

## **Chapter 8**

# **The Defense Industry of South Korea**

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## The Defense Industry of South Korea

### THE ROLE OF GOVERNMENT

The South Korean Government has nurtured the development of a defense industry since the early 1970s. Three measures promulgated at that time have set government policy: a Special Law on the Defense Industry (1973), a Force Improvement Plan (1974) for the buildup of the Republic of Korea (R.O.K.) armed forces, and a Defense Tax Law (1975) to finance the development of the defense industry.

Government support for defense industries was related to the general government policy in the 1970s of fostering investments in such industries as heavy machinery, shipbuilding, steel, and electronics. The growth of these industries provided linkages to developing defense production, as the manufacture of weapons became integrated into the broader production of heavy machinery and ships.

The South Korean Government has followed a policy mixture of pressure and incentives for companies that enter the defense business. Confessional financing-loans at below market interest rates has been extensive for the defense sectors of such companies. The government has eliminated tariffs and quotas on imports needed for defense production. Employees of Korean companies involved in defense work receive exemptions from the military draft. The government is prepared to assist key defense firms that fall into financial difficulties.<sup>1</sup>

Pressure and control have been equal to incentives in government policy. In the 1970s and early 1980s, the government made the financing and licensing of commercial production depend on the willingness of Korean firms to go into defense production. The government closely manages production levels, marketing, and the export of weapons and military equipment.

The government also dominates weapons R&D. The Agency for Defense Development (ADD) has carried out most of the research and design of

weapon systems. Defense firms generally enter the picture by producing prototypes based on ADD designs. The ADD also has a role in managing the relatively small amount of R&D carried out by defense companies.

The South Korean defense industry currently comprises some 80 firms, which employ about 45,000 people. Of the 80 firms, 44 have over 500 employees. The government in recent years has tried to foster smaller and medium-sized companies in the defense field. Nevertheless, a small number of giant corporations dominate the defense industry just as they do in the civilian product sector. Many of these corporations, known as the *chaebol*, now have international reputations: Samsung, Daewoo, Hyundai, and Lucky Goldstar. These corporations produce textiles, automobiles, home appliances, and electronics products, and engage in ship building and construction. Within the defense industry, they manufacture the majority of systems that South Korea produces.<sup>2</sup> Many of the smaller Korean companies in defense work engage mainly in subcontracting to these giants.

Given the size and the range of activities of the chaebol, defense work comprises a small percentage of their business. For example, Hyundai Precision Industries, a division of the Hyundai conglomerate, devotes only 15 percent of its work to defense, according to company officials interviewed in May 1990. Many of the component companies of the Daewoo Corp. are involved in defense production, but this amounts to less than 10 percent of Daewoo's total business. Defense products comprise about 25 percent of the sales of Samsung Aerospace, a component of Samsung Corp.

Nevertheless, the chaebol will spearhead the future of South Korea's defense industry, and will no doubt be the leaders in manufacturing new systems. Their role in R&D will likely expand. They will dominate future collaborative and joint venture endeavors in military production between Korean firms and United States or other foreign companies.

<sup>1</sup>Chung-in Moon and Kwang-il Baek, "Loyalty, Voice, or Exit? The U.S. Third-Country Arms Sales Regulation and ROK Countervailing Strategies," *Journal of Northeast Asian Studies*, vol. 4, spring 1985, p. 42.

<sup>2</sup>Mike Howarth, "Defending the Republic of Korea: Armed Forces and Industry Forge Ahead," *International Defense Review*, No. 2, 1986, pp. 193-197.

## ACTIVITIES OF U.S. DEFENSE FIRMS IN SOUTH KOREA

South Korea occupies a place second only to Japan in the activities of American defense firms in East Asia. U.S. defense companies have conducted extensive business in South Korea, and the potential for expanded business appears to be great. A continued growth of defense business, however, raises several policy questions for the U.S. Government regarding the future of U.S. defense industries and foreign and technology policy priorities.

