10. CHINA'S DEFENSE INDUSTRIES: A NEW COURSE?[1]

John Frankenstein[2]

"We must deepen the structural reform and make continuous efforts to improve the mechanisms of management and operation. We must strengthen unity and cooperation, fully bring into play the role of provincial and municipal offices of science, technology and industry for national defense, energetically promote the "64-character spirit of pioneering an enterprise" advocated by Central Military Commission Chairman Jiang Zemin, especially the spirit of patriotism, the spirit of seeking truth from facts and blazing new trails, the spirit of working hard and devoting one's services, and the spirit of unity and cooperation, in close conjunction with the reality of our scientific and technological industries for national defense, take over and carry forward the fine and age-old tradition and workstyle of "working hard and relying on one's own efforts, being scientific and matter-of-fact in one's approach, going all-out in work, and making selfless sacrifices" of China's defense industries, and strive to make the building of spiritual civilization in scientific and technological industries for national defense outpace that in all other trades and professions and to reap a double bumper harvest in the building of material and spiritual civilization."

—General Cao Gangchuan

Director, Commission on Science, Technology & Industry for National Defense, 1997[3]

"Grim."

—Yu Zonglin,

Director, National Defense Department, State Planning Commission on the condition of Chinese defense industries. 1996.[4]

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[2]John Frankenstein writes and consults on Asian issues. His most recent book is the edited volume *Mixed Motives, Uncertain Outcomes: Defense Industry Conversion in China*, Boulder, CO.: Lynne Rienner, 1997. A former U.S. Foreign Service Officer, he has held academic positions in the United States, Hong Kong, and Europe.

[3]"Enhance Sense of Strategy, Elevate Level of Science and Technology for National Defense," *Jiefangjun bao*, February 24, 1997, in FBIS-CHI-97-048, March 28, 1997.

[4]From China Defense Industry, May 24, 1996, cited in Defense Science Technology & Industry (DSTI), Hong Kong, May 16–31, 1996.

CONTRADICTIONS

A first glance at the Chinese defense industrial complex (CDIC) suggests that it suffers from the same afflictions and has attempted the same remedies as the defense industries of other countries. The CDIC faces major declines in military procurement, problems with second and third tier suppliers, and falling employment. Attempted fixes include rationalization, consolidation and "conversion."[5] But a closer examination shows that both the problems and solutions reached in the People's Republic have "special Chinese characteristics."

Those characteristics arise from the economic and military contexts in which the CDIC operates. CDIC is caught up in a contradictory relationship between the policies of economic reform and the goal of "revitalizing the economy" on the one hand, and the People Liberation Army's (PLA) attempts to modernize on the other. The developing synthesis is far from neat and contains numerous contradictions, even though the aim of both economic reform and military modernization—wealth and power—is the dream shared by Chinese modernizers from the Self-Strengtheners of the 19th century down to the current leadership.

FAILURES AND REFORM

The CDIC, part of the larger state-owned enterprise (SOE) sector, has more than its share of SOE problems. For most of the 1980s and 1990s it was told to sink or swim in the sea of commerce ("convert") *and* to continue resource-consuming, low-profit military production. This dual-track strategy appears to have been unsuccessful. One outcome of the CDIC's failures: the PLA, the CDIC's main customer, has turned to the outside world for the technologies on which it bases its future, as CDIC can not develop, much less make, those advanced weapons systems. Another result: "conversion" as part of the CDIC development strategy will be cut back if not abandoned. "Converted" enterprises will continue as commercial enterprises, but not as part of the CDIC.

Yet for almost two decades Beijing sought solutions to its problems in "conversion" and organizational shifts. Briefly, the strategy of conversion was to promote "spin-ons"—that is, to utilize gains achieved through commercially viable production for civilian purposes to modernize defense production and defense technology. The outcome of this strategy was mixed. "Conversion" as a business proposition appears to have been successful only in a few cases. Much of the effort came to be justified in terms of maintaining employment and "social stability."

Over time it became apparent that what the Chinese would call a "strategic shift" in the CDIC would be necessary, and at the March 1998 Ninth National People's

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[5]For a global view, see "Linking Arms: A Survey of the Global Defense Industry," *The Economist*, June 14, 1997; "A Farewell to Arms Makers," *The Economist*, November 22, 1997, p. 79; GAO Report "Defense Trade: European Initiatives to Integrate the Defense Market," GAO/NSIAD-98-6, October 1997. For an insider's perspective, see Norman A. Augustine, "Reshaping an Industry: Lockheed Martin's Survival Story," *Harvard Business Review*, May-June 1997, pp. 83–94.

Congress (9NPC), a program of major, long-term restructuring was announced. That long-term program, if realized, will change the face of the CDIC.

The key elements of this reform include:[6]

The "civilianization" of the Commission on Science Industry and Technology for National Defense (COSTIND) and CDIC consolidation. COSTIND, formerly a military body which reported to the Party's Central Military Commission, was given ministerial status under the State Council. General Cao Gangchuan, who had been its chief, was replaced by Liu Jibin of the Ministry of Finance, a civilian with defense industry experience. COSTIND will be in charge of military production, supervise the corporations of the CDIC, and indeed take over the governmental and ministerial responsibilities of those corporations. The corporations themselves will be reformed as enterprise groups, reconcentrating on defense production under COSTIND. At the same time, their commercial ties with their parent bureaucracies will be reduced. We can surmise that defense procurement in the future will be conducted through contracts rather than command economy allocation mechanisms. "Converted" enterprises and other components of the CDIC that produce only civilian products will be divested or otherwise separated from their CDIC parents and turned over to local authorities and the market. We would add that this last step echoes the reforms slated for the non-defense SOE sector: the state will retain control of the top 1000 or so SOEs while the remainder will be "set free" in the marketplace.

A new General Department in the PLA high command. General Cao (ex-COSTIND) was appointed head of a new PLA general department, the General Armaments Department (GAD). The GAD retains COSTIND's direct military responsibilities, including weapon systems management and research and development (R&D). The GAD will also absorb sections concerned with military equipment from other General Departments. A PLA source volunteered that the move of the Equipment Department (ED) from the General Staff Department (GSD) to the GAD came about because the GSD/ED had jurisdiction over only equipment for the ground forces, while the new GAD will have authority for weapons systems management in all the service branches of the PLA.[7]

PLA Inc. closed down. In a related development, in July 1998 the PLA was ordered to withdraw from its commercial activities. This move is discussed below.

But first we shall take a brief look at CDIC's past organization, its economic environment, and trends within the People's Liberation Army. We then shall turn to an examination of how the CDIC is responding to these challenges.

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[6]For some of the details, see "Luo Gan Explains Restructuring Plan," *Ta kung pao*, March 7, 1998 in FBIS-CHI-98-068, March 9, 1998. The text is a speech given by Luo, Secretary General of the State Council, at the First Session of the Ninth NPC on March 6, 1998.

[7]See "China Defense White Paper," *Xinhua*, July 27, 1998, in FBIS-CHI 98-208, July 27, 1998.

STRUCTURE

The CDIC is made up of ministries and enterprises under the Chinese state (the State Council and its central ministries, plus provincial and municipal governments). PLA enterprises served more to generate funds to cover shortfalls in the military budget and are—or were—not central to the CDIC. The CDIC has evolved from a collection of secret, numbered "machine-building" industrial ministries headed by military officers, to an array of civilian-run, profit-seeking corporations within horizontally integrated enterprise groups (*jituan*) which have increasingly sought to diversify their activities beyond their core military businesses. Currently the major CDIC organizations are:

* China Ship Construction Corporation (CSCC)—Commercial/naval vessels

* Aviation Industries of China (AVIC)—Aircraft

* China North Industries Group (NORINCO)—Armor, artillery, small arms

* China Aerospace Corporation (CASC)—Missiles, satellites

* China National Nuclear Corporation (CNNC)—Nuclear technology

The reforms were set underway in March 1998, but the shapes—and perhaps even the names!—of these organizations apparently have yet to be determined.

SOME HISTORY

Historically, the CDIC has occupied an important part of the state sector of the economy. Of the 156 "key industrial projects" that formed the centerpiece of Soviet assistance to the PRC in the 1950s, 41 were for weapons production.[8] Between 1966–1976, a "Third Front" strategic relocation moved or constructed a major proportion of the defense sector (55%, according to Chinese officials) in remote areas of southern and western China.

The rationale of the Third Front was strategic relocation of key defense plants away from vulnerable coastal areas. It was a huge expense, absorbing perhaps 50% of Chinese national investment during the period 1966–1976. It left a legacy of isolation and technological backwardness which still burdens the CDIC. In private conversations, Chinese defense industry analysts acknowledge that the Third Front project—like Mao's other campaigns—led to great waste. Indeed, the construction of the Third Front effort coincided with the Cultural Revolution and must have been affected by "the ten years of chaos." In retrospect, the Third Front was a mistake

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[8]The historical background is covered in John Lewis and Xue Litai, *China's Strategic Seapower*, Stanford: Stanford University Press, 1994, p. 76; and John Frankenstein, "The People's Republic of China: Arms Production, Industrial Strategy and Problems of History," in Herbert Wulf (ed.), *Arms Industry Limited*, Stockholm: Stockholm International Peace Research Institute/Oxford University Press, 1993. See also Liu Xiaohua, "Zhu Rongji Discusses Matters of Vital Importance With Military—Inside Story of Reorganization of China's Five Major Military Industry Departments," *Kuang chiao ching*, No. 305, February 16, 1998, in FBIS-CHI-98-065, March 6, 1998, for a discussion of the CDIC's historical bureaucratic alignments.

MBI	Ministry/Corp. (1982)	Ministry/Corp. under State Council(1988)-	Ministry/Corp. under State Council(1993)	Corporation/Group under COSTIND* (1998 - 9th NPC)
2	Nuclear Energy Ministry	Ministry of Atomic Industry	China National Nuclear Corp. (CNNC)	CNNC
3	Aviation Ministry	Ministry of Aerospace (MAS) *(combines Aviation & Space Industry Ministries)*	Aviation Industries of China (AVIC) *(MAS separated into AVIC and CASC)*	AVIC
4	Electronics Ministry	Machine Building & Electronics Industry (MMBEI)	Ministry of Electronics Industry (MEI) *(MMBEI divided into MEI and [civilian] Ministry of Machine Industry)*	*Merged with Ministry of Posts and Telegraphs to form Ministry of Information Industry*
5	Ordnance Ministry	MMBEI	North Industries Group (NORINCO) *(Ex-Ordnance, MMBEI)*	NORINCO
6	Ship Construction Corp.(CSSC)	CSSC	CSSC	CSSC
7	Space Industry	MAS	China Aerospace Corporation (CASC)	CASC
8	Missiles *(Merged with #7 in 1981)*	—	—	—

NOTE: #1 MBI dealt with civilian production.

*COSTIND shifts from military chain of command to come under State Council.

