moran, *supra* note 82, at 90, does not inform the present discussion.

What matters is concentration at the individual product level.

99. Domestic monopoly largely redistributes national income rather than lowering it as foreign monopoly does. But this distinction scarcely stands out in security related matters.

100. See Salop, *supra* note 94, at 8.

effective cartel prevention abroad, the application of any "one size fits all" standard seems difficult to defend.<sup>101</sup>

Graham and Krugman take a somewhat different view of the concentration in defense-related industries by implicitly treating domestic and foreign firms similarly.<sup>102</sup> They suggest that the Sherman Act<sup>103</sup> might be amended to be especially stringent for goods and services "critical to the national defense."<sup>104</sup> The allowable share for the largest firm "would surely be less than 100 percent but probably more than 25 percent".<sup>105</sup> This rule differs conceptually and not just numerically from that offered by Moran.<sup>106</sup> From the rule's context, it appears that Graham and Krugman would look only at concentration in the U.S. market in making their determinations. But ignoring barriers to entry in this situation is even less defensible than when the global market is considered because suppliers not currently serving the U.S. market might be able to substitute quickly for current sources if the latter's performance proved to be unsatisfactory. This is just the sort of entry considered in the DOJ Guidelines.

Moreover, both Moran and Graham-Krugman should consider that in some industries the wait could be short enough to be tolerable, even if the measured concentration ratio is high. In particular, intra-industry reallocation of production should be considered. Finally, neither Moran nor Graham and Krugman consider an important recent concern of antitrust policy: econo-

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101. Furthermore, how are member states of the European Community to be counted? The overwhelming part of global capacity in high technology is located in the United States, Japan, or the Community.

102. See generally GRAHAM & KRUGMAN, *supra* note 81, at 139-61.

103. The Sherman Act of 1890 provides the foundation for U.S. antitrust law. Sherman Antitrust Act, ch. 647, 26 Stat. 209 (1890)(current version at 15 U.S.C.S. §§ 1-3). Section one of the Sherman Act states that "every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce of the several States, or with foreign nations, is declared to be illegal . . ." *Id.* Section two declares that "every person who shall monopolize or attempt to monopolize any part of the trade or commerce among the several States, or with foreign nations shall be deemed guilty of a felony . . ." *Id.*

The Clayton Act of 1914 covers specific firm practices that can be found illegal. Clayton Act, 38 Stat. 730 (1914) (current version at 15 U.S.C. § 18 (1988)).

104. GRAHAM & KRUGMAN, *supra* note 81, at 151.

105. *Id.*

106. If the schemes could be applied to the same defined market, the numerical benchmark would differ significantly. If the largest firm had 25 percent, and the four firm ratio was only 50, the next three firms in the four firm ratio could have an average of only a little more than 8 percent apiece.

mies of scale.<sup>107</sup> What price in overall efficiency should one pay to decrease top level concentration?

#### B. DISCRETION IN A NEW PROCEDURE

Graham and Ebert propose yet another approach to the application of competition policy to defense-related industries:<sup>108</sup> the development of what amounts to a U.S. version of the British Monopolies and Mergers Commission.<sup>109</sup> Incoming foreign direct investors would have their proposed activities vetted as part of a process involving the Justice Department and the Federal Trade Commission so that competition issues receive thorough consideration. They propose three screens for an acquisition above a certain threshold of firms holding classified contracts with the Departments of Defense or Energy: 1) would the acquisition affect the ability of the armed services to buy desirable quality at attractive prices? 2) would the sources for defense purchases be significantly reduced? and 3) would rivalry in R&D be significantly diminished?<sup>110</sup> This is "rule of reason," situation-specific, antitrust policy in a fairly pure form.<sup>111</sup> No real economic guidelines such as those now governing ordinary mergers are offered.

Another subjective criterion would apply to defense-relevant mergers or acquisitions, regardless of whether classified activity is involved and whether or not one of the firms is foreign. Authorities may have "serious reservations about a domestic takeover of that firm if the bidder lacked experience in defense procurement, had a history of less than satisfactory contractual dealings with the U.S. government, or perhaps was a corporate raider with a reputation for dismembering its trophies after concluding a takeover".<sup>112</sup> The authority would probably have strong concerns about a takeover from a firm located in a nation that is a "likely adversary" of the United States, as well as from

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107. For a discussion of economies of scale as a competition policy issue, see generally Graham & Ebert, *supra* note 54.

108. *Id.* at 256-61.

