Chapter 16

Export Controls: A Clash of Imperatives

Charles B. Shotwell

This chapter examines the difficult challenge facing the U.S. Government in a globalizing world: forging sound export control policies for selling or releasing advanced technologies abroad.[1] The purpose of this assessment is not advocacy, but education. It seeks to illuminate the complex issues and trade-offs at stake and to portray the governmental processes by which export control policies are being made. The chapter begins by examining the emergence of the issue in recent years. It then appraises its impact on international security affairs and its implications for U.S. interests and policy. Finally, the chapter offers some observations on how the Federal Government might be able to strengthen its ability to handle the welter of tough export control decisions that doubtless lies ahead as globalization accelerates.

The thesis of this chapter is that in this policy arena, the United States faces a clash of imperatives. The prospect of a dangerous world creates powerful incentives to control the spread of destabilizing technologies that could fall into the hands of rogues or promote damaging weapons proliferation. At the same time, there are compelling reasons for helping allies remain militarily prepared and for using high-technology exports to help promote American economic prosperity and competitiveness in world markets. The United States always acts unilaterally: working closely with other countries often is critically important, and these countries have views of their own. Striking an appropriate policy balance among these sometimes competing concerns is not easy, and it is made harder by a properly democratic process that employs complex bureaucratic and political machinery to make decisions.

This chapter judges that there are no magic formulas for handling the export control challenge: there are neither simple strategic formulas nor equally simple procedural steps for getting the job done far better than it is done now. The tough decisions ahead will have to continue to be handled on a case-by-case basis by the executive branch and the Congress. Improvements can be made, however, in several key areas to bring better strategic guidance, analysis, coherence, and consistency to the export control review process. The bottom line is that this challenge can be handled effectively. If the U.S. Government consistently uses the instruments at its disposal clearly

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and acts wisely, it will stand a good chance of both protecting its security and advancing its economic prosperity in the coming years.

Setting the Stage

Globalization challenges the current regime of export controls in many respects. As borders have become more porous, economies more international, and technology/information more transportable, the underlying assumptions of programs to stem the flow of dual-use technologies and commodities come under question. The task facing the United States is to design export control policies that respond to the current era and the years ahead.

Export controls themselves are hardly new. U.S. export controls date back to a 1775 act of the Continental Congress outlawing the export of goods to Great Britain. Subsequent legislation imposing export controls included the Embargo Act, the Trading with the Enemy Act, and the Neutrality Act. The Export Control Act of 1949 gave the Department of Commerce (DOC) primary responsibility to administer and enforce export controls on dual-use commodities and, for the first time, defined three reasons for the imposition of these controls: to preserve national security, to advance foreign policy goals, and to prevent short supply.

During the Nixon-Kissinger era of détente, export controls were relaxed but later were reinvigorated when East-West tensions mounted with the Soviet invasion of Afghanistan. The end of the Cold War shifted focus to economic concerns over national security concerns and to the targeting of so-called rogue states. More recently, the continuing trend toward globalization (together with the post-Cold War defense drawdown) has meant that key industries in the technology sector are more dependent upon international trade for investment capital and overall economic viability. In turn, the military has grown more reliant on technologies from the private sector. These developments have created the framework for shaping export control policies.

Key Phenomena, Dynamics, and Trends

During the Cold War, the Soviet Union and the People's Republic of China and their client states were the focal points of U.S. export control policy. The Coordinating Committee on Multilateral Export Controls (COCOM) was designed to prevent certain commodities and technologies from acquisition and use by the Soviet Union. As a reflection of the Cold War's demise, COCOM was disbanded in 1994. The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies was created as a successor regime in 1996, but with Russia and many former Warsaw Pact states as parties rather than adversaries.[2] By its own terms, the arrangement

> has been established in order to contribute to regional and international security and stability, by promoting transparency and greater responsibility in transfers of conventional arms and dual-use goods and technologies, thus preventing destabilizing accumulations. Participating nations will seek, through their national policies, to ensure that transfers of these items do not

> contribute to the development or enhancement of military capabilities which undermine these goals, and are not diverted to support such capabilities.[3]

This is a broad-based multilateral arrangement, focusing on exports of arms and sensitive dual-use equipment and technologies. There are key differences between COCOM and the Wassenaar Arrangement. The latter's policy development is based on the consensus of all 33 members to bar exports as opposed to COCOM, where a single country (often the United States) could veto exports.

In terms of enforcement, however, the Wassenaar Arrangement is weaker than its predecessor was. COCOM had mandated export controls, but Wassenaar relies upon national discretion to implement controls. The Wassenaar Arrangement provides guidance, but it is not binding per se. Despite the arrangement's statement that measures "will not be directed against any state or group of states" and although the targets of the regime are not publicly stated, it is understood that the arrangement aims to control exports to four states: Iran, Iraq, Libya, and North Korea.

Essentially, the Wassenaar Arrangement provides for export controls for items not covered by regimes for weapons of mass destruction (WMD) and missile technology. In addition to controlling exports to four pariah states, it provides guidance regarding the export of arms to Africa and provides a mechanism for the review of export control lists in light of rapid technology developments. Most recently, the arrangement has served as an effective forum for American concerns about exports of high-performance computers and data encryption. Even so, some have argued that the Wassenaar Arrangement would be more effective if it had the discipline of COCOM and had legally binding authority over export controls.

The Wassenaar Arrangement operates in a new international setting vastly different from that of the Cold War. The end of the Cold War brought about a new emphasis on market economies and the promotion of global free trade, as evidenced by the objectives of organizations such as the North American Free Trade Agreement (NAFTA), the European Union (EU), and the World Trade Organization (WTO). The fall of communism also meant a precipitous decrease in the U.S. defense budget, defense industry consolidation, and a frenzied scramble for new markets, including foreign ones, for defense industry products.

