Chapter 3

International Operations of U.S. Defense Firms

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U.S. DEFENSE INDUSTRIAL INTERESTS

The nature of international markets confronts U.S. firms with a variety of difficulties: global overcapacity, the demand by foreign customers that U.S. firms offset trade imbalances created by large arms sales,[1] and the interest of the United States in checking the worldwide proliferation of defense technology and advanced weaponry.

Global overcapacity exists in many sectors of the defense industries. In civil industry, the typical response to overcapacity is that increased competition drives the less efficient producers out of business. But due to national security considerations, the United States and other nations have chosen to subsidize indigenous defense production. The burden of supporting defense overcapacity has been acute in Europe for many years. As a consequence, European governments engage in extensive international collaboration in weapons development, have adopted lenient defense export policies, and have encouraged their defense companies to produce simultaneously for national consumption and export markets. Because of the rapidly escalating costs of weapons systems and reduced production runs, U.S. defense planners and industrialists are now experiencing similar pressures to reduce the number of suppliers and to share the costs and risks of development more widely—through domestic teaming arrangements and increased international collaboration in defense technology.

U.S. defense companies that seek to export face stiff international competition. In the 1980s there were at least nine fighter aircraft planned or under development, few of which could be expected to recover development costs without extensive foreign sales.[2] The same holds for fully deployed systems. The French Air Force can only afford 35 Mirage 2000 fighters per year, but Dassault, the company that produces them, needs to sell about 75 to 80 per year to make a profit. Moreover, competition will not come exclusively from our allies; countries like Czechoslovakia, Bulgaria, and the Soviet Union, whose defense industries were among their few dynamic sectors, may sell armaments to increase their stores of hard currency.

Foreign customers—including the developing countries-are demanding more of their suppliers. One U.S. defense executive noted that in foreign sales "there is no longer any such thing as an unsophisticated customer. " Few foreign nations will buy weapons off-the-shelf from U.S. firms or elsewhere if there is an option to produce all or part of the system at home. To make a sale, U.S. defense companies must offer a variety of incentives, ranging from offsets to licensed production and joint ventures that permit a high degree of local content. Increasingly, U.S. defense executives face difficult decisions concerning how much proprietary technology to share with foreign partners and how to adapt hardware developed for the U.S. military to different requirements. In this respect, the U.S. defense industry is still relatively parochial; U.S. weaponry is designed with the Department of Defense (DoD) in mind, and DoD managers largely determine the design of systems that firms may subsequently market overseas.

The ability of U.S. suppliers to make foreign sales depends as much on U.S. arms transfer policy as on economic factors. The United States is the only major Western supplier whose arms export policies have been primarily motivated by political considerations. Even though economic factors are gaining in importance and U.S. arms transfers dwarf those of Europe, U.S. Government regulation still exerts a limiting influence on international sales of U. S.-made defense products. This takes the form of export restrictions on defense items and technologies that might be militarily useful to potential adversaries, foreign policy restrictions aimed at specific countries, prohibitions against certain sensitive technolo-

[1]The term "offsets" is used t. cover a variety of arrangements by which sellers direct new or additional purchases to the industry of the buying nation as part of the sale agreement. Direct offsets are directly related to the product delivered to the customer, such as producing a component of the system in question. Indirect offsets consist of the purchase of unrelated products or services.

[2]These include the Advanced Tactical Fighter, Israel's Lavi, Northrop Corp.'s F-20 Tigershark, the FSX (Japan), the Korean Fighter Plane, the Taiwanese Indigenous Defense Fighter, the Cheetah (South Africa), the Grippen (Sweden), the European Fighter Aircraft, and the Rafale (France). The Lavi and the F-20 were canceled, and several of the others are in trouble.

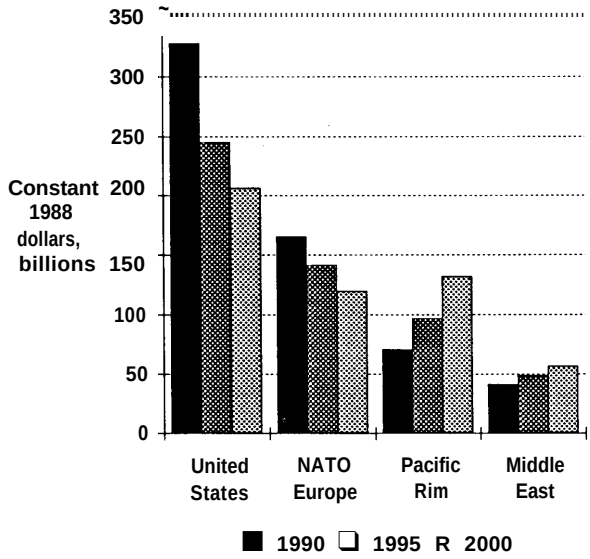
gies, and a number of international agreements and treaties.

The largest potential markets for U.S. defense firms appear to be the Middle East and the Pacific Basin (see figure 3-l). Petrodollars will continue to fund the acquisition of advanced weaponry by a variety of Middle East states. Sales of U.S. military equipment to NATO Europe more than doubled from $1.8 billion in 1978 to $4.2 billion in 1988.[3] (See figure 3-2.) As the European market becomes more integrated, however, U.S. defense sales are likely to decline. While U.S. defense firms will not automatically be locked out of Europe, competition will be intense, probably requiring extensive collaboration with European firms, offset incentives, and reciprocal access to the U.S. defense market.

U.S. defense industrialists and government officials recognize that the days of high-volume, off-the-shelf foreign sales of major systems are over. Many countries that desire U.S. equipment cannot afford it, and future U.S. financing will likely be difficult to obtain. Countries that can afford U.S. weapons, and to whom the United States would sell, like Japan and the European NATO nations, would rather build their own. Finally, sales to countries like Saudi Arabia that can afford what they cannot build are politically controversial in the United States. To increase foreign business, firms will have to plan for the occasional large sale, the internationalization of their operations, and follow-ups to existing sales.

Industry representatives and some government officials complain that the Department of Defense has tended to restrict the export of technologies intended for commercial products; that the Department of State can deny a license for the export of munitions without explanation; and that the Departments of State and Commerce do not coordinate policies in controlling the export of so-called dual-use technologies-those that have commercial and military applications. Nor are these purely interagency difficulties. Within the Defense Department, many potentially direct commercial sales go the government-to-government Foreign Military Sale route because a Defense agency or military Service mandates it.

Figure 3-1—industry Projection of Worldwide Defense Spending, 1990-2000



SOURCE: Major U.S. defence company.

