

Chapter 4

Emergence of Transpacific Collaboration: The Case of Japan

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Emergence of Transpacific Collaboration: The Case of Japan

SUMMARY

Cooperative defense programs have been fundamental in U.S.-Japan security relations since the Korean war. Defense collaboration has been pursued for both economic and strategic military reasons, but until recently the United States has favored the latter while Japan has placed at least equal emphasis on the economic aspects of such programs. The United States generally has been willing to overlook the economic consequences of these policies to satisfy its higher priorities of preserving the regional military balance in Asia and of assuring that Japan remains a close ally.

The shift from Japan as buyer to Japan as developer of independent weapons systems has forced the United States to reconsider its traditional postwar policies, especially because advanced technologies have potential applications in both military and civilian sectors. Furthermore, Japanese firms have pursued a different agenda throughout the postwar period, emphasizing the economic gains of military production at least as much as their military benefits. With Japanese industrial capabilities nearing or surpassing those of the United States in many fields, the potential economic challenges to the United States cannot be dismissed.

COOPERATION WITH JAPAN

The Mutual Cooperation and Security Treaty of 1960 established the fundamental basis for the overall U.S.-Japan bilateral security relationship while the Mutual Defense Assistance Agreement (MDAA) of 1954 established the legal basis for providing equipment and technology to Japan. As Japan's role as a provider of technology grows, the agreement is also important to U.S. policymakers in developing arguments for technology 'flow-backs' to the United States to reciprocate, in a sense, for years of technological imports by Japan.

Collaboration between the United States and Japan in the production of advanced weapons systems, and transfer of military-related technology from the United States to Japan, emerged in the late 1970s as a key element of the overall growth of

U.S.-Japan defense cooperation and Japan's effort to build up its military capabilities. By the end of the 1980s, however, collaboration had become *controversial* between the two nations amidst growing economic disputes between Tokyo and Washington. The merits of collaboration were debated by government officials, influential organizations, and individuals on both sides of the Pacific.¹ The belief that collaboration is mutually beneficial was under criticism by the end of the decade. This, coupled with a changing international security environment, has made collaboration a more uncertain proposition in Japan-U.S. relations of the 1990s.

Collaboration in defense production goes back to the beginnings of the defense relationship in the 1950s. The MDAA provided the basis for sales of American weapons to Japan and the coproduction of weapons systems developed in the United States. The agreement provided for broad exchanges of defense "equipment, materials, services, or other assistance, and it contained a reference by Japanese Government officials to the desirability of U.S. assistance to Japan's defense industries.

Coproduction emerged in the 1960s as the key element of defense production collaboration, accelerated by the discontinuation of American military assistance to Japan in the mid-1960s. Cooperative programs expanded after 1975, and remained paramount until the latter part of the 1980s. Nearly all arrangements were made between Japanese and U.S. firms with government approval. Under these transactions, the two governments signed a Memorandum of Understanding (MoU), to allow Japanese firms to produce U.S. equipment under a licensing agreement. The U.S. firm typically provides data on manufacturing procedures, machinery and tools, components, management assistance, and help in quality control.

The U.S. and Japanese Governments agreed to two other forms of collaboration in the 1980s. The first dealt with the transfer of Japanese military technology to the United States and was formalized in an exchange of notes in November 1983. The notes established a Joint Military Technology Com-

¹Concerns over the FSX were widely publicized in the United States. For Japan's part, these problems manifested themselves in Strategic Defense Initiative (SDI) negotiations, where private businesses in Japan were concerned that they would not be allowed by the terms of participation to utilize advances for commercial products.

mission (JMTC) to review requests by the United States and the responses of the Japanese Government. The Japanese Government promised in the notes to facilitate the flow of military technologies to the United States and to encourage the transfer of related technologies (dual-use technologies such as materials, operations systems, and components) developed for nonmilitary purposes but applicable to advanced weapons systems.

A second new form of collaboration is codevelopment. The prototype of a U.S.-Japanese codevelopment agreement is the FSX fighter. General Dynamics Corp., the U.S. participant, will provide an advanced airframe and wing sets for testing and aft fuselages. Japanese firms will contribute a phased-array radar, and reportedly new, lightweight materials for aircraft wings. Under a MoU signed in November 1988, U.S. firms in the project will have access to this Japanese technology. U.S. firms will receive 35 to 45 percent of the development costs paid by the Japanese Government and about 40 percent of the \$5 billion realized through sales to the Japanese Government. Unlike codevelopment projects between the United States and NATO countries, the United States does not intend to acquire the FSX for the U.S. Air Force.² In U.S.-European codevelopment deals, a U.S. commitment to purchase is often an integral offset of guaranteed profits to the American participants.

THE U.S. POLICY FRAMEWORK

Although economic considerations have not been entirely absent from U.S. policy, military and security considerations have been the decisive elements in U.S. policy toward Japanese arms production in the post-World War II period. American strategy has separated the economic, political, and military components from one another. Issues have been viewed in isolation or in the context of overall U.S. relations with East Asian nations, specifically regarding the security ties deemed necessary to counterbalance communist influence and Soviet military presence in the region. From a foreign policy perspective, both the United States

and Japan frequently warn of the danger of trade tensions spilling over into the defense arena.³

As early as the Korean war, U.S. defense planners saw the utility of Japan serving as a forward line of defense in Asia, providing both a base for U.S. forces in the region and a source of logistical support. Japanese business and government saw opportunities for economic recovery in the same crisis. Japan resuscitated its domestic aircraft industry in 1952 by manufacturing spare parts for U.S. military aircraft based in Japan, a full 2 years before the establishment of either the Self-Defense Forces or the Japan Defense Agency (JDA). Total aircraft production in Japan rose from 29 million yen in 1952 to 2,451 million yen the following year.⁴ During the 1952-54 period, demand by the U.S. armed forces in Japan constituted between 60 and 80 percent of total aircraft production. The Japan Defense Agency gradually supplanted the U.S. presence, and by 1958, over 80 percent of total aircraft production was directed to JDA needs.⁵

Because of the relative weakness of the Japanese economy in general and the aerospace industry in particular, these growth trends were not viewed with any sense of alarm. Instead, they justified U.S. policies to help stimulate economic growth in the war-torn Japanese economy, to reduce the threat of Japan becoming a burden for the United States, and to strengthen the security alliance in the Pacific. These strategic factors also predominated in the years that followed.