U.S. defense firms currently are engaged in three types of business in South Korea:

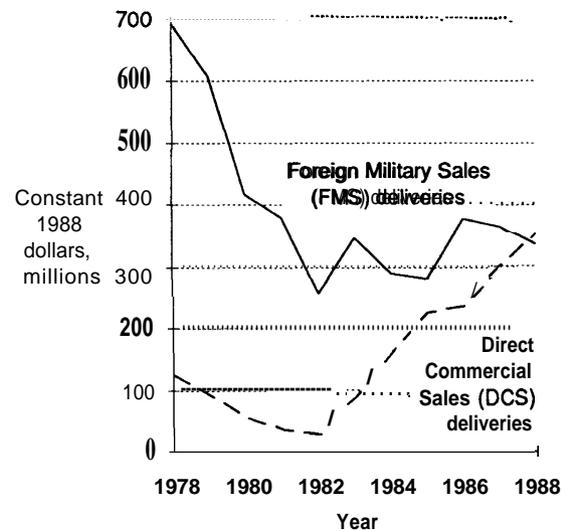
1. the direct sale of weapons and other military-related items to South Korea,
2. collaborative relationships with South Korean firms—licensing and coproduction—for the assembly or production in South Korea of U.S.-designed weapon systems, and
3. contractual arrangements under which South Korean companies supply components to American firms for the manufacture of U.S. weapons systems in the United States.

The three types of cooperation are often integrated in the industry relationships between U.S. and Korean firms.

South Korea ranks with Australia, Japan, and Taiwan as a leading market in the Western Pacific for U.S. exports of arms and military-related equipment. U.S. military exports have been conducted commercially or under the Foreign Military Sales (FMS) program of the Defense Security Assistance Agency (DSAA). The United States has removed South Korea from the list of countries eligible for future FMS credit financing; however South Korea has continued to make cash purchases under FMS because it sees advantages to U.S. Government oversight of transactions between Korean and American companies. Direct commercial exports (from U.S. companies to Korean firms) rose in the late 1980s and may even surpass FMS exports by the late 1990s, once current FMS agreements are implemented.

Both FMS and commercial sales are expected to expand in the early 1990s, according to estimates of the Joint U.S. Military Assistance Group, Korea. FMS exports probably will exceed \$800 million

**Figure 8-I-Foreign Military and Direct Commercial Sales Deliveries From the United States to South Korea, 1978-88 (constant 1988-dollars, millions)**



SOURCE: Office of Technology Assessment, calculated from data in U. S. Department of Defense, Defense Security Assistance Agency, "Fiscal Year Series," Sept. 30, 1989, p. 34.

annually by 1995, and commercial sales should reach \$800 million in that year (see figure 8-I).

An important part of U.S. military exports has been the supply of U.S. parts and components for the assembly of American weapons and equipment in South Korea. This has been the major form of collaboration between U.S. and South Korean firms since the early 1970s. Coproduction emerged in the 1980s as a more advanced form of collaboration, in which Korean firms produced agreed-upon percentages of the components of U.S. weapons systems assembled in South Korea.

The following are examples of major collaborative endeavors:

1. the assembly of F-5E and F-5F aircraft by an affiliate of Korean Air in collaboration with Northrop;
2. the assembly of MD500 helicopters by an affiliate of Korean Air in collaboration with McDonnell Douglas;
3. the assembly of the 5.56 mm Colt M-16 rifle by the State Arsenal in Pusan, South Korea;
4. coproduction of the M167A1 Vulcan anti-aircraft gun between the Daewoo Corp. and General Electric; and
5. assembly of the U.S. 155 mm and 105 mm howitzers by KIA Machine Tool Corp.

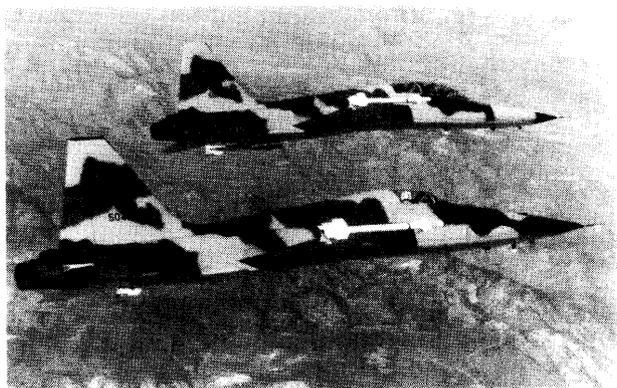


Photo credit: U.S. Air Force

Northrop Corp.'s Tiger II F-5E (foreground) and F-5F have been built under license in South Korea, Switzerland, and Taiwan. The F-5 series is one of the most widely used U.S. military aircraft, with 3,805 having been built between 1959 and 1987.



Photo credit: U.S. Army

The U.S. M-109 155 mm self-propelled howitzer was first fielded in the United States in the early 1980s, and has been upgraded frequently since. Assembly of the M-109A2 version by South Korea's KIA Machine Tool Corp. began in 1983.