The procurement budget of the Department of Defense (DOD) has shrunk to about one-half of what it was in 1990.[4] Following up on efforts begun by the Bush administration, the Clinton administration made efforts to reduce or remove controls as impediments to free trade, reducing the value of restricted goods from $6.1 billion per quarter in 1993 to $2.7 billion per quarter in 1995.[5] Export controls were liberalized for chemicals, software, computers, and telecommunications products.[6] As a result of export liberalization, the number of license cases dropped from a high of 120,000 per year under the Reagan administration to 9,000 in 1996.[7] Nevertheless, a dynamic tension continued between the imperative of enhancing American competitiveness and the imperative of denying certain technologies to potential adversaries. The DOC Bureau of Export Administration (BXA) has made a deliberate effort to publicize its objective to "enhance international competitiveness of American industry by making our export control system more efficient and effective."[8]

Ironically, many defense manufacturers initially opposed the liberalization of exports. The changing nature and consolidation of the defense industry have resulted in a shift in attitude. In 1992, General Dynamics, Martin Marietta, McDonnell Douglas, and Rockwell International all resisted easing government restrictions toward Russia and China, particularly for satellite launchers.[9] Hughes, Loral, and General Electric Aerospace favored easing access to low-cost foreign launchers. By 1995, Lockheed, GE Aerospace, and Martin had merged and developed a joint venture (International Launch Services) to sell launches on Russian boosters.[10] McDonnell Douglas and Rockwell were acquired by Boeing, which had an arrangement to use Ukrainian Zenit boosters for its Sea Launch Venture. Industry attitudes toward the foreign defense industry's access to American technology are also shifting as the shrinking defense market and other globalization trends compel defense firms to look at international partners and mergers. DaimlerChrysler Aerospace (DASA) and the speculated Lockheed Martin-GEC-Marconi merger demonstrate that the internationalization of defense is a key consideration and complication for national technology controls.

At the same time, manufacturers increasingly depend on access to the global economy, and profit margins are often driven by exports. This is particularly true of the aerospace industry.[11] It is also true of semiconductor and machine tool manufacturers.[12] Government contracts no longer drive the industry.

Impact of International Politics and Security Affairs

Studies of export controls show that the experiences for different technologies and commodities vary greatly. A key variant is the *fungibility* of the technology.[13] As time passes, the relative currency of the technology, its relative availability, and, hence, the need to keep it secure (in theory) decrease. Technologies that are considered state of the art one year are not necessarily the most advanced technologies a year later. Fungibility is important not only because a technology can quickly go from state of the art to antique, but also because new technologies are being invented and brought to market very quickly—possibly before a judgment about national security implications can be made. As Holman Jenkins has said, "What was yesterday's supercomputer is today's mass-produced cheapo PC."[14] On the other hand, even old technology may be very useful militarily to potential opponents. Exactly what technology should be controlled often depends upon a case-by-case determination, based upon a careful assessment of what enhanced capabilities will mean for an opponent and whether the opponent is likely to acquire that technology in spite of export controls.

Computers: Processing Speed. In 1994, the United States raised the control level for desktop personal computers from 12.5 million to 500 million theoretical operations per second (MTOPS), freeing about $30 billion in computer exports.[15] Under heavy industry pressure (in 1993, President Clinton had made a pledge to computer executives to liberalize controls), the control level was raised to 710 MTOPS in 1996. The administration, in effect, made the exporter responsible for deciding whether a license was required. The decision was based upon, inter alia, a Stanford University study (commissioned by DOC and DOD) that found these high-performance computers to be already available around the world. A 1998 General Accounting Office (GAO) report

(prepared at the behest of the Senate Subcommittee on International Security, Proliferation, and Federal Services) criticized the study as empirically flawed and lacking any national security threat analysis, particularly with regard to military implications for Russia and China.[16] A major concern was that these "supercomputers" can assist in the design of ballistic missiles.[17] The National Defense Authorization Act for Fiscal Year 1998 requires exporters to notify BXA when they intend to export or re-export high-performance computers from 2,000 to 7,000 MTOPS to end users in Tier 3 countries (for example, China, India, or Pakistan).[18]

In January 1999, leading computer industry chief executive officers (CEOs) strongly urged Secretary of Commerce William Daley to loosen controls on computer exports and pressed him to resist Cox Commission recommendations to tighten controls.[19] In July 1999, on the basis of a survey of advances in technology and widespread availability of existing technology, President Clinton raised the export limit to 6,500 MTOPS without an individual license for military end users and up to 12,300 MTOPS for civilian end users.[20] In February 2000, those limits were raised to 12,500 MTOPS for military end users and 20,000 MTOPS for civilian end users.[21] American companies plan to sell chips capable of 5,000 MTOPS by late 2000. Under the Enhanced Proliferation Control Initiative, the administration retains the power to block export of computers at any level where particular end uses or end users pose concerns or risks of nefarious proliferation.

Computers: Data Scrambling/Encryption. Originally, the Wassenaar Arrangement control list covered all encryption, despite the objections of many countries. In November 1998, a new consensus was achieved. At the request of the United States, the Wassenaar group agreed to restrict the export of mass-market encryption software with numerical keys above 64 bits, Data Encryption Standard, in length. The United States has long disallowed the export of "strong encryption" software (currently defined as greater than 56 bits) but was concerned about the lack of controls for foreign exporters.[22] Groups such as the Economic Strategy Institute claim that these export controls will cost the American industry $96 billion over the next 5 years.[23] The United States uses 128-bit encryption to protect financial transactions. The new Wassenaar Arrangement is intended to reduce criticism from the American high-technology industry about the competitive disadvantage placed upon it by unilateral export controls. Nations such as Germany and Finland have opposed any restrictions on the export of encryption software. Nevertheless, even the House National Security Committee (after persuasive classified briefings by the National Security Agency and the Federal Bureau of Investigation) voted 45 to 1 to strengthen, rather than ease, export restrictions on export technology in September 1997.[24]

Computers: Hardware/Components. During the Cold War, almost all semiconductor manufacturing gear and materials were subject to export controls under COCOM. With the end of the Cold War, controls have been loosened and the industry has grown at a phenomenal rate. The so-called Moore's Law (named after Intel Corporation co-founder Gordon Moore) holds that the quantity of information storable on a computer chip doubles every 18 months, while the costs of manufacturing the chip are cut in half. The United States holds about 50 percent of the world market

share of semiconductor equipment. Current controls date back to the 1990 COCOM "Core List."