The U.S. strategic posture provided the policy framework for more generous coproduction agreements from 1978 through 1985. F-15 fighters, P-3C antisubmarine aircraft, and Patriot **surface-to-air missiles** were either specified in Reagan administration proposals for Japan's self-defense or fell within the U.S. emphasis on Japan's air defense and sea control capabilities. They were also central to the U.S. goal of persuading Japan to **modernize existing forces** rapidly. Key Japanese **sea** and air defense **systems** (such as the F-104 fighter, P-2J antisubmarine aircraft, and the Nike-J **surface-to-air missile**) were either **aging or obsolete** by 1980. Coproduction

²Industry observers have suggested, however, that General Dynamics is looking to the project in order to help develop its "Agile Falcon," an advanced version of the F-16 for deployment in Europe with multiple missions capability. Daniel Sneider, "Mitsubishi, General Dynamics 'Very Close' To Signing FSX Contract," *Defense News*, vol. 4, No. 49, Dec. 4, 1989, p. 8.

³Richard L. Armitage, "The U.S.-Japan Alliance," *Defense* 86, July/August 1986, pp. 20-22.

⁴Society of Japanese Aerospace Companies, Inc., "Aerospace Industry in Japan, 1987-88," p. 11.

⁵*Ibid.*, pp. 3-13.

offered a means of bringing modern systems into the Japanese military arsenal within a relatively short period of time.

U.S. officials also viewed coproduction as helping to achieve the objective of broadly based defense cooperation, which 1978 guidelines spelled out. Stepped-up coproduction occurred amidst progress in joint planning, an expansion of joint military exercises in scope and frequency, greater coordination of intelligence, and agreement on the U.S. deployment of F-16s to the Japanese home islands (U.S. fighter squadrons had been stationed only on Okinawa).⁶

The Pentagon also stressed the military advantages of common use by U.S. and Japanese forces of U.S.-designed weapons.⁷ Standardization of weaponry would facilitate combined operations and would make possible mutual logistical support, including the establishment of joint stockpiles of weapons and ammunition and the U.S. ability to resupply Japanese forces in a war-fighting situation.

The Pentagon, however, displayed concern about maintaining control and secrecy over sensitive technological components of weapons produced through coproduction. There was concern that such technology could fall into the hands of the Soviet Union or other unfriendly powers.⁸ The Department of Defense (DoD) rejected the JDA request to grant Japanese firms access to all software in coproducing the Patriot missile, including the guidance and target identification components.⁹ Similarly, DoD withheld data on electronic systems, radar equipment, and compounds used in the body of the F-15.¹⁰ Nevertheless, subsequent reviews of the F-15 MOU resulted in the Defense Department releasing some materials technology and other items that had previously been withheld.¹¹

Commercial considerations have played a secondary role in the decisions of U.S. Defense Department officials regarding coproduction. In contrast to that attitude, the Japanese Government has consistently shown a preference for coproduction over direct purchases of American equipment, a policy that was augmented with the end of U.S. military aid to Japan in 1968. Coproduction was an established practice by 1975. It also coincided with numerous coproduction arrangements with NATO Allies. Official U.S. policy, in fact, had designated Japan as one of several countries eligible for coproduction of U.S.-designed equipment.¹²

While DoD ignored or minimized the commercial impact of its policies, commercial considerations became paramount in the decisions of U.S. companies to enter into coproduction.¹³ License fees and the lucrative upgrade business have rivaled or surpassed the profits companies could make through off-the-shelf sales without posing any problems associated with expanding production for comparatively small orders. In addition, U.S. firms have been dissuaded from holding out for direct sales by their assessment of several factors: the Japanese Government's commitment to progressive coproduction of American weapons rather than purchase, the parallel policies of NATO governments favoring coproduction, the occasional possibility of Japanese coproduction deals with European competitors, and Japan's growing capabilities to produce similar, if less technologically sophisticated, systems without foreign participation.

DEFENSE PROGRAMS AND CIVILIAN SECTORS

In 1984 a Defense Science Board report noted Japan's pattern of indigenous defense production

⁶U.S. Congress, Joint Economic Committee, Subcommittee on Economic Goals and Intergovernmental Policy, *Japan's Economy and Trade With the United States: Selected Papers*, 99th Cong., 1st sess., 1983, p. 209.

⁷U.S. Congress, General Accounting Office, *U.S. Military Co-production Programs Assist Japan in Developing Its Civil Aircraft Industry*, #ID-82-23 (Gaithersburg, MD: Mar. 18, 1982), p. 1.

⁸Michael W. Chinworth, "Industry and Government in Japanese Defense Procurement: The Case of the Patriot Missile System," MIT-Japan Science and Technology Program Working Paper 88-04, 1988, p. 21.

⁹*Ibid.*, pp. 24-25.

¹⁰Reinhard Drifte, "Japan's Growing Arms Industry," P. S.I.S. Occasional Papers Number 1/85, Geneva, Switzerland, Program for Strategic and International Studies of the Graduate Institute of International Studies, 1985, pp. 75-76.