Joint venture collaborative arrangements sometimes have led to subcontracts under which Korean firms produce components that go into military and civilian systems, manufactured in the United States by American defense firms. Korean firms, for example, produce several airframe parts for the F/A-18 fighter manufactured in the United States by McDonnell Douglas. Korean companies also make composite materials for the General Dynamics F-16 fighter, and produce parts for McDonnell Douglas, Sikorsky, and Bell helicopters. The Daewoo Corp. produced wings for the Lockheed P-7 naval aircraft. The extent of these subcontractor relationships is unknown. In 1989, South Korea exported \$182 million in aircraft and aircraft parts.<sup>3</sup> It is reasonable to assume that a sizable majority of these exports went to the United States.

## SOUTH KOREA'S PARTNERSHIP STRATEGY

Like their Japanese counterparts, South Korean Government and industry leaders seek to increase the percentage of weapons and military equipment produced locally, but they do not appear to aim for an independent defense industry with no foreign involvement. Long-term aims, however, are uncertain. South Korean leaders speak of a growing partnership between Korean firms and foreign companies, especially U.S. corporations, in producing weapons systems. They seek collaborative relation-

ships in which Korean firms assume a progressively greater and more equal relationship status with U.S. partners. Korean officials assert that South Korea needs an independent capability for maintenance of its military equipment, for which it currently depends on the U.S. military. They believe that these objectives should be achieved through an acceleration of technology transfer from U.S. companies to their Korean partners, which will allow Korean firms to produce more sophisticated components and complete systems and be able to provide full service and maintenance to systems in South Korea's military arsenal.

South Korean officials have outlined three elements of this partnership strategy. One is to develop a significant role for Korean firms as suppliers of components and parts to major U.S. defense firms that produce in the United States. South Korean leaders stress the advantages of Korea supplying components and parts at reduced costs, as major U.S. defense corporations face declining U.S. defense budgets, fewer contracts, and a greater need for efficiency and cost-cutting. This, they argue, would allow American firms to retain the lead in developing advanced technology while economizing on standard parts and components through subcontracting with Korean companies.

South Korea has instituted an offset policy toward U.S. and other foreign suppliers similar to those of

<sup>3</sup>"Korea Threatens To Scrap F/A-18 If Classified Technology Excluded," *Defense Daily*, May 18, 1990, pp. 277-278.

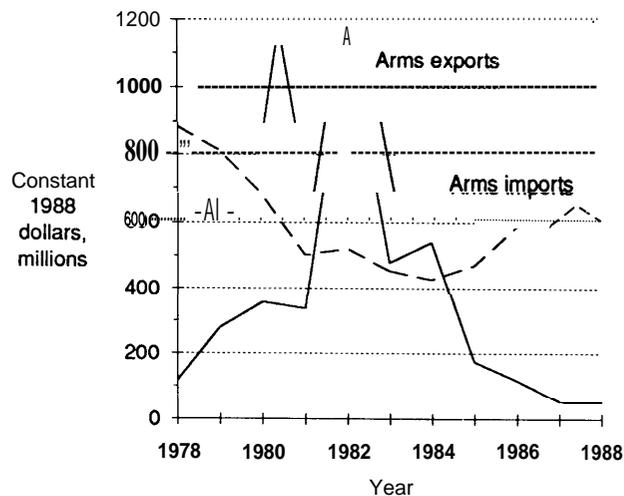
Japan and Western European countries to induce U.S. firms to subcontract for Korean-produced components and parts. Under such agreements, U.S. defense companies selling or coproducing in South Korea would purchase Korean products at a specified level. In the now-abandoned F/A-18 coproduction deal, the Seoul Government and Samsung Aerospace sought offsets from McDonnell Douglas equal to 20 percent of the expected profit of the U.S. company (plus another 10 percent in indirect sales). South Korean Government and industry officials saw the F/A-18 transaction as opening opportunities for expanded subcontractor relationships between Korean companies and McDonnell Douglas and presumably have similar expectations in their dealings with General Dynamics on the proposed F-16 coproduction deal.

Exports are a second element of the “partnership strategy,” and are integral to South Korea’s defense industry policy. The Korean Ministry of National Defense stated in its *Defense White Paper, 1989* that the defense industry has no alternative but to turn to overseas markets.<sup>4</sup>

Since the late 1970s, South Korea has exported several hundred million dollars of military equipment. Annual exports currently run about \$100 million and comprise mainly munitions and light naval vessels. Much of this is Korean-designed without U.S. involvement. South Korea’s largest markets have been the Middle East, Latin America, and Southeast Asia. This distribution is similar, on a smaller scale, to the markets of the principal Western suppliers of arms, the United States, and Western European countries. South Korean firms have been able to gain markets through competitive prices based partly on lower labor costs. Korean firms also adopted high quality-control standards for their hardware. Moreover, the government has not imposed significant foreign policy restraints on sales to specific countries (human rights, arms control, and conflict limitation constraints, for example).<sup>5</sup>

The emphasis on exports stems from the problem of maintaining a profitable defense industry. South Korean defense firms have operated at below 60 percent of capacity for most of the period after 1984. Government procurement has not been sufficient to bring about a more efficient use of production

**Figure 8-2-South Korean Arms Imports and Exports, 1978-88**



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

capacity, a situation that will continue, especially since the emergence of a more democratic political system in 1987 has produced political pressures on the government to spend more in the civilian sectors and restrain defense budget increases. The 1991 defense budget contains much higher rates of spending increases for social welfare, infrastructure, and the environment than for defense.