109. OFFICE OF FAIR TRADING, MERGERS, A GUIDE TO PROCEDURES UNDER THE FAIR TRADING ACT OF 1973 25-28 (London: H.M.S.O., 1989).

110. Graham & Ebert, *supra* note 54, at 261-66.

111. Early in the history of U.S. antitrust, certain practices, i.e. most explicit agreements among nominal competitors, were found to be illegal *per se* as violations of Section I of the Sherman Act. Other challengeable behavior was considered under a "rule of reason" standard. The Clayton Act of 1914 employs the "reasonableness" standard explicitly. See SCHERER & ROSS, *supra* note 88, at 317-325.

112. Graham & Ebert, *supra* note 54, at 265.

one in a friendly or non-aligned nation if the firm has a "reputation for imposing its interpretations of strict neutrality on its domestically-owned firms".<sup>113</sup>

The Exon-Florio Amendment<sup>114</sup> gives the President the authority to block foreign acquisitions on national security grounds. We fear that revisions inspired by Graham and Ebert, although clearly intended to be friendly additions to competition policy, might be construed virtually as a mandate to find and keep domestic suppliers for the Defense Department. The availability of so many unweighted criteria could provide a promising avenue of attack for domestic protectionists. But this is speculation. Uncertainty about just how decision-making would actually be made means that even the general impact of the policy innovation cannot be confidently predicted.

### C. STRONG-ARMING FOREIGN MONOPOLISTS

Thus far, the discussion has focused mainly on alternative measures of probable competitiveness and their use to bar increases in market power based on acquisition. This leaves open the question of what to do about suppliers who already have monopoly power. In the more activist tradition of U.S. antitrust, divestiture has been proposed as a solution.<sup>115</sup> This policy direction seems to be favored by Graham and Krugman,<sup>116</sup> although only in extreme conditions. But such an approach, which has actually been used very rarely in American history, can feasibly apply only to firms already in U.S. jurisdiction.<sup>117</sup>

What if a monopolist sells from a foreign base? Moran clearly prefers the encouragement of such exporters to become direct investors because of the leverage it gives the U.S. government: a supply cut-off by an exporter at its government's direction becomes instead an extraterritorial dispute.<sup>118</sup> The United States has been the aggressive party in such disputes countless

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113. *Id.*

114. 50 U.S.C. App. § 2170(d) (West Supp. 1993).

115. See e.g., CARL KAYSEN & DONALD F. TURNER, *ANTITRUST POLICY: AN ECONOMIC AND LEGAL ANALYSIS* (1959).

116. GRAHAM & KRUGMAN, *supra* note 81, at 153.

117. A measure as radical as break-up can clearly take place only where jurisdiction is firmly established. Moreover, such restructuring is very costly to litigate and involves considerable risk. The courts have ordered restructuring only eight times since 1950 in monopolization cases (of the 33 ordered since 1890). As Scherer and Ross have argued, "[t]ime and market forces are powerful restructurors — more powerful than U.S. antitrust has ever been." SCHERER & ROSS, *supra* note 88, at 482.

118. Moran, *supra*, note 82, at 82-84.

times in the post-war period, usually directing foreign subsidiaries to respect American policy concerning such issues as anti-trust, trading with communist countries, or the selection of national sources for finance.<sup>119</sup> Such practice outraged our allies, and even the Canadian government passed blocking legislation.<sup>120</sup> With the volume of direct investment in the United States now approximately of the same magnitude as such U.S. investment abroad, the shoe can be expected to be on the other foot with increasing frequency. This reality should give impetus to the search for an international agreement restraining extra-territorial practices.

Graham and Krugman emphasize fall-back more than leverage. They favor obliging foreign monopoly exporters either to license U.S. firms or to integrate forward into the U.S. market, perhaps with requirements about U.S.-based R&D and the employment of American nationals in certain echelons of the subsidiary's operations.<sup>121</sup> Moran and Graham-Krugman agree that entry should be denied if access to the U.S. market on acceptable terms cannot be negotiated, and that the United States should then attempt to duplicate the monopolized product.<sup>122</sup> To do this, of course, it must maintain a posture of comprehensive scientific, technological, and manufacturing excellence.

Graham and Krugman regard such limited "performance requirements" as reasonable for all nations;<sup>123</sup> in fact, they advocate enshrining them in an international agreement.<sup>124</sup> Yet notice how difficult it is to distinguish in practice between a policy designed to assure and a policy designed to advantage. With so many "strategic trade" advocates willing to accept policies that seem suited to their perspective, we think at the very least

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119. *Id.* at 65. See also JOHN H. DUNNING, *MULTINATIONAL ENTERPRISES AND THE GLOBAL ECONOMY* 580-83 (1993).