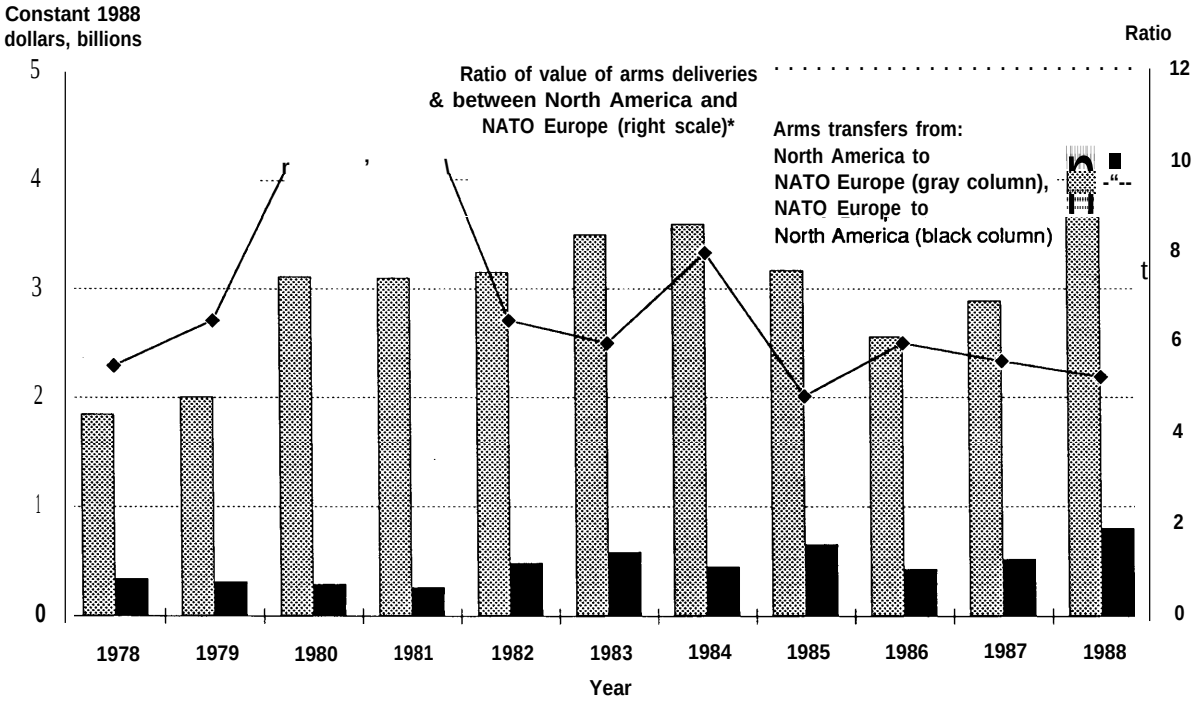
WHY U.S. FIRMS SEEK INTERNATIONAL BUSINESS

With defense budgets declining and few major development programs on the horizon, many U.S. defense firms will seek additional foreign business. According to one industry association, total defense spending in real, inflation-adjusted terms may drop by 8.5 percent in fiscal 1991, with defense procurement dropping by as much as 21 percent.[4] Industry projections point in one direction: while the United States controlled about 62 percent of the total non-Communist world aerospace market in 1988, its share may drop to 53 percent by 2000 and to just half by 2010. For U.S. defense firms to survive, let alone prosper, without reorganization or industry-wide restructuring, they will have to make foreign sales a larger part of their business-provided that government policy permits it. U.S. Government policy may be the single most important factor influencing the international prospects of U.S. defense companies, especially those that are beginning to think in terms of designing systems with foreign sales in mind.

[3]At the same time, NATO Europe deliveries to the United States increased from $300 million in 1978 to $800 million in 1988.

[4]These are the estimates of the Electronics Industry Association's lo-year defense forecast. EIA predicts that in real terms total defense spending will drop by4 to 6 percent a year through 1996. See "Defense Budget Smaller Than Before WWII," *Forbes,* vol. 146, No. 11, Nov. 12, 1990, p. 31.

Figure 3-2—Transatlantic Defense Trade, by Value and Ratio, 1978-88



•Example: in 1978, value of arms delivered from North America to NATO Europe was 5 times greater than from NATO Europe to U.S

SOURCE: Office of Technology Assessment,from data in U.S. Arms Control and Disarmament Agency, *World Mi/itaWfipenditures and Arms Transfers, 1989* (Washington, DC;U.S. Government Printing Office, 1990).

Many of the larger U.S. firms will start from a small foreign business base. Others, like Boeing and McDonnell Douglas, are heavily involved in international markets, particularly the market for wide-bodied jets; they derive 45 and 23 percent of their revenues respectively from foreign sales, the bulk of which (especially for Boeing) are in civil aviation. But other major firms have a much smaller foreign presence: Grumman (5 percent), Lockheed (6 percent) and Rockwell (16 percent) are typical in this respect. When such firms compete for business in overseas-particularly European-markets, they are at a disadvantage when compared to local firms with substantial operations on the ground. European firms tend to integrate defense and civil business more successfully than American fins, and European industrial policies create greater barriers to market access for U.S. defense companies.

U.S. firms face other obstacles to winning foreign business. The first is lack of access to capital that also hinders their ability to compete in U.S. markets.[5] Defense firms have found it increasingly difficult to raise funds for expansion in capital markets. Because Wall Street does not regard defense as a growth business, firms must pay higher rates to attract investors wary of the risks involved in purchasing their debt. This problem is compounded by many defense fins' inability to explain to shareholders and potential investors precisely what their most sensitive programs are.

Weak capitalization of even the major defense firms makes them vulnerable to takeovers and mergers. Moreover, some companies that might compete successfully in foreign markets are divesting their defense businesses, whether to prevent them from depressing their stock prices, concentrate on their core businesses, or pay the costs offending

[5]Unlike the other two obstacles, which are sensitive to regional Conditions, lack of access to capital is a *general* obstacle to overseas expansion. Regardless of which markets U.S. firms seek to penetrate, they must be able to raise capital, whether through issuing new stock, raising funds from commercial banks, getting government financing, or selling a portion of the company to investors in return for an infusion of capital.

off hostile takeovers. For reasons like these, Ford Motor Co. and Goodyear sold their aerospace divisions and Honeywell spun off its defense businesses.[6]

A second obstacle is the increasing competition that U.S. firms face from foreign producers in such potentially lucrative businesses as defense electronics. Fueled by the consolidation of the European defense industry, companies like Daimler-Benz, Thomson-CSF, and British Aerospace offer product lines competitive with U.S. weaponry and tailored to their customers' needs.

By contrast, most of what U.S. firms sell overseas is equipment originally designed for the U.S. military and then modified for export purposes. U.S. weapons sold overseas are often somewhat less advanced and have less capable black boxes than those sold to the U.S. military. An executive whose company has been quite successful in exporting defense equipment explained that his company "is not in the business of designing systems for foreign customers. It designs systems for U.S. customers that can be sold overseas. What you have in stock at any point in time is what you offer to foreign customers.

U.S. defense industry's performance in fixed-price development programs raises further doubts about its ability to compete overseas; Lockheed wrote off $300 million in losses on the P-7 anti-submarine patrol aircraft, McDonnell Douglas swallowed $72 million in overruns on the C-17 cargo transport, and the Navy canceled its $50 billion A-12 stealth fighter program, for which McDonnell Douglas and General Dynamics were the prime contractors. Some analysts believe these losses and writeoffs will degrade the ability of the U.S. defense industry to compete, and that industry maybe losing the know-how it once had to develop next-generation weapon systems.

