

# Other Approaches to Civil-Military Integration: The Chinese and Japanese Arms Industries

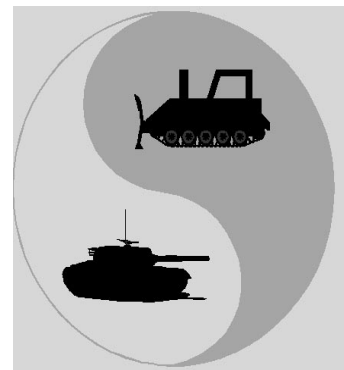
**T**he end of the Cold War has not necessarily heralded the end of prospects for conflict for the United States, as the Gulf War showed. It is generally recognized that a strong American defense-industrial base should be preserved as insurance against potential future conflicts. There is, however, also a desire to gain a technological and industrial “peace dividend,” through the redirection of resources from defense needs to the civilian economy. These somewhat conflicting objectives confront not only the United States, but also other countries. Useful lessons might, therefore, be learned from examining other countries’ approaches to defense procurement, particularly the degree to which their defense and commercial technology and industrial bases are integrated.

In 1994, the Office of Technology Assessment (OTA) issued its assessment report, *Assessing the Potential for Civil-Military Integration: Technologies, Processes, and Practices*.<sup>1</sup> An earlier OTA background paper examined the French defense industry.<sup>2</sup>

This background paper addresses the People’s Republic of China (PRC) and Japan, which are of interest for several reasons. First, they both have extensive defense-industrial bases that allow them to support their militaries with predominantly domestically produced weapons (although in both cases, many of these weap-

<sup>1</sup> See U.S. Congress, Office of Technology Assessment, *Assessing the Potential for Civil-Military Integration: Technologies, Processes, and Practices*, OTA-ISS-611 (Washington, DC: U.S. Government Printing Office, September 1994).

<sup>2</sup> U.S. Congress, Office of Technology Assessment, *Lessons in Restructuring Defense Industry: The French Experience*, OTA-BP-ISC-96 (Washington, DC: U.S. Government Printing Office, 1992).



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ons are based on foreign designs). Second, both states' defense and commercial-industrial bases are somewhat integrated. That is, in both states, at least some defense items are produced with the same methods, sources, equipment, and personnel used to produce certain civil items.<sup>3</sup> (see box A). Because civil-military integration (CMI) has been suggested as one way to achieve the disparate objectives of preserving a defense-industrial base while gaining a peace dividend, some have suggested the PRC's and Japan's approaches may offer useful lessons for the United States.

Secretary of Defense William Perry, for example, has shown great interest in the Chinese<sup>4</sup> conversion effort and its effect on the national technological-industrial base by initiating several discussions with the Chinese on the subject.<sup>5</sup> Indeed, the Chinese have been pursuing a form of conversion and integration since Deng Xiaoping's ascension to the top leadership in the late 1970s. Although this effort has been motivated by factors considerably different from those at play in the United States, the Chinese effort may provide some insights into both the benefits and pitfalls of the conversion and integration processes.

The Japanese, meanwhile, have created an advanced economy, including technological and economic leadership in several technological sectors, with little emphasis on military production. Indeed, the United States has sought to acquire commercial Japanese technology since at least 1980. The relatively small Japanese military (both in terms of absolute size and relative to the Japanese population) enjoys the support of a fairly comprehensive defense-industrial base. Tokyo is, therefore, believed by some analysts to have successfully integrated its commercial technology and industrial base (CTIB) and its defense technology and industrial base (DTIB) (see figure 1).

The proportions of defense and commercial industries in the Chinese, Japanese, and American economies differ. These differences reflect several circumstances. Each country began the post-World War II era with a different level of overall technological sophistication within its economy, as well as widely disparate economic and human resources. As of 1950, for example, the Chinese were the poorest of the three countries, as well as the least sophisticated. Japan had a trained work force but was still recovering from the devastation of World War II, and the United States had the wealthiest economy and the most available resources, both human and technological. In the postwar period, Beijing, Tokyo, and Washington each placed a different degree of emphasis on the development of military-industrial power, relative to its commercial base. Each state's decisions about economic and technological resources have yielded different results.