CDIC Evolution

based on an inappropriate reading of the Soviet experience. More than the centrally controlled industries were involved: provinces and localities were urged to build their own "small" Third Fronts for self-sufficiency in small arms and ammunition manufacture. The *Encyclopedia of the Chinese Economy* gives figures which indicate the scale of the Third Front burden: total investment of about RMB200 billion, employing 16 million people to build some 29,000 factories (with RMB120 billion in fixed assets), of which about 1300 were medium-sized and about 600 were large-scale, key "backbone" (*gugan*) enterprises.[9]

SIZE

Official numbers are vague as to the size and scope of the defense industry.[10] According to the *Encyclopedia of the Chinese Economy*, the State Council–run defense sector encompasses about 1000 enterprises (each consisting of multiple factories, marketing organizations and research units), and 200-plus major research institutes

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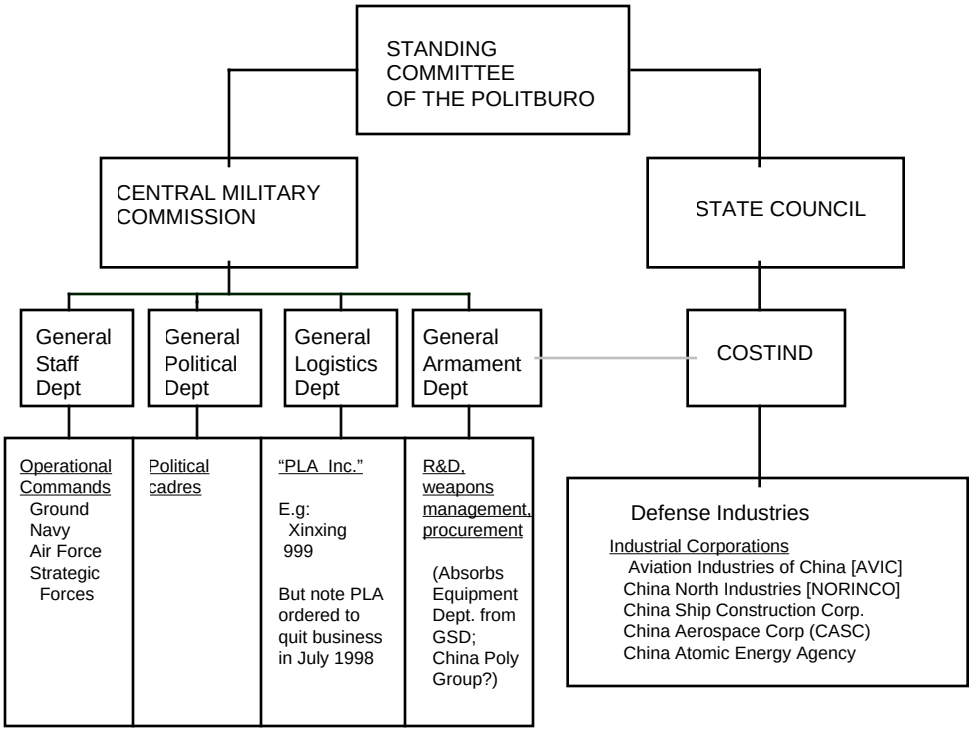
[9]For the Chinese figures, see Chen Daisun (ed.), *Zhongguo jingji baike quanshu* (The *Encyclopedia of the Chinese Economy*), Beijing: *Zhongguo jingji chubanshe*, 1993, p. 135. See also Bates Gill, "Defensive Industry," *Far Eastern Economic Review*, November 30, 1995, p. 62; and Barry Naughton, "The Third Front: Defence Industrialization in the Chinese Interior," *China Quarterly*, September 1988, pp. 351–386. See Qiang Zhai, "Beijing and the Vietnam Conflict, 1964–1965: New Chinese Evidence," Cold War International History Project Bulletin special issues on "The Cold War in Asia" (draft version), Winter 1995/1996, pp. 233–250, for additional Chinese documentation on the Third Front.

[10]Since the 1998 reforms are so recent and as yet incomplete, we caution that most of our discussion of the CDIC refers to the sector as it was *before* the reforms.

PLA/CDIC LINES OF CONTROL
A SIMPLIFIED CHART



The PLA is deployed in 7 military regions, which supply the infrastructure to the various commands. MRs and operational commands also were or are involved in "PLA Inc."

(RIs), employing 300,000-plus engineers and technicians as well as some 3 million workers.[11] Given the proliferation of operations encouraged by the Chinese reforms, shifting ownership and control patterns, and the deliberate vagueness of Chinese statistics, particularly concerning this "forbidden area," it is difficult to be more precise than these general figures.

Individual sectors of the defense industry are quite diverse. According to accounts published in the mid-1990s, the aviation industry includes six universities and colleges, over 30 research institutes and more than 200 trading companies and enterprises employing more than 500,000 workers. Enterprises under such an organization are not small; rather, they are vertically integrated conglomerates. For example, the Chengdu Aircraft Engine Corporation, a "backbone" enterprise, employs 20,000 engineers and workers in 16 factories, 4 research institutes, and 11 branch companies, with more than 40 joint ventures and 6 "window" enterprises set

[11] *Zhongguo jingji baike quanshu*, p. 1754.

up in the open coastal cities.[12] One suspects, but cannot confirm, that the reduction of this kind of organizational complexity is one of the goals of the structural changes introduced at the 9th NPC.

In sum, China built a substantial defense industrial complex based on the Soviet technologies of the 1950s. But the complex was at once embedded in, yet isolated from, the larger command economy. That, plus the cutoff of Soviet aid in 1960, effectively left China with a defense industrial system stuck in the past, unable to innovate and dominated by politics. Reverse engineering and copy production was the norm. To be sure, and to its credit, China did develop some advanced technologies on its own, especially nuclear weapons, satellites, missiles (including SLBMs) and nuclear-powered submarines. But these were developed as special projects under the patronage of top officials—almost as one-off demonstrators—at a time when China perceived itself to be under nuclear threat from the U.S. and the USSR. They were isolated from the larger military and industrial system and, thanks to their patrons, from much, but not all, of China's tumultuous politics. The projects required enormous investments, but perhaps with the exception of land-based missiles, which are making a transition to solid-fuel boosters, but were never deployed effectively in significant numbers, they have never been modernized to any significant degree. Technological and operational shortcomings, problems with maintenance, lack of expertise (including the lack of a critical mass of technicians) and questions of expense all have contributed to China's difficulties with these systems.[13]

THE PLA

Although "PLA Inc." does not properly fall within the category of "defense industries," a brief comment is appropriate. PLA economic organizations started as units devoted to internal, self-supporting supply, distribution and military logistics—the guerrilla legacy—but expanded their operations to the civilian sector. These highly varied commercial ventures, perhaps as many as 20,000, are run by top command organizations, the seven military regions, the 24 group armies and subordinate local units. Some of these companies are large, truly commercial businesses (services and manufacturing, ranging from property and food processing to clothing, pharmaceuticals, steel pipe fabrication and telecoms), while many others are engaged in more local operations (transport, recreational and entertainment facilities [some reportedly of a dubious nature!]). Many provide employment for army dependents and income to support troop living conditions.[14] The

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[12]China Aviation News, June 2, 1994, cited in *Defense Science, Technology & Industry Digest (DSTI)*, Hong Kong, June 1994, p. 5.

[13]See Lewis and Xue, *China's Strategic Seapower*, for an account of the struggles China went through to develop China's nuclear submarines, which still spend most of their time tied up dockside. A glance through *China Defense: Research and Development*, China Defense Science & Technology Information Center, Hong Kong and Beijing, 1988, shows that most of China's leading military scientists and technicians were born before 1920. In fact, many of those responsible for the development of China's strategic weapons had studied and worked in the U.S. and returned to China during the McCarthy era.

[14]Again, this is an echo of what is happening elsewhere in Chinese society. Many SOEs have set up "collectives" to provide employment for SOE worker family members.

conventional wisdom is that cash generated by these activities mostly stays with the originating unit for reinvestment, troop support and other local purposes, although a certain percentage of profits—in some cases as high as 70%—is supposed to be remitted to the Center.[15]

The impetus for the expansion of the PLA into commerce came from the military budget shortfalls of the 1980s, when military modernization was downgraded to the last of the "Four Modernizations." For instance, one of the goals given the PLA's *Sanjiu*, or 999, pharmaceutical conglomerate is to "play a positive role in developing the army's production and in making up for the inadequacies in military spending."[16] Other military analysts have written of "contradictions" between army requirements and budget allocations.[17] But the economic freedoms granted the PLA also led to massive corruption, and in July 1998 the PLA was ordered to divest itself of its commercial operations. Given the number and diversity of PLA businesses, it is not clear how this order will be carried out.

We should not be surprised by the PLA's commercial involvement. It is an example of "bureaucratic entrepreneuralism" that one finds throughout the Chinese economy. Indeed, if the Academy of Sciences can run a construction company, why shouldn't the PLA run hotels, sell medicine, provide transport services, and peddle surplus weapons? One must remember that the PLA, virtually a separate society within China, has a long tradition of self-reliance and self-support. It simply diversified and commercialized its internal economy as it expanded into the unregulated "white space" of the economy. Furthermore, the very structure of the Chinese economy unavoidably drew the PLA into business, for there are areas in which the PLA has a monopoly (e.g., air traffic control or radio frequency allocations in cellular telephone bands).

In any event, the evidence is that the PLA enthusiastically embraced this new battle front. Indeed, there was a Chinese joke to the effect that China only has a navy, because the air force and the army have all jumped into the sea. (The Chinese expression used to describe going into business, "*xia hai*" translates as "going down to the sea [of commerce]".)[18]

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[15]See Arthur Ding, "China's Defence Finance: Content, Process and Administration," *China Quarterly*, No. 146, June 1996, pp. 428–442. There are, of course, many ways to calculate profits, and one suspects that PLA units have figured out how to maximize what they can retain. See also Tai Ming Cheung, "Can PLA Inc. be tamed?" *Institutional Investor*, July 1996.

[16]See "Military Organizes Military Transnational Group," *Zhongguo xinwen she*, December 9, 1992, p. 33.

[17]Gu Jianyi, "*Junshi jingji rougan xianshi wenti fenxi*" (On Current Problems in Military Economy), *Junshi jingji xue (Military Economic Studies)*, June 1995, pp. 32–35.

[18]Recounted in Min Chen, "Market Competition and the Management Systems of PLA Companies," in Brömmelhörster and Frankenstein, *Mixed Motives, Uncertain Outcomes*, p. 205.