Despite these obstacles, many U.S. defense executives report they need more foreign business to ensure profitability and, in some cases, survival. They argue that foreign business lowers unit costs of production and increases returns on research and development, and that foreign sales will help to offset declining business at home. Companies also assert that they benefit from foreign government subsidies and that sharing risks for new developments is increasingly necessary, because of the escalating costs of major new weapons systems. Many defense executives believe that if only governments—foreign and domestic—would get out of the way, U.S. industry could dominate world defense markets.

Industry spokesmen tend to minimize the dangers of proliferation of modern weapons and the spread of advanced defense industry and technology. As one industry representative suggested,

> The best thing about the Persian Gulf War is that it established American weaponry as the standard for the region for many years to come and, of course, the United States will have to replace much of the ordnance and equipment expended in the war.

Defense Electronics

Most electronics firms contacted by OTA think they can hold their own in both domestic and international markets. In domestic markets, individual firms believe they can greatly expand shares of a declining market, tailoring semiconductors bought from merchant suppliers for applications such as radar, jamming, night vision, and guidance and control systems for warheads. In international markets, U.S. firms see robust international opportunities for upgrades and retrofitting.[7] In both markets, advanced electronics add value to aging weapon systems; one executive remarked that "a $250,000 black box can protect a $9 million helicopter." But to the extent that a large domestic market remains available, defense electronics firms may feel less pressure than the makers of aircraft and land systems to expand abroad.

While many executives think the potential for international business is enormous, they recognize the difficulties in gaining market share. European firms like Thomson-CSF and the Deutsche Aerospace unit of Daimler-Benz are prepared to go head-to-head with U.S. firms for electronics business. There are fewer and fewer U.S. products for which alternate sources cannot be found; in any case,

[6]Of course, one firm's divestiture is another's acquisition. Thus Loral, a major supplier of defense electronics, acquired the Ford and Goodyear operations as well as Honeywell's Electro-Optic division. It financed the acquisitions by selling off unwanted assets and borrowing the rest.

[7]See "DefenseBudget Smaller Than Before WWII," op. cit., foomote 6. Such a switch, the article continues, will mean less spending on the Strategic Defense Initiative, more light forces, and new fast cargo ships for the Navy.

European governments prefer European suppliers.[8] Many electronic systems embody the kind of advanced technology that triggers export controls and reviews by the Defense Technology Security Administration, the DoD agency charged with reviewing licensing applications for selling controlled items to proscribed destinations. The electronics business is also sensitive to the worldwide decline in defense expenditures that began in 1987.[9]

Land Systems

Land systems like tanks and armored personnel carriers are at the other extreme from electronics. Makers of tanks and other heavy land-fighting equipment, who have traditionally oriented sales to the European front during the Cold War, will not fare well unless they can find international markets.

The experience of General Dynamics (GD), which produces the M-1 main battle tank, is instructive. In the absence of significant foreign sales, GD contends that by 1993 it will have to shut the Detroit, MI, Lima, OH, and Scranton, PA plants that produce the M-1. Company representatives argue that international sales can rescue these plants, preserve an important part of the defense industrial base, and improve the U.S. balance of trade. In testimony before Congress, GD representatives predicted dire consequences if the United States terminated production of the M-l.[10]

GD contends that the United States would face enormous costs in reopening M-1 production lines, once the plants were shut. By GD's estimates, closing the plants would cost the government $200 million, weaken the tank design and engineering community, and force 15 percent of vendors involved in tank production out of business. According to the company, it would take 48 months and cost anywhere from $500 million to $1 billion to restart the industry from a cold base. While some industry analysts dispute these figures, they agree that if M- 1 production lines close down, it would be difficult to restart them with less than a year's notice.[11]

GD asserts that international sales would enable it to continue tank production. The company claims that it has a firm commitment for 555 M1A1 tanks for Egypt and that Congress had approved the sale of 315 M1A2 tanks to Saudi Arabia before the outbreak of the Gulf War. According to company officials, filling these orders would also position GD to sell the Ml to the United Kingdom, which was reviewing both the Ml and the Challenger 2 design proposed by Vickers PLC.[12] With the Lima and Detroit plants kept open, GD officials believe they could fill these and other foreign orders and still meet existing commitments to the U.S. Army.

Whatever may be said about foreign competition, the M-1 remains the world's premier battle tank and the weapon of choice for those countries that can both afford it and gain U.S. approval to purchase it. To that extent, the implication of GD's argument—that foreign sales could maintain M-1 production lines-may be valid.

But making domestic production depend on foreign sales would create many problems. An alternative strategy to produce M-is and comparable systems in smaller quantities would obviate the need to find overseas markets, avoid the risk of having to sell there in order to recover R&D and production costs, and mitigate the overcapacity problem. The proposal to use foreign sales as a way to sustain excess M-1 production illustrates a fundamental policy dilemma facing the U.S. Government. The primary purpose of the U.S. defense industries is to meet U.S. military and national security requirements. A policy and an industrial structure that depends on foreign sales to make the manufacture of defense systems profitable (or even possible) would create strong pressures on DoD and the State Department to approve foreign sales that could not stand on their own merits.

Military Aircraft

U.S. aircraft and engine manufacturers are also counting on international business to keep production lines humming. GD originally tooled to build 216 F-16s per year; for several years, it was building

[8]In its 1989 report, the Defense Policy Advisory Committee on Trade observed that "there are few U.S. products or technologies which are not now available from other sources." Defense Policy Advisory Committee on Trade, *Year-End Review, 1989*, p. 10.

[9]Rick Whiting, "Tracking the Changing Defense Electronics Market," *Electronic Business*, vol. 16, No. 17, Sept. 3, 1990, p. 31.

[10]Prepared statement by General Dynamics for House Appropriations Subcommittee on Defense, June 21, 1990, p. 4.

[11]Eric Deritis, "Army Phases Out M1 As Budgets Shrink," *Government Executive*, vol.22, No.8, August 1990, p. 92.

[12]The British Government was also reviewing the French LeClerc and the German Leopard.

300 planes a year at its Fort Worth and overseas plants, a figure that has dropped to 72 and may fall as low as 48, according to a Congressional Budget Office estimate. Thus GD's Fort Worth Division is counting on foreign sales, which now account for 40 percent of revenues.

Many suppliers of aerospace systems find themselves similarly situated. It now costs between $1 and $2 billion to develop an advanced aircraft engine, and considerably more for a fighter plane like the Advanced Tactical Fighter. Under such circumstances, firms are increasingly forced to enter into domestic teaming arrangements and to seek international joint ventures and sales.[13] For U.S. markets, teaming enables the partners to share development costs that neither could handle alone. International teaming and joint ventures might help cover development costs and allow U.S. firms access to markets that might otherwise be closed to them. They may also help to ensure an up-front commitment by a foreign government to a minimum purchase of a jointly produced weapon system. Reasons such as these led General Electric and the French firm SNECMA to establish CFM International, which is developing the CFM56 engine; Textron to team with Boeing to develop the V-22 Osprey; and McDonnell Douglas and British Aerospace to collaborate on the Harrier AV-8B vertical takeoff-and-landing plane and the T-45 Advanced Jet Trainer.