China is emerging as one of the most lucrative markets. One trade association predicts that the market for semiconductors in China will grow to $2 billion by the year 2000.[25] China envies South Korea's and Taiwan's burgeoning chip-manufacturing industries and has targeted this area as a vital industry for its own investment. Export limitations, along with uncertainties and delays in the American export license process, may have played a role in China's selection of Japan's NEC, rather than an American manufacturer, to build a $1-billion semiconductor plant in a joint venture, according to industry sources.[26] The China-NEC agreement will implement a .35-micron line width processing capability. Industry advocates claim that American and Japanese manufacturing capability has proceeded well beyond the .35-micron level.[27] The industry is displeased with the control of the export of cluster tools essential for enhanced manufacture of semiconductors. Its advocates believe that controls on computers have not changed enough from the old COCOM "Core List" days. Flat panel display equipment is another American industry that is having a hard time competing with foreign exporters. IBM recently paid fines for violating export controls for computers. IBM was the top PC vendor in China in 1996, with $382 million in sales.[28] Intel ran into problems with its $198-million flash memory packaging plant in Shanghai because test equipment was limited to not more than 60 megahertz.[29]

Missile Technology. Much U.S. effort has focused on reining in the flow of missile technology from Russia and China to Iran and Iraq. Even so, there has been a lack of consistent will on the part of the United States and other governments to take action against Russia and China for their support of Iranian missile development. In June 1998, Congress passed (but President Clinton vetoed) the Iran Missile Sanctions Act, which would have imposed tough economic sanctions on the Russian government if it did not stop technology transfers to Iran.[30] China claims that its sales to Iran are legal because NP–110 (170-km range) ballistic missile technology is not prohibited under the Missile Technology Control Regime (MTCR).[31] Although technically correct, this stance provides effective cover for transfer of prohibited technology. On July 21, 1998, Iran tested the Shahab-3 missile, which has a range of 800 to 930 miles. Among the accusations investigated by the Cox Commission is that U.S. aerospace firms and satellite makers allowed China to "dramatically shorten the timetable" for developing the DF–31 intercontinental ballistic missile, which will have a range in excess of 4,500 miles (capable of hitting the American Midwest).[32]

Satellites. The Bush administration began and the Clinton administration implemented efforts to transfer authority for export control decisions over commercial satellites from the State Department Munitions Control List to the DOC Control List, shifting not only the departmental authority but also allegedly the balance, in favor of exports.[33] President Clinton overruled Secretary of State Warren Christopher in 1996 when the administration opened up billions of dollars of satellite sales to Chinese companies.[34] The attraction to the private sector was the availability of relatively inexpensive Chinese launch vehicles. Congressional disenchantment with the decision in 1996 can be seen in the October 1998 reversal of administration policy by the return of satellite export control to the State Department. Fears of technology leaks

have dampened joint ventures such as the Boeing Sea Launch program (commercial satellite launches) with Russia and Ukraine, where a Russian-born translator (granted asylum in the United States) was caught with computer disks with codes to access the National Aeronautic and Space Administration's highly classified Tracking Data and Relay Satellite System. Both Hughes Electronics and Loral have been investigated for transfers of prohibited satellite technology in connection with the Sea Launch program.[35] On July 27, 1998, the State Department suspended Boeing's technical assistance agreement and most work on the Sea Launch program.[36] In the wake of the Congressional investigation, the administration canceled plans to eliminate U.S. launch quotas for Russian and Chinese boosters.[37]

The Office of the U.S. Trade Representative is responsible for reviewing interagency launch quotas. A current agreement with China allows up to 20 geosynchronous launches through 2001. Industry executives point out that other sources, particularly Europe, where export regulations are less stringent, are available for satellite technology.[38] Hughes Space and Communications Company emphasized that its security personnel always accompany the satellites while in China, in response to criticism that Office of the Secretary of Defense monitors were absent during the launch of Hughes satellites on Chinese Long March boosters in 1994, 1995, and 1996.[39] The 1996 crash of a rocket carrying a Loral satellite allegedly led to Chinese possession of an encrypted circuit board, though some believe the encryption technology was old and widely available anyway.[40] In June 2000, Lockheed Martin Corporation agreed to pay a $13-million fine for selling satellite technology to China in 1994, though the company did not admit guilt.[41]

Recent discussions have focused on making synthetic aperture radar and hyperspectral imaging technology (both used on satellites) available commercially. Although the technology has been used for military purposes, civilian demands for the technology and products thereof have been burgeoning. These types of demands put further pressure on the U.S. bureaucracy to open up exports.

Export controls can have consequences for manufacturers in the face of market demands. The Aerospace Industries Association claims that the shift of commercial satellite licensing from DOC to the State Department cut American export orders by 40 percent over the last year, though total sales exceeded $32.6 billion in 1999.[42]

Other Technology/Commodities. As the private sector has leaped ahead in the development of civilian applications for military technology, commercial demand often contributes to making certain technologies widely available. Night vision goggles were covered by the Munitions List yet were available through L.L. Bean. Global positioning system (GPS) technology is also commercially available, with more than 250,000 GPS receivers being sold each month.[43] Localized satellite imagery is available over the Internet. In the area of manufacturing, the export of machine tools is of much concern, particularly those that assist in perfecting the manufacture of nuclear weapons casings and advanced artillery. Other current areas of concern are wafers (for computer chips) and jet engine hot technology.

According to DOD, only about 0.5 percent of all American exports require an export license, and those items lie mainly in the high-technology sector. Most exports go to friendly, industrial nations. Only 2 to 3 percent of license requests are denied.

The recipient nations of concern, although not stated in official communications, are Iran, Iraq, Libya, and North Korea. The Cox Commission report turned the focus toward China and Russia. This tried to reverse a trend begun with the Bush administration to "decontrol" sensitive military technology, particularly for China. The Clinton administration continued and greatly expanded the effort in this area.