Herein lies the pressure to export, either as suppliers of components and parts to Western defense firms or as suppliers of entire weapon systems to developing countries. Foreign participation would enhance the range of potential arms exports, and the involvement of American firms in coproduction would help break down U.S. defense industry opposition to the overseas sales of U.S.-designed weapons and equipment from South Korea. South Korean arms exports have fallen dramatically over the past several years (see figure 8-2).

South Korea’s inducement to U.S. firms is the prospect of a more competitive position in the world arms market through coproduction of weapons with Korean industries. South Korean officials cite lower Korean production costs, which will become increasingly important as the world arms market shrinks in the 1990s, especially if European and

<sup>4</sup>Republic of Korea, Ministry of National Defense, “Defense White Paper 1989,” p. 167.

<sup>5</sup>Moon and Back, op. cit., footnote 1, pp. 25-29.

Chinese arms manufacturers are able to cut into traditional U.S. markets in Southeast Asia, Latin America, and the Middle East. According to South Korean spokesmen, U.S. firms would control the export marketing of weapons manufactured inside South Korea under coproduction deals.<sup>6</sup>

Technology cooperation in weapons development is the third element in South Korea's partnership strategy. R.O.K. Government and industry spokesmen have stated that South Korea needs to produce more sophisticated military equipment in the future. They have spoken of aircraft, missiles, telecommunications equipment, and electronics.<sup>7</sup> In order to achieve this, they believe that future Korean-U.S. industry cooperation should involve increasing levels of technology transfer from U.S. companies to their Korean partners. Korean officials describe several ways for this to come about.

First, there would be established coproduction arrangements under which U.S. companies would provide Korean firms with more sophisticated technology. In U. S.-R.O.K. negotiations over coproduction of the F/A-18 fighter, South Korean officials reportedly pressed for technology for the radar system, certain composite materials, computer software, and high-heat tolerant parts of the engine. South Korea's recent decision to switch to General Dynamics (GD) and its F-16 fighter stem in part from attractive technology transfer terms offered on advanced radar and the Advanced Medium Range Air-to-Air Missile (AMRAAM).

Technology transfer constituted an important consideration in the South Korean Government's initial decisions regarding coproduction of an advanced fighter plane. The government's initial selection of the U.S. F/A-18 fighter over the F-16 had a military rationale (the South Korean Air Force reportedly favored the F/A-18 because of maneuverability and armaments), and the government at that time viewed McDonnell Douglas as better suited to assist South Korea's aerospace industry than GD.

McDonnell Douglas reportedly expanded its technology transfer offers after the South Korean Government ordered a review of the F/A-18 coproduction deal in October 1990. The government ordered the review in reaction to McDonnell Douglas' notification that it had to raise the cost of the project from below \$5 billion to about \$6.2 billion. The U.S. company reportedly offered expanded Korean participation in McDonnell Douglas' civilian production of jet aircraft. This would have included not only increased subcontracting but also equity participation in a joint venture to produce the MD-12, a priority commercial jetliner project.

These concessions were apparently not enough to satisfy the South Korean Government at the new price. General Dynamics reportedly has offered the same type of technology transfer package, but for only \$5.2 billion. In addition, the unit cost of the F-16 is only about \$18.4 million, compared to \$30.8 million for the F/A-18, a cost difference that will enable South Korea to buy an extra 25 airplanes.<sup>8</sup>

Korean industry spokesmen view the role of the U.S. prime contractor as assisting South Korean participants in the fighter project to design and plan future aircraft. An official of Samsung Aerospace Co., the main South Korean participant in the F/A-18 project, stated that the U.S. partner will be asked to assist Samsung in designing an "interim aircraft," which could be a light transport aircraft, a helicopter, or a subsonic jet trainer.<sup>9</sup> General Dynamics has agreed to provide similar assistance in codeveloping a Korean jet trainer.