The PRC's top priority, until the 1980s, was developing its military capabilities. Commercial development was slighted as the best available Chinese resources were directed toward the development of the country's defense industries. With the rise of Deng Xiaoping, however, the Chinese have shifted their focus toward a more broad-based industrial-development program. Part of this effort has involved directing much of the Chinese DTIB to produce commercial products.

On the other hand, the Japanese in the post-World War II period have focused primarily on developing commercial technologies and industries. This has been due to several factors. The Japanese have pursued a more pacifist foreign and defense policy, codified in their Constitution. This has been possible, in turn, because of the American security umbrella that allowed the Japanese to de-

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<sup>3</sup> In this background paper, the modifiers "civil," "civilian," and "commercial" are used interchangeably when discussing the portion of the national technology and industrial base that sells non-military goods on the basis of price.

<sup>4</sup> In this background paper, the terms *Chinese* and *PRC* are used interchangeably.

<sup>5</sup> B. Gertz, "Perry Approves Helping China's Defense Conversion," *Washington Times*, p. 3, Feb. 1, 1994, and S. Mufson, "U.S. To Help China Shift Arms Output to Civil Use," *Washington Post*, p. 28, Oct. 18, 1994.

## BOX A: Civil-Military Integration Concepts

There is no single definition of civil-military integration (CMI). This background paper uses the definition of CMI that is in the OTA report *Assessing the Potential for Civil-Military Integration: Technologies, Processes, and Practices*.<sup>1</sup> There, CMI is defined as:

The process of uniting the Defense Technology and Industrial Base (DTIB) and the larger Commercial Technology and Industrial Base (CTIB) into a unified National Technology and Industrial Base (NTIB)

Under this definition, CMI involves the sharing of fixed costs, incurred in the course of both defense and commercial product and process development, by promoting the use of common technologies, processes, labor, equipment, material, and/or facilities. This includes cooperation between government and commercial facilities in research and development (R&D), manufacturing, and/or maintenance operations; combined production of similar military and commercial items, including components and subsystems, side by side on a single production line or within a single firm or facility; and use of commercial off-the-shelf items directly within military systems.

The desire to increase economic efficiency through reductions in redundant fixed costs may lead to CMI. Political or social goals, particularly the preservation of existing organizations or labor pools, may also call for CMI. In pursuit of such goals, CMI can involve the alternative use of defense facilities, infrastructure, or work forces for commercial applications when past investments in training, experience, R&D, equipment, and structures might be useful, even if they are not economically efficient or profitable.

CMI may occur at three levels. The most thorough form of integration is at the **facility level**. Facility-level integration involves the sharing of personnel, equipment, and materials within a single facility. In an integrated facility, ideally, defense and commercial goods are manufactured side by side, with differences in production processes and parts dictated solely by differences in product function.