Implications for U.S. Interests, Strategies, Policies, and Goals

The onset of a new era in international affairs, influenced by globalization's dynamics, means that the task of designing sound export control policies is becoming more complicated and thornier by the day. It also has become both political and administrative in nature, in a setting where difficult tradeoffs must be balanced in a large number of controversial cases. President Clinton personally promised to sell Boeing Apache attack helicopters to Singapore in 1999; however, when Singaporean officials attempted to consummate the sale, American officials repeatedly denied export requests until there was high-level executive intervention.[44] Clearly, the unrestricted export of certain commodities and technologies is contrary to U.S. national security interests when it provides enhanced military capabilities for potential adversaries.[45] It now appears, however, that certain export policies hurt relations (and interoperability) with friends and allies. Furthermore, the long-term effect of inappropriate export controls in competitive industries (such as semiconductors) may actually hurt U.S national security more than the target state.[46]

During the Cold War, export controls were used to maintain a qualitative advantage for the United States and its allies against the Warsaw Pact and the People's Republic of China.[47] Historically, other objectives for export controls have included support for mercantilist policies, "starvation" of adversaries, and prevention of domestic scarcity.[48] In addition to the prevention of adversarial access to enhanced military capabilities generally, current controls are maintained for purposes of nuclear nonproliferation under the Nuclear Nonproliferation Act of 1978, which implements provisions of the Nuclear Nonproliferation Treaty. But the globalization of national economies has changed the dynamics by making key industries dependent upon exports for their economic vitality.

Current Export Controls Framework

The primary authorizing legislation for many years was the Export Administration Act of 1979, as amended by subsequent acts, and currently implemented by authority of Executive Order (EO) 12924 in 1994. Congress allowed the act to lapse in 1994, and President Clinton continued administration of the export control system by EO 12924 under the International Emergency Economic Powers Act. In addition, the United States is party to a number of international export control regimes, including the Wassenaar Arrangement, the MTCR, the Australia Group, and the Nuclear Suppliers Group. The United States also is party to the Nuclear Nonproliferation Treaty, the Biological and Toxicological Weapons Convention, and the Chemical Weapons Convention, which contain limitations on export of certain commodities and technologies.

Current agreements and regimes restrict the export of certain items and technology through the required use of export licenses. Commodity jurisdiction is divided between DOC and State Department. These two agencies administer critical lists. The BXA (under DOC) controls dual-use commodities and technical data exported from the United States and its territories and possessions or re-exported to foreign countries. The Commerce Control List (CCL) identifies commodities and technologies that were created (or were designed and developed) for civilian purposes but can have military applicability. Maintaining the CCL creates an institutional challenge for the BXA, since DOC is charged with the promotion of commerce and may be viewed as unofficially representing the interests of industry. DOC interfaces with international institutions, too, such as the Wassenaar Arrangement. The Wassenaar Arrangement Dual-Use List is incorporated into the CCL.

The State Department's Political-Military Affairs Bureau administers the U.S. Munitions List, which ostensibly identifies technology designed primarily for military purposes (unless exclusively controlled by other agencies). In reality, some dual-use items (communications satellites and encryption software) have appeared on the Munitions List.[49] The Munitions List identifies registered munitions manufacturers and provides generalized descriptions of controlled items. Certain commodities have been moved from the Munitions List to the CCL.

In 1996, as a result of high-level executive branch intervention, satellites and certain encryption items were transferred from the Munitions List to the CCL. Congress intervened in October 1998 to move satellites back to the Munitions List as a result of the Cox Commission investigation into divulgence of advanced technical data to China.[50] New regulations provide DOC with a voice, but not a vote, in the process.[51] In addition to DOC, the Departments of Energy and Transportation, along with the U.S. Trade Representative, have an advisory role in the process. A new goal was set for the State Department to complete the review process for satellite export applications within 90 days of submission.[52]

In addition to the State Department Munitions List, DOD maintains the Military Critical Technologies List (MCTL), which originated in 1981. The list was previously maintained by the Office of the Secretary of Defense, Office of Acquisition and Technology (Defense Technical Security Administration [DTSA]), but was assumed by the newly formed Defense Threat Reduction Agency (DTRA) in October 1998. DTSA, along with the On-Site Inspection Agency and the Defense Special Weapons Agency, now reports to DTRA. The MCTL is intended for U.S. Government guidance but is not binding in any form and does not automatically subject items to export controls. Current areas of concern from the DOD perspective are communication satellites, machine tools, and high-performance computers. Most machine tools are not controlled. Other machine tools are listed on the CCL. Machine tools are critically advantageous as they guide the cutting and shaping of metal and produce complex, geometric shapes and components. This technology is critical in the production of aircraft with Stealth attributes and the manufacture of nuclear weapons.

The Interagency Process: Help or Hindrance?

The interagency process has become the epicenter for contentious cases. DOC has the charter to administer and enforce export controls on all CCL dual-use technology, while the State Department oversees munitions and defense trade exports. The lead agencies participating in the review process are the State Department; the Arms Control and Disarmament Agency (ACDA), which was incorporated into the State Department effective March 1999; DOC; DOD; and the Department of Energy (DOE). The principal agencies for the licensing referral process are DOD for national security items, DOE for nuclear nonproliferation-controlled items, and the State Department for chemical, biological, and missile-related nonproliferation-controlled items. The Nuclear Regulatory Commission oversees reactor materials, whereas DOE focuses on technologies. Based on EO 12981, issued in 1995, the scope of the interagency review has been broadened. The State Department, ACDA, DOE, and DOD are notified of pending export licenses and have the authority to review any license application submitted to DOC and must justify applications they will not review (for example, because of not having pertinent expertise and not being related to designated mission). Other government agencies, including intelligence agencies, may also be requested to participate in the review process.

The National Security Council (NSC) has a coordinating role in the interagency export controls policy process, particularly regarding appeals. The Interagency Working Group for Nonproliferation originally encompassed export controls, but now export control policy is headed by the State Department. The NSC also works with the President's Export Council and leads a working group composed primarily of engineers from private industry.