¹¹U.S. Congress, General Accounting Office, *U.S. Military Co-production Programs Assist Japan in Developing Its Civil Aircraft Industry*, #ID-82-23 (Gaithersburg, MD: Mar. 18, 1982), p. 7.

¹²*Ibid.*

¹³U.S. Department of the Army, Office of Management and Budget, "Second Annual Report on the Impact of Offsets in Defense-Related Exports," December 1986, p. II-29.

and underscored the Japanese Government's role in high technology, its drive to develop self-sufficiency in defense production and the perceived link between commercial and defense projects.¹⁴ A 1985 DoD task force report identified 16 dual-use technologies, including fiber optics, X-ray lithography, and ceramic materials in which the Japanese excelled.¹⁵

More recent Japanese assessments have stressed this 'spin-on' the use of existing and new commercial technologies in the military sector and/or developing new military products and applications out of commercial technologies. This philosophy was a major element in *Japan's Choices*, a recent survey of future economic policy directions sanctioned by the Ministry of International Trade and Industry (MITI).

IMPLICATIONS OF MARKET STRUCTURE ON TECHNOLOGY TRANSFERS, BILATERAL COMPETITION

The competitive impact of U.S. collaboration in defense technology with Japan is heightened because Japan has a limited number of market participants, each of which is in a position to absorb technology from a number of mature U.S. firms.¹⁶ As illustrated in figure 4-1, major Japanese contractors typically have overlapping relationships with several U.S. defense contractors. While many of the Specific programs illustrated in the figure are dated, the patterns nevertheless demonstrate that Japanese companies are the focal points where technology from several U.S. firms converge in cooperative programs. These same Japanese firms often have prime contractor-subcontractor relationships that facilitate the transfer of technology throughout the domestic industry. By implication, any technology transferred from a single U.S. firm has the potential to benefit multiple contractors in Japan.¹⁷

The high degree of subcontracting in Japanese defense production contributes to the potential for building the Japanese defense industrial base through licensing agreements with American companies. In keeping with trends throughout Japanese industry, the percentage of subcontracted work in Japanese programs can run as high as 80 percent. This diffusion of contracting work contributes to the growth of the domestic defense industrial base in Japan. Since subcontractors are also a significant source of innovation for Japanese civilian industries, similar patterns could emerge in domestic defense industries as well, as these companies grow more experienced in defense production. Thus, proportionately larger numbers of firms in Japan have potential opportunities to develop their capabilities through licensed defense production from the United States and emerge as possible competitors to U.S. firms, especially to second-tier contractors. The competitive implications for the United States extend beyond the military sector because of the emphasis by Japanese firms on multiple applications of technologies, their highly diversified, vertically integrated structures, and the relative lack of regulatory and other obstacles that would retard application of military technology to civilian products.

In many Japanese facilities, civilian and defense production occurs side-by-side.¹⁸ Subcontract work for Boeing aircraft has been carried out in Mitsubishi Heavy Industry's (MHI) Nagoya works along with F-15 production and the now defunct MU-300, a private corporate jet that failed to make headway in either U.S. or Japanese markets. This constitutes a subsidy to those industries in Japan that work with defense--to the extent that production facilities and overhead costs financed by defense budgets are actually exploited for nonmilitary production. This possibility also appears evident in the case of MHI missile production, where missile production facili-

¹⁴U.S. Department of Defense, Office of the Under Secretary of Defense for Research and Engineering, *Report of the Defense Science Board Task Force on Industry-to-Industry International Armaments Cooperation: Phase II—Japan* (Springfield, VA: National Technical Information Service, June 1984).

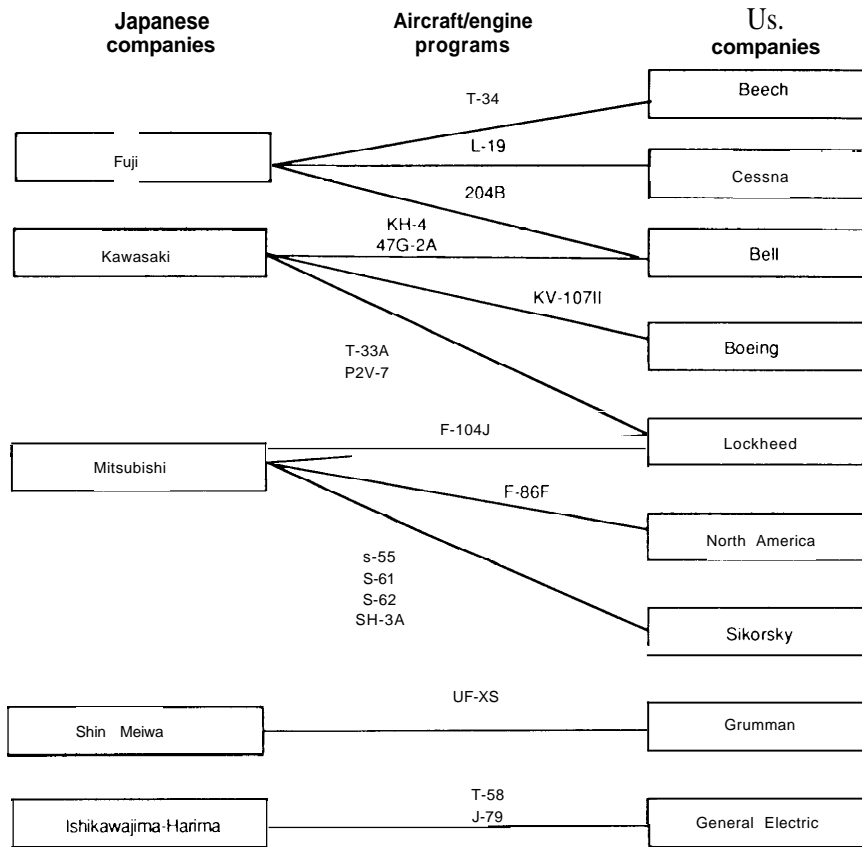
¹⁵U.S. Department of Defense, Office of The Under Secretary of Defense (Acquisition), Research and Advanced Technology, "Electro-optics Millimeter/Microwave Technology in Japan," report of the DoD Technology Team, 1987. The preliminary report was issued in May 1985 and the final report was released in May 1987.