The history of U.S. aerospace exports has followed a well-defined pattern. Most early international sales did not involve much foreign company participation. As foreign customers became more sophisticated, they demanded direct offsets, coproduction, or both. Thus early F-15 sales to Israel involved 25 percent offsets, while the last five involve 50 percent. In the case of Japan, McDonnell Douglas negotiated two major licensed coproduction agreements with Mitsubishi Heavy Industries, the second of which is for the production of 217 F-15J aircraft through 1995.

U.S. firms have accepted collaboration in various forms because it is often the only way to sell to Europe, Japan, Israel, South Korea, and other nations with sophisticated defense needs. Most countries wish to be as self-sufficient in defense production as possible. To this end, countries (and companies) insist on collaboration as soon as possible (often with direct offsets of components) in lieu of direct buys. That is why U.S. firms concede that it is basically unrealistic to expect Japan or the European nations to buy finished systems.

Many U.S. firms assert that technology transfer issues are red herrings. Because planes like the F-15, F-16, and F/A-18 are fully developed fighters, they contend that no transfer of development technology is involved. According to industry sources, the proposed sale and licensed production of 120 F-16 fighters to the Korean Air Force involves normal U.S. Government controls and licensing procedures, offset credit requirements will be limited to 30 percent, and there will be no "directed buybacks"—that is, U.S. purchases of components coproduced by the Koreans[14] Most defense firms assert that, even in the absence of U.S. Government controls, they would not license their most advanced technologies to other nations.

However, coproduction always leads to the transfer of some manufacturing technology and often stimulates the development of indigenous defense industries. DoD has been sufficiently concerned about the risk of transferring sensitive technologies to South Korea that it prepared a list of items that must be procured as U.S. industry-supplied end items through government-to-government Foreign Military Sales (FMS). The initial "FMS Must" list included engine hot sections, computer source code, inertial navigation hardware, and classified radar hardware technology. Thus, while DoD attempts to stem the transfer of sensitive technologies to foreign customers, the very nature of coproduction makes it difficult to avoid such transfers.

Second, there is consensus that for all the constraints associated with arms transfers, international business is still very profitable for U.S. firms. Whether the transfer occurs through foreign military sales arranged by DoD or through direct sales to the

[13]No one is yet suggesting that next generation systems such as the ATF should be designed with export markets in mind.

[14]Under a U.S.-Korean Memorandum of Understanding, negotiated with McDonnell Douglas' F/A-18 in mind, the Korean Fighter Program would occur in three phases. Phase I would entail the sale of 12 off-the-shelf aircraft under a Foreign Military Sale; under Phase II, Korea would buy 36 U. S-built kits and assemble them under license; in the final phase, for 72 aircraft, most of the components would be built in the United States and assembled in Korea under a limited commercial license. Similar terms will likely obtain under the new agreement South Korea has made with General Dynamics for production of its F-16 fighter.

end user, firms engage in the business because they can make money. One large contractor claimed that although foreign sales were only 11 percent of revenues, they accounted for 25 percent of profits. For another firm, the figures were 15 and 33 percent; while an executive in the electronics group of one large firm asserted that international sales **accounted** for 40 percent of the group's profits, about 20 percent of total business.

Many of the larger firms contacted by OTA believe that foreign business will be important to their continued profitability. The lack of new domestic defense business and the risks associated with getting what remains have made foreign business even more attractive. Executives at U.S. firms believe that they can win foreign business. Going after it presupposes several things: a willingness to engage in joint ventures, to accept some kinds of offsets even if they make little economic sense, and to license technology that maybe close to state-of-the-art. U.S. firms recognize that, in collaborating, they may be nurturing future competitors. But **as one** U.S. executive remarked: "Everyone you do business with is a potential competitor."

THE INTERNATIONAL MARKETPLACE

According to industry sources, there are three foreign markets whose size and buying power make them attractive to U.S. defense fins: Europe, the Pacific Rim, and the Middle East, with most of the prospective business expected from the latter two. Although U.S. firms continue to market in Europe, the obstacles they face are formidable. These include the consolidation of the European defense industry, leading to firms like the Daimler-Benz group, Thomson-CSF, General Electric PLC (U.K.), and Aerospatiale, which offer a full line of defense products; and the reluctance of European governments to accept outside suppliers unless they can offer a product clearly superior to anything European firms can provide.[15] In this environment, outside firms must collaborate to have any chance of winning contracts.

These trends axe already firmly established, **as McDonnell** Douglas' collaboration with British Aerospace on the Harrier II and T-45 trainer and General Electric's CFM venture with SNECMA suggest. The T-45 is especially interesting because it is being built in the **first** instance for the U.S. Navy. Collaboration gives McDonnell Douglas access to foreign capital and positions it to sell the product **to other countries.** British Aerospace is responsible for the airframe, Rolls Royce for the engines, Hughes Aerospace for the aircraft simulators, and McDonnell Douglas for systems integration and production.[16]

More than the Americans, the Europeans accept that they are producing both for indigenous markets and for export. Their own markets are **too small to** absorb the quantities their manufacturers must produce in order to recover their R&D and production investments. Marketplace realities dictate **that the same** firms that collaborate with U.S. companies on European procurements will compete with them for contracts elsewhere.

The **history** of France's Mirage III and Mirage 2000 fighters illutstrates how the need to export drives arms production. In 1977 Dassault-Breguet produced 162 Mirage IIIs, only 44 of which were procured by the French government; the other 118 were exported. The same holds for the more advanced Mirage 2000. Since the French Air Force can only afford 35 of these aircraft per year, the company must find other buyers for the additional 75 to 80 planes it produces annually. Orders from India, Egypt, Greece, Morocco, and the United Arab Emirates have permitted economies of scale in production. With the French Government prepared to underwrite only 80 percent of the indigenous procurement costs of weapons, the balance and profit must come from foreign sales.[17]

Even when blessed by government, U. S.-European collaboration can be risky. Some of the most ambitious cooperative ventures are in serious trouble. The Advanced Short-Range Air-to-Air Missile is in jeopardy as the U.S. Air Force prepares to withdraw from the program; both Hughes Missile

[15]It was this consideration that led the British Government to choose Westinghouse's AWACS radar system over British Aerospace's Nimrod on technical grounds. The other factor was that Westinghouse offered 130 percent offsets.

[16]The partners in the T-45 program have formed a joint marketing committee to discuss international sales opportunities.