In contrast to dual-use items on the CCL, exports of defense articles on the Munitions List are more tightly controlled by the State Department and the Department of Defense.[53] Because of their predominantly military nature, many of these items are sold under Foreign Military Sales programs or as authorized Direct Commercial Sales and are subject to close scrutiny by regulatory agencies such as the Defense Security Assistance Agency. More often than not, foreign militaries are the recipient of these items pursuant to bilateral agreements with the foreign government. In Munitions List cases, agencies other than the State Department or DOD play merely advisory roles and do not have a vote in the process.

There is a rough balance of views in the interagency process. In some ways, the contentious nature of the process is a good thing because it allows a full debate of views at the upper levels. The dynamic balance of the interagency process, however, can be skewed when the White House or Congress intervenes for its respective purposes. Congress has intervened on satellite sales and technology transfers to China. The White House, in turn, has criticized legislation like the Helms-Burton Act and the "new propensity for the Congress to take a direct hand in the direction and conduct of foreign policy vis-à-vis unacceptable behaviors of Third-World countries by utilizing unilateral economic sanctions in a much more prescriptive manner."[54] The reality is that the process for reviewing export controls has become bureaucratized and politicized. The challenge is to manage this complex process so that it produces wise decisions.

Cooperation with Allies

Allies have openly complained that American export controls have impeded defense cooperation and contributed to the so-called technology/capabilities gap between the United States and its allies. Something as simple as obtaining an export license to sell a tank clutch to the United Kingdom took an average of 89 days last year.[55] If a U.S.-supplied part broke, it required another set of licenses to return the part to the United States and to re-export the repaired part back. Export controls were a significant factor in the UK decision to buy a European-built missile to arm the Eurofighter.[56]

On December 16, 1999, Dutch Ambassador Joris Vos wrote a letter to Secretary Albright (signed by senior diplomats from 16 other states) criticizing U.S. export controls as "a serious impediment to defense cooperation."[57] This came on the heels of a request from Manfred Bischoff, president and CEO of Germany's DASA, to Secretary Albright to streamline export procedures and his company's decision to look for alternate sources for American-made components. The particular problem for DASA was satellite components. During the March–June 1999 intervention in Kosovo, U.S. export controls prevented allies from having sufficient numbers of precision-guided munitions. Ironically, in April 1999, at the 50th-anniversary NATO summit in Washington, the United States announced the Defense Capabilities Initiative to bridge the gap between U.S. and allied technology and capabilities. As Bischoff pointed out, transatlantic defense cooperation is difficult when technical assistance agreements require months (100 days on average) to process.

More recently, the administration has taken steps to loosen export controls for NATO members and close allies such as Australia and Japan.[58] This Defense Trade Security Initiative (DTSI) was officially announced at the May 24, 2000, NATO Ministerial in Florence, Italy. The measures include 17 improvements to the export controls system, including speeding up the processing of license applications (to about 10 days for allies), extending program licensing from 4 to 8 years, streamlining authorizations for technology transfer, revising the U.S. Munitions List, and permitting American firms to export certain technical data in support of DOD bid proposals without a license.[59] Also proposed is a $30 million computer link between the Departments of Defense, State, and Commerce, an action that will require the approval of and funding from Congress.

Cooperative development and production programs have suffered because of restrictive American export policies and unilateralist tendencies. In recent decades, the NATO Sea Sparrow and Rolling Airframe Missile programs have been among the few successes in cooperative efforts. Often joint and international programs, such as the Medium Extended Air Defense System with Italy and Germany, suffer because of service and Congressional support for single-service programs or U.S.-only programs. The U.S.-UK Joint Strike Fighter and Tracer Scout Vehicle programs are becoming victims to similar interests in the Pentagon and on Capitol Hill.[60] Though support of these programs is as much a question of funding as of export controls, the resistance to cooperation with allies is sired by the same unilateralist orientation. Nevertheless, DTSI has moved in the right direction by paving the way for a pending

joint venture between Raytheon and France's Thomson CSF.[61] DTSI provides for blanket license approvals for major collaborative projects.

Are Current Regimes Effective?

Multilateral regimes can be more effective than unilateral regimes for obvious reasons. The number of participants, however, is not the sole critical factor. Effectiveness of regimes is dependent on careful selection of commodities appropriate for restrictions, participation of key producer nations, and adherence to agreed-upon restrictions by participating nations. The participants need only be a select group if they are the sole and leading producers of a particular commodity, whereas a more common technology requires a far greater partnership. In the latter case, it is necessary to encompass a greater range of technical knowledge and production and to uniformly enforce an agreed-upon common set of export controls. In some cases, bilateral regimes may be appropriate. Bilateral regimes may effectively supplement multilateral regimes with enforceable standards, such as agreements made with Hong Kong under the Wassenaar Arrangement. Bilateral agreements may better assist newly formed nations such as Kazakhstan in developing their export control policies.

Unilateral export controls and sanctions are contentious and usually ineffective.[62] They can be effective only if the nation that applies them is the sole producer and owner of the commodity or technology or otherwise substantially controls its availability. The United States has historically applied unilateral sanctions more than have other nations.[63] As was the case with the U.S. embargo of wheat to the Soviet Union in 1979, unilateral sanctions often result in the target nation seeking supplies elsewhere, resulting in long-term loss of markets for American producers. The Aerospace Industries Association recommends that unilateral U.S. export controls be limited to those technologies that are exclusively available from the United States.[64] Oftentimes, in spite of the futility of such measures, unilateral controls are used by policymakers to emphasize national and political "resolve." Despite the purported symbolic value, unilateral actions have historically had little impact, especially on nations whose economy or national security is hardly linked to the United States. More effective measures have resulted from the exercise of American leadership to forge multilateral sanctions targeting the most dangerous behaviors.[65] Ultimately, export controls cannot forever hinder nations from developing alternative technologies if other exporters are willing to provide them.

In addition to the question of effectiveness of unilateral controls is the issue of the impact of these controls on American exporters. As was the case with the wheat embargo of the Soviet Union, foreign competitors benefit from new markets. Investment capital, in turn, can lead to increased competitive strength, particularly for high-technology industries. That loss of investment capital can have serious implications for industries with long lead times and high infrastructure costs, such as the aerospace industry.[66] The interdependence of national security policy, foreign policy, and economic interests in a global context underscores the importance of multilateral agreements, particularly in light of the diminishing role of the United States as a sole provider for many technologies and commodities.