¹⁶See app. D for a discussion of the domestic defense industry in Japan.

¹⁷G.R. Hall and R.E. Johnson, "Transfers of United States Aerospace Technology to Japan," Raymond Vernon (ed.), *The Technological Factor in International Trade* (New York, NY: Bureau of Economic Research, 1970), pp. 305-363.

¹⁸Prepared testimony of Joseph E. Kelley, director, Security and International Relations Issues, National Security and international Affairs Division, General Accounting Office, before the House of Representatives Energy and Commerce Subcommittee on Commerce, Consumer Protection and Competitive, Feb. 23, 1989, p. 8.

Figure 4-1-Coproduction of U.S. Planes, Helicopters, and Engines in Japan, 1954-66



SOURCE: G.R. Hall and R.E. Johnson, "Transfers of United States Aerospace Technology to Japan," Raymond Vernon (ed.), *The Technological Factor in International Trade* (New York, NY: Bureau of Economic Research, 1970), p. 314.

ties have been separated entirely from other aerospace facilities to provide additional production capabilities.

From time to time, American defense firms also use workers and production facilities for one program that actually were financed by another.¹⁹ Japanese companies have taken this one step further, adding civilian production to the picture and multiplying the potential for diversification and entry into new markets. This could explain why Japanese industry is proceeding to expand defense production despite the apparent costs and limited markets. It also raises the question of whether Japanese companies use their defense investments more effectively than the United States. The "spin-on" theory in Japan is not limited to products; it also extends to the facilities used to produce them.

This has important implications for the United States if domestic defense budgets are reduced drastically. Effective use of production capabilities provides Japanese firms with more numerous options than those available to U.S. defense contractors. If the military component of the Japanese missile market fails to materialize, for example, MHI will be in a position to reallocate production facilities to projects in the country's growing civilian space program. Although such a shift is not beyond the abilities of American defense contractors, U.S. firms nevertheless are often so dependent on DoD contracts that they may face insolvency before they are able to anticipate and implement comparable adjustments to market conditions.²⁰

This is not a recent phenomenon for Japanese firms. It is literally a way of life. For example,

¹⁹Donald L. Pilling, *Competition in Defense Procurement* (Washington, DC: Brookings Institution, 1989), pp. 13-15.

²⁰See "Assessment of Research and Development Opportunities in Defense-Related Technologies," September 1989, p. 3.

Yamaha, a well-known manufacturer in Japan of musical instruments, shifted production from pianos to aircraft parts as conflicts heightened in World War II, only to shift back to piano manufacturing, after the surrender, with equal ease and fluidity. While other Japanese firms may have had more difficulty than Yamaha, recent indications point toward Japanese agility in shifting between different types of production.²¹ It is likely that Japanese companies will be better able to adapt to changing defense budgets while also being able to benefit from spinoffs and spin-ins from technology transfers resulting from cooperative programs. In Japan, defense budgets have grown steadily over the past two decades at stable rates, unlike their more erratic U.S. counterparts. This provides additional long-term stability in the domestic defense industry, reducing uncertainties facing Japanese managers and strategic planners. Although additional data are needed to draw firm judgments, it is reasonable to believe that sharing defense and civilian resources (plant facilities, skilled labor, etc.) is a common practice in Japanese firms, especially among larger contractors. This suggests that excess defense production capacity in Japan can be converted with relative ease to commercial production, and that “surge capacity” may belittle more than a backdoor means of expanding commercial production capabilities.

ATTITUDES TOWARD DOMESTIC PRODUCTION

Cooperative programs with Japan, as in Europe, tend to move up the collaboration ladder from licensing toward codevelopment. The more work allocated to local industries, the more experienced and skilled these firms have become. This in turn has led to higher expectations of contributing more value-added components in successor programs. Ultimately, of course, this could threaten U.S. companies through the creation of potential competitors, although Japan would have to modify its ban on the export of military technology.

In the Japanese experience, there is an import substitution pattern of replacing U.S.-licensed sys-

tems with domestic counterparts as soon as is feasible. In some instances it involves components, as in the case of avionics upgrades for F-4 Phantoms originally produced under license. In other cases, complete systems have been supplanted by domestic alternatives, including the AAM-3 (which replaces the U.S. Sidewinder air-to-air missile), the ASM-1 (in place of the U.S. Harpoon air-to-surface missile), and the Keiko-SAM (in place of the U.S. Stinger, a hand-held missile used for short-distance, point defense).

The JDA has announced costly defense programs specifically to develop successors to systems supplied by the United States, in many cases under license production arrangements. These include a medium range surface-to-air missile system (currently designated M-SAM) to replace Raytheon’s Hawk SAM and a supersonic engine development program that optimistic observers in Japan have suggested could be used for the FSX, alleviating any need to license an engine from the United States for the program.²²

INDIGENOUS PRODUCTION v. COLLABORATION

The 1954 Mutual Defense Assistance Agreement stated the Japanese Government’s goal of developing a domestic defense industry, and the government has followed this policy consistently, giving it increased priority as it began the defense buildup in the late 1970s. The government reaffirmed its intention to develop and provide business for private defense firms in a “Basic Policy for Development and Production of Defense Equipment” put out by the Defense Agency in 1970.²³

Like many European governments, Japan has chosen this course despite the higher costs and longer lead times associated with domestic production. A primary objective is to provide opportunities for Japanese companies to develop and expand production in defense, and to apply civilian technologies to weapons systems, both in the initial production stage and in followup modifications and improvements. A stronger, more diverse defense industry gives the government more flexibility and

²¹For an examination of the contrasting experience of the United States in terms of transforming peacetime industry to war production and then back again, see Merritt Roe Smith (ed.), *Military Enterprise and Technological Change* (Cambridge, MA: MIT Press, 1987).