[17]Information on Mirage III and *2000* from David J. Louscher, "Patterns of Demand and Supply of Weapons Systems," a presentation prepared for the Workshop on Arms Transfers to the Middle East, O'IA, International Security and Commerce Program, Sept. 21,1990. Several of the fighter planes cited in footnote 4, as well as France's LeClerc main battle tank, will also require foreign sales to recoup their R&D and production costs.

Systems Co. and BAe are presenting an alternative to Britain's Ministry of Defense to revive the program. Similar problems affect the production of Patriot missiles in Italy, as funding constraints there threaten Raytheon's collaboration with Fiat Aviazione and Selenia. All of this is in addition to the problems of those European ventures that have some U.S. content, above all the European Fighter Aircraft (EFA). Germany has requested analysis of the potential cost of withdrawing from the EFA program, while Italy is seeking additional funding to cover its share of R&D.

U.S. firms doing business in Europe will be fortunate to maintain the business they have. Given global overcapacity, the pressures on European governments to maintain their defense industrial base, and the acquisition of smaller European firms by the larger ones, U.S. firms will find it difficult to increase their current market share. The efforts of the Independent European Programme Group to promote armaments cooperation have also affected U.S. prospects. One U.S. executive noted that while IEPG ''was intended to make European firms more efficient, locking the United States out was a secondary, but welcome, effect. '

Pacific Rim nations, including Japan, present greater opportunities and other difficulties. Both Japan and the Republic of Korea have sophisticated production capabilities, although Japan, with its formidable R&D infrastructure, is by far the larger and more important.[18] Even more than with the Europeans, weapons transfers to Japan, South Korea, and possibly Singapore, Indonesia, and Taiwan raise issues of technology transfer. Both Korea and Japan have growing indigenous defense industries; and although Japanese policy does not currently permit the export of arms, many U.S. executives told OTA they expect that by the end of the decade Japan will be a major competitor, especially in defense electronics.

The long-term prospects of U.S. firms in the Pacific Rim are problematic. Their traditional role as suppliers to Japan and South Korea is an advantage; it may well lock out European fins, since many Japanese and Korean weapon systems are produced to U.S. specifications. But the FSX controversy raises the issue of whether-and if so, for how much longer—these nations will be willing to depend on outside sources for weapons development.

Photo credit: Raytheon Co.

Raytheon Co.'s Patriot missile defense system is produced under license in Japan and Germany, and Italy has negotiated to produce it as well.

According to a General Accounting Office official, the sale and licensed production of advanced U.S. fighter aircraft with South Korea is only the first phase of an ambitious program to develop an advanced indigenous armaments industry. The second phase would be a follow-on codevelopment, while the third would lead to an indigenous fighter. Although many observers consider these goals unrealistic, several U.S. defense industry executives

[18] On Japanese defense programs, see U.S. Congress, Office of Technology Assessment, *Arming OurAllies: Cooperation and Competition in Defense Technology, OTA-IS(X49* (Washington+ DC: U.S. Government Printing Office, May 1990), ch. 4, pp. 61-72. For South Korea, see ibid., app. D, pp. 111-113.

conceded that Korea could become a significant producer of aircraft parts and components in the world market.

The Middle East is the largest and most problematic remaining armaments market. According to the U.S. Arms Control and Disarmament Agency, in 1988 the region as a whole imported about $15 billion in arms, accounting for 31 percent of all arms transferred that year.[19] Between 1984 and 1988 the Soviet Union supplied about one-third of all arms imported to the region, with the United States (18 percent) and France (14 percent) second and third, respectively. During the 1984-88 period, Iraq, Saudi Arabia, Iran, and Syria were the region's largest importers.[20]

In selling to the Middle East, the United States will face competition not only from Britain and France, but the Soviet Union and the People's Republic of China as well. The competition will be shaped by the fact that, except for Israel (and to some extent Egypt), none of these countries has an indigenous development, production, or support capability. In effect, when the United States or Britain sells to Saudi Arabia, each must provide a complete weapons package that includes spare parts, logistic support and other support services. U.S. companies, however, may enjoy a significant advantage in the future, because of the performance of U.S. weapons in the Persian Gulf War.

Israel presents a special case because it is the only regional power with a major defense industrial capability. It is also the only country with which the United States has an agreement for directed offsets; that is, U.S. suppliers to Israel agree to purchase specified offset amounts of equipment from Israeli firms. Further, Israel has tried to develop its own weapon systems even when, in the view of some industry and DoD officials, it would have made more sense to buy products off-the-shelf from U.S. suppliers.

There is, then, a certain tension between Israel's defense needs and its willingness to rely on outside sources to satisfy them. To the extent that Israel relies on a single supplier country, as it did on France until the 1967 Six Day War, it faces the risk of being cut off if political conditions change. The Israeli desire for indigenous production capacity is thus motivated by more than nationalism; up to a point, it is a rational response to the political realities it faces. Chapter 5 of this report provides a detailed description and analysis of the Israeli defense industries.

The problems U.S. officials and suppliers face with Saudi Arabia are of a different order. With virtually unlimited amounts of cash, the Saudis are in a position to buy what they want—if not from the United States, then from elsewhere. In connection with the 1986 and 1988 Al Yamamah sales by Britain of 25 to 30 billion dollars' worth of weaponry to the Saudis, one observer noted:

> The fact that Saudi Arabia-a country that 20 years ago would only have been able to buy obsolete stock from the arms manufacturer's bottom drawer—is able to buy such modern weapons is a mark of how rapidly the market has changed. As the Saudi deal clearly showed, the amount of leverage that the supplier countries can now impose on the buying nations is much less. In many respects, power has now moved from the seller to the buyer. Hard bargains can be struck and barter is the common currency.[21]

More than in the European and Pacific markets, the effects of U.S. sales to the Middle East will ripple throughout the region. Sales of F-16s to Belgium and the Netherlands raise no major political issues because they conflict with no other regional security interest; even the proposed F-16 fighter sale to South Korea is fairly straightforward inasmuch as the threat to that country is clear-cut.[22] But a sale to the Saudis must be weighed against other, equally important regional interests. To counterbalance the Saudi sale, the Administration announced that it was *immediately* sending Israel two Patriot air defense units, as well as a promise of more munitions, 15 F-15s, and 10 CH-53 Sea Stallion cargo helicopters. Thus a sale to one country triggers sales to others in the region.

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[19]U.S. Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers 1988* (Washington DC: U.S. Government Printing office, 1990), pp. 7, 75.

[20]U.S. clients included Saudi Arabia, which bought $5.8 billion, Israel ($6.1 billion), Egypt ($2.8 billion) and Jordan ($0.5 billion). Ibid., p. 9.

[21]James Adams, Engines *of War: Merchants of Death and the New Arms Race (New* York, NY: The Atlantic Monthly Press, 1990), P. 126.

[22]The debate over the FSX presents a different kind of issue, since that debate focused almost entirely on technology transfer rather than the military merits of the plane.