Security Implications

A 1984 Reagan administration study recommended loosening controls against China to balance the Soviet threat. More recently, at least one participant in the study, Paul Wolfowitz (Under Secretary for Defense Policy in the Bush administration) recommended tightening controls against China because of its export of missile technology to Iran and Pakistan, as well as its emergence as a "strategic competitor and potential threat to the U.S. and its allies in the first half of the next century."[67] By 1995, approximately $1.9 billion in sales to China had been removed from Federal regulation. This removed the requirement for export licenses for many categories of sales and resulted in the absence of any record of sales for many dual-use items.

In October 1998, Congress created a senior Pentagon position for technology security after concluding that the DOD role in controlling exports had been "significantly and improperly reduced over the years."[68] In July 1998, the Rumsfeld Commission reported that looser controls and lax enforcement increased the possibility that rogue states such as Iran or North Korea would build missiles that could hit the United States as a result of exports from China. In the words of the report:

> Trends in the commercial sector of a market-driven, global economy have been accompanied, and in many ways accelerated, by an increased availability of classified information as a result of:
>
> - Lax enforcement of export controls.
> - Relaxation of U.S. and Western export controls.
> - Growth in dual-use technologies.
> - Economic incentives to sell ballistic missile components and systems.
> - Extensive declassification of materials related to ballistic missiles and weapons of mass destruction.
> - Continued, intense espionage facilitated by security measures increasingly inadequate for the new environment.
> - Extensive disclosure of classified information, including information compromising intelligence sources and methods. Damaging information appears almost daily in the national and international media and on the Internet.[69]

A key concern is keeping high-technology industries economically viable. Former Secretary of Defense William Perry believed loosening export controls on computers actually helped DOD by keeping the industry healthy, with profits providing incentives to develop more powerful machines. For example, an item essential for the manufacture of advanced microprocessors ("steppers") is banned from export to China, although Japan is able to export to China without limitation. Japan's three stepper manufacturers (NEC, Nikon, and Canon) are flourishing, while the sole American manufacturer languishes. Industry representatives believe that the United States is in danger of losing its only indigenous manufacturing capability.[70] The substantial startup costs for this capability (approximately $8 billion) are such that gov-

ernment subsidies are not likely, and revenues without the benefits of exports will not sustain the enterprise. Similar experiences are occurring for products such as high-purity silicon wafers and ceramic packages, contained in components for U.S. Patriot, HARM, Tomahawk, Sidewinder, AMRAAM, Maverick, Sparrow, TOW, and Trident missiles, as well as for the Aegis and F–18 radar systems, B–2, B–52, Comanche helicopter, F–14, and M1–A1.[71] Overall, the American semiconductor industry claims that 40 percent of revenues come from exports. The aerospace industry attributes 31 percent of recent sales to exports, up 7 percent from 1989.[72]

Industry representatives state that to be effective, export controls should be

- Applied on a multilateral basis.
- Applied only to controllable and chokepoint products and technologies.
- Responsive to continual changes in technology and its availability.
- Implemented with regularized analyses of the impact of controls, taking full account of economic, competitive, and technology-related interests.[73]

In December 1999, the Defense Science Board Task Force on Globalization and Security released its report:

> The reality is that the U.S. capability to effectively deny its competitors access to militarily useful technology will likely decrease substantially over the long term . . . the utility of export controls as a tool for maintaining the U.S. global advantage is diminishing as the number of U.S.-controllable militarily useful technologies shrink. . . . Equally obvious, shutting U.S. companies out of markets served by foreign firms will weaken the U.S. commercial advanced technology and defense sectors upon which U.S. economic security and military-technical advantage depend.

Globalization has altered DOD dependence upon heavily subsidized, single-customer-oriented industries. Once relying upon government contracts, telecommunications firms now have vast private sector markets and are dependent upon these markets for investment/research capital. National security is intrinsically linked to the health of industries such as these. Nevertheless, denying dangerous technologies to rogues remains a valid concern.

Key Recommendations

Has globalization pitted the imperative of free trade against the imperative of national security? A close examination of the debate reveals that simple choices and solutions do not exist on the subject of export controls. The dilemma is not simply one of choosing between Adam Smith's and David Ricardo's ideals of free trade on the one hand and protection of militarily significant technologies on the other. Instead, it is one of degrees of restraints on trade or identification of critical chokepoints for particularized technologies and commodities based on cogent threat analysis. Nor are advocates for export control reform discretely divided along political or ideological lines. Industry comments that strangling of foreign export revenues en-

dangers national security must be taken seriously but not be allowed to rule the roost when genuine national security interests are at stake. The commercial viability of the high-technology sector is a substantial part of national security because it promotes American technological competitiveness and self-sufficiency for key defense products. This is even more critical when American industries must compete with European and Asian industries receiving heavy state subsidies. This does not mean that the United States should adapt a similar national industrial policy approach, but rather that it should make an effort to level the playing field for American companies.

The interagency process provides a roughly balanced, albeit contentious, way to explore, determine policy, and implement export controls for dual-use items. To a degree, DOC represents industry, the State Department represents foreign policy interests, DOD represents national security concerns, and DOE represents a nuclear-centered policy viewpoint. The intelligence community participates in the process by providing data but does not function as a decisionmaker. The rough institutional balance of views can be influenced by the intervention of "external elements," such as the White House or Congress, whose agendas may steer export controls in one direction or another. In essence, this is the pluralist process of democracy at work, with both its positive and negative features.

Specific Policy Actions

The following actions are among those that can be considered in developing future policies.

Define the Mission. Establish a broad mission statement for export control policy that can serve as strategic guidance on specific goals, criteria, and policies. This document, perhaps incorporated in a Presidential Decision Directive, would recognize national security interests and the goal of preserving a robust and competitive American technology sector while preventing, as well as controlling, security-relevant technology transfers to certain entities when realistically possible. This policy document should recognize new post-Cold War realities: the change in the threat environment, trends toward globalization in business and security, and the Information Revolution that is driving commercially developed technologies faster than defense-developed technologies.