PLA INCOME

But how much did the PLA "make" from these activities? This is one of the more intriguing guessing games in the PLA-watching trade.[19] In the mid-1990s it was estimated that the PLA "made" about US$5 billion from its commercial activities, though it was never clear if this represented sales, income or profit.[20] If sales, this would have put "PLA Inc." into the bottom half of the Fortune 500, close to the sales of the Quaker Oats Company. Other estimates range from a low of US$720 million to over US$7 billion. [21]

Reports in the Hong Kong press commenting on the business ban suggest that the PLA take was somewhat lower: around RMB15 billion a year (US$1.8B).[22] The Hong Kong Chinese language press reports that the central government will reimburse the PLA to the tune of RMB10–15 billion (US$1.2B–US$1.8B) per year to make up for lost revenues from curtailed PLA businesses, though one commentator has put the figure at RMB30 billion (US$3.6B).[23] RMB15 billion represents about 18 percent of the *official* 1997 defense budget of RMB81.3 billion. Since Beijing claims that about one-third of the defense budget goes for personnel, and that PLA Inc. revenues went mainly for personnel expenses, we can see that PLA Inc. revenues represent a substantial subsidy—roughly another 50 percent—to the personnel budget. But we don't know precisely how PLA Inc. revenues were allocated, and, as noted above,

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[19]Not only is there some controversy about the contribution "PLA, Inc." makes to the Chinese military budget, there are disputes among analysts about how to calculate the budget itself. The U.S. Arms Control and Disarmament Agency (ACDA) calculates that Chinese defense spending (overall) between 1985–1995 followed a rising curve between US$53.5 billion and US$63.5 billion (in 1995 constant dollars). Official Chinese numbers are, needless to say, considerably below those amounts. Even though the official military expenditure figure has increased each year by 13%, the 1995 figure was US$7.7 billion and only US$9.8 billion for 1997. In any event, while analysts differ about the budget itself and the *amount* of "PLA , Inc.'s" contribution, the consensus is that it is supplemental to larger central government expenditures. Units generating cash get to keep most of it. As Gill remarks, "a significant share of extra-budgetary earnings is allocated toward the improvement of living standards . . . and other socioeconomic responsibilities of the unit. See ACDA, *World Military Expenditures and Arms Transfers 1996*, Washington, D.C., Table I, p. 65. For discussion on the perils of Chinese military expenditures analysis, see Bates Gill, "Chinese Defense Procurement Spending: Determining Chinese Military Intentions and Capabilities," Wye Conference on the PLA, 1997; Wang Shaoguang, "Estimating China's Defence Expenditure: Some Evidence from Chinese Sources," *China Quarterly*, September 1996; Arthur Ding, "China's Defence Finance: Content, Process and Administration," *China Quarterly*, June 1996; Gill, "Chinese Defense Procurement Spending," p. 8. We would note in passing that the U.S. military also generates significant "non-allocated funds" from on-base activities (PXs, recreational facilities) which are plowed back into troop benefits.

[20]See, for instance, David Shambaugh, "The Cash and Caches of China's Brass," *Asian Wall Street Journal*, September 22, 1994.

[21]Cited by Bates Gill, "Chinese Defense Procurement Spending."

[22]Kuang Tung-chou, "Premier Promises To Increase Military Funding To Make Up for 'Losses' After Armed Forces Close Down All Its Businesses," *Sing tao jih pao*, July 24, 1998 in FBIS-CHI-98-205, July 24, 1998. "Enterprises Belonging to Seven Military Regions Must Cut Ties with the Military Within Three Years, Analysts Say Prospects for Some Hong Kong Companies Should Be Reassessed," *Xin bao*, July 27, 1998 in FBIS-CHI-98-208, July 27, 1998.

[23]See "Government Reportedly Planning To Compensate PLA Firms," *Ming Bao*, July 25, 1998 in FBIS-CHI-98-207, July 26, 1998. See also Willy Lam, "PLA Gets Payoff for Business Loss," *South China Morning Post*, August 3, 1998.

most analysts believe that the "real" Chinese defense budget is considerably more than the official figure, perhaps as much as at least double.[24]

Still, reports from Hong Kong insiders suggest that returns from most PLA industries and services have been flat or in decline for the past two or three years. Tai Ming Cheung suggests PLA-run services—hotels, transportation, trading—were the most profitable, while factories run mostly in the red.[25] But the off-budget expense (covering losses from failing factories, housing, other social costs) may be considerable, perhaps as much as RMB100 billion (US$12B).[26] Removing this burden from the army's shoulders makes economic sense. But there is another, political reason for getting the PLA out of business: corruption.

The military's economic activities gave rise to a considerable amount of corruption, ranging from the sale of army vehicle license plates to smuggling. The army, Chinese critics say, has been diverted from its military mission and professionalism, even by its more legitimate business dealings. By the mid-1990s, amid much criticism from top army leaders of the PLA's enthusiasm for commerce, there were moves to prohibit combat units from business and to otherwise limit PLA commercial activities. The July 1998 order proscribing PLA business came, in fact, as part of a larger assault on official corruption by the Party, and should be seen as the outcome of the confluence of several currents affecting both China as a whole and the PLA: anti-corruption drives, pressures for professionalism (in both the civilian and military worlds), and, in the background, the larger economic reform movement to cut official ties with the commercial world.[27]

Still, what will happen to some of the high-fliers in PLA Inc.? There are numerous smaller firms run by the sons and daughters of high military officials—"princelings" involved in what one might term "*nomenklatura* capitalism"—which benefit from their connections. Companies with access to the highest levels—the arms-dealing Poly Group (which reported to the General Staff Department and whose leadership has included relatives of Deng Xiaoping), the General Logistics Department's

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[24]The China Defense White Paper (op. cit.) says that 35% of the budget—RMB28.5B—goes for personnel. If we add a hypothetical RMB15B to this, and assume PLA manpower at 3,000,000, we find that the PLA "spends" RMB1450 (US$175) per year per soldier. We leave it to the reader's imagination to find this amount credible.

[25]See Tai Ming Cheung, "The Chinese Army's New Marching Orders: Winning on the Economic Battlefield," in Jörn Brömmelhörster and John Frankenstein (eds.), *Mixed Motives, Uncertain Outcomes: Defense Conversion in China*, Boulder, CO: Lynne Rienner Publishers, 1997.

[26]Willy Lam writes in the *South China Morning Post*, August 3, 1998: "Provincial and municipal administrations will also be footing bills totaling more than 100 billion yuan when they take over PLA businesses and assume more responsibility for providing social welfare and employment for soldiers."

[27]See Zhang Ruosang & Luo Yuwen, "Jiang Orders PLA-Owned Firms To Close," *Jiefangjun bao*, July 22, 1998 in FBIS-CHI-98-204, July 23, 1998. This article explicitly links the closing of PLA, Inc. to corruption. See also the wrap-up on corruption in the PRC, Susan V. Lawrence "Excising the Cancer," and related stories, *Far Eastern Economic Review*, August 20, 1998, pp. 10–14. For examples of other official Chinese commentary linking the ban on PLA business with corruption, see "Major PLA Units Vow To Cease Businesses," *Xinhua*, August 3, 1998 in FBIS-CHI-98-217, August 5, 1998; "China: PLA Logistics Director Calls for Commercial Disengagement," *Xinhua*, July 29, 1998, in FBIS-CHI-98-210, July 29, 1998. For insightful Hong Kong commentary, see Lung Hua, "China: PLA Business Ban To Hit Central Government—Zhongnanhai Trends," *Xin bao*, July 29, 1998, in FBIS-CHI-98-216, August 4, 1998; and Ren Huiwen, "'Inside Story' of Antismuggling Drive—Beijing Political Situation," *Xin bao*, August 7, 1998, in FBIS-CHI-98-219, August 7, 1998.

Xinxing, and Sanjiu, for example—have increased the scope and depth of their activities to the point where they have become indistinguishable from other highly diversified Chinese holding companies. If the Center continues to push for economic results over all other criteria and manages to push through these reforms, it is highly likely that PLA firms will lose their military coloration all together. Still, one of the more interesting questions to come out of the 9th NPC CDIC reorganization and the PLA business ban is whether PLA firms like Poly, Xinxing and 999, plus PLA service branch operations, such as the PLAAF's United Airlines, will come under COSTIND's supervision or otherwise be removed from their PLA parent, mirroring steps taken elsewhere in the CDIC.

THE DILEMMA OF THE STATE SECTOR

The CDIC is part of China's crisis-ridden state-owned enterprise sector. We do not want to present a detailed account of the SOE situation here, and we would acknowledge that there some SOEs which are in fact doing well. But on the whole, even though the Chinese leadership has in the past called the SOE sector the "core of the economy," that core is rotten.

In the mid-1990s, some Chinese economists were saying that 70 percent of SOEs were "in the red."[28] Industrial debt (that is, money owed by factories to each other within the sector) had reached RMB631 billion—over 14% of GDP and 34% of industry valued added—and unsold inventory had reached a value of RMB401 billion—9% of GDP and 22% of industry value added. At a news conference during the 1996 National People's Congress, Wang Zhongyu, minister of the State Economic & Trade Commission, said that SOE losses had increased by over one-third.[29]

A 1997 World Bank report noted that overall SOE industrial overcapacity was more than 40%. Chinese government surveys taken in mid-1997 show overcapacities ranging from 70% for excavators to 50% for TVs, engines and bulldozers and 40% for chemicals—significantly, these are industries in which the CDIC plays a part. About 50% of SOE industries suffer net losses. Preliminary 1997 figures suggest that unsold inventory levels may have reached RMB730 billion or about 10% of GDP.[30] In fact, official 1996 figures suggest that the SOE sector as a whole ran at a net loss, with total losses of RMB79 billion exceeding profits of RMB42 billion by 88%.[31]

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[28]"State Culprit for Surge in Company Losses," *South China Morning Post (Business)*, November 15, 1995, p. 4; *South China Morning Post*, March 7, 1995; *South China Morning Post*, March 10, 1995; *China Daily*, March 5, 1995; *China Daily*, March 6, 1995; *China Daily*, March 12, 1995; and *Jingji ribao*, March 1, 1995. For a useful discussion of SOEs from a managerial perspective, see T. MacMurray and J. Woetzel, "The Challenge Facing China's State-Owned Enterprises," *The McKinsey Quarterly*, No. 2, 1994, pp. 61–74.

[29]See "Losses Grow for Chinese Industry," *International Herald Tribune*, March 15, 1996, p. 15.

[30]World Bank, *China's Management of Enterprise Assets: The State as Shareholder*, Washington, D.C.: World Bank, 1997, p. xi. The specific industry figures are from Directorate of Intelligence, "China's Economy in 1995–1997," Washington, D.C.: CIA, December 1997, p. 6–7. The 1997 inventory figures are extrapolated from data in Pamela Yatsko and Matt Forney, "Demand Crunch," *Far Eastern Economic Review*, January 15, 1998, p. 45.

[31]*China Statistical Yearbook 1997*, Table 12-17, p. 439.

Inefficient concentration simply adds to the slow-growth misery of the SOEs: the World Bank notes that the SOEs account for only about one-third of industrial production but provide two-thirds of urban employment and absorb about three-quarters of investment.[32] Not surprisingly, the profitable portion of the SOE sector hogs resources: the major SOEs—some 512 key enterprises, much less than 1% of the sector—control 55% of the total assets, 60% of sales and 85% percent of SOE pre-tax profits.[33]

Furthermore, the Chinese financial system is shaky. China's stock markets are more of a crap shoot than anything else, and Chinese banking procedures—accounting, credit analysis—are weak and are further enfeebled by politics and cronyism. Although China's foreign reserves and domestic savings rates are high, nonperforming loans are currently estimated to be equal to 20–30% of GDP, and, according to the World Bank, the entire banking system has negative net worth.[34] Even though the further reforms promised by the Ninth NPC would appear to move the Chinese economy forward, the 1997–1998 financial turmoil in Asia has sparked gloomy prognoses for the Chinese economy and undoubtedly has given pause to the Chinese leadership.[35] Overall, not a healthy picture.