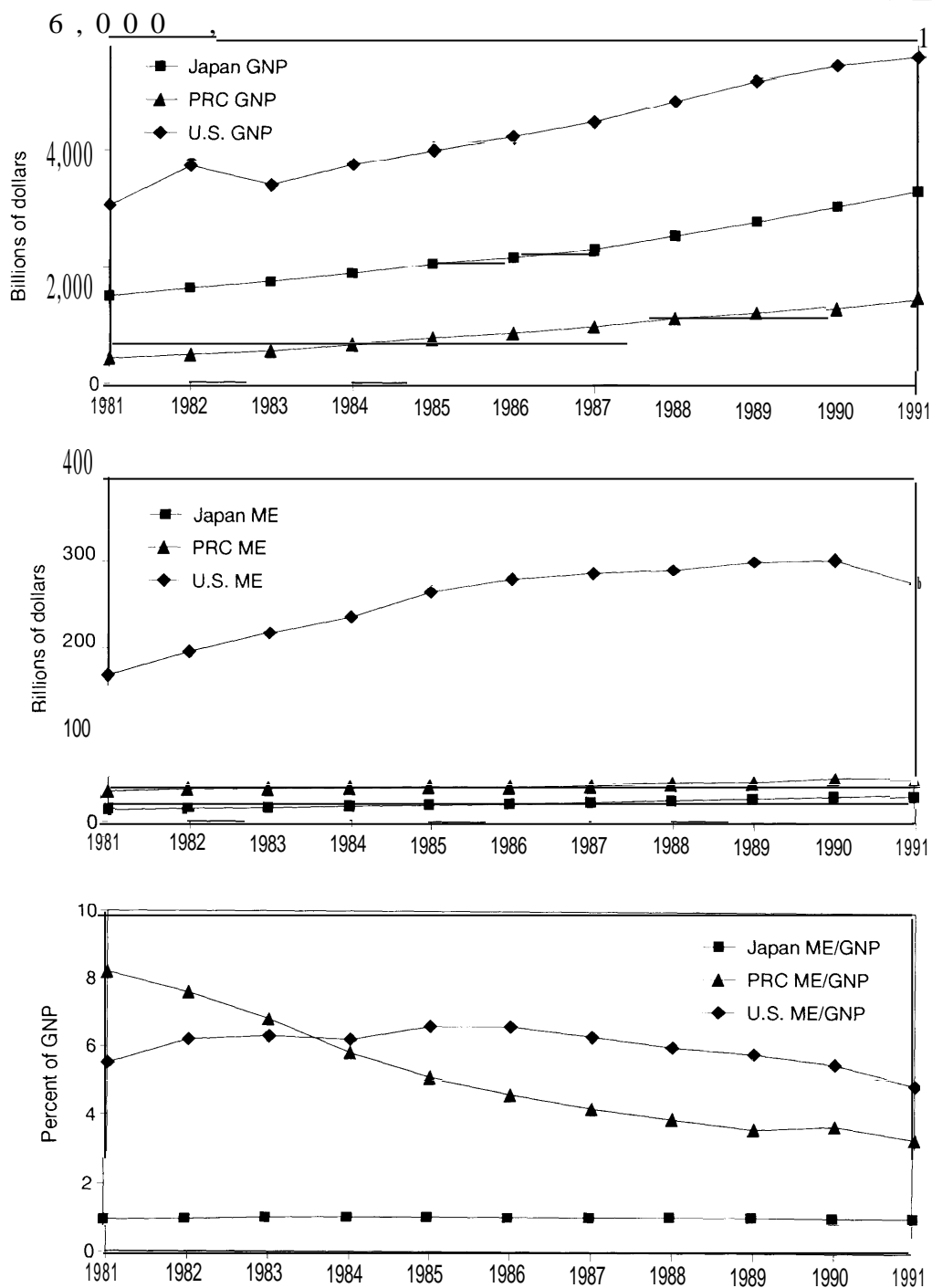
Another form of integration can occur at the **firm level**. Firm-level integration involves the use of corporate resources to meet both defense and commercial needs. Under this scenario, defense and commercial product lines have access to the same management, workers, research centers, equipment, stocks, and perhaps even facilities. A corporation that has integrated facilities is, by definition, also integrated at the firm level. An integrated firm might have segregated facilities, however, because it might separate its operating divisions along commercial and defense product lines. Within an integrated firm, however, there are, ideally, no barriers to the flow of staff, information, and product and process technologies among the divisions.

**Sector-level** integration is somewhat more abstract than the other levels. An industrial sector is considered to be integrated if defense and commercial goods and services are developed from the same pool of technologies, specialized assets, and processes. In particular, a sector is considered integrated if the same standards and manufacturing processes are used for both defense and commercial product and service lines. Sector-level integration, however, does not necessarily imply that the resulting products and services are identical or that they are produced at the same firms or facilities.

<sup>1</sup>U.S. Congress, Office of Technology Assessment, *Assessing the Potential for Civil-Military Integration: Technologies, Processes, and Practices*, OTA-ISS-611 (Washington, DC: U.S. Government Printing Office, September 1991), p. 5.

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FIGURE 1: GNP and Defense Expenditures for the PRC, Japan, and the United States



PRC, Japanese, and U S GNP 1981-1991

PRC, Japanese, and U S Military Expenditures 1981-1991

PRC, Japanese, and U S Military Expenditures as Percent of GNP, 1981-1991

SOURCE Arms Control And Disarmament Agency, *World Military Expenditures And Arms Transfers 1997-1992*, 1994