Define the Threat. A major problem is the failure to clearly define the threat or, put another way, to identify the specific states (or even nonstate entities) that may adversely affect U.S. national security. Although the Wassenaar Arrangement is vague in written form, it is generally understood that Iran, Iraq, North Korea, and Libya are the target countries of this agreement. The United States does not have a consensus with its allies over the threat posed from other states, particularly China. U.S. policy itself is ambivalent toward China, sometimes treating it as a partner, sometimes as a potential rival, and with no clear and consistent guidance for export control reviewers and enforcers. The European states and Japan recognize the vast market for high-technology goods that China offers. Is China a threat? In what ways should it be so treated? Consideration must also be given to sharing technology more equitably with U.S. allies and to cooperative development and production of new

technology. Despite the recent initiatives, U.S. policy still does not allow many technological secrets to be shared with its allies.

Identify Critical Technologies. Some areas, such as cluster tools (improving the manufacture of wafers), lack sufficient nexus to strategically sensitive products. Conversely, export limitations may provide less control for the United States by denying intelligence (on importer capabilities) that may otherwise be unavailable and inaccessible. Although DOD-maintained MCTL does not necessarily feed into the Munitions List, a review of critical technologies requires significant consideration of this register. Efforts in this arena can ensure that criteria to identify critical technologies take into account all qualifying factors, such as international availability over time, availability of different technologies with comparable military capabilities, and the potential for third-party transfer and subsequent controls.

Develop Better Criteria to Delineate Military/Civilian End-use Technology. Because of rapid advances in many technologies, more specific and distinct criteria are needed to determine the current and future purposes of a technology and the time at which that technology may need to shift between critical lists (Munitions List and CCL) and controls.

Determine Critical Chokepoints for Technology. By focusing on certain technologies beyond which nations cannot develop adverse military capabilities, export controls can gain maximum effect for the effort. Chokepoints have worked well in the nuclear fields, where the technology is more than 50 years old, and in access to weapons-grade materials that are key to developing a weapon system. Chemical and biological technology chokepoints are far more difficult to define because some materials are used for routine purposes (for example, plant fertilizer).

Optimize Interagency Process. The competitive and dynamic current interagency process and its key participants should be maintained; however, a review should be undertaken regarding whether economic and intelligence information should be a required consideration for all participants and, if so, when such a review should be inserted into the review process. Also, GAO should examine the effects of legislative and executive interventions, which differ from the agencies' agreed-upon export controls decisions. The review might also look at ways to balance the licensing process, within and between agencies, so that lengthy appeals and resulting delays do not hurt American competitiveness.

Maximize a Consensus through International Forums. The lack of support by other nations for export control undermines U.S. controls and hurts U.S. industry. The latter and the Federal Government are in agreement regarding the clear-cut advantages of multilateral agreements and the near futility of unilateral ones. Greater priority should be given to achieving multilateral cooperation for export controls. Bilateral cooperation should be regarded as a base for multinational initiatives, not an end in itself. This could be proposed early in the bilateral negotiations.

Conclusion

The problem of developing sound export control policies is here to stay, and globalization is magnifying the troubles posed by it. This policy arena is a classic

case where multiple objectives are at stake. These objectives are incommensurable in the sense that they are hard to evaluate in relation to each other and that they sometimes clash. Moreover, the task of analyzing policy options often is clouded by major uncertainties about the consequences of releasing advanced technologies abroad or of denying their release. These features make for a policy arena of thorny bushes—one that invites strong debates and bars the way to easy consensus building.

A sense of caution is necessary for the simple but powerful reason that the world remains a dangerous place whose turbulence is being intensified by proliferation of advanced military technologies, both nuclear and conventional. The United States clearly has a valid interest in stemming proliferation of destabilizing technologies to rogues and other countries prone to irresponsible conduct. Just as clearly, the United States has a valid interest in helping its allies remain militarily strong and in using high-technology exports to advance its own economic prosperity and competitiveness in global markets. The continuing challenge will be to strike a sensible balance among these disparate concerns.

Strong and clear policy guidance from the White House and Congress can help; however, because no simple policy formula can provide concrete guidance for all choices, decisions will have to be made on a case-by-case basis. These decisions will be made via a democratic process of pluralism that is both bureaucratized and often politicized. The continuing challenge will be to use this process in ways that lead to thorough analysis, a careful weighing of the tradeoffs, and wise decisions as often as possible. Perfection will be hard to achieve; however, if the United States succeeds in acting sensibly most of the time, it will enhance its prospects for having its cake and eating it, too (that is, promoting both security and prosperity).

Notes

[1] This chapter is based in part upon a study for the Institute for National Strategic Studies (INSS) conducted by Diana Kowitz and Charles B. Shotwell entitled "Export Controls: Balancing the Imperatives of National Security and Free Trade," written in February 1999.

[2] Members are Argentina, Australia, Austria, Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, the Republic of Korea, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States.

[3] As adopted in plenary session, July 11–12, 1996.

[4] Michael Hirsh, "The Great Technology Giveaway? Trading with Potential Foes," *Foreign Affairs* (September/October 1998), 3.

[5] U.S. Department of Commerce, *Export Administration Annual Report of 1995*, 1–2.

[6] Many key appointees in the early Clinton administration, such as William Perry, John Deutch, and Ron Brown, favored liberalization of exports.

[7] Hirsh, "The Great Technology Giveaway? Trading with Potential Foes," 7.

[8] Secretary of Commerce Ron Brown, statement in Introduction to *Export Administration Annual Report of 1995.*

[9] Joseph C. Anselmo, "Industry Impacts U.S. Space Policy," *Aviation Week and Space Technology* (July 6, 1998), 34.

[10] Anselmo, "Industry Impacts U.S. Space Policy," 34.

[11] "Export Control Reform Ranks as Top AIA Issue for 2000," *Defense Daily*, February 2, 2000.

[12] William A. Reinsch, Keynote address to UpDate West Conference, February 9, 1999, 3.

[13] Hirsh, "The Great Technology Giveaway? Trading with Potential Foes," 6.

[14] Holman W. Jenkins, Jr., "Business World: High-Tech Noose Merchants?" *The Wall Street Journal,* January 20, 1999.