²²“Japan to Develop First Independent Surface-to-Air Missile,” *Nikkei News Service*, Apr. 20, 1989; “Defense Agency to Develop Supersonic Engine,” *Nikkei News Service*, Aug. 11, 1989.

²³Rheinhold Drifte, “Japan’s Growing Arms Industry,” op. cit., footnote 10, pp. 10-11.

independence in setting future defense priorities. It also ensures availability of spare parts and prompt maintenance.²⁴

Political considerations are also important. The government faces a continuing problem of justifying the defense buildup in the face of anti-defense public sentiment, media that are often hostile to military programs, and opposition political parties unsympathetic to stated defense goals. A policy that supports domestic industry through defense programs helps gain the support of business and business-influenced groups for defense policy, including increased defense spending.²⁵ Nevertheless, the government continues to restrain the development of a defense industry, by imposing extensive restrictions on arms exports, which the government outlined in 1967 and expanded in 1976.

Coproduction and codevelopment with U.S. firms helps domestic industries secure technology that will improve their capabilities in diversifying potential weapons production and in related nonmilitary fields. The government's 1976 defense white paper declared foreign licensing agreements had "accomplished the acquisition of manufacturing technology. . ."²⁶ The 1988 white paper elaborated that: "In recent years, various high technologies have been increasingly integrated into military, hence it is desirable that Japan should utilize to the fullest extent the defense-related technologies owned by the U. S." It added that Japan would seek from the U.S. secret technical information in order to strengthen Japan's future research and development of military equipment.²⁷ The 1989 white paper laid out similar policy aims with regard to codevelopment with the United States.²⁸

These sources would indicate that the Japanese Government clearly has a long-term objective of producing major weapons system strictly with Japanese resources and technology. It stated this preference in the 1976 white paper and prescribed

coproduction and importation of foreign production technology to fill gaps in Japanese industry's expertise.²⁹ But the Japanese Government is not so cohesive as these sources suggest. In the FSX case, for example, industry, the JDA (including the Technical Research and Development Institute (TRDI) and the Air Staff Office), and MITI's Aircraft and Ordnance Office advocated domestic development. On the other side, MITI's Trade Bureau, JDA's budget officials, the Ministry of Finance (MOF), and the Ministry of Foreign Affairs were either cautious or opposed to domestic development without U.S. collaboration. Despite the careful groundwork laid by the proponents of indigenous development, the final decision endorsed collaboration.³⁰

As noted in appendix C, security policies are formed to a large extent by committee, with nonmilitary interests representing important views. These include, for example, those of the Ministry of Foreign Affairs, which is concerned with the impact of increasing autonomy in defense production on relations with the United States in general, and the mutual security treaty in particular. Some argue that even the economic interests represented by MITI do not necessarily translate into support for indigenous systems, noting that in 1986 the ministry revised its approach to aircraft development to emphasize international cooperation. Even former defense agency directors do not always side with those in the agency favoring autonomous production, noting again the importance of restraining autonomous development and production in the name of relations with the United States.³¹

Some analysts argue, however, that "restraining" domestic development and production does not necessarily mean reversing the trend toward increasing domestic supply of weapon systems, but simply slowing the pace a degree. They interpret MITI's well-publicized decision to encourage international cooperation as a tactical adjustment in a long-term strategy that remains directed toward

²⁴Japan Defense Agency, "Defense of Japan, 1978," p. 117.

²⁵Michael W. Chinworth, "~~~~q and Government in Japanese Defense Procurement," *op. cit.*, footnote 8, p. 10.

²⁶Japan Defense Agency, "Defense of Japan 1976," p. 126.

²⁷Japan Defense Agency, "Defense of Japan 1988," p. 181.

²⁸Foreign Press Center (Japan), "Summary of 'Defense of Japan 1987,'" p. 49.

²⁹Japan Defense Agency, "Defense of Japan 1976," pp. 125-127.

³⁰Richard J. Samuels and Benjamin C. Whipple, "Defense Production and Industrial Development: The Case of Japanese Aircraft" Chalmers Johnson et al. (eds.), *Politics and Productivity* (Cambridge, MA: Ballinger Press, 1989), pp. 293-305.

³¹Former director general Koichi Kato, for example, enunciated such views in an interview on Feb. 28, 1989 with the *Asahi Shimbun*, one of Japan's leading daily newspapers, on the FSX controversy.

developing a domestic aircraft industry. In this view, the means alone have changed, with Japanese companies being encouraged to team with foreign partners in the short-term to realize this long-term objective rather than relying solely on internal and government resources.

In addition, the annual defense white paper has continuously underscored the policy objective of self-reliance since its initial publication in 1970. The white paper must be formally approved by the cabinet and the Security Council to be released and as such represents official government policy. There can be no doubt that policy divisions have existed in the past and will continue in the future. However, the long-term trend is toward autonomy at this point and represents a continuum throughout the postwar period.