The Samsung official also gave a broader set of objectives in the development of an aerospace industry: reaching parity with the developed countries in the manufacture of airframes and engines by the early part of the 21st century, and reaching parity some time after that in the manufacture of avionics and other specialized systems and in the development of advanced systems.<sup>10</sup> He also made clear that government, industry, and the scientific community would work together to reach these goals.

<sup>6</sup>Park Young-koon, "ROK-U.S. Defense Industry Cooperation—Past Achievements and Future Tasks," paper presented at the Fourth ROK/U.S. Defense Industry Conference, Jan. 16, 1990, p. 5.

<sup>7</sup>Ibid.

<sup>8</sup>Rick Wartzman and Damon Darlin, "South Korea, in a Reversal, Picks F-16 Jet," *The Wall Street Journal*, Mar. 29, 1991, p. A3.

<sup>9</sup>Kim Dho-su, "ROK-U.S. Cooperative Programs: KFP and HX," paper presented at the Fourth ROK-U.S. Defense Industry Conference, Jan. 16, 1990, pp. 13-14.

<sup>10</sup>Ibid., pp. 12-13.

Second, joint R&D of new weapons or weapons-related technology would be promoted. In 1988, the United States and South Korea signed a Memorandum of Understanding (MOU) on Defense Technological/Industrial Cooperation. In 1989, Washington and Seoul signed a second MOU for cooperative R&D in missile guidance technology in the development of short-range surface-to-air missiles. This is the first joint R&D program in defense between the two countries.

South Korea's long-term aim is to draw U.S. defense industries into cooperative R&D with Korean firms. Under the F/A-18 coproduction agreement, South Korean industry engineers would have received training at McDonnell Douglas research centers, and McDonnell Douglas engineers would have worked in Korea with the Korean firms involved in the project.<sup>11</sup> Though contract details have not yet been made public, GD will likely pursue similar arrangements.

The South Koreans are aware that U.S. private companies carry out much sophisticated defense-related research in the United States and thus would be an invaluable resource to draw on in developing new weapon systems. The direct participation of U.S. firms would boost the R&D capabilities of South Korean firms substantially. Korean scientists and engineers could gain access to U.S. laboratories and production facilities that they currently do not have.

From the South Korean perspective, collaboration in defense R&D would result in both a higher level of technology in future U.S.-R.O.K. coproduction arrangements and increasing interoperability between the two countries in components and parts. It also could enhance the cooperative export strategy advocated by R.O.K. Government and industry officials.

Third, the South Koreans envisage coproduction of the F-16 fighter and other modern systems as enhancing the ability of Korean companies to provide full maintenance of such weapons. This capability would increase if the South Koreans had knowledge of the technology of such systems. The

South Koreans have a strong national security motive for seeking an independent maintenance capability. Korean officials believe that South Korea's current dependence on the U.S. military for maintenance would leave it vulnerable to equipment failures if the United States withdrew its troops from South Korea.

## ISSUES FOR THE FUTURE

### *South Korea's Technological Capabilities*

South Korea's technological capabilities in defense appear to lag considerably behind those of Japan and the Western European countries. (Design and construction of naval vessels is probably the single exception.) In general, the gap in defense technology appears to be larger than in the civil industries. In civil technology, South Korean companies have benefited from inflows of technology from Japanese firms in electronics, steel, metals, and automobiles.<sup>12</sup>

The most advanced weapons produced in South Korea suggest the limits of South Korean defense technology. With the exception of naval vessels, none represent original Korean-designed systems, although the government's Agency for Defense Development has succeeded in modifying several U.S. weapon systems. The bulk of weapons produced in South Korea are assemblies of U.S. or other foreign components.

The highly touted Korean K-1 main battle tank is an assemblage of components produced in the United States, Germany, and France. The components are relatively advanced, and the South Koreans have integrated them in the planning and production stages in a relatively short amount of time. Nevertheless, even this most sophisticated of South Korean weapons had no original research and development.<sup>13</sup>

The same situation will likely prevail in the coproduction of the F-16 fighter. If the previous F/A-18 arrangement is any guide, South Korea will purchase about 85 percent of the components of the F-16 from the United States, including the most advanced components. Korean firms will produce

<sup>11</sup>Sin-Yong-su, "Korea's Aerospace Industry," *Korea Herald*, Feb. 11, 1990.

<sup>12</sup>Nanshi Matsuura, "Management Conflict and Foreign Direct Investment: The Case of Japanese Investment in South Korea," *Columbia Journal of World Business*, summer 1989, pp. 61-67.

<sup>13</sup>Brig. Gen. John C. Bahnsen, "Koreans Build Armor Force While U.S. Army Fights Red Tape," *Armed Forces Journal*, May 1988, pp. 58-62.

the remainder, but some of these are components already used in the U.S. version of the F-16.