CDIC FINANCIAL PROBLEMS

Chinese reports concerning the defense sector throughout the 1990s are similarly downbeat, with many commentators noting losses and overcapacity. Indeed, in the early 1990s economic boss Zhu Rongji was reported to have claimed that the majority of the SOEs in trouble were from the defense sector.[36] In 1995, *People's Daily* noted that "over the past decade and more, the country's munitions factories have seen a constant drop in the production orders of military goods; as a result, there are more hands than work in these munitions enterprises, the proportion of loss-making enterprises are expanding. . . . "[37] In mid-1996 the director of the national defense department of the State Planning Commission called the situation facing the defense sector "grim" and "very arduous." Weapons production would continue at only about one-third of the sector's capacity. A "considerable number" of defense

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[32]World Bank, *China's Management of Enterprise Assets*, p. xi.

[33]"Yearender: State Enterprise Reform Enters Crucial Stage," *Xinhua*, December 24, 1997, in FBIS-CHI-97-358, December 24, 1997.

[34]Steven Mufson, "Time Runs Short for China Banks, the Economy's 'Soft Underbelly'," *International Herald Tribune*, November 24, 1997, p. 13; and "When China and India Go Down Together," *The Economist*, November 22, 1997, p. 73.

[35]See, for instance, the range of opinion expressed in Robert Dernberger, "China's Transition to a Market Economy: Back to the Future, Mired in the Present, or Through the Looking Glass to the Market Economy," and Wing Thye Woo, "Crises and Institutional Evolution in China's Industrial Sector," both in Joint Economic Committee, *China's Economic Future: Challenges to U.S. Policy*, Armonk, N.Y.: M. E. Sharpe, 1997; Mark Clifford *et al.*, "Can China Reform Its Economy?," *Business Week*, September 29, 1997, pp. 39ff; and George Wehrfritz, "Will China Be Next?," *Newsweek* (European Edition), December 1, 1997, pp. 32–33.

[36]Tai Ming Cheung, "On Civvy Street: China's Lumbering Arms Makers Face Market Rigours," *Far Eastern Economic Review*, February 6, 1992, pp. 40–43.

[37]Huang Shaohui *et al.*, "A Successful Practice of Converting Military-Oriented Industries to Civilian Production," *Remin ribao*, December 14, 1995, in FBIS-CHI-96-004, December 14, 1995.

enterprises were losing money and appeared unable to solve their financial problems.[38]

THE MILITARY DILEMMA

As if these structural and economic issues were not enough, the military context also poses problems for the CDIC. An industry must serve its customers—in the case of the CDIC, the PLA. But the PLA has requirements that the CDIC cannot meet.

To understand any army, one has to go beyond counting the number of troops and weapons systems. One has to look at doctrine—the definition of the enemy and how force would be used—as well as the state of readiness and logistical capability. Yet a quick "bean counting" glance at manpower and inventory levels is the place to start. And when we look at the PLA, the first two things that strike us are the army's size—about 3 million (although perhaps as much as a third are essentially civilians in uniform providing services such as medical treatment)—and the huge number of antiquated systems it has deployed: 24 group armies deploying 12,000 main battle tanks and armored personnel carriers based on 1950s and 1960s Soviet models (but only two fully mechanized divisions); and an air force based on Chinese adaptations of MiG 19s (3000 highly cannibalized airframes) and MiG-21s.[39] Not withstanding China's recent but small purchases of Su-27s and other modern military equipment, some military observers privately term the PLA a "military museum" and a "junkyard army." These huge numbers reveal not strength but weakness—the cost of full-scale force modernization would be overwhelming. At the same time, the announcement that up to half a million troops will be cut by the year 2001 is a step in dealing with this issue (though, we would add, about 14 divisions—approximately 150,000 troops—will simply swap their cap insignia in a transfer from the PLA to the People's Armed Police).[40]

But China's strategic focus has shifted to claims in the littoral and the South China Sea, where Chinese claims clash with those of many ASEAN states—and toward Taiwan. The importance of the South China Sea is not so much that it *may* contain oil and gas fields, but rather that it is a key choke point in the flow of oil from the

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[38]Yu Zonglin, in *China Defense News*, May 24, 1996, cited in DSTI 16-31, May 1996. We would add that authoritative Chinese sources are silent on actual weapons production figures, so we must fall back on estimates. These indicate a significant decline in major systems production: annual warplane production has fallen from a high point of about 200 aircraft in 1982 and 1983 to about 80 in the 1990s; no bombers have been produced since 1990. Warship production is by its nature slow, and, in China, at low volume—6 destroyers and 13 frigates, and nothing heavier, have joined the fleet since 1990. Main battle tank production fell from about 650 in 1984 (half were, however, exported) to 100 in 1994. See Frankenstein and Gill, op. cit., for more detail. Michael Swaine cites a variety of sources which give somewhat lower production estimates for aircraft in his contribution "China" in Zalmay Khalilzad (ed.), *Strategic Appraisal*, Santa Monica: RAND, MR-826-AF, 1997, pp. 185–221.

[39]See the order of battle presented in Michael Swaine, "Chinese Military Modernization: Motives, Objectives and Requirements," U.S. Joint Economic Committee, *China's Economic Future: Challenges to U.S. Policy*, Armonk, N.Y.: M. E. Sharpe, 1997.

[40]See "Chi Haotian on Defense Policy," *Zhongguo xinwen she*, February 4, 1998 in FBIS-CHI-98-037, February 6, 1998.

Middle East to Japan, Korea, and China itself. Taiwan, of course, remains unfinished business from the Chinese civil war. But the "threat" has changed.

Today, the short-term threat is more ambiguous: not so much outright, head-to-head conflict, but rather the ability of outside forces—particularly the United States—to constrain or thwart China's freedom of military action in pursuit of her strategic goals, especially vis-à-vis Taiwan. And in the longer term, China's security problems may become more complex. China will have to deal with the emergence of a Japan with as much political and military clout as it has economic importance. And China's attention must once again turn toward her land borders as energy, vital to China's continued development, begins to flow from Central Asia and Siberia (Chinese oil interests have major investments in Kazakhstan). Furthermore, there has been a major shift in thinking about the way modern warfare is conducted, away from massive conflict to increased maneuver, highly targeted attack using precision weapons, and information warfare. The Gulf War was an early and already dated example of this "revolution in military affairs" (RMA).

Thus China faces the need to modernize the force, to deal with the widespread obsolescence of its inventory, and to overcome the PLA's "short arms and slow legs" in the face of mobile potential enemies—in the Chinese phrase, "fight a modern war under hi-tech conditions." It is easy enough to list China's weaknesses: lack of combat experience in the officer corps; rudimentary logistics and "C4I" (command, control, communications, computers and intelligence); no airborne platforms for early warning and mid-air refueling; limited blue water and amphibious capabilities; questionable abilities in anti-submarine warfare; low ground force mobility; and poor joint force coordination (including virtually no close air support capabilities), to name just a few.

However, it is also clear that the Chinese leadership is aware of these problems—or at least they should be. The library of COSTIND's China Defense Science and Technology Information Center subscribes to virtually every important foreign military journal in print, from *Jane's Defence Weekly, Aviation Week, US Naval Institute Proceedings, Parameters,* and other English-language materials to French, German, and Russian publications. Ever since the Gulf War the Chinese military press has been full of articles about the "revolution in military affairs," "five-dimensional warfare," "information war," "building weapons of soft destruction," and the like; Chinese leaders constantly exhort the army to move toward hi-tech.[41]

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[41]Just a few citations here: Zhao Chengmou, "A Prediction of Future Battlefields and Weaponry in the Early 21st Century," China Defense Science & Technology Information Center Papers #4 & 5, 1990; *Jiefangjun bao*, March 20, 1991; "High-Tech War and Military Strategy," *Jiefangjun bao*, May 29, 1991; "Watch Closely the Revolution of Military Technology in the New Era," *Jiefangjun bao*, October 23, 1995 in FBIS-CHI-95-231, October 23, 1995; Wang Baocun "Military Transformation in an Information Era," *Jiefangjun bao*, April 21, 1998 in FBIS-CHI-98-126, May 6, 1998; Wang Jianghuai and Lin Dong, "Viewing Our Army's Quality Building From the Perspective of What Information Warfare Demands," *Jiefangjun bao*, March 3, 1998 in FBIS-CHI-98-072, March 13, 1998. These articles are more exhortations to achieve high-tech capabilities than celebrations of PLA achievements. One gets the impression that at least some of the Chinese leadership regards the RMA as a kind of "Sunzi-esque" magic bullet that will allow the PLA to achieve a low-cost, asymmetrical advantage over a high-tech enemy. In this one can see the continuing influence of Mao's "People's War" approach—indeed, for the historically minded, much of the current discussion reminds one of the Self-Strengtheners' fixation on "superb and secret weapons."

Area	Item
Aircraft	Air combat simulator under development by AVIC's "Blue Sky Aviation Simulator Technology Development Center; Aviation Industries of China Research Institute no. 613 of Luoyang conducting R&D in photo-electronic detection and tracking systems, head-up displays, and helmet aiming and display systems.
Aircraft, ship-borne	PLA Navy Aviation Technology Academy studies flight safety, air stream dynamics at the stern of a moving vessel through modeling and actual flight operations of a helicopter flying from a missile destroyer; ship-borne aircraft flight dynamics studied at symposium sponsored by Beijing Aerospace University; participants were from PLA Navy, Electronics Ministry, AVIC, other universities.
Computing	CAS national research center works on the "Shuguang 3000" massive parallel super computer; Aviation RI completes airborne high speed computers and airborne computer networking project; Space Industry Number 771 RI develops 5.8 kg "supercomputer" using 32-bit RISC CPU developed by the RI; Second Artillery engineering design RI develops "4-dimensional engineering construction computer management and simulation system"; VSLI research.
C4I	R&D on advanced transmitters operating in the 900 MHz range; telemetry advances; General Staff Dept. research institute develops army-wide on-line communications network and advanced command automation; Zhuhai Kexing Development Co. develops command and control central and remote display systems using GPS; Academy of Military Sciences operations institute develops an expert artificial intelligence system to aid commanders; research institutes under the General Staff Dept, COSTIND, 2nd Artillery and aerospace jointly develop a ruggedized microcomputer for field use; reports of successful test of real-time remote-sensing image processor; Ministry of Machine Building Industry Research Institute no. 55 announces completion of China's first liquid crystal display panel; Beijing MR group army achieves transportable field combat command automation from army down to regiment; PLA's first "wire communications automated duty management system" operational in Guangzhou MR [1996]; Electronics #7 RI works on multiple mobile/wireless communications systems; establishment of fiber-optic systems.
Cruise missiles	No. 8359 Research Institute completes a cruise missile assembly and testing facility.
Fire control automation	Guangzhou MR field artillery unit claims complete automation of fire control for all systems from field guns to anti-aircraft weapons; Southwest computer industry company develops automated artillery fire communications and command system.
Logistics	Guangzhou MR engineering institute develops field combat railroad platform vehicle, which serves as a temporary loading platform; it can also be used as a bridge.
Long-range navigation	"Changhe-2 Long-Range Radio Navigation and Positioning system" in operation; PLA Airforce develops airborne GPS system
Naval systems	Seminar on ship artillery and missile systems held by China Shipbuilding Engineering RI; delivery announcement of newly-designed supply ships for PLA navy; Shipyard builds first 10,000 ton "national defense mobilization vessel"
RPVs	R&D on RPVs conducted by PLA; at Northwest China Industrial University (termed China's largest r&d and production base for pilotless aircraft); National Defense S&T University and Guangzhou MR Logistics Dept. develops a drone with real-time photographic capabilities; Xian drone center develops a new "B-7" drone with a 40 km/60 minute range; Xian Aisheng Technology Corp develops unmanned reconnaissance aircraft equipped with cameras and infrared scanners.
Radars	An electronics research institute under the Chinese Academy of Sciences, working on synthetic aperture radar technology since the mid-1970s claims progress on airborne and satellite SAR applications; China National Aerospace Industry Corp develops warning radar; Chinese Academy of Engineering Sciences develops inverse synthetic aperture radar technique; anti-stealth wide-band radar