Those who do not see a Japanese effort to supplant foreign systems entirely with domestic products point to the FSX codevelopment program, and to recent Japanese decisions to acquire Aegis destroyers through the Foreign Military Sales program from the United States. Each vessel purchased will bring in over \$500 million in sales to this country. Furthermore, it is likely that Japan will also deploy U.S. AWACS in the near future. These transactions will help maintain the U.S. shine of Japan's defense market in the short-run, which varies, but is currently about \$1 billion annually in sales and license fees. These analysts believe that the Japanese white papers state policy in a very general way, allowing flexibility on the part of various actors, and therefore that less emphasis should be placed on them in identifying policy, at least if the concern is with actual government behavior.

However, these cases are more important initially for their precedent-setting value in overall security policies for the government than as potential sales to industry. Both Aegis and AWACS will represent quantum policy leaps in the context of Japan's postwar defense policy because of their highly advanced capabilities. Decisions to deploy sophisticated defense equipment can become highly politicized issues, subject to intense parliamentary debates. Consequently, deployment decisions can be defended more easily if other diplomacy and/or political agendas are addressed by doing so. In this case, the procurements can be justified in part in the

name of improved U.S. relations since they will generate significant U.S. contracts or sales that will help diminish divisive trade frictions.

For JDA, the important thing is the precedent of deploying state-of-the-art military systems that will give the Self-Defense Forces greater technological leverage. Once these foreign-supplied systems are deployed, however, both industry and government may lobby for substituting domestic upgrades for foreign components in deployed systems. This may lead to further pressures for the development of totally domestic replacements.

U.S. v. JAPANESE APPROACHES TO SECURITY

By the end of the 1980s, the escalation of economic and trade disputes had begun to affect a number of defense issues between the two countries, including cooperation in military technology. U.S. sensitivity to and fear of Japanese economic competition has subjected defense cooperation to considerable scrutiny. Critics charge that coproduction and codevelopment programs transfer to Japanese companies technology that may later be useful in producing civilian goods that compete with U.S. products, and specifically that collaboration in military aircraft will assist Japan in building up its civil aviation industry. The issue came to a head in the FSX controversy when critics in Congress nearly succeeded in blocking approval of the codevelopment agreement.³² Attempts in Congress to prevent the sale of the Aegis air defense missile system to Japan also were intended to deny Japan access to advanced air defense systems and automated defense technology.

Others are concerned that Japan may eventually drop its ban on arms exports and become an instant competitor of U.S. arms export firms. They cite the views of the Japanese business association Keidanren and other industry groups in favor of relaxing the prohibition; several borderline cases of overseas sales of dual-use equipment; and the logic of exporting as defense production grows and diversifies. Indeed, some Japanese executives already feel they produce a variety of weapons, especially missiles, that would compete with U.S. counterparts for third-country markets, even if they fall somewhat

³²For details of the technology issues of the FSX deal, see John Moteff, Library of Congress, Congressional Research Service, "FSX Technology: Its Relative Utility to the United States and Japanese Aerospace Industries," CRS Report No. 89-237, 1989.

below the technological sophistication of American arms.³³

The 1983 U.S.-Japan agreement to exchange military technology, the Joint Military Technology Commission, represented an attempt to alleviate the growing perception in the United States that only Japan benefited from existing arrangements. So far, however, the results have been modest. The United States has applied for only three systems, and transfer has taken place under the agreement since 1987.

It is difficult to explain these results, which some observers cite as evidence of the failure of the transfer agreement and mechanisms. Reluctance on the part of both U.S. and Japanese companies has been cited as one cause. American firms still are unaccustomed to turning to foreign sources for technological inputs in the design and development stage, perhaps a cultural reflection of "not invented here" attitudes. Given the limited U.S. corporate presence in Japan, it is reasonable to question the extent of knowledge within industry and government of militarily applicable R&D in Japan, especially among civilian sector firms. Without extensive knowledge of Japanese capabilities, it is difficult to expect success of the arrangements established by the 1983 notes. Finally, many U.S. defense contractors still see Europe, not Japan, as their primary market, and see little justification for making corporate commitments in Japan beyond those that already exist.

Japanese companies, for their part, face similar considerations to the extent that defense technology transfers represent a departure from established business. Furthermore, despite increasing emphasis on defense-related sales, they are still concerned about antidefense public opinion, and do not wish to risk being labeled arms merchants for fear of losing commercial sales. Japanese firms, aware of the importance of technology to their own growth, may be less willing to part with vital technology under any circumstances, no matter how lucrative the financial rewards might be. Some observers have accused Japanese firms of simple greed. In the Keiko surface-to-air missile case, for example, the guidance developer, Toshiba Corp., sought \$5 million for

the technology, reflecting the company's entire R&D costs (the firm finally settled for a \$500,000 payment).

Mirroring the lack of activity through the JMTC channel is the slow pace of other codevelopment projects proposed by Japan in June 1988. Five projects were proposed for Nunn Amendment funding:

1. millimeter wave/infrared hybrid seekers;
2. ducted rocket engines;
3. armor-piercing, fro-stabilizing, discarding-sabot (APFSDS) and shaped-charge ammunition;
4. gas dynamic laser optical jamming systems; and
5. technology for analyzing and estimating magnetic fields.

The U.S. Army has indicated interest in the first two, and while finding no direct applicability in the third, nevertheless has proposed exploring cooperative projects in related areas such as electromagnetic technology. The United States apparently has little interest in the fourth and fifth areas. Japanese motivations for participating in these projects include the desire to enhance Japan's armaments and weapons capabilities, solid@ its technological base, and compensate for insufficient investments in these areas until recently.³⁴

There are several working-level panels that have helped promote relations and day-to-day contacts despite the relative lack of success at more highly publicized levels, such as the Japan-U.S. Systems and Technology Forum (STF). The bilateral panel has met roughly once a year since its establishment in September 1980, focusing on such issues as joint communications problems, bilateral technology assessments, and cooperative production programs. Although initially viewed by many Japanese officials as a means to facilitate technology transfers from the United States to Japan, the STF served as a vehicle for encouraging Japanese participation in Strategic Defense Initiative research and *exchanges* of views that led to the 1983 exchange of notes on military technology transfers.³⁵

³³ *Shimbun Shakaibu, Heiki Sangyo* (Tokyo: Asahi Shimbunsha, 1986), pp. 126-127.