120. A. EDWARD SAFARIAN, *MULTINATIONAL ENTERPRISES AND PUBLIC POLICY: A STUDY OF THE INDUSTRIAL COUNTRIES* 124 (1993).

121. GRAHAM & KRUGMAN, *supra* note 81, at 103-04, 151-55.

122. Moran also strongly advocates a "national security tariff" aimed at those who use "targeting" through predatory pricing to achieve their goals. Moran, *supra* note 82, at 84-88. He implicitly endorses greater vigilance in the enforcement of U.S. antidumping laws, despite abundant evidence from Richard Boltuck and Robert Litan that 1) successful international "targeting" has involved an unknown, but perhaps very minor, use of predatory pricing and 2) the antidumping laws typically employ an indefensibly protectionist exercise of administrative discretion to assist industries that fail in international competition. See RICHARD BOLTUCK & ROBERT E. LITAN, *DOWN IN THE DUMPS: ADMINISTRATION OF THE UNFAIR TRADE LAWS* (1991).

123. GRAHAM & KRUGMAN, *supra* note 81, at 154.

124. *Id.* at 155-58.

an additional proviso is needed. Increased international cooperation demands that any performance requirements clearly aim only at minimizing the defense risks resulting from a reliance on foreigners. No uncompensated commercial advantages should accrue. The United States might be understandably anxious to gloss over such distinctions; it has more bargaining power for access to its market than any other single state.<sup>125</sup> But with the civilian component of dual-use technologies already dominant and increasing, only very carefully crafted restrictions on performance requirements could prevent cooperative intentions from resulting in acrimony.

#### D. PROBLEMS OF POLITICAL MANIPULATION AND ESPIONAGE

Discussions of monopoly in largely commercial, or "commercial-like," terms ignore the specific characteristics of other countries. The attempt to find one size that fits all may be highly useful as a heuristic; we can scarcely imagine it in practice. The historically warranted special trust that the United States has placed in the United Kingdom and especially in Canada as defense suppliers makes us doubt whether it makes sense, even in developing policy schematics, for the United States to treat most foreign countries as essentially the same. Specifically, we think the differing willingness of countries to engage in extraterritorial manipulation of subsidiary behavior in the United States provides some grounds for differential treatment of direct investors of different nationalities. And it suggests the potential for bilateral agreement on extraterritoriality.

Historically, of course, the United States has been one of the most notable employers of extraterritoriality,<sup>126</sup> and we strongly endorse multilateral disarmament in this area. We endorse the explicitly home-country sensitive approach outlined by Graham and Ebert who would require careful investigation of any acquisition "when a foreign bidder is from a nation deemed to be a potential adversary of the United States or from a 'country of concern'"<sup>127</sup> under the Export Administration Act.<sup>128</sup> This is es-

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125. Just how Europe will handle such performance requirements cannot presently be described because of continuing incongruities between transnational economic cooperation and considerable independence in national defense.

126. See GRAHAM & KRUGMAN, *supra* note 81, at 133.

127. Graham & Ebert, *supra* note 54, at 264.

128. Export Administration Act of 1979, Pub. L. No. 96-72, 93 Stat. 503 (codified as amended at 50 U.S.C. App. § 2401 *et seq* (1993)). The United States maintains an extensive export control system. In the mid-1980s, about half of all U.S. exports required a (non-trivial) license. Since the end of the Cold War,

pecially important for the purposes of avoiding espionage and assuring compliance with U.S. export controls.

One of the first results of the Exon-Florio Amendment<sup>129</sup> was the blockage of an acquisition by the PRC's China National Aero-Technology Import and Export Corporation (CATIC) of an American aerospace components firm, Mamco Manufacturing Company, which would have allowed the free flow of otherwise unapproved exports.<sup>130</sup> This demonstrates both the flexibility of Exon-Florio in its present form, and that Graham and Ebert's proposed "potential adversary" criterion could be variously construed. There are those who would broaden Exon-Florio to include threats to national objectives such as industrial competitiveness, but that sort of inclusiveness would basically cover exactly those nations with whom technological cooperation has the most to offer for U.S. objectives.