Table 1—Selected Chinese Defense R&D, 1993–96

Military R&D concentrates on many of these issues. See the table above for a selection of Chinese military R&D efforts. The open sources available to this writer suggest that the PLA is extremely far, even at the R&D level, from "post-modern" battlefield command systems that feature multiple sensor links and automatically configurie multi-channel/frequency hopping secure communication networks. Still, a wide range of R&D is going on within academic institutions and research institutes.

The question is, however, whether this R&D can be translated into production and deployment. The record of the "hardware" producing part of the CDIC suggests that it will be difficult to move into wide production of this type of "software." Rather, as was the case with strategic weapons, we could hypothesize that China's version of the RMA will be developed in special organizations.

In other words, China will follow a "pockets of excellence" approach, as seen in the creation of a small number of rapid reaction units (RRUs—army units, smaller than divisions, with more modern equipment, logistics and mobility). This reflects the Chinese penchant for experimentation. It also echoes China's "trickle west" coastal

development strategy: focused investment that may have a demonstration effect. Thus, in a larger sense, the "dual economy/dual society" phenomenon that we see in China is now reflected in China's military development. We are likely to see continuing expansion of these small-scale modernization efforts, which have, in fact, been underway for much of the last decade.[42]

Still, the PLA has a long road to go down to reach a military status commensurate with the PRC's political and economic importance. The PLA's capabilities have improved and that modernization in the long term is firmly in the Army's sights. But modernization is, in fact, a target moving faster than most players can keep up with.[43] Chinese military writers certainly are up-to-date on Western thinking. Whether the PLA can make the adjustments necessary to incorporate large-scale modernization even to Western levels of the 1980s is, however, highly uncertain.

THE DILEMMA OF TECHNOLOGY TRANSFER

Thus, in the short term, at least, China has turned outward for its modern military technology, a violation of the Chinese imperative of self-reliance. The PRC's shopping list is long and reveals what the CDIC has been unable to develop and produce: advanced jet fighters (both purchase and production licenses for the Su-27K), airborne early warning and other avionics, modern air defense systems, precision-guided munitions, armor technology, larger surface combatants equipped with hypersonic sea-skimming anti-ship missiles, submarines, and dual-use communications technology. The sources are worldwide. Much comes from Russia, but Israeli, West European, and even U.S. firms have been suppliers.[44]

But Chinese officials, from the Self-Strengtheners to top PLA generals, have long emphasized that China must avoid dependence on foreign sources, or otherwise be stuck in a developmental trap, unable to adapt or proceed beyond the level of expensive imported technology.[45] In other words, there is a severe strain between the Chinese drive for self-reliance and the reality of foreign dependence. For

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[42]We will not discuss issues surrounding China's nuclear forces here, since that would take us into realms of theology beyond our immediate interest. Suffice it to say that China has a limited "counter-value" deterrent capability. Or to put it another way, China's ICBM guidance systems are good enough to target "soft" cities, not good enough to target "hard" missile silos. However, a study of international military critical technologies by the U.S. Department of Defense grades China as having essentially world-class nuclear capabilities. Still, that some Chinese political leaders would casually ask, during the 1996 missile exercises around Taiwan, whether the U.S. would trade Los Angeles for Taipei suggests that some in Beijing may not fully understand the implications of nuclear war.

[43]Even the Chairman of the NATO Military Committee, German General Klaus Naumann, has expressed concerns that European armies may not be able to keep up with the innovations deployed by U.S. forces. In particular, he worries that NATO members "can no longer cope with the speed of the revolution" in reconnaissance, command and control, information systems and precision weapons. See *Aviation Week & Space Technology*, October 6, 1997, p. 23.

[44]Joseph C. Anselmo, "China's Military Seeks Great Leap Forward," and Nickolay Novichkov, "Russian Arms Technology Pouring Into China," both in *Aviation Week & Space Technology*, May 12, 1997, p. 69–73. See also "China: Military Imports From the United States and the European Union Since the 1989 Embargoes," Washington, D.C.: General Accounting Office, GAO/NSIAD-98-176, June 1998.

[45]Old Marshal Zhang Aiping raised the issue in the March 1983 *Hong Qi [Red Flag]* in words virtually identical to those of Feng Gueifen, the 19th century Self-Strengthener. It's an old issue, and old issues, like streetcars, tend come around.

instance, even as China signs up to co-produce Su-27s, other military factories, no doubt encouraged and perhaps protected by their local political authorities, continue ahead with at least two other fighter programs. These tensions between foreign procurement and competing domestic programs can only lead to an inefficient allocation of resources.

Furthermore, success in the technology transfer process is not guaranteed. Western technology executives at a recent defense conversion meeting in China noted privately that they wouldn't take some of the factories they were shown even if they were given away. A Beijing-based American executive with long experience in dealing with the CDIC considers most Chinese defense plants "dismal . . . right out of the Middle Ages," burdened with "enormous overheads," and unable to reach economies of scale, in part because of a lack of managerial and technical expertise. They have "a false faith in their abilities," possessing the skills of "hammer and chisel engineering in the age of CAD/CAM." In a general critique of the process, noting poor results and incomplete assimilation, officials at the State Science and Technology Commission complain:

> Our sense of technological innovation is underdeveloped. People do not fully realize the import of technology is just the beginning, that what really matters is absorption, assimilation, and independent innovation. . . . As a result, the relationship between the import of technology and self-development is a tenuous one.[46]

The reality of the situation constrains Chinese military capabilities. As Paul Godwin of the National Defense University has written,

> China's military planners face an increasingly difficult dilemma. A national strategy focused on limited, local war along its borders and its maritime claims, accompanied by the requirement to sustain its nuclear forces, has created requirements for technologies which the military technology base cannot develop and the industrial base cannot yet produce. . . . For the foreseeable future. . . . China's armed forces will have to continue to plan on the basis of the assumption of obsolescence.[47]

THE CDIC RESPONSE: "CONVERSION"

One CDIC response to this poor combination of circumstances was "*jun zhuan min*"—"defense conversion." The term, at least as used in the West, encompasses many concepts: the use of military production assets to produce for the civilian market; the production of dual-use items; spin-off, or the adaptation of military technologies for civilian uses; diversification; demobilization of personnel and facilities; surplus weapons management; reengineering an entire sector through

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[46]Shi Dinghuan, Yang Tiancheng, and Mu Huaping, all from the Department of Industrial Science and Technology, State Science and Technology Commission, "Proposals to Improve Import of Technology and Accelerate Technological Innovation," *Zhongguo keji luntan* (Forum On Science And Technology In China), No. 4, July 97, pp. 8–12, in FBIS-CHI-97-283, October 10, 1997.

[47]Paul Godwin, "Military Technology and Doctrine in Chinese Military Planning: Compensating for Obsolescence," in Eric Arnett (ed.)., *Military Capacity and the Risk of War*, Stockholm, Sweden: Stockholm International Peace Research Institute/Oxford University Press, 1997.

consolidation ("shrinking smart")[48]; or, more broadly, a process of industrial disarmament. It is also clear that for many in the Western defense industry, "defense conversion" is a four-letter word. Norman Augustine, president of defense giant Lockheed-Martin, has called the process a strategy "unblemished by success."[49]

But for the CDIC, "conversion" appeared to offer a solution to many of the sector's problems. It received attention at the highest levels, was included in the mechanisms of the central Five-Year Plans and came under the direction of a Three Commission Liaison Group for Defense Conversion, which brought together officials from the State Planning Commission, the Science and Technology Commission, and COSTIND (when it came under the military), plus a State Council office that deals with problems of the Third Front industries.[50] The fate of this Commission, given Premier Zhu Rongji's bureaucracy busting, is not known. But even as Beijing was attentive to conversion, the responsibility for much conversion work has been shifted down to the province level, particularly in the Third Front areas of Guizhou and Yunnan. If a result of the 1998 reforms is that "converted" enterprises will be cut off from their CDIC parents, it will effectively signal an end to the attempt to combine military and civilian production and perhaps also be another indication that the post-Deng leadership of Jiang Zemin and Zhu Rongji are distancing themselves from Deng's policies. And it will mean that much of the writing about "conversion" in China will shift from the policy inbox to the historical bookshelf. But given China's claims of considerable success in its conversion efforts—Beijing has asserted that 70–90% of CDIC output goes for civilian purposes—a closer look is still warranted.

A Xinhua news agency release from September 1997 is typical of official Chinese media reporting on conversion:

> For every 10 such taxis, seven are manufactured by former weapons factories. These factories also turn out one fifth of the total national output of cameras and almost two thirds of motorcycles. Even the rice on the dinner table may be one of the 325 kinds of grains that have been treated by nuclear radiation technology, formerly the preserve of the military.[51]

Other Chinese statements give more detail of a sort.[52] For instance, in 1994, the ordnance industry claimed that 90 percent of its industrial output in southwest

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[48]"Shrinking smart," a useful short-hand term, comes from J. T. Lundquist, "Shrinking Fast and Smart," *Harvard Business Review*, November–December 1992. The article looks at possible remedies for the ills of the U.S. defense sector.

[49]K. L. Adelman and N. R. Augustine, "Defense Conversion," *Foreign Affairs*, Spring 1992.

[50]See Paul H. Folta, *From Swords to Plowshares? Defense Industry Reform in the PRC*, Boulder, CO: Westview Press, 1992; and Jörn Brömmelhörster and John Frankenstein (eds.), *Mixed Motives, Uncertain Outcomes*.

[51]"PRC Defense Industry Turning Swords Into Ploughshares," *Xinhua*, September 29, 1997, in FBIS-CHI-97-272, September 29, 1997.