³⁴ U.S. Army Materiel Command, "Assessment of Research and Development Opportunities in Defense-Related Technologies," *Report* of the Army Reciprocal Visit to Japan, September 1989, p. 5.

³⁵ See Japan Defense Agency, "Defense of Japan 1988," p. 179.

In commercial sales transactions, however, reliance on Japanese products has grown to the point that it has become a national issue. The Pentagon and U.S. defense firms are purchasing significant numbers of Japanese components for weapons systems, especially electronics components. U.S. defense companies reportedly are subcontracting increasingly with Japanese suppliers due to cost factors, and American firms are dropping out of certain segments of the domestic electronics and computer chip business.³⁶ This is a different issue, however, from that of reciprocal technology transfers, especially from Japan to the United States.

FUTURE ISSUES—JAPAN

At least four sets of issues will influence the future of defense technology relations between Japan and the United States in the early 1990s:

1. the impact of military-related technology and weapons development policies on Japan-U.S. competition and cooperation;
2. the rise of Japanese industrial capabilities coupled with the level of tensions in overall U.S.-Japan relations;
3. global security issues, especially the current changes in the communist world and in U. S.-Soviet relations; and
4. internal Japanese political trends.

On the question of the impact of Japanese defense spending increases on Japan-U.S. competition it has been noted repeatedly that Japanese business and government emphasize a far more integrated approach to defense and civilian technologies. Under these circumstances, Japanese firms are likely to benefit from cooperative programs regardless of what steps this country takes to minimize the disadvantageous aspects of technology transfers.

This circumstance points to the need for policymakers to define acceptable compromises that inevitably will involve economic, political, and military tradeoffs. Attempting to secure Japanese contributions into new codeveloped weapons systems might be a desirable policy option for the United States, but it will also mean elevating the capabilities of the Japanese defense industry and potential competition for the United States in the future. By the same token, U.S. observers should not

be shocked by Japanese proposals to acquire aircraft carriers if Japan assumes responsibility for sea-lane defense to the 1,000-mile perimeter, the policy encouraged by the United States.

Arms export resistance is strong in the Japanese public, and any government would risk a political backlash if it changed current policy. Nevertheless, there is pressure on the government to change course and each precedent may make it more difficult to hold the line on the export of complete weapons systems. As dual-use technologies proliferate and as Japanese overseas investment becomes more active, these policies will likely come under fire. The issue of exporting complete systems may become moot because of the proliferation of dual-use technologies, their reduced half-lives, and relative affordability. This would complicate U.S. efforts to manage technology flows with military applications and the growth of competitors in international markets.

MITI and MOF have remained relatively consistent in their efforts to restrict Japanese investments in overseas companies with defense production facilities. In the specific case of the United States, DoD regulations governing foreign acquisitions of companies essential to national security have influenced possible acquisitions of U.S. defense companies by Japanese firms.

Internal Japanese politics also have ramifications for bilateral relations, although to a lesser extent. Over 30 years of continuous rule by the majority Liberal Democratic Party, appears to have been reaffirmed in the March 1990 elections, despite gains by the opposition in the July 1989 House of Councillors elections. It is nevertheless possible that an opposition coalition led by the Japan Socialist Party (JSP) could come to power in the foreseeable future. A stronger, more influential opposition is likely even though these electoral gains have come primarily in the less important house. The JSP has moderated both the tone and substance of its critical positions on U.S.-Japan security relations, intimating that the party would welcome a continuation of the bilateral security treaty and would not challenge the legitimacy of the Self-Defense forces.

There will continue to be disagreements between the United States and Japan about the degree of Japanese domestic development and production of

³⁶Michael Schrage, "U.S. Dependence on Japan for Parts Worries Pentagon," *Washington Post*, Mar. 11, 1986, p. A1. The Defense Science Board examined U.S. dependency on foreign semiconductors in its February 1987 report, "Defense Semiconductor Dependency."

new, advanced weapons systems. To deal with these conflicts the United States will have to make some decisions regarding the extent and nature of Japanese participation in the cooperative development of future U.S. systems and what prices the Japanese will be expected to pay for participating in these programs. The United States may have to accept a tradeoff between the development of a potentially competitive Japanese aerospace industry and the degree of participation permitted in future codevelopment/coproduction projects.

Another area of uncertainty is Japan's ability to use military technology, including U.S.-supplied technology, in developing civilian products and clones of U.S. weapons. Japanese firms are adept at internalizing technology introduced from abroad, and likely will identify new applications for technologies unanticipated in the United States. Focusing excessively on the aircraft industry risks missing the point of a diversified Japanese long-term industrial strategy of using technological inputs from military production for everything from fishing rods to high performance aircraft.

In the U.S.-Japan context, defense-related technology transfers should not be viewed as one-on-one relationships between individual Japanese and American firms. While an American company might have extensive experience with one or perhaps two Japanese companies, Japanese firms have overlapping relations with many U.S. companies. This situation, coupled with interdependent relations through informal corporate ties and extensive subcontracting arrangements, improves the opportunities for technology diffusion throughout Japanese industry. Japanese firms have made significant progress in weapons development, particularly in the area of missiles. Industry observers generally agree that older generations of American technologies already have found their way into many of these Japanese systems by virtue of cooperative programs.