South Korea's push to acquire more foreign defense technology coincides with a slowing of civilian technology transfer by Japan and other countries. The government responded in 1990 by announcing a \$40 billion, 5-year (1990-94) program to develop research institutions in companies and universities for developing new materials, microelectronics, bioengineering, fine chemicals, optics, and aircraft. The goal of the program is to raise production in these fields from \$14 billion in 1987 to \$50 billion in 1994 and \$140 billion by the year 2000.

Although this program aims primarily at the development of these technologies for civilian purposes, it could in time enhance South Korea's military technology in missile guidance, communications and intelligence gathering, computer fire control systems, and materials used in aircraft, tanks, and transport equipment.

Most major South Korean corporations have established new civilian research centers since 1986. To date, civilian-related research has had little application to weapons development; but if the government's technology plan comes to fruition in the 1990, linkage likely will emerge, though gradually. The chaebol now are giving more priority to military-related research, which was neglected until now because of the low profitability of defense business. The Ministry of Defense likely will fund industry and university research on the development of new materials for the aerospace industry and possibly other industries.<sup>14</sup>

The high-technology program and the government's new emphasis on military R&D by Korean firms may indicate that South Korea is prepared to "go it alone" in developing military-related technology in the 1990s, if foreign technology is not available or is denied. If the high-technology program is successful (there are skeptics who believe the government is overreaching), South Korea's conditions for foreign entrance into the defense business will rise accordingly.

In addition to the progress of this program, two other factors will exert major influence on South Korea's defense industrial policy: the emergence of

Western European firms as potential participants in South Korea's defense industry and U.S. policy on defense industrial cooperation.

### *Western European Competition*

French, British, German, and Italian defense firms have emerged as competitors to American companies in South Korea's defense market. They are receiving strong support from their respective governments, whose officials have visited Seoul in the last 4 years promoting sales and coproduction.

U.S. military officials in South Korea and U.S. officials in Washington acknowledge that the Europeans are offering South Korea more generous terms than those offered by U.S. companies and the U.S. Government. The Europeans are proposing coproduction deals with extensive technology transfer that, according to these officials, would enable South Korean firms to manufacture a high percentage of components. The Europeans also impose fewer restrictions on South Korea exporting European-designed equipment to third countries than does the United States, and they reportedly offer more generous offsets for South Korean purchases of European weapons and systems.

*These* initiatives have resulted in several major European sales to South Korea in the last 2 years. South Korea recently announced **that it** would purchase five **or six** submarines from Germany. South Korea purchased **several** European-made components for the K-1 tank. The French have good **prospects** for business in antisubmarine aircraft, light helicopters, and **surface-to-air missiles and other items** under an agreement Seoul and Paris plan to sign in 1991.

The South Korean Government has shown particular interest in the European-built Tornado **fighter**, and **there** reportedly are discussions between South Korean and German officials over a possible deal. The government's **view** apparently **is not to substitute the** Tornado for **a** U.S. model for production of the Korean Fighter Plane. Rather, the government reportedly wants **a** squadron of strike aircraft **that** would have the electronic equipment capable of nighttime and precision attacks on **North** Korean targets. The Tornado could fit **that** requirement.

<sup>14</sup>Bob Johnstone, "Seoul vs. Heavy Metal," *Far Eastern Economic Review*, Aug. 3, 1989, p. 54.

R.O.K. interest in the Tornado mounted after the South Korean Air Force determined that the U.S. F-16 did not have adequate nighttime strike mission capabilities. This led the government to cease consideration of a retaliatory air strike against North Korea for Pyongyang's blowing up of a South Korean airliner in 1987.

**Germany** has shown **greater interest in doing** business with South Korea **over the** Tornado since October 1990, including an offer to train R.O.K. pilots in using the plane's electronic warfare systems and providing South Korea with classified data on the systems. The R.O.K. Government **at this stage** reportedly has not decided finally **to seek the** Tornado, and the Germans have made no definite offer of the aircraft and technology. Nevertheless, the Korean Government's view of its mission requirement likely will grow if North Korea is, as reported, constructing a nuclear facility capable of producing atomic bombs by 1994. **This**, coupled with the apparent inadequacy of U.S.-provided aircraft **to meet the** requirement of an electronic warfare strike aircraft, soon may give Germany an opportunity **to break into a** South Korean **weapons** market in which the United States has had a monopoly for nearly 40 years.