FOREIGN MILITARY AND DIRECT COMMERCIAL SALES

U.S. foreign and national security policies shape the procedures by which weapons are actually sold: foreign military sales negotiated by the Defense Security Assistance Agency (DSAA) and direct commercial sales by U.S. firms. This section reviews the impact of both on U.S. defense firms.[23] The merits of each procedure matter because each has its own effects on the overall pattern of activities in international defense business.

An FMS is a government-to-government transaction in which a foreign government transmits a letter of intent to purchase a specified weapon system. It is similar to a domestic procurement inasmuch as the same regulations cover both. Following a Planning and Review cost analysis, DSAA may then issue a Letter of Offer and Agreement setting forth the terms under which the equipment will be sold, followed by the procurement and delivery of the items requested by the foreign government.

Increasingly, foreign governments are willing to deal directly with U.S. suppliers, although FMS remains the principal conduit for the export of U.S. weaponry. Figure 3-3 illustrates that while direct commercial sales deliveries have increased dramatically, they have not yet superseded FMS as the principal means of transferring arms to foreign buyers. In general, however, such figures should be used cautiously. While DSAA tracks FMS, for which it is the lead agency, the main data on direct commercial sales deliveries are derived at second-hand from U.S. Customs figures made available to the State Department.

Although the FMS process is not difficult to grasp, its effects on the domestic arms industry are controversial.[24] There are some clear advantages from both the buyer's and seller's perspective. A Foreign Military Sale is a cradle-to-grave process managed by DSAA. The weapons package assembled by DoD guarantees "single vendor integrity" — the same parts over the life of the weapon system. Further, the purchaser pays only the actual cost to DoD, plus a 3-percent fee for DSAA, with profits controlled by the Federal Acquisition Regulations. And once U.S. equipment is deployed overseas, foreign governments have access to DoD stocks in times of emergency. Some foreign governments actually feel more comfortable with a process in which DoD handles all the paperwork. Finally, the DSAA field staff of DoD Security Assistance Officers, while not defense equipment sales representatives, do serve to promote U.S. arms transfers indirectly. For DSAA, the presumption is that the United States will sell a system to a foreign government if it can. Such indirect marketing assistance can be quite valuable to U.S. defense manufacturers.[25]

Direct commercial sales also have advantages. Company-to-company negotiations cut procurement lead times, enable the supplier to tailor the package to its customer's needs, and allow the customer to buy new equipment directly from the production line. For U.S. defense companies, the direct sale is the process of choice. One major exporter noted that there are three conditions that enable it to make a profit on international sales: 1) if it can sell commercially, 2) if, as with Israel, the foreign government does business with the U.S. supplier on a direct commercial basis and pays more than the U.S. Government would, or 3) if a foreign country buys spare parts directly from the supplier.

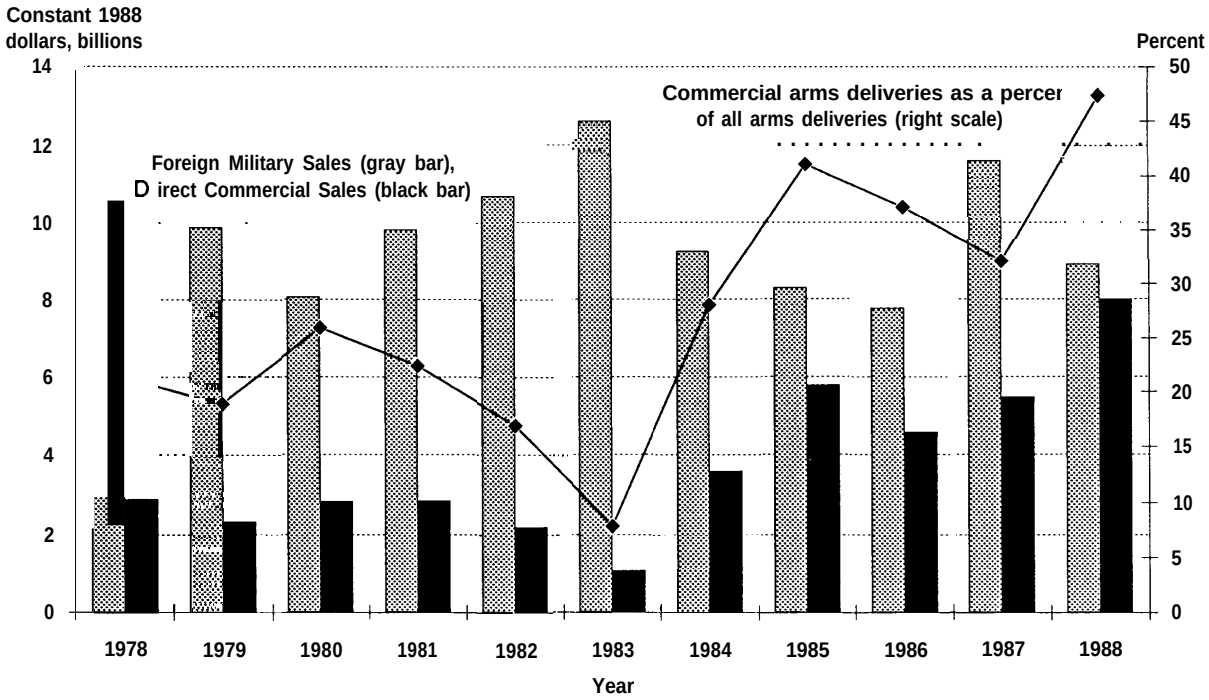
Through an intricate division of labor, DoD and the State Department make security assistance policy. Once the President certifies a country as eligible to buy U.S. weapons, State determines what major sales may be made. This determination involves extensive consultation with DSAA field staff on foreign countries' requirements, with the Defense Technology Security Agency, and with the Services. If agreement on the desirability of the transaction is reached, State then issues the munition export licenses required by the International Traffic in Arms Regulations. DoD determines what equipment is available for sale, administers the FMS program, and implements the funding of FMS and

[23] For a brief description of how FMS and direct commercial sales work, see OTA, *Arming* Our A/lies, op. cit., footnote 18, app. B, "Techniques and Mechanisms for Cooperation' pp. 96-101.

[24] On the advantages and disadvantages of FMS and direct commercial sales, see U.S. Department of Defense, Defense Security Assistance Agency (DSAA), "A Comparison of Direct Commercial Sales and Foreign Military Sales for the Acquisition of U.S. Defense Articles and Services," August 1989.

[25] U.S. security assistance efforts to promote U.S. defense equipment sales are minor compared to those of the United Kingdom and France, both of which have very active government defense sales organizations.

Figure 3-3--Foreign Military Sales v. Direct Commercial Arms Deliveries, 1978-88 (constant 1988 dollars, bililons), and Commercial Arms Deliveries as a Percent of All Arms Deliveries



SOURCE: Office of Technology Assessment, from data in U.S. Department of Defense, Defense Securfty Assistance Agency, "Fiscal Year Series," Sept. 30, 1989, p. 2.

other military assistance programs. ultimately, the decision whether or not a sale will be made depends on a variety of considerations: the sensitivity of the technology being exported, the sale's impact on regional security, its effect in limiting the adversary's influence, and the like.