[52]Transparency is not a notable feature of the Chinese economic landscape. CDIC officials can be downright cagey and misleading when asked to go beyond general statements. For instance, the manager of an aircraft plant I visited claimed not to know the selling price of his production. Several young Chinese analysts I have spoken with do not appear to understand basic analytical techniques or why, when percentages are cited, one would like to know the numerator and denominator of the calculation. Even when company records are available they are difficult to interpret. An American executive told me that most of these records are worthless in any event: "unreadable." In one case, not atypical, it took

China was for the civilian market—motorcycles, minicars, heavy-duty trucks, cameras, refrigerators and other white goods, optical and electrical instruments, and machinery for oil production.[53] By 1996, sales had reached US$1.5 billion, 95% of total sales.[54] In 1995 the official *China Daily* reported that 1994 sales of civilian products made by the ordnance sector increased 31 percent over 1993, to reach 18.5 billion yuan (about US$2.2 billion), with a forecast for another 30 percent increase during the year.[55] In a paper delivered at a conference on conversion held in Beijing in mid-1995, Zhang Weimin, a North China Industries Group [NORINCO (G)] vice-president, gave an upbeat account of the group's development. It had grown to encompass 157 large and medium-sized factories, more than 30 research and development institutes, 200 sales companies, and 60 subsidiaries trading in 100 countries (including the United States, Dubai and Russia). Overall, he said, the group's joint ventures produced 40 percent of the motorcycles sold on the Chinese domestic market, and aimed to produce 450,000 mini-cars and 20,000 heavy trucks per year by the end of the century.[56] The diversity of production is great—for instance, the aviation and space industries produce everything from satellites and aircraft to motor vehicles to typewriters, pots and pans, and even religious objects, such as the cast bronze Buddha on Hong Kong's Lantau island.

Following practices found on the nondefense side of the economy, the CDIC formed new enterprises through consolidations and mergers. COSTIND sponsored a holding company in Hainan which drew on investments from across the various CDIC ministries and corporations (we understand that the company failed). Both industry-based and regionally based groups, such as the Huanghe electronics group and Guizhou's defense conglomerates, were established. NORINCO has formed joint ventures in motorcycle production and communications. Third Front firms have been urged to make a "triple jump"—"jump out of the backwater, skip to coastal areas, pole vault overseas"—and by the early 1990s it was claimed that they had established 800 enterprises along the coast and in cities and special economic zones. These operations are strictly commercial, designed to cash in on the boom in the "China Gold Coast"; the Shenzhen special economic zone just north of Hong Kong is full of such "window firms" (e.g., a NORINCO plastics factory making manufacturing molds and toys and, in an interesting example of exploiting machining competencies, an aviation factory workshop that makes watch cases for export). The Guangzhou HuaMei (i.e., China and America) Communications Ltd. joint venture, established to set up a high-speed broadband telecommunications network, reflects some of the new horizontal flexibility in organization we see throughout the Chinese economy. The U.S. side is SCM Brooks Telecommunications, while the Chinese side, Galaxy New Technology, is a cross-ministerial enterprise between the Ministry of

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accountants over 6000 man-hours to validate a potential joint venture (JV) partner. Thus we are thrown back to anecdotal evidence and press reports for our data.

[53]See "'War Industry' Produces More Civilian Products," *Xinhua*, June 9, 1994, p. 36.

[54]"PRC Defense Industry Turning Swords Into Ploughshares," *Xinhua*, September 29, 1997, in FBIS-CHI-97-272, September 29, 1997.

[55]See "Arms Maker Produces More Civilian Goods," *Xinhua*, January 19, 1995, p. 36.

[56]Untitled paper distributed at the International Conference on the Conversion of China's Military Industries, sponsored by the OECD and CAPUMIT, Beijing, June 1995.

Electronics, the Ministry of Posts and Telecommunications and COSTIND. The joint venture is of interest because the technology transferred has dual-use potential.[57] And in 1997, just before the 15th Party Congress, Chinese officials were promoting direct foreign investment in defense electronics enterprises; the pitch for foreign investment in the defense sector continues.[58]

SUCCESS?

In other words, there has been, as elsewhere in the Chinese economy, a good deal of experimentation going on. But how successful has it really been? Jin Zhude, the former head of the COSTIND affiliate China Association for the Peaceful Use of Military Industry Technology (CAPUMIT), has written that success in defense conversion would include management reform, adapting to domestic and international markets, attracting foreign investment, moving from capital-intensive to technology- and information-intensive industry, and developing "mainstay" or "pillar" industries that can drive development such as automobile manufacturing.[59]

Have these goals been met? It doesn't seem so. At a defense conversion conference in China, a NORINCO official confided to a visitor that "90" out of "100" defense firms were having problems meeting their payrolls. The regime, he said, "was not telling the whole truth." A Chinese newspaper report on Sichuan-based defense industries found that "most factories are on the verge of bankruptcy," and concluded that in their turn to the market, "prospects for success were dubious."[60] More understated, another Chinese military researcher noted "the policy of stimulating civilian industry through military R&D and arms production, if not a complete failure, has many limitations itself."[61] A 1996 report from the Hong Kong–based PRC-sponsored *Wen Wei Bao* noted that "nearly half" of the 80% of the CDIC that have attempted conversion "have failed to reap reasonable profits or have suffered losses."[62]

Officials involved in defense conversion have criticized the CDIC's record. One noted that the defense sector, habituated to allocated capital and handicapped by a corporate culture that promoted "self-reliance for all things," carried excess

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[57]The case raised a number of issues about U.S. export licensing procedures. See "Export Controls: Sale of Telecommunications Equipment to China," Washington, D.C.: General Accounting Office, GAO/NSIAD-97-5, November 1996. This JV also illustrates some of the complications of the recent reforms: how will this JV be governed and who holds what shares, now that the MPT and the Ministry of Electronics have been merged into the Ministry of Information Industry and COSTIND is no longer a military organ?

[58]See Tom Korski, "China: PLA Sets Sights on New Type of Recruit," *South China Morning Post*, January 19, 1998; and G. Arslanov, "Foreign Investments Help China to Convert Defence Industry," *Tass*, January 18, 1998.

[59]Jin Zhude, OECD/CAPUMIT conference paper, 1995.

[60]Pei Jiansheng, "Market Solution Eludes Remote Military-Industrial Complex," *China Daily Business Weekly*, November 6–12, 1994, p. 7. The remarkably frank story ran in *China Daily*, an official English-language paper aimed at foreigners.

[61]Fan Wei, "Arms Procurement and National Economic Development in China," unpublished manuscript, March 1995.

[62]Yin Tan, "China Quickens Pace of Defense Production Conversion Into Civilian Production," *Wen wei pao*, April 16, 1996, in FBIS-TAC-96-006, April 16, 1996.

inventory, found cooperating and networking with other organizations extremely difficult, had no market knowledge, produced low-quality goods, and lacked cost- and customer-consciousness.[63] Defense sector scientists told a visitor to a 1995 defense industry conference in Beijing that defense conversion faced major problems: lack of capital, high indebtedness, and poor market research, which led to the production of low-quality but overpriced, noncompetitive goods and a belief that defense conversion was a technical production problem requiring a hardware fix when in fact it demanded a software fix—changes in management and strategy.

The State Planning Commission (SPC) also is not happy with defense conversion progress. According to a report in the *Chinese Defense Industry News* quoting a SPC official, very few—about 12%—of the CDIC had the ability to develop "pillar products" by themselves, while 40% did not have "pillar products" at all. CDIC civilian products, the official said, were of medium to low technological levels and quality; product mix was low; and because of limited investment, production runs lacked economies of scale, leading to low, if any profits.[64] It would also appear that Chinese banks are not overly impressed with defense conversion efforts. In late 1995, it was reported that Beijing was considering setting up a RMB50 billion fund (US$6.1 billion)—on top of RMB10 billion already spent—to underwrite defense conversion efforts. The reason, according to Wu Zhao, the president of CAPUMIT, was clear: "Banks have become more independent. Although lending quotas are available, sometimes local banks refuse to lend the money to local military industrial enterprises."[65] If Chinese banks, bolstered by guarantees, won't bet on conversion, who should?

Authoritative statements suggest that there is some anxiety about the process, and, with 20-20 hindsight, suggest that by 1996 the conversion process was under the kind of reexamination that would lead to the 1998 reforms. Certainly the economic environment in China in the 1990s posed problems for the inefficient CDIC. Jin Zhude pointed out that economic austerity moves (primarily tightened credit), designed to cut inflation, had weakened the conversion program: "Since 1993, as China strengthened macroeconomic controls . . . the development momentum of conversion has clearly weakened, and it is necessary to make new restructuring and plans." There is more than a hint of crisis in his urgings that the defense sector become more efficient. Otherwise, it "again could become a major burden on or hindrance to [*baofu*, a very strong word with negative implications] China's economic development, as it was in the 1970s."[66] A State Planning Commission official noted that if the CDIC cannot continue their failing high-cost, low-profit conversion operations, their products will be "squeezed out" or eliminated through competition. The SPC's solution would be to continue structural reform, "centering

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[63]He Jianhua, unpublished 1995 defense conversion conference paper.

[64]Yu Zonglin, *China Defense Industry News*, May 24, 1996.

[65]Vivien Pik-Wan Chan, "State Considers Fund To Aid Defense Conversion," *South China Morning Post*, November 7, 1995. Local CDIC managers told a visitor to Chongqing in 1995 that even COSTIND support was inadequate, thus the need to go to banks.

[66]Jin, in OECD/CAPUMIT conference paper (1995). In the Chinese text this is *youyou keneng chengwei yinxiang guomin jingji fazhan de baofu, zhongjian 70 niandai de lishi.*

on raising modern weaponry research and development (R&D) and production capabilities, while solving the problem of excess capacity for old products and insufficient capacity for new products. *Only in this way will [the CDIC] be able to meet the requirements of defense modernization.*" [67] In other words, concentrate on weapons.

SWORDS INTO . . . ?

Indeed, "conversion" had another purpose beyond improving the efficiency of the CDIC. It was, as Paul Folta has put it, "Swords into plowshares . . . and better swords."[68] Defense conversion in the Chinese context was not only intended to deal with the CDIC's economic situation, it was also part of China's military modernization program by aiding Chinese military production capabilities. This has not exactly been a secret. Defense plant managers interviewed by Paul Folta said they expected profits from civilian production to aid defense production modernization. Conversion activities would also allow military production costs to be spread over a wider base.[69] The basic strategy is spelled out in the so-called 16-character slogan, attributed to Deng Xiaoping:

Jun-min jiehe,	Combine the military and civil,
Ping-zhan jiehe,	Combine peace and war,
Jun-pin youxian,	Give priority to military products
Yi min yang jun.	Let the civil support the military.

These intentions have been expressed many times throughout the 1990s. For instance, speaking at a defense conversion conference held in Beijing in 1991, a senior engineer in the aerospace industry said: "Among the dual tasks of serving national defense construction and serving economic construction, the national defense construction goes first and the economic construction second. . . . [the aim of] both military and civil use is a long term stable military system." A Hubei provincial official said that the "guiding principle" for conversion was to "treat [military and civilian] equally without discrimination, [but to] put military production first, and give it appropriate preferential treatment" (by which he meant tax breaks and first call on infrastructure).[70] This dialectical view of the relationship between military and civilian industrial capacity was one of the major themes of a long 1996 article in a major ideological journal by Chinese defense minister General Chi Haotian, who called for converting enterprises to keep military mobilization and production needs in view: "On condition that production of military supplies is not

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[67]Reported in China Defense Industry News, May 24, 1996. Emphasis added.