As an example of the problems we see with the other analyses, consider the following case. Suppose a foreign firm develops a monopoly in a particular product deemed vital for U.S. defense; this might even happen subsequent to a compulsory period of U.S. production following American subsidization of the development of the essential technology. The United States has a number of options. Assume, for example, that stockpiling or extensive inventories are feasible in the context of a close and confident working relationship with the home country government concerning issues such as extraterritoriality and cooperation under the Defense Production Act.<sup>131</sup> Assume further that the United States has the capacity to quickly duplicate the product, a capacity that would be reflected in a DOJ-type concentration measure and which may be quite likely because U.S. firms would almost certainly have been active in the original consortium. In this case, perhaps nothing should be done at all. Attempting to force either the licensing of a U.S.-owned firm operating on American soil or foreign integration by the foreign producer might well be seen abroad as giving the United States

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U.S. concerns have shifted from keeping goods and technology out of communist hands to issues connected with nuclear and biological warfare proliferation. Most western nations have somewhat similar controls, but they are imperfectly coordinated with those of the United States. See J. DAVID RICHARDSON, *SIZING UP U.S. EXPORT DISINCENTIVES* 34-38 (1993).

129. 50 U.S.C. App. § 2170 (West Supp. 1993).

130. Graham & Ebert, *supra* note 54, at 252; see also TYSON, *supra* note 55, at 147.

131. 50 U.S.C. App. §§ 2061-2170. The law allows the U.S. government preferential access to the firm's production capacity in times of national emergency. See GRAHAM & KRUGMAN, *supra* note 81, at 104-05, 122, 152-53.

an unwarranted advantage. Moreover, a refusal by the foreign firm to cooperate would, in the schemes advocated by Moran and by Graham and Krugman, apparently necessitate independent U.S. production which could result in massive economic waste as well as increased international acrimony.

## V. A POLICY AGENDA

We have criticized some of the specifics of recent suggestions to reconcile U.S. R&D, trade, and investment policy with a more symmetrically interdependent post-Cold War world. Nonetheless, our own policy analysis rests on the same basic assumption: the most serious challenge to U.S. national security comes from an excess of autarchic impulses and coolness toward interdependence — not the reverse. Moreover, several of our suggestions strongly parallel the recommendations of the other analysts.

Most generally, the American economy and American security will benefit from two sets of actions by the United States. One set should be proposed for multilateral assent and implementation by the major industrial countries, perhaps in a G-7 or G-8 framework. The second set involves unilateral measures by the United States with a fixed deadline for reciprocity by others. Reciprocity would lead to continuation, and lack thereof to reconsideration. A lack of agreement and reciprocity by others surely is a possibility. We turn to that possibility after introducing our recommended initiatives.

### A. MULTILATERAL INITIATIVES

First, we favor further international antitrust cooperation of the kind recently initiated between the United States and the European Community. As explained earlier, only where collusion is carefully monitored do concentration ratios have a common meaning. Increased cooperation on competition matters with the third member of the triad, Japan, should be a top priority.

Second, the United States should seek agreement with other countries aimed at minimizing the extraterritorial reach of national law. Past U.S. claims, many of them driven by Cold War tactics at variance with those of its allies, have generated spectacular acrimony. The United States should recognize that the changed international situation has removed much of the rationale for previous intrusion abroad, while the large stock of FDI in the United States could provide a source of future diffi-



culty if understandings are not reached. Effective agreement could remove much of the current anxiety about FDI in defense-related industry. Some ongoing dispute resolution mechanism would also certainly be useful.

Third, the industrialized countries should agree that government-sanctioned R&D and procurement activity should not discriminate on the basis of nationality of controlling ownership. If a government wishes to subsidize private firms, or simply to allow them exemption from the competition laws in spheres such as joint research, these policies should aim at the efficient improvement of economic welfare and not dispute-inducing national advantage. Any national advantage should be confined to the spillover from nationally-located activity to the larger economy. We see no problem with allowing governments to specify periods of national production growing out of voluntary participation in R&D consortia as a *quid pro quo* for subsidization.

## B. UNILATERAL MEASURES

In addition to the multilateral steps initiated above, we advocate the following unilateral measures. First, while we think the Bush Administration administered the Exon-Florio provisions prudently,<sup>132</sup> we are unsure about the Clinton approach, and the fundamental language may yet provide grounds for abuse. Exon-Florio should mandate that the Executive consider *only* national security defined narrowly.