For weapons exporters, the decision to sell through FMS or directly is not theirs to control.[26] Firms would be indifferent to which route buyers prefer were it not for some unattractive features of the FMS process. The most notorious of these is the 3-percent surcharge that DSAA levies on foreign military sales, which may be regarded as DSAA's management fee (covering 80 percent of its operating expenses). This fee depresses the value of the sale to the supplier because a firm is not permitted to charge more on foreign than on domestic sales. Further, DSAA has enabling legislation that waives recoupment of nonrecurring costs, such as for R&D. In other words, in a government-to-government sale, DoD recaptures the contractor's R&D investment and transfers it to a miscellaneous account in Treasury.

Many defense firms complain that the surcharge works against their interest in gaining international business because it makes FMS transactions less profitable than direct sales, and that financing DSAA's activities this way may provide DSAA with an incentive to direct sales through FMS rather than commercial channels.[27] However, DSAA argues that waiving recoupment of nonrecurring costs means that DoD effectively lowers the price of U.S. weaponry for our friends and allies, which can have a dramatic effect on marketing. Finally, the 3-

[26]Even where sales are direct, DSAA can still intervene, especially where the sale involves transfer of technology developed under U.S. Government contract.

[27]Industry specifically opposes imposing nonrecurring recoupment surcharges on direct commercial sales and on nonmajor defense equipment for FMS. DSAA maintains that imposing surcharges on direct sales and not on FMS would undermine government neutrality toward the two major sales options, thereby skewing military sales toward DCS. See Carlos Aquino, *Strengthening the Army- Industry Dialogue on Defense Cooperation and Trade #AR910Rl* (Bethesda, MD: Logistics Management Institute, November 1990), p. 3-3.

percent surcharge may also have the effect of motivating DSAA to promote defense sales in general.

U.S. defense manufacturers claim further that the FMS system is inflexible because customers can seldom get pricing information in less than 90 days. Countries might also want flexible waivers and guarantees, which are almost impossible to get through DSAA.[28] Even where DSAA is willing to leave the choice of FMS or direct sale up to the customer, one of the Services might add a proviso to the export license requiring that it go FMS. Many sales that are nominally direct have as many as a dozen provisos attached requiring that some components or subsystems be sold government-to-government.

Defense firms also assert that an FMS makes it more difficult for them to negotiate offsets with the customer, since DoD will not pay for offsets as part of an FMS. Instead, they must be negotiated separately by the purchaser with the contractor. Most U.S. contractors view offsets as a necessary condition of doing business with certain countries. If the U.S. Government prohibited U.S. companies from offering offsets, it would effectively cede many markets to foreign suppliers. Moreover, contractors can do several things to dilute the impact of offsets on their profits, such as trading offset credits with other firms or overestimating the dollar value of the technology they are transferring. One contractor contacted by OTA put the matter this way: ''An offset is an evaluation of what's valuable; in other words, we get the work done overseas because it's cheaper than doing it at home. ''[29]

There remains the question of whether FMS and direct sales can be regarded simply as economic transactions. Viewed purely as commercial agreements, either route may appear cost-effective depending on the buyer's degree of sophistication, the level of support he desires, and the price he is prepared to pay. Even with an FMS agreement, companies can still make more money on foreign than on domestic business because they are spreading their freed overhead over a larger base-not to mention the importance of foreign contracts that keep production lines open long enough for domestic sales to resume.

But to view weapons exports in such terms is perhaps to miss the point. DSAA exists not so much to improve the U.S. trade balance as to further certain national security and foreign policy interests. One of these is to promote foreign procurement of U.S. defense equipment consistent with U.S. security objectives; another is to prevent the export of sensitive technology that might fall into the hands of current or potential adversaries. For this reason, the United States negotiates government-to-government Memoranda of Understanding when such technologies are included in weapons transfers. It was likewise for reasons of national security that, in negotiating the sale of F/A-l 8s to South Korea, DoD placed certain items on a government-tc-government ''must list" (i.e., made them subject to FMS) and prohibited directed buybacks. (Similar conditions are likely to be imposed on the newly proposed F-16 sale to South Korea.)

It is, however, legitimate to ask whether DSAA and DoD are the proper fora for balancing concerns about arms proliferation against the perceived need to strengthen the defense industrial base. Given its mission, DSAA is not likely to have an arm' s-length relationship with its suppliers. After all, an FMS sale is a contract with a domestic supplier. And whatever problems firms have with the process, it represents a sale that might otherwise not be made. Moreover, FMS surcharges, which amount to approximately $330 million per year, fund Service military assistance programs and support DSAA operations .30 There may be a conflict of interest inherent in a situation where an agency reaps a surplus from the industry it regulates.

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[28] Some FMS transactions include cross-leveling agreements, by which country funds on deposit in the FMS trust fund can be moved between separate FMS purchases or to and from special holding accounts. Where a direct commercial sale normally has a fixed price, a cross-leveling agreement gives the buyer greater flexibility in meeting changing requirements. See the Defense Security Assistance Agency (DSAA), "A Comparison of Direct Commercial Sales," op. cit., footnote 24, p. 18.

[29] For data on offsets, see Executive Office of the President, Office of Management and Budget, *Offsets in Military Exports* (Washington, DC: Office of Management and Budget, December 1988).

[30] In this context, it should be noted that DSAA has experienced serious problems in administering DoD's FMS trust fund. DSAA's failure to develop a system to correct accounting deficiencies in the FMS program led DoD to transfer responsibility for the system from DSAA to the Air Force in July 1988. See U.S. General Accounting Office, *Financial Integrity Act: Inadequate Controls Result in Ineffective Federal Programs and Billions in Losses*, GAO/AFMD-90-10 (Gaithersburg, MD: November 1989), p. 33.

WHAT THE DEFENSE INDUSTRIES WANT

Industry complaints about Foreign Military Sales are only part of a broader critique of the export control regime that appears to have outlasted the Cold War that established it. The defense industry's position is that the government has a legitimate interest in protecting the defense industrial base by promoting arms exports. As expressed by the Defense Policy Advisory Committee on Trade (DPACT), an industry group that consults with the Secretary of Defense and the U.S. Trade Representative, "the wisest policy for government to pursue is to ensure that mechanisms are in place which will enable industry to keep ahead, both technically and economically, of the foreign competition. ' '[31]

For all the obstacles U.S. firms face in selling overseas, they have one great advantage. With the Soviet threat now almost irrelevant, the United States has become, almost in spite of itself, the world's largest arms supplier and the one with the best products. For economic as well as strategic reasons, a case can be made-aria is being made-that the government has much to gain by supporting U.S. arms exports.