[68]Folta, p. 1.

[69]See Folta, p. 168.

[70]Unpublished papers by Zhang Hongbiao of the Aerospace Ministry and E' Wanyou, Vice Director, Hubei Economic Commission, circulated at the International Cooperation in Peaceful Use of Military Industrial Technology Conference, Beijing, 1991.

affected, facilities and equipment of [defense] scientific research should enthusiastically service the country's economic construction."[71]

DUAL USE—SPIN-OFF *AND* SPIN-ON

Others promoted dual-use technologies in the conversion effort. Indeed, some 1995 commentary suggests that for some, conversion means "spin-on" as much as it does "spin-off." No less than former Central Military Commission (CMC) Vice-Chairman General Liu Huaqing was reported by *Liberation Army Daily* to argue at a January 1995 national conference on cooperation and coordination work in the military industries that "we must seize the opportune time of the end of the Eighth Five-Year Plan [1995] and the Ninth Five-Year Plan to push our national defense science and technology and weaponry onto a new state." According to the paper, he said that contributions from civilian industry, the Chinese Academy of Science and the university system are "component parts" and the "foundation for developing science and technology industries for national defense." China, he said, "should pay attention to turning advanced technology for civilian use into technology for military use. . . ."[72] A Xinhua commentary, also dating from January 1995, noted a number of "spin-on" developments: civilian industry "solved a large number of sophisticated technology problems crucial to the production of nuclear weapons, nuclear submarines, guided missiles and satellites [and] new materials. . . ."[73] And Huai Guomo has pointed out: "The trend toward the interchangeability of military and civilian technology is increasing, and this provides a solid technological basis for the rapid modernization of national defense and the constant upgrading of weaponry."[74]

Arguing that dual-use makes a contribution to the civilian economy while keeping military production lines warm, an official of the Chinese Defense Science and Technology Information Center noted that in times of crisis this capability can strengthen deterrence. Remarking on foreign experiences with dual-use, he said "the development of dual-use technologies provides the opportunity of developing military technologies in disguised form . . . [and] can save the costs in weapons

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[71]Chi Haotian, "Taking the Road of National Defense Modernization Which Conforms to China's National Conditions and Reflects the Characteristics of the Times—My Understanding Acquired From the Study of Comrade Jiang Zemin's Expositions on the Relationship Between the Building of National Defense and Economic Development,"Qiushi [Seeking Truth], April 1996.

[72]"Liu Huaqing Urges Development of Defense Technology," Xinhua, January 30, 1995, p. 30ff.

[73]Xinhua, January 25, 1995, p. 24.

[74]Cited in Xiang Wang, "Development of Modern Technology and Defense Conversion: Interview with Huai Guomo, vice minister of the Commission of Science, Technology and Industry for National Defense," Conmilit (Xiandai Junshi), No. 296, May 1993, p. 4. This perception must have been reinforced when Huai was a visiting fellow at the Stanford University Center for International Security and Arms Control, located in the heart of Silicon Valley, in 1993. In any case, some of COSTIND's joint ventures with U.S. firms, such as Hua Mei Telecommunications, may have been set up with "spin-on"—as well as minimization of potential problems with export controls—in mind. See Bruce Gilley, "Peace Dividend," Far Eastern Economic Review, January 11, 1996, pp. 14–16.

systems and [military] modernization."[75] A Chinese scientist, who formerly designed ICBM engine systems, told this writer privately that money from civilian satellite launches goes toward the salaries of scientists and engineers working on the military side of the Chinese missile program.

In other words, one *intention* of conversion appeared to be not only to utilize redundant facilities, but also to apply the benefits of conversion—funds and improved technology—to the maintenance of the defense industrial base and to further military modernization. The aim, according to an article in *Military Economic Research*, is to put the defense industries "on the development road of the socialist market economy, and to guarantee the unbroken improvement of military production capabilities."[76] If industrial demilitarization (or industrial disarmament) is one definition of conversion, we do not find it in the Chinese case.

A PARADOX

Thus the Chinese conversion effort on the whole appears to be a muddle—not much success in moving toward success on the civilian market, not much success in modernizing defense production. Indeed, it would seem that in those cases where defense conversion has been economically successful, there is an unwillingness to remain a military supplier. Indeed, the fear that the conversion effort would crowd out military production has been expressed by Chinese officials. One acute Chinese observer formerly involved with defense conversion efforts has written:

> Profits from military production tend to be lower, requirements higher and quantities less than in civilian production. Motivating enterprises and maintaining an adequate industrial base for military production under a tight defense budget are therefore questions that have become important. . . .[77]

His concerns appear to have been realized. There are the management problems of "one factory, two systems," in which the cash-generating civilian side of the operation has taken precedence over the military production side.[78] CDIC managers, who have the bottom line responsibility, appear to be rather forthright about this issue. A defense industry manager complained to *China Defense Conversion News* that he was caught in a bind, trapped between the new environment brought about by the economic reform program and the requirement that he keep military production going: his factory had to "expend 50% of our efforts

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[75]Unpublished paper by Li Hechun, China Defense Science and Technology Information Center, circulated at the International Cooperation in Peaceful Use of Military Industrial Technology Conference, Beijing, 1991.

[76]"On the Development of Conversion in Large- and Medium-Sized Defense Enterprises," Junshi jingji yanjiu, February 1997, p. 14.

[77]Chai Benliang, "Conversion and Restructuring of China's Defense Industry," in Brömmelhörster and Frankenstein, p. 80.

[78]See Du Renhuai, "*Jungongye shixing 'Yi Qi Liang Zhi' zhanzhi zhidu shentao*" (Military Enterprises Carry Out 'One Enterprise, Two Systems'), in *Junshi jingjixue*, July 1997.

to produce barely 5% of our output [i.e., military products]."[79] Similar comments have been offered to Western visitors—a NORINCO official volunteered that the organization really didn't like to meet military production quotas because it was not as profitable as more lucrative commercial opportunities. Another CDIC official noted that he could obtain profitable market prices for his civilian goods, but had to accept marginal payments for his military production.[80]

The paradoxical outcome of the Chinese defense conversion strategy—that is, promoting conversion to increase defense capabilities but ending up with successful conversion enterprises not being willing to supply defense needs—is mirrored elsewhere in the Chinese case. The implicit strategy behind Beijing's effort to attract foreign direct investment (FDI)—"the open door"—was not to enmesh China's economy with the rest of the world, bur rather to develop import-substitution industries. But the outcome was that China's growth has became heavily dependent on exports and FDI. Of course, China is hardly alone in finding that grand strategies might have unintended consequences.

CONVERSION AND "SOCIAL STABILITY"

But there may be yet another more compelling rationale behind the defense conversion effort: the maintenance of employment. Indeed, a criterion of "success" outlined by Jin Zhude was "dealing with problems of social security" in the defense sector. When a newspaper reporter asked him about the results of defense conversion, he said that while a little profit was being made overall, "the remarkable thing" was that "unemployment was avoided."[81] Jin had earlier written that "timely conversion" had many benefits: it "avoided unemployment, close downs of factories, and social instability caused by sharp reduction of military orders."[82] His remarks were echoed by CAPUMIT official Wu Zhao, who noted that CDIC employment would fall as the PLA cut its forces: "We have to speed up the pace of defense conversion, or mass unemployment will threaten social stability." [83]

Indeed, concern over "social stability" runs throughout commentary, pro and con, about Chinese economic reform in general.[84] In 1993, the Chinese Academy of Social Sciences issued a 300-page report warning of social and ethnic clashes as the

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[79]*Zhongguo junzhuanmin bao (China Defense Conversion News)*, April 2, 1993. My thanks to Evan Feigenbaum of Stanford University for drawing this news clip to my attention. Interestingly enough, this "one factory-two systems" problem has also been noted by foreign joint venture managers—but it is the JV side of the operation that tends to get exploited for its technology and skills.

[80]Bates Gill, "Defensive Industry"; CBNC Asia program on Chinese defense conversion by Robert Stern, 1995.

[81]T. Poole, "China's Army Storms Hong Kong With Goods for Sale," *The Independent*, July 1993.

[82]Jin Zhude and Chai Benliang, "Strategic Thinking of Chinese Conversion in the 1990s," International Cooperation in Peaceful Use of Military Industrial Technology Conference, Beijing, 1991.

[83] Vivien Pik-Wan Chan, op. cit.

[84]This view has been expressed to the author personally by both Chinese and foreign observers. See the useful summary in Steven Mufson, "Chinese Reforms: 'Neoconservatives' Cast a Cold Eye—Challenges to Deng Flow Into the Mainstream," *International Herald Tribune*, November 14, 1995, p. 2, and Chen Yizi, "A Realistic Alternative for China's Development and Reform Strategy: Formalized Decentralization," *Journal of Contemporary China*, No. 10, Fall 1995, pp. 81–92.

economic reforms brought change. Jiang Zemin highlighted the issue in his "12 major relationships" issued in 1995. This concern also runs across the Chinese political spectrum, from liberals concerned about social pressures to conservatives, who see a major source of instability in the masses—perhaps 100 million—of displaced rural folk who have flooded into China's burgeoning coastal cities in search of menial work. We would add that this concern seems to underscore managerial decisionmaking in China. A study of decisionmaking in Beijing-area SOEs by Yuan Lu shows concern for stability a constant undertone.[85] The same issues show up in interviews with joint venture managers, who have mentioned sabotage of machines as a possible consequence of worker unrest. A factory manager in central China once told a potential Hong Kong investor that at least half of his employees were redundant. But he didn't let them go. Why? Because, he said, he cared for his workers. And for his life.

To be sure, China is a "high friction" society. Peasant uprisings and urban disturbances regularly mark Chinese history. Today, rural disturbances, strikes, and ethnic clashes in the West and in Tibet continue. We would not argue that China is on the verge of massive unrest or break-up. But as Chairman Mao once said, a single spark can start a prairie fire. For a regime that operates in the shadow of June 1989 and has, in effect, lost cultural hegemony, the issue of social stability is particularly sensitive.[86]

LESSONS?

These concerns also point up the importance of considering the reform of the Chinese defense industries in the full context of the current Chinese situation. The CDIC is embedded in a system that is undergoing severe transition and has encountered a host of difficulties. Attempts to deal with these problems have generated unintended consequences.[87]

Are there lessons here? Maybe. Certainly the Chinese case demonstrates the difficulties of defense industry reform, not to mention the problems of transition from a planned to a market-oriented economy. We would not deny that there have been market successes in the program (many the outcome of foreign investment or

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[85]Yuan Lu, *Management Decision-Making in Chinese Enterprises*, London: Macmillan, 1996. Yuan Lu, formerly the head of research at the EU-sponsored management training institute in Beijing, is now at the Chinese University of Hong Kong.