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132. Our view differs from that of Tyson. Tyson cites data indicating that the Exon-Florio process received 700 notifications of proposed foreign acquisitions between October, 1988 and the summer of 1992. Of the 600 actual acquisitions that took place over that period, only 14 were subject to investigation and only the Chinese case mentioned in the text was blocked. Tyson cites with approval another case in which an American semiconductor-photolithography firm, Perkin-Elmer, was "saved" from acquisition by its only major competitor, Nikon, because of government cooperation with American industry to find another buyer. Tyson's two suggested principles for handling foreign acquisitions are 1) to use national ownership or local production "to enhance national control over suppliers regardless of their nationality" and 2) to "seek a diversity of suppliers to maintain a competitive global supply base." TYSON, *supra* note 55, at 147-48. In our view, these principles are excessively vague. For example, Tyson notes with alarm that the committee responsible for administering Exon-Florio approved an acquisition of Semi-Gas Systems by Nippon Sanso which raised the former firm's share from 2 to 40 percent. *Id.* Tyson does not report, however, that the acquisition was also reviewed by the Department of Justice, which would have properly considered competition in a global context. See Graham & Ebert, *supra* note 54, at 247. Most fundamentally, we differ from Tyson in finding little significance in national ownership *per se*. Tyson's views take on special significance since she chairs the Council of Economic Advisors in the Clinton Administration.

Second, antitrust expertise should be part of the Exon-Florio process from the very beginning because of the need for an understanding of competitive conditions both in the United States and globally. An efficient process thus requires that security and competition issues be considered simultaneously in a joint process involving both defense and competition authorities.<sup>133</sup>

Third, the United States should far more carefully monitor the location of production and the competitive situation of all suppliers to the national security effort; present tracking seems woefully inadequate with respect to subcontractors below the first tier.<sup>134</sup> In a very few instances the United States might interfere with purely market decisions solely for logistical reasons.<sup>135</sup>

Fourth, the United States should explore reduction of extra-territoriality through bilateral negotiations. Because we believe that the administration of Exon-Florio should remain sensitive to home-country policies, the United States should have considerable leverage in such discussions, which must pay great attention to export policies and their enforcement.<sup>136</sup>

Fifth, participation by foreign-owned firms should be allowed in R&D consortia approved or subsidized by the U.S. government.<sup>137</sup> If it is deemed appropriate to insure that cooperating partners exploit the results of their efforts in the

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133. Legislation by Rep. Philip R. Sharp (D.-Ind.), H.R. 2631, 102nd Cong., 1st Sess. (1991), illustrates that such integration is now taking place along lines suggested by Graham & Krugman. See GRAHAM & KRUGMAN, *supra* note 81, at 154.

134. *Id.* at 108.

135. See generally MARTIN LIBICKI, JACK NUNN, & WILLIAM TAYLOR, U.S. INDUSTRIAL BASE DEPENDENCY/VULNERABILITY: PHASE 2 - ANALYSIS (1987); ERLAND H. HEGINBOTHAM ET AL., DEPENDENCE OF U.S. DEFENSE SYSTEMS ON FOREIGN TECHNOLOGIES (1990); DEPT. OF COMMERCE, OFFICE OF INDUSTRIAL RESOURCE ADMINISTRATION, NATIONAL SECURITY ASSESSMENT OF THE DOMESTIC AND FOREIGN SUBCONTRACTOR BASE: A STUDY OF THREE U.S. NAVY WEAPON SYSTEMS (1992).

136. See, e.g., Robert T. Kudrle, *Regulating Multinational Enterprises in North America*, in MULTINATIONALS IN NORTH AMERICA (Lorraine Eden ed., forthcoming 1994); Ellen L. Frost & Edward M. Graham, *The New Global Environment, the Globalization of the Defense Industries, and National Security: With Special Reference to Canada in the Context of NAFTA*, in MULTINATIONALS IN NORTH AMERICA, *supra* (manuscripts on file with author) (suggesting increased harmonization of investment and trade policies within North America).

137. Tyson's recent review of Sematech lauds its performance and does not recommend expanding its membership, or that of any similar future consortia, to foreign-owned firms. TYSON, *supra* note 55, at 151-54. Tyson offers no defense for the exclusion of foreign owned firms.

United States as a condition for government subsidy, such requirements should apply equally to all firms, regardless of ownership.<sup>138</sup>

Sixth, we think that both U.S. vulnerability and the response to it should be decided carefully on a case by case basis. In particular, we fear that the use of conventional concentration ratios (for either all activity or "arm's length" transactions) as the main criterion for measuring vulnerability should be avoided. The use of any simple but conservative rule could result in a large amount of unnecessary protection — exactly the outcome that it is meant to avoid.