The dilemmas of coproduction are illustrated in Raytheon's experience with Japan in the Sidewinder air-to-air missile. Japan sought Raytheon's Sidewinders AIM-9B in the 1970s at a time when domestic development of a similar guidance system was a high priority for JDAs TRDI. When it became evident that the Sidewinder guidance package was not available for release to Japan, JDA and TRDI embarked on a development program that resulted in

the AAM-1, a Sidewinder replacement that was to be utilized on the domestic F-1 fighter aircraft.

The AAM-1 was in line to become JDA's favored air-to-air missile, replacing Sidewinders entirely. But the domestic guidance development was suspended temporarily once the United States indicated to the Japanese Government that the more advanced Sidewinders AIM-9L would be available for local production in Japan.³⁷ This option appealed to JDA because it would give greater access to the Sidewinder guidance and would thus promote the goal of developing domestic counterparts. MHI completed an agreement with Raytheon to license produce the Sidewinder in Japan in 1980, and JDA shifted its infrared guidance efforts from AAM-1 production to further research in TRDI.

In the meantime, advances have continued on the AAM series, and while U.S. industry experts are divided on its technological capabilities compared even with earlier Sidewinder generations, it has moved into full-scale production and has begun replacing Sidewinders on all Japanese aircraft that can carry air-to-air missiles. Raytheon, the U.S. Government, JDA, and Japanese business currently are involved in negotiations to allow licensed production of the next generation, the AIM-9M.

Any rationale for continuing cooperation in arms development in the 1990s will run up against the possibility of further deterioration of Japan-U.S. relations. The FSX controversy helped to push tensions to a new high in 1989. But disputes such as the FSX do not threaten a total rupture in bilateral relations. Their importance lies in the fact that proponents of domestic arms production renew their lobbying with each instance of perceived "Japan bashing" in the United States. Autonomy is more appealing and credible as Japanese industry grows more proficient and capable of developing alternative weapons systems. The appeal is not limited to industry: government officials, weary of perceived political pressure and inconsistent policies on the part of the United States, could side increasingly with those who favor an independent course on defense development and production.

The FSX controversy has raised opposition to joint weapons programs at several levels in both countries. If disputes over economic and trade issues escalate in the early 1990s, it is possible that neither

³⁷Koichiro Yoshihara, *Nihon no Boei Sangyo*, 1988, pp. 124-125, 130-131.

government would wish to expend the political capital necessary to promote new codevelopment arrangements like the FSX. Government and business elements in Japan, which argued originally for independent development of a fighter, may have their way in the future. Opponents of cooperation in the U.S. Government may have put the Pentagon permanently on the defensive after the FSX dispute.

This is not to suggest that the United States should shy away from articulating its own interests in cooperative arrangements if they threaten serious political conflict. However, the United States is no longer in a position to dictate the terms of participation in these programs with Japan. European firms have recognized the marketing opportunities with Japan arising out of the FSX controversies, and might be less concerned about many of the issues on which Congress focused during the FSX debate. The Japanese Government has recently demonstrated a willingness to select European systems over American alternatives, for example, an Italian patrol boat for the Maritime SDF and the British Aerospace BAE 125-800 as a flight-check aircraft. While these are isolated cases there is no doubt that European companies offer a comparable range of systems. Furthermore, it indicates the willingness of Japan to diversify its options in defense at the expense of its traditional supplier when credible alternatives exist.

U.S. policymakers must ask whether it is possible to establish a reciprocal relationship with Japan given differences in the nature of defense policies and industry contracting in the two countries. While reciprocity appeals to those in the United States who seek greater transfer of Japanese technology for use in U.S. systems, it is difficult to establish criteria for judging the degree of reciprocity in the relationship. For instance, it has been noted that in the case of the FSX program, the benefits of future technology flowbacks from Japan to the United States might be limited solely to General Dynamics (GD), the U.S. subcontractor in the Japanese-led program, not to the entire U.S. defense industry, much less the national industrial base. Furthermore, since GD's contracts are overwhelmingly military, civilian applications of any technology will be restricted.

This stands in contrast with Japanese firms that are the recipients of U.S. technology transferred

through defense programs. Major prime contractors in Japan, while increasingly emphasizing defense-related sales in their marketing strategies, nevertheless rely on such business for only a small portion of their total sales. With corporate strategies that emphasize intermingling of civilian and military technology applications, they are far more likely to benefit from defense-related and especially dual-use technology transfers through cooperative programs. The high percentage of subcontracting work, the limited number of contractors in the defense market, and overlapping relationships with U.S. firms tend to facilitate greater benefits for the Japanese partner in cooperative programs with the United States. Under these circumstances defense industrial relationships between the two countries may not be truly reciprocal.

The rapid changes in Eastern Europe and rising possibilities of improved U.S.-Soviet relations could affect substantially the priority the United States has given to the Japanese defense buildup and military cooperation with Japan. U.S. popular perception is that the Soviet threat has already declined markedly. That perception could strengthen if force reductions and other arms limitations or arms control agreements are reached with the Soviet Union in the near future. DoD officials already are referring to possible defense budget cuts of \$180 billion over 5 years if current developments are sustained. This would result in major cuts in the size of the current U.S. force structure and slowdowns in development of advanced weapons, including conventional weapons.

Under such policies, the United States may have less reason to encourage a Japanese defense buildup, but the reaction in Japan could be profoundly different. Unconvinced of peaceful Soviet intentions in the region, and that the "framework" of the Cold War indeed remains in the Asia/Pacific region, the Japanese Government has argued for holding the present course on defense spending at least for several more years. A decline in U.S. defense budgets would thus encourage industry and government in Japan to accelerate their movement toward autonomy, especially if declines are coupled with U.S. withdrawals from the region, and with additional demands for Japan to share the burden.