[86]On this last point, see, for instance, An Yunqi, "Surveys on Changing Concepts of Value of Chinese Workers," *Dangdai sichao [Contemporary Thinking]*, April 1997, in FBIS-CHI-97-108, April 20, 1997. The article reports on attitude surveys carried out among urban workers between 1986–1996. The surveys reveal decreasing political awareness and increasing concern for personal values; increasing urban income disparities; and large concealed underemployment, not to mention unemployment. All of these factors contribute to social apathy and even social unrest. Even Party members are not immune: "What merits our attention is the fact that the number of party and youth league members who cling to social and political ideals is on the decline each passing day."

[87]All of these problems with the CDIC may have contributed to shakeups in the CDIC bureaucracy: the 1996 retirement of long-time COSTIND head Ding Henggao and his replacement by LtGen Cao Gangchuan; the 1998 reorganization of a civilianized COSTIND under the State Council; and the subsequent creation of the General Armaments Department, headed by General Cao.

foreign cooperation)—shipbuilding (major exports here, but also increased competition from Korea), consumer electronics, aircraft subassemblies (work for Boeing) and motorcycles.[88] But successes have come when the enterprises involved have not strayed far from their core competencies. As Norman Augustine has written,

> Defense conversion must be approached cautiously. The strategy can work, as indeed it has in some instances when companies have moved in adjacent commercial markets: markets that share technologies and customers with a company's established business. But conditions must be right, and expectations must be realistic.[89]

Might there be other solutions to the CDIC dilemma? Might increased arms exports at least keep the weapons lines open? After all, moving into exports is a conventional way of extending the product life cycle and keeping factories open. But in fact, the value of Chinese arms exports have been declining since their peak during the Iran-Iraq war, when China supplied both sides. According to the Stockholm International Peace Research Institute, Chinese deliveries of major weapons systems dropped from US$3.1 billion in 1987 and US$2.2 billion in 1988 to about US$1.1–1.2 billion per year in the 1990s.[90] Arms Control and Disarmament Agency (ACDA) figures show the same trends, though the valuations are slightly different. The high point came in 1988, when China transferred US$3 billion worth of arms. By 1995 those deliveries had dropped to US$600 million. China's major customers were and remain in the Middle East and South Asia, and the categories of weapons system delivered were concentrated on armor, jet fighters, artillery and missiles.[91] But the PRC's current clients—e.g., Myanmar—are not a big market, and in any case, Chinese arms, while cheap, are not that militarily competitive when stacked up against those of Russia. Whether China has a niche market in nuclear and missile technologies with countries like Pakistan and Iran is another question, but if so it is likely that the dollars stay with the marketing organization. In any event, Chinese non-proliferation pledges at the 1997 U.S.-China summit in 1997 will further erode this market.

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[88]For instance, the Changhong Electronics Plant in Sichuan, formerly a defense electronics operation, has switched over to color TV manufacture and apparently dominates the market. See "Chengdu Aircraft Uses High Technology to Grab New Vitality," *Science & Technology Daily*, May 28, 1998 in FBIS-CHI-98-167, June 16, 1998, for a listing of advanced imported technologies acquired for aircraft subassembly work. The article does not mention that Chengdu Aircraft also makes J-7 fighters. NORINCO joint ventures in the motorcycle industry have led to market dominance in that sector and are usually a stop on any industrial tour, but according to an interview with the Japanese manager of one of those model joint ventures (in 1995), profits were still a way off, and in 1998, the Thai backer of one of these plants withdrew from the venture. See Karen Cooper, "CP Pokphand losses mount to US$109m," *South China Morning Post*, May 22, 1998. In August 1998, Motorcycle Center of America, a distributor, announced the cancellation of a deal with another related Sino-Thai joint venture because promised financial statements were not forthcoming. See "Motorcycle Center of America Inc. Terminates Acquisition of Hai-Nan Jia-Thai Motorcycle Company," *PRNewswire*, August 14, 1998.

[89]Norman Augustine, "Reshaping an Industry," p. 87.

[90]In constant 1990 U.S. dollars. See SIPRI arms trade database, 1995.

[91]ACDA, *World Military Expenditures and Arms Transfers 1996*, Tables IV and V.

TAKING THE LONG VIEW

Thus we must take a somewhat long perspective on CDIC issues. The reforms kicked off at and after the 9th Party Congress will take years to sort themselves out. Access to capital is one of the key issues facing the CDIC, though this problem is not limited to the Chinese defense sector. Some of the more aggressive central corporations in the CDIC—NORINCO, for example—have sought to raise capital in both domestic and international capital markets, and no doubt other firms have tried the same. Joint venturing is another way to attract capital. But for most of the CDIC, bank loans appear to be the favored method of finding working capital. Since it is a habit in SOEs to enter bank loans in the account books as income (which never has to be paid back), it is no wonder, as we have seen, that Chinese banks are not crazy about CDIC "opportunities." And given the recent ups-and-downs of Asian stock markets and a general decline in foreign direct investment in China, finding capital by other means is not going to be easy.

The March 1998 reforms suggest that Chinese policymakers have decided to further rationalize the CDIC structure, to "shrink smart," by keeping core defense capabilities within the CDIC and getting rid of nondefense business. How the reforming CDIC will handle the tight vertical integration that marks the socialist industrial structure and how the CDIC supply chain will be managed is not clear. CDIC managers talk about the need to modernize plant and equipment, or set up new lines (if not factories) because the defense plants themselves are obsolete ("the one factory, two systems" issue). To make refrigerators, build a refrigerator plant. And to make Su-27s, take a green field approach: the planes China will build as part of its deals with Russia will not be built in old factories.

Policies that allow structural rationalization and more efficiency, better human resource management practices (particularly workforce training), and flexible managerial leadership are essential to make any headway. (See the Harbin Aviation case below.) Indeed, these are precisely the same remedies that the modernizing civilian sector is adopting. And, of course, these are the recipes recommended by "the market." But even so, the prospect for much of the CDIC is not secure. Will the reforms planned for the CDIC result in further isolation from the more dynamic civilian sector? And while we've seen that parts of the CDIC have benefited from participation in the international division of labor (particularly aviation), a more self-contained CDIC may find it difficult to access those benefits. Finally, it is not enough simply to have grand plans for restructuring. In business, as in war, the human factor is crucial. New structures will demand new managers and more technical talent—and most observers find China facing challenges in developing human capital.

It will be a difficult road ahead. Perhaps the future can be found in the views of Wang Zhongyu, minister of the State Economic & Trade Commission. Speaking at the 1996 National People's Congress, he pointed out: "The relationship between reform, development and stability must be properly handled." A number of consolidations and bankruptcies were being carried out as an experiment. The aim, he said, was to

develop a system of "the survival of the fittest."[92] Indeed, the road to wealth and power is not an easy one.

CASE: HARBIN AVIATION

The Chinese press tends to report good news, especially about defense matters. Still, a long-time observer of Chinese reporting about defense industry issues cannot help but note shifts in contemporary coverage. To be sure, the general tone remains policy-oriented and upbeat. But now it is also politically correct to talk about shortcomings and even describe failures. One lengthy example can be found in reports on Harbin Aviation, one of the key defense industries in China's northeastern Heilongjiang province, an area heavily dependent on SOEs and the defense sector.

A major producer of H-6 (Tu-16) mid-range jet bombers, Harbin Aviation in 1971 produced 200 planes with a claimed output value of RMB1.5 billion. By 1982, total output value had fallen to RMB70 million, about 5% of the output value 11 years previous. Military output accounted for only 5% of this figure.

Harbin's initial response was typical of Chinese state-owned enterprises: opportunistic and somewhat primitive diversification. Make anything that might generate cash, including washing machines, noodle machines, pots and pans, even horseshoe nails. But the market for these items was saturated and production ended up unsold—in warehouses, not households. Needless to say, this outcome was hardly satisfactory.

The enterprise leadership then took a long—and from our experience, an unusually strategic—rethink. They essentially moved to establish themselves in niche markets: minivans, small civilian aircraft and mid-tech pharmaceutical packaging machines, even as they kept up military production. They reformed the enterprise personnel system by instituting a labor contract system, increasing pay differentials and instituting ways of handling surplus labor. By putting excess workers into training and opening up a diversified range of sideline services, supplier and production subsidiaries could absorb surplus labor according to market demands for their products (a common enough practice in nondefense SOEs). They also took steps to start charging for welfare services the enterprise formerly provided for free.

Significantly, Harbin Aviation also became involved in foreign investment and foreign contract work. The enterprise undertook to manufacture parts and subassemblies for foreign aircraft manufacturers, including British Aerospace. They licensed technology from Aerospatiale and Turbomeca for the French Dauphine II helicopter in several configurations. Foreign sales were in the offing.

Heilongjiang papers reported that total output value for 1995 was projected to be RMB30 billion, with profits and taxes paid above RMB5 billion. Not only was this a considerable nominal increase, but more important, compared to the numbers noted above, a four-fold increase in the ratio of profits and taxes to overall output

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[92]See "Losses Grow for Chinese Industry," *International Herald Tribune*, March 15, 1996, p. 15.

value, from the 4–5% range to over 16%. The enterprise was also reported to be one of the nation's top 500 companies in terms of sales.

None of this transformation, of course, happened overnight. The process took most of the 1980s, required substantial support from central, provincial and municipal authorities as well as outside investment.

The lessons the Chinese press draws from this experience could have come from any basic MBA text, especially the importance of good leadership, initiative, training for personnel at all levels, market research leading to high-value-added products, quality control, flexible organization, and a developed sales and service force. And starting up separate, new lines for civilian production. Harbin Aviation thus is a model for "conversion." Other defense sector operations in the province need to learn from the company. The reports say that while Heilongjiang's aviation industries are "in the fast lane," other defense enterprises are "bogged down in a ditch."[93]

For analysts interested in the aims of conversion, however, the implications of the Harbin experience go further than illustrating a successful example of economic reform. The "Dauphine" helicopters come in artillery spotting, armed, shipboard and high plateau models for "both domestic and foreign market requirements." A Hong Kong magazine highlighted a gunship model of the aircraft in an article which discussed operations that might be mounted against Taiwan.[94] Subcontracting spare parts for foreign manufacturers "enables [the enterprise] to learn advanced technology free of change," leading to increased export sales and an increase in the quality of military aircraft produced: "This shows that Harbin Aviation has not relinquished its old aircraft manufacturing business, and it also demonstrated how a sideline business can provide reverse nurture to the main industry."[95]

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[93]Xu Feng and Sun Yongxiang, "Report on Heilongjiang Defense Enterprise Troubles," *Heilongjiang Ribao* (*Heilongjiang Daily*), December 1995–January 1996, in FBIS-CHI-96-032, 15 February 1996. Additional details are drawn from Yitzhak Shichor, "Converting the Military-Aviation Industry to Civilian Use" in Brömmelhörster and Frankenstein.

[94] "Helicopter Gunships of China's Ground Forces," *Kuang chiao ching*, 16 April 1998 in FBIS-CHI-98-128, 8 May 1998.

[95]"Defense Conversion Survey at Harbin Company," *Fendou* [*Struggle*], Harbin, April 1995, in FBIS-CHI-95-108, 6 June 1995.