South Korean purchases of European military equipment **totaled** about \$300 million in 1989. It is expected **to reach at** least \$500 million by 1995. This **estimate** depends on South Korea continuing **to give** a general preference **to the** United States in defense business. Given the array of weapons **that the** Western Europeans could offer South Korea, European sales could climb above this **estimate if Seoul** decided **to accelerate** business with European firms. South Korean officials and U.S. military officials in Korea **stated in interviews that** younger R.O.K. officers and Defense Ministry officials are attracted by European proposals and are pressing the government to shift more defense business away from the United States and to the Europeans.

### **U.S. Policy**

**The** South Korean Government and defense industry can be expected **to encourage Western** European offers of defense industrial cooperation and likely will select European bidders for certain high-value military hardware. In addition **to obtain-**

**ing attractive terms from the** Western European firms, the South Koreans no doubt will try **to use** European competition to pressure U.S. firms and the U.S. Government to be more forthcoming in their terms for sales and reproduction.

South Korean Government and industry spokesmen that OTA interviewed in Seoul were critical of U.S. policy on defense industrial cooperation. They charge that the United States is stingy in sharing military-related technology and has added new restrictions on technology transfer. They allege that U.S. firms provide little help in giving Korean firms repair and maintenance capabilities. R.O.K. officials also criticize U.S. restrictions on offsets as imposing higher limitations on offset arrangements with Korean firms than on Western European firms that coproduce U.S. military equipment. They assert that U.S. "Buy American" regulations prevent South Korean companies from subcontracting for components for U.S. defense firms producing weapons for the U.S. Department of Defense. They note that the U.S. Government has exempted 18 other countries from these restrictions but not South Korea.

The South Koreans also accuse the U.S. Government of limiting sales of American fighter aircraft and other weapons systems to equipment **that is** inferior to systems sold to the NATO countries. South Korean Air Force officers point to two deficiencies of the R.O.K. version of the 1%15: the absence of low altitude navigation and targeting infrared equipment for nighttime missions, and the absence of the U.S. Sparrow air-to-air missile with its electronic guidance system. The R.O.K. version of the F-15 does not have the mounting platform for the Sparrow. The South Korean Air Force, therefore, must use the older, heat-seeking Sidewinder missile. The absence of the nighttime mission equipment would restrict South Korea from launching selective air strikes against North Korea.

The South Korean press increasingly echoes these and other complaints. A feature article in the Seoul daily *Tong-A Ilbo* cited U.S. State Department statistics reputedly showing **that offsets to** Korean companies for the purchase of American military equipment from 1980 through 1987 **amounted to** 46 percent of the value of the sales compared to 105 percent for Great Britain, 78 percent for Canada, and 133 percent for Spain.<sup>15</sup> (The same figures, however,

<sup>15</sup>Pang Hyong-nam, "Korea Purchases From the United States Under Unfavorable Terms," *Tong-A Ilbo*, Apr. 24, 1990.

showed a 48-percent average offset sales percentage for all NATO countries, only slightly above the percentage for South Korea.)

U.S. officials in Seoul and Washington acknowledged in interviews that many of the South Korean allegations were factual. U.S. military officials in Seoul **stated that the missiles** and radar systems in F-16 fighters recently sold to South Korea were out-of-date models or inferior to the missiles and radar systems of F-15s sold to NATO allies. U.S. officials also asserted that the U.S. Government was tightening restrictions on the transfer of military-related technology. They cited the denial of key R.O.K. requests for technology in the F/A-18 negotiations and the repeated refusal of South Korean requests for technical data for the 105 mm gun used on U.S. tanks. The U.S. insistence on no more than a 30-percent offset arrangement in the F/A-18 negotiations also showed an apparent tightening of U.S. terms.

The R.O.K. and U.S. Governments have been at odds since the early 1980s over South Korea's desire to export weapons and military equipment produced under U.S. licenses. U.S. law requires State Department approval before South Korea exports military equipment manufactured under U.S. licenses or coproduction arrangements. Over some periods, the State Department has denied more than 50 percent of South Korean applications for third country exports. Knowledgeable U.S. military officials in South Korea stated in May 1990 interviews that, in the last 2 years, the state Department had approved all but one R.O.K. application for export but that the single denial constituted nearly 40 percent of the monetary value of all the applications.

U.S. officials cite several factors behind the increase in restrictions: pressure from Congress for tougher terms; reluctance to share advanced technology because of South Korea's poor record on protecting intellectual property rights; fear of competition from Korean exporters to U.S. arms sales to third countries; and an unwillingness to relax "Buy American" regulations on the purchase of components by American defense firms until South Korea opens its domestic market further to U.S. civilian products.