[15] U.S. Department of Commerce, *Export Administration Annual Report of 1995* and *1996 Report on Foreign Policy Export Controls*, 1–2.

[16] Jeff Gerth, "U.S. Agency Faults Study on Exports of Computers," *The New York Times*, September 17, 1998.

[17] Rodger Doyle, "By the Numbers: The Arms Trade," *Scientific American* (July 1998), 29.

[18] U.S. Department of Commerce, *Export Administration: Annual Report of 1997* and *1998 Report on Foreign Policy Export Controls*, III-3.

[19] Peter H. Stone, "A Clash Over Export Curbs," *National Journal* (January 23, 1999), 2.

[20] The White House, Office of the Press Secretary, press release, February 2, 2000.

[21] Ibid.

[22] John Markoff, "International Group Reaches Agreement on Data-Scrambling Software," *The New York Times*, December 4, 1998; Laura Wonnacott, "There are Exceptions of Encryption Export Controls That Can Stymie Your Business," *Infoworld* (January 1998), 2.

[23] Jeri Clausing, "Study Puts Price on Encryption Controls," *The New York Times*, April 1, 1998.

[24] Jeri Clausing, "House Panel Votes to Strengthen Export Controls on Encryption," *The New York Times*, September 10, 1997.

[25] "SEMI Export Control Proposal for Category 3-Wassenaar List Review," *Semiconductor Equipment and Materials International* (December 21, 1998), 2.

[26] Ibid., 3.

[27] Ibid., 7.

[28] Drew Wilson, "In for the Long Haul: Foreign Electronics Investors in China Look to the Future," *Electronic Business Asia* (February 1998), 25.

[29] Ibid., 24.

[30] Kenneth R. Timmerman, "Long Beach Missile Transfers," *The American Spectator* (September 1998), 48.

[31] Ibid., 49.

[32] Ibid.

[33] Laura D'Andrea Tyson, "Washington Can't Keep High Tech to Itself, So Why Try?" *Business Week* (July 6, 1998), 18.

[34] Jeff Gerth and Eric Schmitt, "Chinese Said to Reap Gains in U.S. Export Policy Shift," *The New York Times,* October 19, 1998.

[35] Timmerman, "Long Beach Missile Transfers," 49.

[36] Joseph C. Anselmo, "U.S. Reviews Plan to Lift Sea Launch Suspension," *Aviation Week and Space Technology* (August 17, 1998), 31.

[37] Anselmo, "Industry Impacts U.S. Space Policy," 34.

[38] Ibid.

[39] Joseph C. Anselmo, "Hughes Defends China Security," *Aviation Week and Space Technology* (July 6, 1998), 35.

[40] Hirsh, "The Great Technology Giveaway? Trading with Potential Foes," 6.

[41] Justin Brown, "Weapons Exports Will Get Less Scrutiny," *Christian Science Monitor*, June 16, 2000, 2.

[42] "Export Control Reform," 2.

[43] Hirsh, "The Great Technology Giveaway? Trading with Potential Foes."

[44] Vago Muradian, "New U.S. Export Policy to be Unveiled in June at NATO Summit," *Defense Daily*, March 27, 2000, 2.

[45] Cecil Hunt, "Overview of Export Controls," in *Coping with U.S. Export Controls 1998* (New York: Practicing Law Institute, 1998), 52.

[46] Reinsch, speech, 2.

[47] Hunt, "Overview of Export Controls," 52.

[48] Ibid., 43.

[49] Ibid., 47.

[50] This legislation was part of the National Defense Authorization Act for Fiscal Year 1999, October 5, 1998.

[51] Jeff Gerth, "State Department Has Final Say on Exports of Satellites," *The New York Times,* January 22, 1999, 1.

[52] Ibid.

[53] See the Arms Export Control Act, the Foreign Assistance Act (as amended), and the International Trafficking in Arms Regulations.

[54] The President's Export Council, *Unilateral Economic Sanctions: A Review of Existing Sanctions and Their Impacts on U.S. Economic Interests with Recommendations for Policy and Process Improvement* (Washington, DC: Government Printing Office, June 10, 1997), 1.

[55] Greg Schneider, "U.S. Will Relax Arms-Sale Curbs to Gain Greater Access," *The Washington Post,* May 24, 2000.

[56] "Cautious Kudos for Reform of U.S. Export Controls," *Aviation Week and Space Technology* (May 29, 2000), 66.

[57] Vago Muradian, "Allies Call on Albright to Reform Export Controls," *Defense Daily,* January 6, 2000.

[58] Vago Muradian, "New U.S. Export Policy to be Unveiled in June at NATO Summit," *Defense Daily*, March 27, 2000.

[59] "Defense Trade Security Initiative Announced," *Defense Daily*, May 25, 2000.

[60] Vago Muradian, "Officials: Export Control Reforms Signal New U.S. Government Stance on Cooperation," *Defense Daily*, June 1, 2000.

[61] Muradian, "New U.S. Government Stance on Cooperation."

[62] Tyson, "Washington Can't Keep High Tech to Itself," 18.

[63] The President's Export Council, *Unilateral Economic Sanctions*, 1.

[64] "Update U.S. Technology Export Controls," *Aviation Week and Space Technology* (April 10, 2000).

[65] Ibid., 2.

[66] The President's Export Council, *Unilateral Economic Sanctions*, 10.

[67] Jeff Gerth and Eric Schmitt, "Chinese Said to Reap Gains in U.S. Export Policy Shift," *The New York Times,* October 19, 1998.

[68] Ibid.

[69] *Commission to Assess the Ballistic Missile Threat to the United States*, Executive Summary (Washington, DC: Government Printing Office, July 15, 1998), 19–20.

[70] Interview with American Electronics Association, January 8, 1999.

[71] Undated AEA Japan Office leaflet, quoting U.S. Department of Commerce, "The Effect of Imports of Ceramic Semiconductor Packages on the National Security," August 1993.

[72] Brown, "Weapons Exports Will Get Less Scrutiny," 2.

[73] American Electronics Association, "AEA Principles for an Effective Export Controls Policy," undated.