## VI. CONCLUSION

Our policy suggestions grow directly from the analysis presented earlier. The case remains unmade that purely commercial monopoly power is more important in security-related industries than elsewhere. Each of the special problems of foreignness needs special attention, however. First, national location of production may sometimes be important for purely logistical reasons. Second, the United States must be satisfied that the probable leakage of security-sensitive information be no greater from foreign-owned than from U.S.-owned firms — and that both be satisfactory. Finally, the American government must also be assured that foreign-owned firms in security-related industries be acceptably amenable to U.S. government influence and acceptably free from foreign direction. We may differ most from other analysts in stressing that this absence of "foreignness" or the dangers from it must be considered in a number of dimensions that allow no simple formulation.

We recognize that many will be skeptical about the extent to which the lines of policy we suggest will be accepted, complied with, and reciprocated. The skeptics have significant historical grounds for their doubts. Yet there are compelling grounds for credible U.S. advocacy of the extensive set of policies we have set forth. Explicit commitment to our policy agenda with clear ex-

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138. Some analysts, such as Graham and Krugman, have advocated a study of the alleged "hollowing out" phenomenon: technology-rich U.S. firms acquired by (frequently Japanese) firms with a subsequent transfer of most of the technological capacity to the home country. GRAHAM & KRUGMAN, *supra* note 81, at 117-18. Such research could be valuable, but any results seeming to demonstrate the phenomenon should be interpreted with care. Even where such firms are valuable, partly because of U.S. taxpayer subsidies to education or R&D, it does not automatically follow that foreign production based on U.S. ideas lowers U.S. welfare by comparison with alternatives.

pectations and a set timetable during which that commitment will be sustained is far preferable to case after case of bilateral friction that erodes confidence in an interdependence framework for managing militarily relevant high technology. Under our proposals, the United States would present a relatively clear program that differs from the current American practice of providing excessive "wobble room" to others,<sup>139</sup> and that has been marked by reversals based on executive-congressional tension, struggles among executive departments, special interest political influence, and electoral temptations.<sup>140</sup> Advocacy of general principles avoids unhelpful targeting of particular nations for punitive action, but leaves open the prospect for American policy differentiated between cooperative and resistant foreign governments and firms. Following a set period, the United States would continue cooperation with firms and governments exhibiting reciprocal behavior, while such cooperation would cease or be sharply diminished with others based on an index of the shortfall from reciprocity.

Lack of foreign adherence and reciprocity so long as we follow a prudent timetable has at most modest costs. Lack of success with our policy agenda could propel nationalist industrial policy steps or security adaptations far more radical than the suggestions we have criticized. The American political economy is not rushing to take profound steps in that direction at this time, so the opportunity cost of our positive interdependence proposals cannot be great.

Our recommendations for trade, investment, and R&D policy grow from the conviction that the United States should con-

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139. Section 301 of the 1988 Trade and Competitiveness Act, "Super 301," which expired in 1990 was merely the most recent in a series of legislative initiatives that mandated investigations and discussions on the part of the executive with trading partners on matters of market access and related matters. Trade Act of 1974, Pub. L. No. 93-618, Title III, § 301, 88 Stat. 1978, 2041 (codified as amended at 19 U.S.C. § 2411 (1988)). After breakdown of the U.S.-Japan trade talks in February 1994 it was widely believed that the Clinton Administration would reinstate "Super 301" by executive order. Bob Davis & Jacob M. Schlesinger, *U.S. Plans Sanctions Move as Talks With Japan Fail*, WALL ST. J., Feb. 14, 1994, at A3. Such legislation has always allowed for Presidential discretion that is typically used to avoid imposing sanctions on foreigners. While part of this can be rationalized on "good cop, bad cop" grounds, we think that in some areas, such as the issues discussed in the text, executive discretion should be reduced.

140. In the famous Toshiba case, *Arjay Associates, Inc. v. Bush*, 891 F.2d 894 (Fed. Cir. 1989), virtually all of these factors were at play. The case involved sanctions that were leveled against the Japanese firm Toshiba Machine Company for failing to prevent a high-tech transfer to the former Soviet Union.

sciously choose to abandon or considerably modify several of its long-standing security policy objectives and firmly embrace a more equal partnership with other major industrial countries. Such an approach holds the potential for greater global prosperity and more efficient U.S. defense expenditures, without sacrificing massive coalition supremacy over any potential military opponent. Perhaps most important, it may be the only path open to the United States that combines long-term political and economic viability — both at home and abroad.