On strictly economic criteria, U.S. restrictions and growing competition from Western Europe likely would lead to a U.S. loss of defense business with South Korea. However, economic considerations

currently are countered by the security ties between the United States and South Korea, the result of the formidable military **threat from North Korea**. North Korea possesses forces of over 1 million, an army of over 800,000 troops, 540,000 **reserves that can be mobilized** within 12 hours, 3,500 **tanks, and over 4,000 heavy artillery pieces and rocket launchers**. The bulk of North Korean ground and air forces are positioned near the demilitarized zone separating the two Koreas. The location of Seoul, only 30 miles south of the demilitarized zone, complicates South Korea's defense problems.

The R.O.K. Government continues to seek an American military presence in South Korea as a counterweight and deterrent to North Korea. The U.S. defense commitment and the presence of over 40,000 American troops in South Korea put pressure on the South Korean Government to buy American military equipment. After voicing their complaints about U.S. restrictions, South Korean officials acknowledge that these considerations create a preference for defense industrial cooperation with the United States. U.S. officials assert that they exploit the security angle in pressuring the South Koreans to choose American firms and weapon systems in procurement decisions. It is uncertain whether the U.S. security advantage will continue throughout the 1990s. The North Korean threat may remain at least until President Kim 11-sung dies. There are no plans at present to remove all U.S. troops, despite the modest reductions in force strength recently announced by the U.S. Defense Department. Nevertheless, the security situation has changed. North Korea increasingly is isolated as the Soviet Union and Eastern European Governments normalize relations with South Korea. The regime apparently has undergone a series of policy debates over how to adjust to the loss of support from allies and how to respond to South Korea's proposals for broadened contacts. The regime has agreed to negotiations between the two Korean prime ministers and talks with Japan on normalization of relations.

These moves may only be tactical, but the pressures on Pyongyang open possibilities for real change in South Korea-North Korea relations. A breakthrough would affect South Korea's defense industrial policy in three ways. First, the rate of defense spending **increases** probably would fall, reducing acquisitions of foreign arms. Second, the United States probably would withdraw most or all

of **its** forces. Third, economic considerations would gain and security considerations would decline in South Korea's decisions regarding U.S.-Western European competition for defense business.

Looking beyond an end to the North Korean **threat**, Korea (whether reunified or not) is likely to retain a sizable, well-armed military. Korea will remain surrounded geographically by three big powers—China, Japan, and the Soviet Union—all of which historically have had aggressive designs on Korea. Security factors thus will weigh heavily in foreign policy. Thus, Korea could have a long-term interest in defense industrial collaboration with the United States, especially if the two countries continue to be aligned.

Current U.S. policies do not detract from doing defense business with South Korea so long as security considerations are paramount in overall R.O.K. policies toward the United States. If security factors decline in the wake of a relaxation of Seoul-Pyongyang tensions, U.S. policies could be detrimental to future collaboration. The United States would have to offer economically competitive terms, which it apparently does not do compared with current Western European proposals.

In the future the United States may have to decide how important U.S. involvement in defense business in South Korea is. The debate over the proposed F/A-18 coproduction illustrates this policy issue, because South Korea, with technologically developing industries and relatively low production costs, could be a prime target of any future internationalization of the U.S. defense industry. Proponents of both the F/A-18 and F-16 deals assert that the

**prospects** of declining U.S. defense budgets make **cooperative** deals with foreign companies **necessary** for the financial health of the U.S. military aircraft industry.<sup>16</sup> They warn that South Korea may turn to European aircraft producers if U.S. collaboration on fighter aircraft does not materialize.

Critics of these deals argue **that the** proponents may underestimate South Korea's ability **to** develop an indigenous fighter by the end of the century if it is able to draw on the technology and production know-how of an advanced U.S. fighter manufacturer. They also **assert that even an** inferior South Korean indigenous fighter could cut into U.S. markets in developing countries because of lower prices.

The proponents and critics have clashed, too, on the issue of the U.S. aircraft industry's role in the globalization of aircraft production into the 21st century. In the case of South Korea, critics accuse U.S. firms of being willing to help that country develop a full-fledged defense and aerospace industry, first by producing parts for aircraft and other weapons systems manufactured in the United States and then by producing aircraft and other weapons in South Korea itself. McDonnell Douglas and General Dynamics may represent the view of other major American defense companies when they assert that U.S. companies must be involved in the globalization of weapons production. They cite profits to be gained from such assistance to countries like South Korea (in contrast to a likely shrinking U.S. market) and cost reductions from shifting the production of components to countries like South Korea.

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<sup>16</sup>Jeff Shear, "Congress Huffs, Puffs as Seoul Seeks to Build Fighter Planes," *Washington Times*, Oct. 12, 1989.