DPACT's position is best considered in light of U.S. export controls. The State Department implements the Arms Export Control Act of 1976 through the International Traffic in Arms Regulations, which are based on the U.S. Munitions List maintained by DoD.[32] The Export Administration Act of 1979 (EAA), as amended, controls the export of dual-use technologies that could significantly augment the military capabilities of an adversary. The Commerce Department's Bureau of Export Administration administers the EAA.[33]

Of these agencies, the State Department has perhaps been the quickest to recognize that the environment within which export control policy is made has changed. In January 1990 the State Department replaced the Office of Munitions Control with a new Center for Defense Trade based in the Bureau of Politico-Military Affairs. Comprising an Office of Defense Trade Controls and an Office of Defense Trade Policy, the Center combines licensing and enforcement with the setting of policy for commercial defense trade.

Thus, the new Center serves two related purposes. First, as State Department officials made clear, the Department concluded that "complaints about the understaffing and underfunding of [the Office of Munitions Control] were entirely legitimate.' '[34] The number of licenses OMC handled had risen from 20,000 annually in the early 1970s to 60,000 a decade later, before falling back to 54,000 in 1990. On one level, then, the Center's purpose was one of administrative consolidation: to reduce backlogs and increase efficiency by bringing more resources to bear.

But the 1990 reorganization was also designed to reduce unnecessary impediments to defense trade. The State Department has endorsed the position that it should support U.S. defense trade, whether by more timely processing of export license applications or by enjoining personnel in U.S. missions to promote purchases of U.S.-made military equipment, as a July 1990 memorandum by Deputy Secretary Lawrence Eagleburger directed.

Yet the export control regime remains, in most respects, what it has been for the past two decades. It is complex, geared to political and military conditions that no longer exist, and open to the charge that it penalizes domestic suppliers without effectively controlling the worldwide dispersion of defense technology.

Even those who administer export controls find the process difficult to grasp; and as one regulator

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[31] Defense Policy Advisory Committee on Trade (DPACT), *Year-End Review,* Op. Cit., footnote 11, P. 4.

[32] The latest version of the ITAR is published in 22 CFR 120-130 (November 1989).

[33] In mid-November 1990 President Bush pocket-vetoed a bill amending the EAA that would have:
- created an essentially license-free Coordinating Committee for Multilateral Export Controls (CoCom), the principal forum for devising common export control among Western Alliance members. In effect, U.S. companies would not have needed licenses to export to CoCom countries;
- created a statutory licensing regime for missiles and chemical and biological weapons, and imposed sanctions against the United States and foreign countries for violating controls;
- given "good" East European countries unlimited access to telecommunications equipment; and
- tied the U.S. Munitions Control List to the CoCom Munitions List.

[34] U.S. Department of State, Bureau of politic@ Military Affairs, *Defense* Trade *News,* vol. 1, No. 1 (Washington, DC: Center for Defense Trade, March 1990), p. 5.

conceded, the EAA "is an antique, because it no longer addresses our concerns." The frost National Academy of Sciences study of the current export control regime (also known as the Allen Report) noted the chilling effect that controls on the export of dual-use technology have on overseas sales. Most importantly, the report concluded that "the United States must clearly distinguish foreign policy export controls from national security export controls. "[35]

There is a deceptive similarity between the findings of the Allen Report and the policy positions of DPACT members. Both would like to see the export regime streamlined; both criticize the emphasis of regulations on East-West trade, at a time when the Soviet threat is greatly diminished; and both would like to see export controls focus on a carefully crafted "core list" of the most sensitive technologies.[36] *And it is these views* that prevaield in the late 1980s.

The similarities between the Allen Report and the views of DPACT members are superficial, however, because the latter propose the de facto deregulation of the U.S. arms industry while the Allen Report accepted the need for some control of weapons proliferation. Testifying before Congress, one DPACT' member argued that ''we can meet the competitors in the international marketplace if we're not hobbled by rules.' '[37]

But the industry that DPACT represents wants more than a relaxation of the more onerous controls. Commenting to OTA that Congress has waived certain FMS requirements for NATO allies and Japan, one executive remarked that it had not done the same for "those cash-strapped countries that may be the biggest customers. " While paying lip service to government export controls, industry officials would like the U.S. Government to take a much more active role in helping them sell weaponry overseas.

What this means is that U.S. agencies would be far more involved in closing deals than they are now. To the extent that DPACT represents an industry consensus, that industry would like government assistance in four ways. After removing regulatory obstacles, industry representatives believe, the most important action the U.S. Government could take would be to promote the financing of defense exports. With certain exceptions, the Export-Import Bank is barred by law from financing military exports to developing countries, and as a matter of policy, it has refused to support sales to developed nations.[38] Available government financing, such as the FMS fund for security assistance, goes to developing countries that wish to arm themselves with U.S. equipment and is largely earmarked by Congress. There is no program to encourage private institutions to finance exports to countries with defense needs.

Second, industry representatives want DoD approval for in-country demonstrations of U.S. weaponry. Many countries will not buy weaponry without such demonstrations, which require DSAA approval. Even absent such approval, however, firms may find ways to demonstrate their wares. For instance, F-16s from the Netherlands and F/A-18s from Canada have been flown to the Farnborough (U.K.) Air Show for demonstrations, while U.S.-manufactured planes were on static display.

Third, the U.S. defense industry would like the assistance of the State and Defense Departments in making international sales. Several executives noted that the official in charge of foreign sales at the U.K. Ministry of Defense is one of the highest-paid executives in the British Government. They contend that given the size of the U.S. military budget, the U.S. Government could do worse than take an example from the British-with 40 to 60 attache% in Washington-and increase the number of security assistance officers at many embassies.

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[35]National Academy of Sciences, Balancing *the* National *Interest: U.S. National Security Export Controls and Global Economic Competition* (Washington, DC: National Academy Press, 1987), p. 19. The report adds that "to the extent that the United States fails to distinguish clearly between the two, allied cooperation in support of consensual national security objectives is undermined." Lew Allen, former Air Force Chief of Staff and current Director of the Jet Propulsion Laboratory, chaired the panel that drafted the report.

[36]The Allen Report focuses on the export of dual use goods and technology, not military hardware. It does, however, note that the Arms Export Control Act "appears to function well." Ibid., p. 37.

[37]Lt. Gen. Howard M. Fish (USAF Ret.) statement in hearings before the House Committee on Banking, Finance, and Urban Affairs, in U.S. Congress, Subcommittee on Economic Stabilization, ' 'Internationalization of the Aerospace Industry," 101st Congress, 1st sess. (May 10, 1989), p. 41. At the time, Gen. Fish was chairman of the American League for Exports and Security Assistance.

[38]Stuart Auerbach, "Defense Firms Seek Ex-Irn Bank Aid in Selling Their Equipment Overseas," *The Washington Post*, Jan. 10, 1991, p. D1. At this writing, the Bush Administration has sent legislation to Congress that would enable Ex-Im Bank financing for military sales.

Finally, the industry would prefer more direct commercial sales instead of FMS. Government-to-government memoranda of understanding (MOUs) make sense where sensitive military technologies are involved. But some industry sources claim that MOUs are often negotiated where coproduction or codevelopment are not involved. By permitting more direct sales, the U.S. Government would give domestic firms a competitive advantage over European suppliers.